



Publications Mail Agreement #40018238

# CANADIAN Healthcare Technology

CANADA'S MAGAZINE FOR MANAGERS AND USERS OF INFORMATION SYSTEMS IN HEALTHCARE | VOL. 29, NO. 1 | FEBRUARY 2024

## INSIDE:

**OUTLOOK  
AND TRENDS**  
PAGE 16

**Robots that do ultrasounds**  
Researchers and clinicians in Saskatchewan are testing robots that can conduct ultrasound exams. The devices can talk to patients in many languages and they can even apply the gel.  
Page 6

**Pediatric trauma training**  
Physicians in Montreal have partnered with a British tech company to create a virtual reality-based solution for advanced training in pediatric trauma. It can be used anytime, anywhere.  
Page 10

**Breast cancer registry**  
Breast Cancer Canada has launched Canada's first national registry to collect patient reported outcomes for breast cancer. It will help guide research and management of the disease for women in the years to come.  
Page 12



PHOTO: COURTESY OF CHEO

## How CHEO keeps its equipment up-to-date

The Children's Hospital of Eastern Ontario (CHEO) keeps 3,800 desktops, laptops, notebooks, kiosks and shared workstations current through a device lifecycle management program with Nova Networks. Before the agreement, computer equipment might have been antiquated and well past its prime. Pictured: CHEO's manager of IT services Brian Vezina and CIO Mari Teitelbaum. **SEE STORY ON PAGE 4**

## Australia deploys AI in radiology across the country

BY JERRY ZEIDENBERG

**C**HICAGO – An Australian diagnostic imaging organization has surged ahead with an enterprise-scale implementation of AI, deploying Annalise.ai to 250 sites and to over 400 radiologists across the country.

The group, called I-MED, provides reading and reporting services to clinics and public and private hospitals throughout Australia. Like other DI organizations around the world, its radiologists had been finding it difficult to keep up with the fast-growing demand for exams.

AI was seen as a solution for improving quality while maintaining throughput and reducing stress and burnout of radiologists. By implementing artificial intelligence

across the enterprise, I-MED has leapfrogged most other reading groups worldwide, most of which are still testing AI in small-scale projects.

"Australia is advanced, compared to the rest of the world, when it comes to deploying AI," said Dr. Catherine Jones, a cardiothoracic radiologist at I-MED who helped lead the project. She is also a professor of clinical imaging at the University of Sydney and a clinical consultant with Annalise.ai.

Dr. Jones outlined how and why I-MED implemented AI software enterprise-wide at

the annual RSNA radiology conference in late November. Addressing an audience in Chicago, she discussed the approach used by I-MED and explained how the organization handled change management and the use of metrics.

She said I-MED had to develop much of this methodology on its own, because no one else had done such a large-scale deployment of AI and there were no cases to model their own upon.

I-MED developed the Chest application, called Annalise CXR, in a joint venture with AI technology company Harrison.ai. The solution was deployed in Australia in 2021 and can detect more than 120 findings; it's now used daily by I-MED's 400+ radiologists.

In an initial test of the AI system for chest

CONTINUED ON PAGE 2

# Australians show the way in large-scale AI deployment for radiology

CONTINUED FROM PAGE 1

X-ray exams, I-MED set several targets for success. The software performed well, with the tool doing three times better than expected on several of the reported metrics.

I-MED had 11 of its radiologists pilot the software for six weeks. All of them used the Annalise.ai solution to assist them with their chest X-ray readings.

- Some of the key aspects of the test:
- I-MED determined that if the AI tool caused the radiologists to change their reports 1 percent of the time, that would be a good outcome. It would also be enough of a quality improvement to justify rolling out the software to the full cohort of 400 radiologists across Australia. In the post-pilot survey, the 11 participating rads reported they changed their reports 3.1 percent of the time – a significantly higher rate than expected.
  - It was estimated that patient management would change 0.5 percent of the time because of the AI findings. In actuality, it changed 1.4 percent of the time.
  - In the pilot, I-MED management didn't want the radiologists asking for extra imaging more than 3 percent of the time

because of the AI findings. “The last thing we wanted was to generate more demand for a lot more CTs,” said Jones. In the end, there was only a 1 percent increase in further imaging recommendations. (Almost all of them were to investigate suspected lung cancers or cases of osteoporosis.)

Moreover, the organization thought that if 50 percent or more of the radiologists felt the software positively impacted their work, it would be considered a success. However, after the six weeks passed, 90 percent of them reported the tool positively impacted their CXR reporting.

“The radiologists who were the most opposed to AI became its biggest supporters, after they had used it,” said Dr. Jones.

With 250 sites across a large geographic area, and with different types of sites – from clinics to large hospitals – and a range of users with various degrees of buy-in, a lot could have gone wrong, she said.

However, with good planning, the pilot project worked and showed excellent results. For that reason, the organization rolled out the chest X-ray AI tool and many others to its full cohort of radiologists across continent.



Dr. Catherine Jones, cardiothoracic radiologist

“We planned out the [initial] deployment for about four months before commencing it,” said Dr. Jones. “This was paramount to making sure we got it right.”

With the full rollout, she noted that it was done in phases, as Australia is such a big country, and I-MED serves a wide range of customers. It operates three different PACS and three RIS and also provides tele-radiology services.

“With the wider rollout, we had to stage

it. We couldn't go from zero to hero in one step,” she quipped. The company also added many different AI tools.

In addition to assisting radiologists with reading exams, such as chest X-rays, Dr. Jones said I-MED wanted a tool that would help with triage. The organization found that at the end of the day, urgent cases were still sitting in the queue.

AI software could help with this, shifting urgent cases to the top of the stack and routing them to available and qualified physicians. Moreover, in future, the company wants to add AI report generation.

But in getting from zero to organizational acceptance of AI, Dr. Jones explained there were several components required to get things right.

First, I-MED had to ensure that it had the in-house skills to manage the project, from AI tool selection to deployment of the system.

To get started, it decided to begin with the most commonly used modality, which is chest X-ray. I-MED then selected Annalise.ai as its vendor. “We knew it had excellent accuracy, based on internal and external validation.”

After deciding the direction to head in, I-MED had to educate its radiologists about the project and AI in general. It had to put together an education and training program.

Dr. Jones said that early engagement with the users – the radiologists – was key. In order to help the project succeed, moreover, they had to make sure that essential stakeholders were on board.

“You must identify who those people are, including senior executives and influential radiologists, and you must have those people sponsoring the project. They will have to be supportive,” she said.

She said, moreover, that you won't get anywhere without having top people from the IT department aligned with the team.

Next, she said, comes the discovery phase. What is it that's needed at every site, in terms of infrastructure? And secondly, how do the radiologists interact with the technology? A solid base must be in place before deploying the AI, and the radiologists must be comfortable with all the underlying technologies in order to benefit from the new systems.

Finally, a change management piece must be deployed. Dr. Jones said constant and effective communication is required. “That means, no one at the end of this process could possibly say, ‘nobody told me this was coming’.”

She asserted that every week, radiologists would receive emails, memos and messages on Teams. Many of the messages

CONTINUED ON PAGE 19

## Coming up in 2024

Issue Date	Feature Report	Focus Report
March	Interoperability	Hospital at Home
April	Mobile Solutions	Artificial Intelligence
May	EHR / EMR Trends	Precision Medicine
June/July	IT Resource Guide	Point-of-Care Systems
September	Community Care	Start-ups
October	Virtual Care	Physician IT
Nov/Dec	AI / Analytics	Cardiology

For advertising or editorial inquiries, contact  
Jerry Zeidenberg, Publisher, [jerryz@canhealth.com](mailto:jerryz@canhealth.com)

**Healthcare Technology**  
www.canhealth.com



## Healthcare Technology

CANADA'S MAGAZINE FOR MANAGERS AND USERS  
OF INFORMATION TECHNOLOGY IN HEALTHCARE  
Volume 29, Number 1 February 2024

Address all correspondence to Canadian Healthcare Technology, 1118 Centre Street, Suite 204, Thornhill ON L4J 7R9 Canada. Telephone: (905) 709-2330. Fax: (905) 709-2258. Internet: [www.canhealth.com](http://www.canhealth.com). E-mail: [info2@canhealth.com](mailto:info2@canhealth.com). Canadian Healthcare Technology will publish eight issues in 2024. Feature schedule and advertising kits available upon request. Canadian Healthcare Technology is sent free of charge to physicians and managers in hospitals, clinics and nursing homes. All others: \$67.80 per year (\$60 + \$7.80 HST). Registration number 899059430 RT. ©2024 by Canadian Healthcare Technology. The content of Canadian Healthcare Technology is subject to copyright. Reproduction in whole or in part without prior written permission is strictly prohibited.

**Canada**

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

**Publisher & Editor**  
Jerry Zeidenberg  
[jerryz@canhealth.com](mailto:jerryz@canhealth.com)

**Office Manager**  
Neil Zeidenberg  
[neilz@canhealth.com](mailto:neilz@canhealth.com)

**Contributing Editors**  
Dianne Craig  
[dccraigcreative@yahoo.ca](mailto:dccraigcreative@yahoo.ca)

Dianne Daniel  
[dianne.l.daniel@gmail.com](mailto:dianne.l.daniel@gmail.com)  
Dr. Sunny Malhotra  
Twitter: @drsunnymalhotra

Norm Tollinsky  
[tollinskyn@gmail.com](mailto:tollinskyn@gmail.com)

**Art Director**  
Walter Caniparoli  
[art@canhealth.com](mailto:art@canhealth.com)

**Art Assistant**  
Joanne Jubas  
[joanne@canhealth.com](mailto:joanne@canhealth.com)







# The new era of AI is here

See the power and potential of AI as your copilot to work smarter, not harder.

Join an upcoming livestream.

[Explore sessions](#)

# CHEO keeps up to date through lifecycle program with Nova Networks

BY NORM TOLLINSKY

Overseeing the purchase, repair and replacement of 3,800 desktops, laptops, notebooks, kiosks and shared workstations at the Children's Hospital of Eastern Ontario (CHEO) used to be a lot more of a headache before it signed a device lifecycle management agreement in 2019 with Nova Networks, an IT services company with 400 staff and offices in Ottawa, Toronto, Calgary, Hudson, Quebec, and Ogdensburg, New York.

"We used to sit with devices that would age out before we got them replaced," recalled CHEO chief information officer Mari Teitelbaum. "We struggle to keep up with the evergreening of our end-user devices because it always seemed to be a lower priority than calls to the helpdesk and the projects we were working on."

As part of its lifecycle management offering, Nova Networks works with CHEO to assemble a catalog of approved devices and schedules when models are to be replaced. It warehouses an inventory of spares for just-in-time replacement, loads the devices with the required software, delivers and can deploy them and provides repair services as required.

"The main problem it solves is ensuring that end-users have a positive experience with the devices they're using because the last thing they want is to work with an old, antiquated computer that should have been retired two or three years earlier," said Tyson

Roffey, Nova Networks' vice-president, digital health. "By participating in a device lifecycle management program, CHEO's equipment won't be any older than, say, five years. That's the most important benefit because it directly links to patient care."

Warehousing of replacement devices at Nova Networks also benefits CHEO because "it insulates us from supply chain shortages," said Brian Vezina, CHEO's manager of IT Services. If a computer needs to be replaced on short notice, chances are Nova Networks already has it in inventory.

"If there's a ransomware attack or a situation like what happened during COVID, when everyone was scrambling to find inventory, a lifecycle management client would be able to sleep better knowing we're holding inventory for them," added Marty Belair, Nova Networks' director of sales.

Just having replacement inventory off-site is important because finding space in the hospital to store computers was always a challenge, noted Teitelbaum. And offsite warehousing benefits CHEO financially because the hospital only pays for the equipment when it's deployed.

"We receive all of CHEO's equipment at our integration centre and we do all of the imaging and asset tagging prior to deployment," explained Belair. "The image has all of CHEO's approved applications baked into it, so we get a device, and load the image because it's more efficient to have the applications installed in a base image rather than installing the applications one at a time."

Nova Networks staff can also schedule the installation of the equipment with the end-user and remove the retired device for decommissioning and disposal, even supplying CHEO with a certificate guaranteeing data security.

Equipment under warranty is repairable by Nova authorized technicians,



Marty Belair

Tyson Roffey

freeing CHEO's staff from having to spend time dealing with hardware issues.

CHEO chooses to purchase its equipment outright, but a Nova Networks sister company offers hospitals customizable financing arrangements, including leasing and the inclusion of software and support services as part of a per user or per device monthly fee.

The lifecycle management program is especially popular with smaller hospitals that don't have the staff dedicated to making sure everyone's device is refreshed on an ap-

proved cycle, said Belair. "Otherwise, devices could remain in service until they break or their OS is so old that it's unsupported."

Nova Networks works with 14 to 16 smaller hospitals in Eastern Ontario, as well as other hospitals in Northern Ontario and across the country, several of which have opted for its lifecycle management program. It also provides monitoring and management services, cybersecurity consulting, and staff augmentation services.

Belair cited the example of a curbside pickup project the company carried out for CHEO during the COVID-19 pandemic when approximately 1,000 remote workers had to be supplied with new security and remote access software.

"We had to schedule and co-ordinate every single CHEO user working remotely to come into a quarantine location with their device. We had staff at the location greeting people, disinfecting their device and adding the software because it wasn't something that could be pushed out remotely. We had to run a script on each device, so we were able to offload a major task for the client while they were busy trying to deal with the pandemic."

It was a great example of how Nova Networks serves as an extension of CHEO's IS department and how we can call on them when needed, agreed Vezina. "We were so used to doing deployments with everyone on the network, and with so many of our people gone home, we needed to do it differently, so it was great to have Nova Networks help with the task."

## Humber River Health applies AI to Emergency Department care

BY SHAHANA GAUR

TORONTO – Humber River Health aims to establish a new level of quality in emergency care with a project called Emergency Department AI-Enabled Virtual Queue and Time Slot Management Application (EDQA).

This ground-breaking project, backed by a grant from SCALE AI through the AI for Healthcare Initiative, aims to transform the patient experience in the Emergency Department.

Humber's Apotex Emergency Department (ED) is the busiest in the province, and hosts almost double the number of ambulances compared to neighbouring hospitals. Humber sees over 350 patients each day, with 75 or more arriving by ambulance.

Caring for a large and diverse patient population daily, the ED team faces the critical task of delivering prompt and effective care under constant pressure. This high-volume patient influx has the potential to strain resources and test the ED's ability to maintain operational efficiency and patient satisfaction.

It is within this challenging environment that the EDQA is set to make a transformative impact.

Humber will study and apply AI and Machine Learning to forecast and opti-

mize patient queues in the ED, determine the best pre-arranged time slot per patient, and dynamically adjust these time slots to continuously optimize and manage the queue of patients using real-time/near-real-time data.

Patients will have remote access to a digital health platform in the form of an app, which will be leveraged as an intermediary between them and the EDQA.

Unlike fixed appointments, this system will allocate a flexible time slot for a patient's ED visit, which is based on real-time ED activity, patient urgency, and resource availability, accounting for the unpredictable nature of emergency care. This will prevent low acuity patients from spending extended periods of time in the waiting room.

Barbara Collins, Humber's president and CEO stated, "Being the busiest Emergency Department in Ontario, we are continuously leveraging technology to work for staff and physicians, giving them more time to spend with patients, eliminating inefficiencies, and reducing the chance of errors."

She added, "AI furthers our ability to revolutionize the patient experience and deliver even higher quality care, resulting in a better patient journey from start to finish."

The overall goals from this project are to achieve more efficient use of health

system resources and improve the patient experience by improving patient flow, reducing occurrences of unexpected surges in ED demand, and eventually redirecting the volume of non-urgent patients accessing the ED to the most appropriate care.

Peter Bak, Humber's CIO, emphasizes, "Our goal is not just to manage patient queues but to revolutionize how patients interact with our ED. We are shifting from a static to a dynamic, patient-centered approach."

Several data sources feed into this AI application, including real-time patient

**The AI algorithm will allocate a flexible time slot for a patient's emergency visit, based on a variety of factors.**

flow information, historical ED visit data, and patient triage information from Humber. Additionally, regional healthcare data might be integrated to provide a more comprehensive understanding of patient inflow patterns and regional healthcare demands.

Humber will be working with partners Deloitte and the MEDITECH Collaborative to test this initiative.

While Humber is responsible for inte-

grating the AI application within their ED operations and providing primary data for AI learning, Deloitte brings expertise in AI integration and healthcare system optimization, ensuring that the AI application aligns with the operational needs of Humber.

The MEDITECH Collaborative is a group of hospitals represented by Mackenzie Health, Oak Valley Health, Guelph General Hospital, Queensway Carleton Hospital, Halton Healthcare, and Ontario Shores. This group has expressed interest in adopting this application and will provide critiques and validation of the AI models and designs, ensuring the solution confers optimized outcomes and benefits to the group and a broad range of potential future adopters.

**Implementation:** The initial phase involves developing the data model by reviewing the current processes and space in the ED. The data model will then be used to develop the AI engine.

Controlled testing and validation with the AI engine will be done, as well as integration with the patient-facing application.

As part of the beta testing, continuous analysis of the AI application's performance in managing patient flow will be conducted, so the algorithm can be refined for accuracy and efficiency.

Upon successful pilot results, the ap-

CONTINUED ON PAGE 10





What customers are saying about RealTime Medical



**Dr. Eda Wallace**  
*Radiologist*  
*Grand River Medical*  
*Imaging Association*

“ RealTime Medical has always been ready to help. We have benefited greatly in these stressful times.



**Dr. John Bennett**  
*Radiologist*  
*RealTime Medical*

“ Amazingly reliable and excellent at seamlessly integrating with the hospitals and clinics PACS/RIS system.

# Do you have a DI Business Continuity Plan in place?

In today’s environment, it’s imperative to have a robust plan in place to safeguard your Diagnostic Imaging Operations. Whether you face a technical problem, a cyber attack or any other unexpected event, our Business Continuity Solution is tailored to provide a ready means for you to continue to interpret exams generated by your diagnostic imaging department.

RealTime Medical DI business continuity benefits		
If our systems go down, will these be covered?	With RTM DI business continuity	Without RTM DI business continuity
PACS	✓	✗
RIS	✓	✗
Modality worklist	✓	✗
Voice recognition	✓	✗
Internet outage	✗	✗
<b>Network down:</b>		
Entire network affected	✗	✗
Only diagnostic imaging affected	✓	✗

The RealTime Medical DI Business Continuity Assurance ensures you can:

- Minimize interruptions to patient care
- Continue to image patients
- Continue to provide final reports
- Have an archive of images acquired during the downtime

Make sure your system is protected during downtimes with RealTime Medical

**BOOK A FREE CONSULTATION**  
<https://resources.realtimemedical.com/di-business-continuity-benefits>

**Whenever needed, RealTime has your back**

# Saskatchewan researchers test a robot that can do ultrasound exams

BY NORM TOLLINSKY

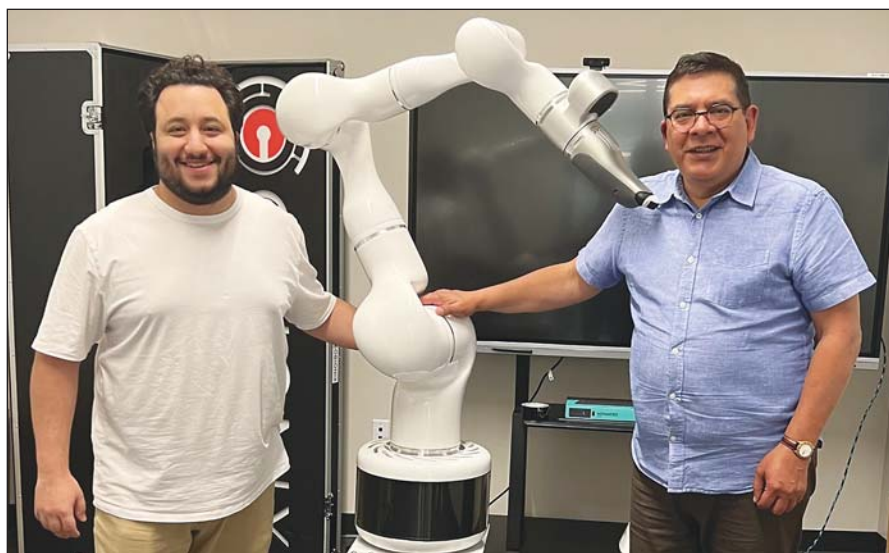
A telerobotic medical imaging device – developed by Waterloo, Ontario-based Cobionix – is undergoing trials in Saskatchewan to deliver remote-controlled ultrasound exams. The work is part of an initiative by the University of Saskatchewan's Virtual Health Hub and the Saskatchewan Indian Institute of Technology (SIIT) to improve access to healthcare for remote communities.

The AI-enabled, seven degrees of freedom ultrasound robotic arm, called Codi, is designed for operation without the need for a sonographer onsite, facilitating the delivery of diagnostic imaging to underserved communities and eliminating the need for travel to distant health centres.

"We are at a pivotal time in the development of technology with artificial intelligence, 5G telecommunications and robotics enabling virtual care," said Dr. Ivar Mendez. "These technologies will transform the way we deliver healthcare in the future. The problem is that we're not prepared for it."

In addition to providing Cobionix with the clinical trial data for approval of the device by the FDA and Health Canada, the acquisition of the device by the Saskatchewan Indian Institute of Technology will provide Indigenous students with the training required to operate these transformational technologies.

The Saskatchewan Indian Institute of Technology trains Indigenous learners in campuses across the province to qualify as practical nurses, mental health workers and radiology technicians. It also prides itself as a world leader in the delivery of robotic pre-natal sonography, having per-



Nima Zamani, CEO of Cobionix, left, and Dr. Ivar Mendez, director of virtual care and remote presence robotics at the University of Saskatchewan, with Codi, an AI-enabled robotic ultrasound device.

formed more than 500 ultrasounds using another telerobotic ultrasound solution from AdEchoTech, a medical device manufacturer in France.

Dr. Mendez describes AdEchoTech's Melody device as a first generation telerobotic ultrasound solution, as it requires the presence of an onsite support person in the remote community to position the robotic arm on the patient. The more advanced Cobionix robotic arm can be operated without the need for an assistant at the patient's location.

"We're especially interested in providing remote care to populations that are underserved, and the most underserved populations are Indigenous populations, so we want to train Indigenous students to use

these technologies of the future," said Dr. Mendez. "This is how we change the narrative of Indigenous youth contributing to the country."

The deployment of telerobotic ultrasound technology to remote, underserved communities by the University of Saskatchewan's Virtual Health Hub and the Saskatchewan Indian Institute of Technology, he added, can serve as a model for the rest of Canada.

"The reason we chose to focus on ultrasound is because ultrasound is one of the most common imaging diagnostic tools for many things, but we were specifically interested in pre-natal care.

"There is a high rate of pregnancies among young girls in Indigenous commu-

nities and they're often high-risk pregnancies. There's no availability of ultrasound in many of these communities, so if you are a pregnant young person, you need to be sent to a city for diagnostic imaging. You're away from your family and put up in a hotel.

"The mortality rate for newborn babies in Indigenous communities," said Dr. Mendez, "is 10 times higher than in the rest of Canada and one of the reasons is we don't have good pre-natal ultrasound and pre-natal care in remote communities."

While the current focus is on pre-natal ultrasounds, Dr. Mendez notes that algorithms will be developed to also perform gall bladder, kidney and other ultrasounds.

The AI-enabled Cobionix device is equipped with speakers, microphones and ten cameras. It can "look at a patient and talk to a patient the same way you talk to Alexa or Siri," said Nima Zamani, CEO of Cobionix. "It can tell a patient to lie on the bed and lift up their shirt. It will deposit gel on the patient's abdomen and perform the procedure."

It's equipped with natural language processing capability for communication and reasoning, position estimation smarts and object detection capability.

And unlike most humans, an AI-enabled robot can converse with patients in multiple languages.

"All of the computation is done inside the robot to avoid problems with latency," said Zamani. "We spent a lot of time miniaturizing, designing it and building it right here in Ontario."

Cobionix was founded in 2021 at the University of Waterloo's Velocity incubator and in June 2023 raised \$2.8 million in seed funding to commercialize Codi.

## AI-enabled platform helps patients to create evidence-based care plans

After 26 years as a registered dietitian working with chronic disease patients, Loreen Wales – founder of My Viva Inc. and designer of My Viva Plan®, is on a mission to close a gap in healthcare delivery that frustrated her from day one: the lack of practical, evidence-based tools to support people in managing their personal health and wellness goals.

Now, through My Viva Plan, Wales is poised to disrupt how personalized care plans are generated and managed using the innovative care plan platform. The system saves time for care teams who typically invest hours to create evidence-based, personalized plans for their patients (and thus frequently don't), empowers patients to make lasting changes, and enables providers to work more efficiently to improve outcomes and better-managed chronic conditions.

"I realized that all we have at our disposal – in clinic and tertiary care settings – to give to patients related to wellness goals are verbal recommendations, general handouts or general websites," said Wales. "They still have to go home and figure out how to put all the advice and direction together."

My Viva Plan enables chronic disease patients to manage their health proactively in partnership with their healthcare team, improving both patient outcomes and the efficiency of the healthcare professionals.

The online platform is unique in that, after entering a patient's personal data, it produces an evidence-based self-care plan along with AI-powered tools that empower the patient to better self-manage their activities between visits with their healthcare team. The interactive experience helps build intrinsic motivation – an essential feature for sustainable behaviour change.

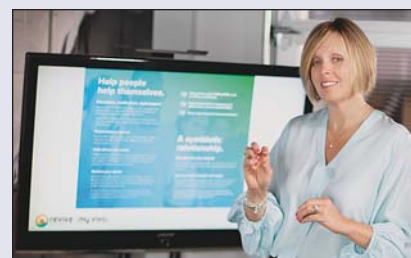
An added complexity in the chronic disease management space is that patients typically interact with multiple providers, including social workers, nurses, primary caregivers, specialists, pharmacists and dietitians, each of whom has a different 'take' on managing the condition.

Different dietary suggestions, different exercise and activity recommendations, and far too infrequently addressed mental health and stress management strategies. This siloed approach is difficult for patients to navigate and manage,

frequently resulting in their giving up trying to do so.

Wales's aha moment came in 2013 when she decided to automate a clinical process she had developed to help improve patient outcomes and reduce the risk of disease by engaging them in their physical and mental health.

What differentiates her company's approach in the digital health space is an



Loreen Wales, founder of My Viva Inc.

unwavering focus on using digital technology, which is far more scalable than humans to assemble evidence-based guidelines and research in a stringent privacy and security-based solution designed for patients and providers to collaborate.

From meal planning with recipes and fitness scheduling, to building grocery lists

and offering daily coaching, to providing a nutrition encyclopedia and access to on-demand fitness videos, and connecting to wearable devices, the comprehensive software-as-a-service (SaaS) program – called My Viva Plan® – is designed to improve blood pressure, cholesterol and blood sugar control; manage weight, stress and anxiety; and improve sleep quality.

The process starts with a basic patient assessment and then uses advanced algorithms, machine learning and data analytics to assist healthcare professionals in developing and delivering a personalized program that is easily tracked and monitored on any smartphone or device.

"It enhances the support the healthcare professional can give to the patient in the time-pressured environment of healthcare," said Wales. "No longer is it just the simple words of 'you need to eat balanced, here's a document that might help' and then letting them go off into the wild abyss. Now, the healthcare professional and patient are figuring things out together."

To ensure strong privacy, security and data protection, My Viva leverages a suite of validated tools from Privacy

CONTINUED ON PAGE 19



# The future of infusion therapy is data informed

New infusion system puts powerful data in clinicians' hands.

In our increasingly strained health-care system, the challenges of managing patient safety, clinical workflows, and costs have become more intricate and complex. Transformative solutions are needed in almost every aspect of healthcare delivery. There is a growing expectation, from healthcare providers and patients alike, that new technologies will be available to help deliver better care.

This isn't an unreasonable expectation. After all, the adoption of new medical technologies has contributed to the evolution of care, treatment options and hospital workflows. It has also introduced complexities. Sometimes, expected benefits have not always materialized.

Given that over 80 per cent of those who visit a hospital will require some form of infusion treatment, infusion care is an important aspect of healthcare that should continually seek out the benefits of new technologies.

Helen Edwards, a registered nurse for 45 years, including over two decades in clinical informatics, recalls the days when nurses had to monitor infusions drop by drop, and manually calculate medication administration rates.

Today, smart pump technology is seen as the standard, incorporating drug libraries and dose error-reduction safety features to help clinicians deliver safer intravenous infusions.

While technologies have advanced, Helen notes that the associated sharing of clinical infusion information has not progressed at the same rate.

"The technological advancements can't just be about the pump itself," she says. "We need to look at how each advancement is impacting the entire ecosystem that supports the administration of intravenous fluids and medications, including how we can improve communications across the multiple departments and networks."

With a range of technologies used in hospitals across the country, enhanced interoperability between infusion devices and other data systems, such as electronic health records (EHRs), presents an opportunity to improve safety and efficiency.

Recently approved in Canada, Fresenius Kabi's Ivenix Infusion System could be an option to realize the benefits of institution-wide infusion pump integration. With interoperability as a critical feature, the system puts infusion-related data at the fingertips of clinicians, helping them to make informed decisions in real-time.

Healthcare Excellence Canada indicates that effective communication about medications within hospitals is a critical component to the delivery of safe care. At the same time, a recent report from Canadian Institute for Health Information (CIHI) found that the rate of potentially preventable harm to patients in hospitals has increased since the pandemic.

For these reasons, it's important to recognize that interoperability, which facili-



tates a closed-loop medication system, might help reduce the potential for errors. This means, for example, that medication parameters flow from the prescriber's orders in the EHR to the infusion pump.

Steve Schiefen, Vice President of Implementation Services at Fresenius Kabi says, "We know auto-programming through EHR integration can help minimize medication errors, that's why the ability to communicate with other systems was central to the design of the Ivenix Infusion System."

"Another way the system can help reduce errors is through an onscreen barcode, as opposed to barcode stickers – which can be misapplied, wear away or fall off, breaking the information flow of the

closed-loop system," he continues. "When our system was developed, every aspect of infusion delivery was re-evaluated and reimaged to reduce the complexities around infusion system use."

Whether due to cost, lengthy procurement processes or the daunting task of implementation, it's not uncommon for hospitals to use technologies that are past their prime. Unfortunately, this can mean hardware and software updates take longer, and are harder to implement.

"When this happens, clinicians may be required to find workarounds to apply care protocols or meet expected practices," says Helen. "It's important to identify new technologies that reduce the need

for things like annual calibration or frequent maintenance, which can take the device out of service for extended periods of time."

An advanced infusion management platform should facilitate enterprise-wide, centralized management of the entire pump fleet. A shift from hardwire to wireless software updates allows for the expeditious implementation of security and information updates.

"The ability to implement cybersecurity updates across an entire fleet, without wasting time hunting and gathering each unit, for example, not only keeps more devices on the floor for patients, but it also helps the hospital put up defenses quickly against malicious actors," Edwards says.

While introducing new technologies is becoming more critical, it's not an easy task. "The Ivenix Infusion System was built in a way that simplifies integration and accelerates pump adoption," says Schiefen. But when introducing any new system, he explains that it's important that organizations work closely with vendors throughout the implementation process. "They've been through it before and can offer solutions and guidance."

As the Canadian healthcare system continues to face challenges, innovative technologies will be essential in heralding a new era for healthcare delivery. Fortunately, with opportunities to reduce medication errors and optimize care coordination, new technologies can empower the next generation of healthcare providers with easy-to-use solutions that allow for more time with patients.

*This article was supplied by Fresenius Kabi Canada.*



**IVENIX**  
INFUSION SYSTEM

## Rethinking infusion delivery

- Seamless integration with electronic health records
- Large smartphone-like touchscreen
- No need for annual calibration
- Robust cybersecurity infrastructure

Learn more at [Ivenix.ca](https://Ivenix.ca)




# AskEllyn uses AI to bring supportive care to breast cancer patients

BY ELLYN WINTERS

One in eight women will be diagnosed with breast cancer in their lifetime. This year in Canada, an estimated 28,600 women will be diagnosed with the disease and 5,500 women will die from it.

Moreover, an estimated one in four women diagnosed with breast cancer will experience post-traumatic stress disorder (PTSD) as they contend with dramatic changes to their long-term health, bodies, and family relationships and grapple with the continued threat of recurrence.

On March 10, 2022, I became one of those women.

For a woman who had only darkened the door of a hospital to have two babies and who had never experienced stitches or a broken bone, I found myself on a 256-day journey through the Canadian healthcare system that included three hospitals, a double mastectomy to aesthetic flat closure (AFC), 12 weeks of chemotherapy, 15 rounds of radiation, two MRIs, a full body CT scan, lung CT scan and bone scan.

I will be on a drug to reduce my estrogen levels and reduce my risk of recurrence for a minimum of five years. I now take anti-anxiety meds daily.

Every six months for the next three years I will return to the chemo suite for an infusion to strengthen my bones and prevent the osteoporosis that can occur as a result of my treatments.

As a first-time patient in the system, I embraced the notion that knowledge is power. I read all I could and conducted re-

search to be prepared for my medical appointments and advocate for myself. My surgeon complimented me on my collaborative approach during my post-operative follow-up.

I came to realize that not all patients are like me. Some are so completely traumatized by the diagnosis they are rendered incapable of thinking let alone asking questions.

Some get drawn into dark places on the Internet where emotions run hot and misinformation is propagated.

There are also many patients for whom English is not their first language, or who believe one does not challenge the authority of a doctor. Others come from a cultural background where breast cancer is still considered to be a shameful diagnosis that is not openly discussed with even close family members.

These individuals find themselves in an overwhelming system, on a health journey they don't fully understand and in a situation where they may feel powerless and isolated.

That recognition of the problem, viewed through the unique lens of a patient's lived experience drove me to do something about it.

So, with the help of a talented team of AI experts (Gambit Technologies, <https://gambitco.io/>) we created AskEllyn.ai, the world's first conversational AI – think a chatbot with emotional intelligence – for those on the breast cancer journey and their loved ones.

There is much conversation about the role of AI in healthcare today. For instance, AI can be applied to administrative tasks such as scribing, to augment and analyze imaging, or to provide virtual nursing sup-

port. All of these applications reside within the context of the healthcare system.

In our design of AskEllyn, we wanted to put the focus on the person, not just the patient. We were careful to design her to never dispense medical advice. We wanted to create a virtual companion that could be



Ellyn Winters led development of the solution.

there at 2 in the morning to provide empathy, emotional support, comfort and the knowledge of someone with lived experience. We wanted her to be useful not just to the person diagnosed with breast cancer, but also to their loved ones, friends and support network.

Leveraging the power of OpenAI and ChatGPT, AskEllyn is completely multilingual. Users can chat with her in any lan-

guage of their choosing and she'll respond in fluent Punjabi, French, Italian or Arabic – to name just a handful of the languages she can capably handle.

Questions that breast cancer patients and family members may have include: How do I tell my kids I've been diagnosed with cancer? How can I support my wife through her diagnosis? How do I prepare for an upcoming meeting with my surgeon? What should I bring with me for a chemo appointment? How fast will my hair grow back? AskEllyn can provide fast answers, in many languages.

AskEllyn is also private and free. We gather no personal data. We keep no data records. Yes, you can use her to prepare for a surgeon's meeting or find ways to best support your spouse.

But you can also complain to her, rage at her, or ask the questions you'd never be brave enough to ask someone in real life. To ensure she is always free to those who need her, we have established a non-profit, called The Lyndall Project to fund the deployment of this solution not just here in North America, but around the world.

Indeed, we already have interest from several corporate partners and countries who see the potential to use this new form of conversational care to more fully support women.

*Ellyn Winters is a breast cancer survivor and advocate, the author of the bestselling book Flat Please, Hold the Shame, co-creator of [www.askellyn.ai](http://www.askellyn.ai) the world's first conversational AI for breast cancer, and the CEO of The Lyndall Project, a non-profit dedicated to the advancement of conversational care to enhance the patient journey.*

## Empego platform aims to modernize today's pharmacy practice

BY NEIL ZEIDENBERG

MONTREAL – Today's pharmacists are doing far more than dispensing medications – increasingly, they're performing advanced clinical interventions. As examples, they can prescribe medications for treatment of UTIs, pink eye, hay fever and acne, and they can also administer flu, COVID and RSV vaccinations to patients.

However, the software for managing these interventions by pharmacists hasn't kept pace – until now.

Empego Technologies Inc., a Montreal-based software company which launched in 2020, is now used in more than 200 pharmacies and has developed an innovative new platform that tracks medical encounters. It also aims to modernize today's pharmacy by using standardized questionnaires to improve medical consultations and follow-ups, so pharmacists can optimize their time when caring for patients.

"Working as a pharmacist, I wasted much time asking the same questions to patients and experienced an inconsistency in the accumulated data," said

Philippe Chartrand, founder and CEO. "It was clear we needed to standardize care workflows if we were going to provide the best patient care possible."

Empego recently announced a partnership with Shoppers Drug Mart/Pharmaprix to test its system at five Pharmaprix-affiliated locations in Quebec in a one-year pilot. Pharmaprix is the name that Shoppers Drug Mart goes by in Quebec, and the project aims to measure the efficiency of Empego's software for pharmacy care clinic owners and their teams. The pharmacies are located in Montreal, Quebec City and Gatineau.

Empego features two modules – one for consultations and another for follow-ups.

The consultation module digitally screens the patients by asking a series of questions to understand the reason for the consultation before meeting with a pharmacist. The questionnaire is accessed through a smartlink sent to a user's phone (text message) or by email. Questionnaires are to be answered prior to arrival.

A complete and legible report is generated based on the answers to the questions, and any red flags can be quickly identified beforehand. Pharmacists can then understand the issues they need to consider and

dispense advice more effectively.

The follow-up module automatically programs follow-up appointments and asks the patient questions about medication adherence, tolerance and efficacy and the patient's health in a timely manner. Pharmacists can check on the progress of a patient's medication and therapy via the electronic system, thereby reducing the time spent on the phone.

On a date (set in advance), patients receive another questionnaire by email

**Empego assists pharmacists with clinical interventions, such as diagnosing and treating a variety of ailments.**

or text personalized to their treatment. Based on their answers, a complete and legible report is generated, and again, any red flags are quickly identified. If necessary, the pharmacist can promptly intervene with the patient, and everything in the file is recorded.

"Empego standardizes data collection by ensuring patients answer the same questions; they get a more modern telepharmacy experience; maintain

patient/caregiver trust; and, in one click the pharmacist can copy and paste the information directly into the patient record," said Chartrand.

Empego is normally integrated with the pharmacy's own system. However, "for the purposes of the current pilot, Empego will act as a standalone. Customers can purchase either module individually, or both," said Chartrand. It's believed that regular use of the Empego platform can save as much as 50 percent of a pharmacist's time when it comes to medical intervention care and follow-ups.

While pricing for the system was not disclosed, clients can expect to pay approximately \$300 per month as a subscription fee on top of the purchase price.

Feedback from more than 200 pharmacies clinics already using Empego has been positive. Patients tend to be more at ease answering the pre-appointment questionnaire and are more compliant. And by standardizing the questions patients are asked, they get a complete and accurate patient file.

"Checking up on patients, verifying how they're feeling and complying with the prescribed orders demonstrates that you've done a good job," said Chartrand. "Follow-up ensures a patients' safety."



# Microsoft + Nuance show generative AI may improve radiology workflows

**C**HICAGO – At the recent Radiological Society of North America (RSNA) conference, Microsoft + Nuance showed attendees how generative AI could impact the lives of radiologists, care teams, and patients.

Microsoft + Nuance have been applying AI to radiology for some time to tackle enduring challenges, such as burnout, staff shortages, and spikes in imaging volumes.

What's new is the extent to which generative AI can unlock meaning from the billions of pixels and other data points available to today's radiologists. This opens the door to further increasing efficiency, productivity, and quality, and to empowering radiologists to successfully keep pace with demand.

At the RSNA meeting, Microsoft + Nuance showcased several existing and exploratory cloud AI solutions based on foundational and large language models. These address three major pain points for radiologists: performing mundane and tedious tasks; leveraging information that's difficult or impossible to see with the human eye; and making sure critical information isn't missed.

They explored how, through a growing number of AI-powered capabilities that automatically collect, extract, and synthesize data, a radiology report could practically write itself – amalgamating information from the patient's prior reports, findings provided by AI, and the radiologist's own natural language observations.

Microsoft + Nuance highlighted the capabilities of its PowerScribe Smart Impression application, which accelerates reporting by using generative AI to automatically create draft impressions in a radiologist's own dictation style.

Users have noted the natural, accurate wording of draft impressions, as well as how the solution enhances reporting quality by identifying possible omissions, misspellings, and other errors.

Mass General Brigham and Quantum Radiology are among the healthcare organizations already using PowerScribe Smart Impression. Users report saving up to a minute per read, a significant amount of time in the context of a busy working day.

"Based on our experience with auto-impression features from other vendors, PowerScribe Smart Impression effectively redefines what radiologists should expect from AI-powered reporting solutions," said Dr. Keirsun Crockett, Quantum Radiology. "We've licensed it for all 83 of our radiologists. It's really helpful because it consistently generates wording that is exactly what I would say."

Microsoft + Nuance also explored how AI can support radiologists by surfacing information that's invisible or unclear to the human eye.

Imagine that a radiologist is investigating a suspicious lesion and wants to compare the image they're looking at with other, similar images.

Instead of turning to a search engine or phoning a professional peer, they ask AI to analyze the image for biomarkers beyond those a human eye can see and search their PACS and other relevant archives. In a matter of seconds, the AI surfaces images

with similar characteristics and presents them for consideration.

AI can also help radiologists maintain precision and quality as their workloads increase. A reliable safety net, it can identify ancillary findings and catch common errors like laterality and sex mismatches. It can

even help ensure information is effectively delivered and acted upon, generating patient-friendly reports, and providing trusted answers to patients' questions.

As Microsoft + Nuance noted, healthcare organizations aren't all at the same stage of their AI journey. As such, the com-

pany is making sure the latest AI advancements can be accessed in a wide variety of ways: through Nuance solutions, through partner solutions such as PACS applications, and through "build your own" experiences that use Microsoft's leading cloud infrastructure and data platform.

## Adopt AI powered automation to empower your workforce.

Our cutting-edge, rapidly deployed solution can extract data from requisitions and forms and establish efficient workflows in 30 days. Use AI capabilities to optimize your processes and enhance patient experience.

In addition, automation offers the opportunity to mitigate burnout and enhance the efficiency of healthcare delivery.

GoAutomateMD is flexible and easily customizable. Making a smooth transition to align with your unique processes.

Seamlessly integrate with HIS, EMR, PACS, and experience streamlined requisition processing with eProtocols, ensuring a seamless, efficient operation.

**Intelligent  
Automation for  
Healthcare**



[www.goautomatemd.com](http://www.goautomatemd.com)

**GOAUTOMATEMD**

# Virtual reality trains clinicians about treatments for pediatric trauma

BY JERRY ZEIDENBERG

**M**ONTREAL — A new Virtual Reality (VR) system has been created by a team at McGill University that enables doctors, residents, nurses and other clinicians to master the challenges of pediatric trauma. By using VR headsets and the new software, learners can participate in educational sessions “anytime, anywhere”, instead of travelling to workshops that are only conducted in a few teaching hospitals in Canada.

“Rural doctors are extremely interested in learning more about trauma procedures for children,” said Dr. Dan Poenaru, professor of Pediatric Surgery at McGill University and co-developer of the new system, known as PeTIT VR (short for Pediatric Trauma Innovative Training in VR). “They’re frightened by the thought of a two-year-old who is in a car accident. If they don’t know how to manage this patient, they’re in trouble.”

In addition to rural physicians, many surgeons, urban GPs and nurses are interested in learning more about the best practices in pediatric trauma care. Traditionally, they’d have to travel to specialized workshops in centres like Montreal.

“The problem is that it’s expensive to go to these courses,” said Dr. Poenaru. “The simulation centres use expensive, high-fidelity manikins, and they need to be staffed. It ends up costing participants about \$2,000 for a two-day course, plus they have to pay for their transportation and hotel.”

By contrast, PeTIT VR allows them to collaborate with others from their own workplaces or homes. “They can be in their own bedrooms, if they want,” quipped Dr. Poenaru. Moreover, the VR software and hardware costs only hundreds of dollars, instead of the thousands required to attend specialized courses.

Dr. Poenaru led the drive to create the VR system in collaboration with a colleague, Dr. Fabio Botelho, a Global Paediatric Surgery Fellow from Brazil who is doing a PhD at McGill. The two physicians were discussing the limitations of teaching pediatric trauma surgery to others and realized there must be a better way.



Clinicians can participate in virtual scenarios of pediatric trauma to learn the best practices of care.

Their solution was to develop virtual reality software that could support learners wherever they’re located, at lower cost, without having to travel.

The other team members are Elena Guadagno, MLIS, and Harvey Beardmore, from the Division of Pediatric Surgery, Montreal Children’s Hospital.

“Just think of the implications for lower income countries,” said Dr. Poenaru. “These skills are in great demand, but clinicians can’t afford to go to workshops. And their hospitals can’t afford to buy high-fidelity manikins.”

Using systems like PeTIT VR, running on the Internet, it all becomes relatively low-cost.

To devise the software, Drs. Poenaru and Botelho reached out to a company with ex-

perience in VR and medical training called i3 Simulations, of London, UK. The company had already been developing training systems for many other medical scenarios.

PeTIT VR is built in partnership with McGill University Research Institute, McGill University, and i3 Simulations Limited.

Devi Kolli, CEO of i3 Simulations, emphasizes the importance of pediatric surgery, and noted how the new software will be able to help clinicians and, of course, patients and families.

She pointed out that preventable medical errors are still a major problem in Canada and worldwide, and that surgical errors are major contributors. It’s been shown that better training and continuous improvement through virtual simulation-based learning can enhance the skills

of clinicians and reduce medical errors.

Moreover, a preliminary test of the system by physicians from various educational backgrounds showed that clinicians liked using PeTIT VR. A survey of 11 clinicians from eight countries using PeTIT VR reported that 87 percent found PeTIT VR useful for training, and 93 percent said they would use PeTIT VR if it was implemented at their hospital.

Moreover, 81 percent preferred PeTIT VR over traditional mannequin simulators, and PeTIT VR was rated highly effective for training teamwork and communication skills.

The group plans to do more testing and surveys, but in the meantime, they feel PeTIT VR is ready for prime time and they have begun to offer it to other clinicians in Canada.

Dr. Poenaru asserted that PeTIT VR is the first VR system for pediatric trauma training that ties multiple users together in a team. Until now, he said, VR systems for this application have only supported a single user at a time.

He explained that this feature is incredibly important, as trauma care requires provider teams and communication is the key to better outcomes. Trauma teams, he said, are typically staffed by two physicians, two nurses, and a respiratory technologist.

“Technical skills are important, and we teach them, but the weakness in trauma care today is on the “soft” side, in non-technical skills like communication and leadership. That’s where most of the errors occur,” he said.

So, the PeTIT VR system emphasizes teamwork in the trauma bay, and helps doctors, nurses and technologists work together.

“If a nurse notices that I made a mistake in a drug that I ordered, she should have no problem in telling me,” Dr. Poenaru said.

“These soft skills are not adequately taught in medical schools or in most hospitals,” he added. “In creating PeTIT VR, we decided to focus on teaching how to work together.”

Dr. Poenaru said the PeTIT VR records everything that happens in the simulated trauma session, then can analyze the quality of the actions and of the communication. For instance, it can be programmed to ensure there is proper “closed loop communication” between team members.

“It’s a very important concept in acute care today,” said Dr. Poenaru. “When one member of the team asks for something or needs something to be done, another must acknowledge that it has been done. That way, you make sure that nothing has been missed or forgotten.”

He said the software has the potential to automatically assess the performance of team members, showing them what they did well and what needs improvement.

On this score, Dr. Poenaru said the team is progressing to leverage generative AI, an exciting new development.

He explained that by using generative AI, software can simulate whole teams, enabling one person to engage in a training session with the sense that there are three others in the room.

This means that clinicians can learn technical and team-building skills while on their own, at any time and from any place.

## Humber River Health

CONTINUED FROM PAGE 4

plication will be fully deployed in Humber’s ED. This will be followed by a period of optimization to further develop the solution.

Research has been key in the implementation of Humber’s EDQA. Humber’s Research Institute is working to incorporate measures, structures, and evaluation methods that ensure the tool is not only technologically advanced but also contextually relevant to the specific needs of patients and staff.

The approach involves an environmental scan of quality metrics and an extensive analysis of retrospective electronic medical records.

Furthermore, understanding potential

barriers to technology use among patients has been pivotal, along with an ethnographic study of the ED environment.

These elements are crucial in ensuring that the AI tool is not only effective in optimizing patient flow and reduc-

**The goal is to ensure that every patient receives timely and appropriate treatment in a high-pressure environment.**

ing wait times but also in addressing the nuanced needs of a diverse patient population.

By managing patient flow and optimizing resource allocation, the application will bring a much-needed paradigm shift in handling the pace and complex-

ity of one of the province’s most in-demand emergency care settings. This initiative is not just about embracing technological innovation; it is also about redefining the very structure of emergency care in a high-pressure environment, ensuring every patient receives timely and appropriate treatment.

The success of this initiative could introduce a new era in emergency care, where AI-driven solutions become integral in healthcare delivery.

The hope is to share this knowledge with hospitals across the country, as Humber remains at the technological forefront and eager to push boundaries, enabling a better quality of care.

*Shahana Gaur is Senior Writer and Communications Specialist at Humber River Health.*



# 16 Bit lands contracts for breakthrough AI osteoporosis-detecting tech

Following the positive response to the launch of its disruptive technology to detect osteoporosis, Toronto-based 16 Bit has landed two major contracts – one with Cambridge, Ontario-based Cambridge Memorial Hospital (CMH) and the other with Alberta-based MIC Medical Imaging.

The technology, called Rho – a disruptive AI ‘radiology assistant’ that uses routine X-ray images to accurately screen and identify patients at risk of osteoporosis – is making its debut in a clinical setting at CMH, the first hospital to adopt the technology in clinical practice.

“We are very excited to be the first hospital in Ontario to deploy this AI technology in a diagnostic setting,” said Dr. Winnie Lee, chief of staff and chief of diagnostic imaging at CMH. “With this technology, radiologists have a powerful aide to help identify low bone mineral density earlier, thereby enhancing the care we offer our patients. By acting early, we can help patients at risk of osteopenia lead full lives and avoid the fractures that might bring them to hospital.”

At MIC – Alberta’s largest radiology partnership with 13 clinics in the Edmonton area – Rho is being pioneered to proactively

address the known care gap in osteoporosis.

“We are proud to be leveraging this innovative AI solution to explore the impact in osteoporosis care for MIC patients,” said Jeff Vandersteen, director of IT at Medical Imaging Consultants. “We are impressed with the ease of integration both into clinical systems and clinical workflow and the AI performance.”

According to the company founders, 16 Bit has been able to scale up the technology thanks in good part to national innovation organization Mitacs after receiving support from a hard to uncover but essential resource: highly skilled, specialized talent.

“The problem we’re trying to solve is the under-diagnosis of this prevalent disease,” said 16 Bit Co-CEO Dr. Mark Cicero, who launched the company with Co-CEO Dr. Alex Bilbily in 2016 to originally develop a smart tool for using X-rays to estimate bone age in children.

Cicero explained that while one in three women and one in five men will suffer a fracture due to bone loss in their lifetime, only 22 percent of eligible at-risk patients are screened for osteoporosis, the underlying disease causing those preventable fractures.

“We know we can treat osteoporosis if

we find it, but typically that only happens after people suffer a fracture, because the screening rates are so low,” he said.

The Canadian Task Force on Preventative Health currently recommends risk assessment-first screening only for women 65 years and up and recommends against



Dr. Mark Cicero (at left) and Dr. Alex Bilbily.

screening men aged 40 and up. Other guidelines recommend screening males over 65 years old, or those between 50 and 64 years old with risk factors.

Drs. Cicero and Bilbily are closing the gap with their personalized solution by making it possible to screen anyone over the age of 50 who goes for a routine X-ray for another medical reason. Rho, a machine learning system trained to identify

low bone mineral density from up to 80 percent of X-ray images ordered, works in the background of a typical radiology information system to alert radiologists whenever suspected low bone density is detected in a patient.

“The idea is to raise a flag so the referring clinician can follow up with that patient, talk to them about osteoporosis risk factors and, when applicable, recommend further testing such as a DXA scan,” explained Dr. Bilbily, noting that early intervention leads to fewer fractures and lowers healthcare spending over the long term.

“Usually AI is perceived as a nice-to-have. We believe it’s a must-have because if we want a sustainable healthcare system in Canada, we have to capitalize on approaches like this that maintain or improve care while decreasing costs to our system,” he said.

To advance their technology, Drs. Cicero and Bilbily are engaging with Mitacs, a national not-for-profit that provides SMEs across Canada with the talent they need to make their innovation projects a success. Mitacs is uniquely positioned to connect Canadian organizations to highly skilled post-secondary students who are experts in their fields



## Privacy & Security Training Module for the Health-Care Sector

### Protect Your Patients and Practice

Learn about the latest cyberthreats by taking two free online training modules (CME-accredited for physicians) for health-care professionals covering key privacy and security topics such as:

- Overview of your legal and professional obligations
- How to obtain and record patient consent
- Developing a privacy policy
- Best practices for in-person and virtual visits, and more.



Visit [OntarioMD.ca](https://OntarioMD.ca) to complete the courses today!  
1-866-744-8668 | [support@ontariomd.com](mailto:support@ontariomd.com)



OntarioMD is a wholly owned subsidiary of the Ontario Medical Association and receives funding from the Province of Ontario. The views expressed are the views of OntarioMD and do not necessarily reflect those of the Province.

# AI-driven database to collect patient-reported breast cancer outcomes

The PROgress Tracker registry will help guide new directions in research and management.

BY KIMBERLY CARSON

**T**he role of artificial intelligence (AI) in healthcare data is undeniably transformative. It's revolutionizing how we collect, process, and leverage data, particularly when understanding patient experiences alongside real-world outcomes.

AI has transitioned from an experimental technology to now an essential part of patient-reported outcomes. Today, AI and its impact is only set to grow.

As the CEO of Breast Cancer Canada, I have had the privilege of witnessing the resilience of countless Canadian breast cancer patients. Each person's journey is unique, and each of their voices holds merit, highlighting opportunities for improvement. At Breast Cancer Canada, we are committed to placing patients at the forefront of research, knowing that lived experiences should inform the future care of Canadians diagnosed with breast cancer.

With the introduction of AI into research, the patient voice and experience becomes more accessible.

Patient-reported outcome measures (PROMs) are validated tools that provide a comprehensive picture of how cancer and treatment impact health status and quality of life from the patient's perspective. For example, Cancer Care Ontario continues to implement 'Your Symptoms Matter' across the province, allowing patients to communicate how they are feeling with their care team at their clinic visits.

Countless clinical trials have shown that collecting Patient Reported Outcomes (PROs) can improve outcomes among oncology patients. However, there remains uncertainty on a larger, national scale about how to best collect and use the data findings in routine clinical care and updates in health policy.

In Canada, we have seen some efforts made to move healthcare towards patient-centered care, which values the inclusion of patient perspectives when looking at the quality of their care. Together, we must recognize the value that lived experience can provide in directing and achieving high-quality and effective healthcare.

Although the Canadian healthcare system is mov-

ing patient-centered care forward, using PROs in clinical care and at the system level is inconsistent. Currently, no standardized mechanisms exist to integrate, measure and monitor the patient experience across Canada.

Research has shown us that there are over 50 types of breast cancer, each with their own unique challenges and demands. AI can transform how we can better utilize PROs data and address those needs by

**Launched in October 2023, PROgress Tracker represents Canada's first national patient-reported outcomes registry for breast cancer.**

providing invaluable insights into the experiences of a breast cancer diagnosis.

One breast cancer journey is powerful but imagine the impact of thousands coming together across the country in one place, powered by AI. PROgress Tracker Breast Cancer Registry (PROgressTracker.ca) is a national patient-reported outcomes (PROs) database set to marry the patient's voice with cutting-edge AI technology.

Launched by Breast Cancer Canada in October 2023, PROgress Tracker represents Canada's first national patient-reported outcomes breast cancer registry.

Validated real-world data and AI analytics from PROgress Tracker study will aid evidence-based decision-making to improve breast cancer management and

**Kimberly Carson is CEO of Breast Cancer Canada**



the development of patient resources, guide future research directions and explore the utility of electronic PROs data capture.

Data can be segmented within a diverse patient population, something that is often not captured in traditional clinical research settings. PROgress Tracker study is also planning (with patient consent) future linkages to the outcome and healthcare utilization metrics via provincial health data.

Over a 10-year period, the data analysis will culminate to improve our current knowledge, allowing comparison across Canadian jurisdictions and longitudinal follow-up of patients prior to, during, and after cancer care.

It is AI-driven capabilities used in the PROgress Tracker Breast Cancer Registry that will set the stage for identifying gaps in care, benchmarking and risk adjustment while improving the well-being of individuals during treatment and in the years that follow.

By integrating AI into PROgress Tracker study, for example, Breast Cancer Canada is elevating the analysis of the physical, emotional and financial journey through breast cancer – from diagnosis to surgery – through treatment and into remission or advanced disease.

The data can be analyzed through AI for the first time as a longitudinal cohort focusing on location, ethnicity, age, breast cancer pathology characteristics, stage, and treatment history.

Mapping individual and clustered experiences over time has the potential to provide new insights into trajectories, offering earlier identification of survivorship health issues, patient risk stratification, more effective clinical intervention, and improved patient outcomes.

The power of AI in healthcare is undeniable, and it can be used to pinpoint the best path forward for patients.

I believe in a future where patient experiences are not just acknowledged, but form a cornerstone for clinical research, health policy, and accessible care standards. AI is amplifying the voices of Canadian patients to advance the breast cancer care landscape.

## Nova Scotia health information professionals credit CHIMA

**N**ancy Munroe and Karen Stanley gained Canadian Health Information Management Association (CHIMA) certification in 2022, something both women say wouldn't have been possible without their friendship. Throughout four years of part-time study, while holding down full-time jobs during the COVID-19 pandemic, and juggling the responsibilities of young families, these co-workers formed a strong bond of support and partnership which played a huge role in achieving their goals.

CHIMA is the national professional association for the health information profession in Canada. It

represents more than 5,600 health information members across the country, and most recently now includes Nancy, Karen, and five other Health Information Management (HIM) staff within the IMIT portfolio at Nova Scotia Health.

Though they were both working in the Northern Zone and living in the same town of Onslow just outside Truro, when Nancy enrolled in the HIM course through Algonquin College, she had no idea her colleague Karen had also enrolled. Nancy was a data quality clerk in Health Records and Karen was on maternity leave from her position as a team lead in Health Records.

Both women say taking the CHIMA program opened whole new career pathways. Achieving CHIMA certification, Nancy says, allowed her the opportunity to take an active role

**Both women say that taking the CHIMA program opened up whole new career pathways.**

in helping the province standardize processes and procedures within Health Information Services (HIS).

"Studying coding health information management, data quality, reg-

istration, pathophysiology, anatomy, and all of the things that you would see on the backend of health processes and procedures allowed me to move from doing switchboard registration and maintaining health records into a management role."

Shortly after finishing the program, she competed for and was the successful candidate for the role of assistant manager of Health Records in Northern Zone. She works out of Colchester East Hants Health Centre in Truro looking after records for the nine facilities in the zone.

Nancy says she always loved records, "I like learning things and

CONTINUED ON PAGE 19





# Care that can never miss a beat.

Our care enables us to provide attention where it's needed. We believe in innovation that continues to build a world where healthcare has no limits.

[gehealthcare.ca](http://gehealthcare.ca)



GE HealthCare



# Electronic system for DI referrals improves workflow for staff and radiologists

Staff can axe the fax and quickly search for exam requisitions by using a digital dashboard.

BY DIANNE DANIEL

After years of chasing an inefficient, tedious and time-consuming paper trail, diagnostic imaging (DI) departments at two Ontario hospitals are axing the fax and turning to more efficient digital workflows for requisitions and referrals.

Orillia Soldiers Memorial Hospital (OSMH) went live with Novari Health's Medical Imaging Requisition Management (MIRM) platform in November 2023, creating an end-to-end digital process for requisition management across all medical imaging services that was kick-started with a push to adopt the province's Ocean eReferral Network in the spring.

Halton Healthcare partnered with healthtech startup GoAutomateMD as an early adopter of the company's healthcare solution, building a digital requisition management system from the ground up that adapts to and builds on the healthcare system's existing processes for medical imaging.

Each implementation delivers benefits such as less data entry, less room for error, better quality data and fewer inconsistencies. Staff are gaining back valuable time, booking turnaround times are shorter and the risk of losing a requisition is gone. And most importantly, the endless paper shuffle between clerical staff, technologists and radiologists is over.

With digital requisitions replacing paper, the hospitals are also laying the groundwork to be among the first to eliminate paper faxes as part of the Ontario government's Axing the Fax mandate laid out in its long-term plan, Your Health: A Plan for Connected and Convenient Care.

"We've got a working solution that allows us to ingest all of the incoming faxes and put them in 'boxes' to be managed by initially clerical, then technologists, then radiologists and then it goes to bookings," said Dr. Saul Valadka, chief of Diagnostic Imaging at Halton Healthcare, describing the digital transition. "Once it's ingested, it's almost completely paperless."

After more than 15 years in the finance sector, GoAutomateMD founders Jason Daly and Jag Basrai transitioned to healthcare with a unique 'try before you buy' model that allows hospitals to use their software for up to 60 days before deciding to go ahead with a purchase. Their solution is based on three key principles – automation, integration and flexibility – with the idea of providing out-of-the box functionality so that users get up and running quickly, but with the ability to easily customize the software as well.

The philosophy resonated with Halton Healthcare because they wanted to go paperless but were having difficulty finding a requisition management system that could support their workflow from A to Z without requiring changes to how they work.

GoAutomateMD differentiates itself in the market by aiming to digitize inefficient processes with as little disruption to existing workflow as possible. Halton Healthcare was impressed by the company's collaborative rapid development process that uses input from front line staff as well as internal PACS and IT teams to understand current processes, identify gaps and build custom solutions that leverage and integrate with electronic medical records and other hospital information systems.

Their vision is an end-to-end digital system to handle the more than 300,000 requisitions received across Halton Healthcare's three sites each year, in-

cluding electronic referrals from Ocean as more providers transition to the provincial network. To get started, they targeted MRI requisitions coming in by fax or paper.

Using GoAutomateMD's built-in optical character recognition and artificial intelligence (AI) capabilities, faxed requisitions are captured and digitized. Missing or illegible information is highlighted so staff can address it and once in the system, digital requisitions are reviewed by technologists, protocolled by radiologists and sent to scheduling.

"The way we like to use technology is to alleviate the tedious processes, not necessarily the overall process," said Basrai, GoAutomateMD's CEO. "You still need a technologist to review, you still need a radiologist to protocol, but we can help with the tedious piece."

"This paper just flies around the hospital all day long and we get duplication of paper, lost paper – so it gets very problematic," he added. "Hospitals are already understaffed, more and more requests are coming in on a daily basis, so these departments are getting overwhelmed."

A key benefit of the digitized process is that instead of wasting valuable time searching through stacks of paper to find spe-

cial requests, staff can search requisitions using a digital dashboard, allowing them to promptly address inquiries from patients or referring physicians.

Inpatient requisitions originating in the computerized physician order entry (CPOE) system are also integrated in the dashboard and, according to Basrai, priority one cases are now processed within 12 hours as opposed to 24 hours.

"It improved the process overnight," said Halton Healthcare director, Diagnostic Imaging and Laboratory Medicine, Shairoz Kherani. "We have a dash-

board where we can look at the number of requisitions processed, the number being booked, it's great." GoAutomateMD also built an automated process for flagging and returning incomplete requisitions. Prior to that, staff were sorting through requisitions manually as they arrived by fax, organizing them and faxing back incomplete forms, which often led to multiple attempts and long waits for responses.

"There is a huge amount of touch time that we're no longer focusing on," said Halton Healthcare manager, DI, Marc Cloutier, adding that booking turnaround time has halved from 20 to 10 days.

"(Staff) can move right ahead to the higher, value-added work of booking, or following up on inquiries that the radiologists need. We can start moving towards that workflow and leaving the paperwork behind."

"What it's doing, is housing all of the data in one place so if somebody is looking for a requisition ... they can just log in and find it and they will know exactly where that requisition is," added Kherani. "Is it in the booking pile? Has it been booked? All of these metrics we can track, and you can actually find where the bottlenecks are very quickly."

The journey to axe the fax at OSMH in Orillia started in 2022 with a proposal to digitize referral pathways for CT and MRI but quickly expanded to all imaging modalities. Relying on a team-based approach that included the Couchiching Ontario health team and the Georgian Bay Information Network – a partnership of six regional health centres that share the same instance of Oracle/Cerner – the hospital completed its adoption of the Ocean eReferral Network by April 2023.

The next step was to digitize internal referral management, working closely with Novari to configure workflow capabilities for each imaging service. Expanding the initial scope of the project was a pivotal decision, said OSMH manager, Central Patient Scheduling, Registration, Admitting and Switchboard Jessica Gourley. "Looking back now, we can't imagine having only a portion of our department digitized; it would be a huge change management piece," said Gourley.

The collaborative effort to digitize referral pathways involved several hospital departments and users, including schedulers, technologists and radiologists, who worked closely with Novari. A staged implementation of MIRM was finalized earlier this year, providing an end-to-end workflow that includes receipt of electronic referrals through Ocean or by fax, integration with Cerner, internal referral management through MIRM and archiving in PACS which connects to the provincial ConnectingOntario repository.

Scheduling remains within the hospital information system, but MIRM automatically sends the





request to schedule and then updates once the appointment data and time is received, with the ability to send the information on to a patient through SMS or email for confirmation. OSMH is currently working with another vendor to build the patient notification piece, said Gourley.

The new digital workflow streamlines what used to be a complex procedure with nuances between modalities. For example, CT requisitions would be scanned and sent to radiology for coding via email while MRI requisitions would be walked over in paper form. “It was just a lot of steps, a lot of inconsistencies and room for losing paper, or (instances when) somebody didn’t get an email or it went to the wrong person,” described OSMH manager, DI and Cardio, Chantel Grant.

The amount of in-house customization available in MIRM is limited, she added, but the team worked with Novari Health to get the workflow exactly to where users want, with more adjustments expected as the teams get comfortable working with the new digital workflow.

“They’re the kinds of things you don’t know until you’re working in the system – extra clicks can add up,” she explained. “There has been a bit of feedback (from users) that they don’t want to go back to paper just as long as we can make the system as efficient as they want.”

One advantage is the Novari dashboard that enables staff to log in to check the status of referrals across all medical imaging services, replacing a manual weekly data collection process with more reliable, immediate online data. Instead of relying on subjective feedback about missing or duplicate referrals, staff access consistent and standard digital records they trust to track activity accurately, with the ability to sort based on patient demographics, modality, priority and body part for reporting purposes.

Greater efficiency means workloads are reduced, said Gourley. “Unnecessary referrals don’t get downstream when they don’t need to anymore, because we can say upfront that we don’t offer that service or we can refer patients elsewhere,” she said.

“I have a handful of people on the team who are already operating at their previous efficiency or speed when it comes to scheduling, and my suspicion is that it will only improve or get better over time,” she added. “One thing I can say is that they’re not manually faxing things back anymore, typing up fax sheets or even clearing off the fax machine.”

Radiologists are benefitting from an e-protocolling feature in MIRM called RadView that provides access to all relevant information required to quickly and efficiently protocol requisitions, aligned with processes outlined by the Ontario Association of Radiologists to determine the type of exam that best suits the clinical question and patient presentation. An added advantage is that radiologists can perform the protocolling step remotely from home if hospital guidelines allow, a capability also provided in GoAutomateMD.

Both Novari MIRM and GoAutomateMD are now working to use AI capabilities to further automate the protocolling step. Basrai said his company ex-

pects to introduce an enhanced feature this year that allows for protocols to be filled out automatically and then reviewed and approved by radiologists.

“We’ve noticed a massive challenge in British Columbia right now, where they can’t find enough technologists and radiologists to do this, so they’re actually asking clerical staff to help with protocolling on simple requisitions,” said Basrai.

“They’re not really trained for that, but an AI can be trained because it can see millions and millions of requisitions, and it can know and understand.”

Digital requisition management is seen as a necessary step as both OSMH and Halton Healthcare prepare for wider adoption of the Ocean eReferral Network as well as the possibility of a provincial central intake model. OSMH is already

scheduling roughly 80 percent of its medical imaging requests through a central team and will be campaigning for more providers to engage with Ocean this year, said Gourley.

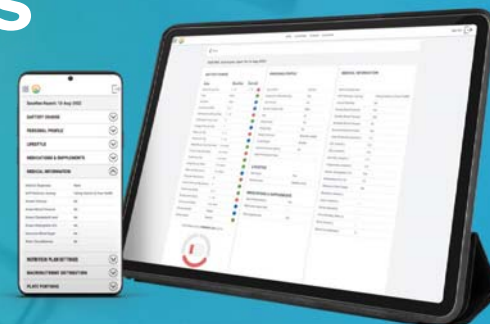
“We want everyone utilizing the Ocean platform for referrals,” she said. “The vision is there in the province and we’re adopting it in Orillia, and we’re really excited about it.”



# Unlock the Power of Your Patients to Help Themselves

Imagine saving your staff  
60-90 minutes per patient...

You can't do it alone. Patient engagement is the key to chronic disease management & prevention.



**Enhanced Efficiency:** Automate the creation and delivery of personalized health plans for your patients to follow, maximizing your time to build stronger patient relationships.



**Empower Patients:** Equip your patients with the tools they need to self-manage their care, boosting their confidence and fostering better health outcomes.



**Comprehensive Content Library:** Give your patients access to an extensive range of resources, including webcasts, videos, recipes, and coaching tips, to support your patients' diverse needs.



**Improved Patient Engagement:** Foster lasting connections with your patients between visits by letting MVP provide them evidence-based support in real-time, saving you time.

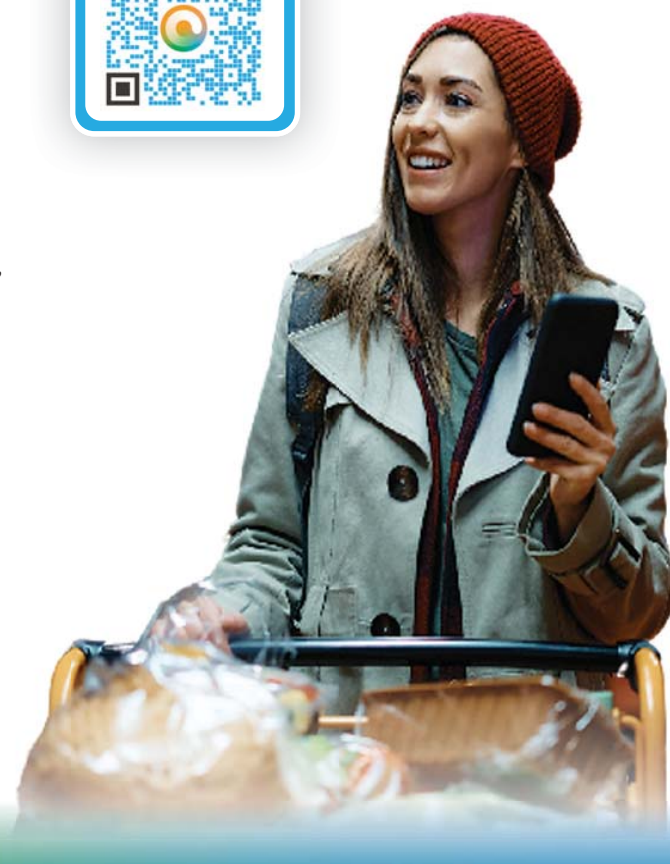


**Optimal Clinical and Financial Outcomes:** Harness the power of your patients to achieve better results for them, and your practice.

**Contact us today** to learn how My Viva Plan can drive greater efficiency in your practice, and better outcomes for your patients:

<https://discover.myvivaplan.com/>

Find out how:



# Radiology vendors focus on AI and improving workplace efficiency at RSNA '23

At the same time, technology developers are offering lower-cost solutions.

**C**HICAGO – The trade show portion of RSNA 2023 buzzed with activity, with the event returning to health after COVID-19 knocked the wind out of so many conferences and trade shows. According to RSNA organizers, attendance hit 40,000. Many new solutions were demonstrated, but readers should be cautioned that some may not yet be available in Canada.

## Canon

Canon Medical announced a new approach to AI called Altivity. The company said it produces a greater level of imaging quality, insight and value across the entire care pathway. Canon's End-to-End CT Workflow Automation, for example, includes a suite of tools designed to enhance confidence in the entire CT study process. It includes:

**INSTINX:** INSTINX provides easy and safe patient positioning and quick scan planning, maintaining consistency between operators, regardless of their experience level. The intuitive design and automated features significantly improved workflow efficiency.

**Remote Assist:** This feature allows direct virtual access from the scanner to in-house experts, empowering care teams to increase productivity and consistently deliver high-quality care across the hospital system.

**Automation Platform:** An AI-powered, zero-click solution that utilizes deep learning technology to streamline workflows, ensuring fast results every time. Automation Platform significantly reduces manual intervention, enhancing overall efficiency.

**Vina Analytics:** A CT Protocol Management solution that simplifies and standardizes protocol management for Canon CT scanners. Vina Analytics offers protocol review, comparison, approval, distribution, and revision history tracking, ensuring an efficient approach to protocol management.

AI enhancements were also exhibited within Magnetic Resonance Imaging, with AiCE for denoising and PIQE for increasing resolution giving the user industry-leading image quality with reduced scan times. Canon is also focused on improving workflow with in-room Ceiling Camera assisting in a more effective patient set-up.

Models were onsite to demonstrate the advancements in Canon's Aplio i-series Ultrasound, with high-resolution imaging. The Aplio's smart, AI-driven algorithms (powered by Altivity) allow users to create simple and streamlined workflows for fast, accurate diagnosis and treatment, including Liver Analysis Tools.

In Interventional Imaging, Canon's Alphenix Sky+ with 12x16 Hi-Def panels is available for shared service in IR/IO. The 12x12 Hi-Def panel is available for Neuro, Pediatrics and others. The Alphenix 4D CT, which offers the synergy of AI-powered wide area coverage coupled with a high-definition angiography C-arm, provided a demonstration of enhanced visualization, workflow, and throughput.

## Carestream

Carestream Health launched its new, affordable HORIZON X-ray System that's said to offer high-quality imaging with user-friendly features to help improve productivity. The budget-friendly system is designed

especially for small-to-midsize imaging centres, orthopedic facilities, urgent care centers, and hospitals.

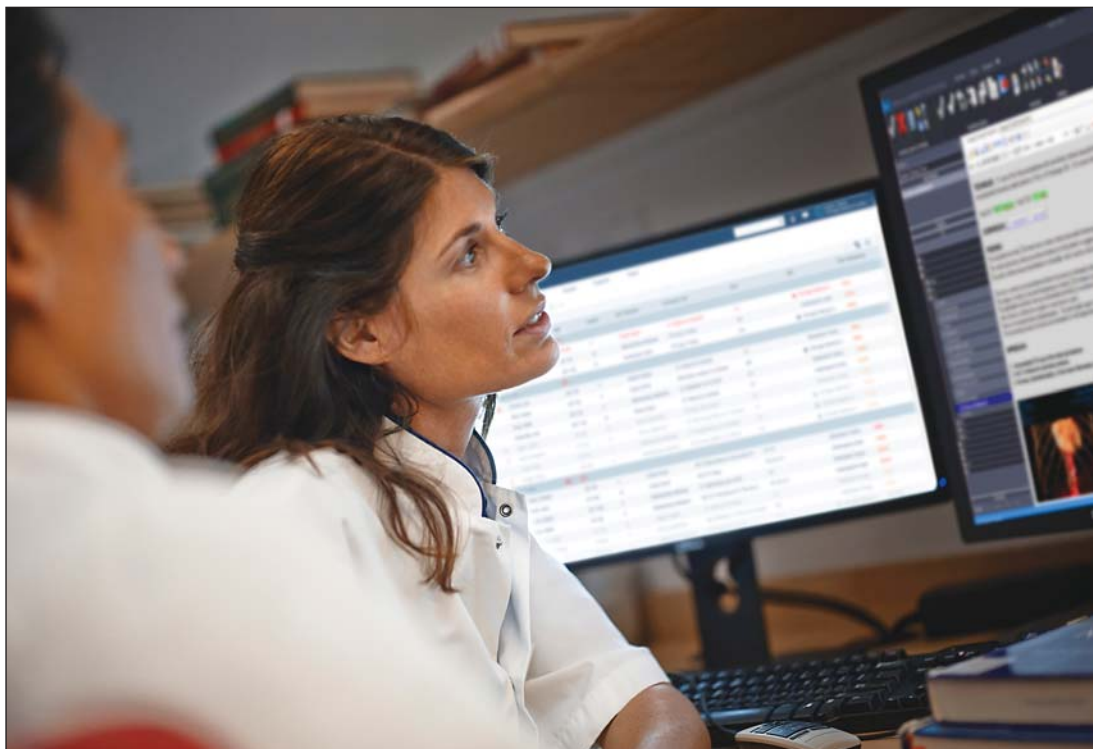
According to Carestream, the intuitive manual analog system offers all the key functionality needed to help providers diagnose with confidence, provide exceptional patient care, and improve clinical outcomes. The system also provides an easy upgrade path to digital imaging to support a facility's evolving radiology needs.

"The HORIZON system is an ideal solution for smaller healthcare facilities where ease of use, equipment reliability, low maintenance costs, and a low level of investment are essential," said Marco Riolfo, global marketing manager, Digital Radiography Rooms, at Carestream. "This is a new opportunity for cost-conscious facilities to get a reliable X-ray room with the

## Siemens

Siemens Healthineers announced the U.S. Food and Drug Administration (FDA) clearance of its Biograph Vision.X, a positron emission tomography/computed tomography (PET/CT) scanner with a time of flight (TOF) of 178 picoseconds (ps) – said to be the industry's fastest TOF. The next-generation system builds on the established performance of the Biograph Vision family of scanners.

The scanner's Optiso Ultra Dynamic Range (UDR) detector technology contains silicon photomultipliers (SiPMs), which enable the use of small 3.2 mm x 3.2 mm lutetium oxyorthosilicate (LSO) crystal elements. These tiny crystals provide higher spatial resolution than larger crystals.



high-quality imaging that Carestream is known for – at an affordable and practical price point."

Its productivity-enhancing features include a floating tabletop that allows fast positioning and flexibility for all major exams. The system fits easily in small rooms and requires no additional ceiling support. It is also available without the table in a floor-mount configuration for chest X-rays or chiropractic imaging. Furthermore, the HORIZON system is easy to install and maintain, helping to lower the costs associated with imaging.

The HORIZON analog X-ray system is digital ready to keep up with a facility's evolving radiology needs. Shifting to digital X-rays is a significant way to speed workflow, increase productivity, and support a higher standard of care. Yet, for smaller facilities, the cost of upgrading to digital can be a substantial barrier.

"HORIZON delivers affordable, quality imaging today and gives providers an easy path forward to gain the benefits of an advanced DR X-ray system," said Riolfo.

The HORIZON X-ray System can be upgraded to digital workflow through Focus 35C and Focus 43C Detectors powered by Image Suite Software.

Leveraging these very small LSO crystals that are 100 percent covered by SiPMs, the Biograph Vision.X delivers high 48-mm<sup>3</sup> volumetric resolution and an industry-best temporal resolution of 178 ps. For these reasons, the scanner can deliver a 20% performance improvement (TOF gain) that can improve patient throughput.

"The Biograph Vision.X's record-shattering, ultra-fast time of flight delivers an image resolution that allows even the smallest lesions to rise above the noise," said James Williams, PhD, head of Siemens Healthineers Molecular Imaging. "This extremely high level of resolution can help physicians detect small lesions and provide patients with a precise diagnosis."

The built-in AIDAN intelligent imaging platform of the Biograph Vision.X uses artificial intelligence (AI) to increase operational efficiency and accelerate patient workflow. Its unique methodology is built on over 700 machine- and deep-learning patents from Siemens Healthineers, which pioneered AI-powered applications in PET/CT scanners. FlowMotion AI, a hallmark feature of AIDAN that is optional on the Biograph Vision.X, combines the continuous bed motion of Siemens Healthineers PET/CT scanners



with anatomical AI to enable the user to standardize and personalize image acquisitions with one click.

The scanner's large 78-cm bore helps calm anxious patients and allows easier positioning of bariatric patients or radiotherapy devices. It fits into any room that houses a PET/CT scanner from the Biograph Vision family.

On the ultrasound front, Siemens Healthineers introduced the ACUSON Maple, a powerful, versatile, and affordable ultrasound system that enables quick diagnosis in all clinical settings. Artificial intelligence (AI)-powered features optimize everyday clinical performance for users of all skill levels, the company said.

Powered by ACUSON technology from the company's established portfolio, the ACUSON Maple is designed for the clinician who needs a workhorse ultrasound system that supports a diverse range of ultrasound use cases. Lightweight, portable, and battery-powered, the ACUSON Maple is ideal for emerging markets, small hospitals, outpatient centers, private practices, and urgent care centres.

"Siemens Healthineers proudly expands its ACUSON portfolio with the ACUSON Maple, which leverages a common hardware and software platform as well as AI-powered applications that automate workflow and analysis to bolster exam efficiency," said Daniel Frisch, head of radiology and image guidance at Siemens Healthineers Ultrasound. "This affordable, configurable, and versatile system offers a broad range of diagnostic imaging capabilities, with a high level of image quality for every patient."

Designed for versatility, the ACUSON Maple supports 15 transducers and has 25 advanced features that enhance usability and streamline workflow. An integrated battery enables up to 75 minutes of unplugged system scanning. This capability is invaluable in emerging markets with power supply challenges and in clinical settings that require movement between exam rooms for rapid patient assessment.

The system's suite of AI-powered tools empowers clinicians to improve efficiency by increasing consistency in repetitive tasks. For obstetrics and gynecology (OB/GYN) imaging, the Auto OB feature leverages machine learning to automatically calculate the fetus's age and weight, reducing overall measurement time by up to 24%. For cardiac imaging, the eSie Measure feature uses machine learning to automatically perform cardiac measurements during a routine echocardiography exam. eSie Measure reduces keystrokes by up to 44% and shortens routine echo exam time by up to five minutes.

#### GE HealthCare

GE HealthCare showcased its growing portfolio of AI-enabled solutions. Indeed, it asserted that for the second year in a row, GE HealthCare topped the U.S. Food and Drug Administration (FDA) list of AI-enabled medical devices with the most 510(k) AI authorizations of any medtech company, with 58 to date. Among the AI-enabled and deep learning innovations demonstrated at RSNA23 were:

Theranostics Pathway Manager Tile on Command Center, aims to offer healthcare providers an easy-to-use application that



simplifies the burdensome work of coordinating the oncology care pathway and identifying and tracking potential theranostics candidates – work that historically has been manual and tedious. Theranostics is a technique in personalized medicine and nuclear medicine where one radioactive drug is used to identify (diagnose) and a second radioactive drug is used to treat cancerous tumors.

SIGNA Champion is a brand new 1.5T MRI scanner designed to offer patient comfort and high-performance scans in a wide bore system, with access to premium technologies such as AIR Recon DL, Sonic DL and AIR Coils. It also has AI-enabled workflow features designed to support efficiency and image quality regardless of the experience level of the user.

Revolution Ascend Platform is a new CT solution with built-in scalability for onsite CT detector coverage upgrades that helps enable healthcare systems to invest in the clinical capabilities they need today, while enabling growth in the future – without replacing the gantry.

MyBreastAI Suite provides an all-in-one platform that integrates a comprehensive collection of AI tools that can seamlessly deploy AI to the breast imaging workflow. As the global cancer burden rises, radiologists face increasing challenges such as burnout, workforce attrition, and patient backlogs, placing strain on and testing the resiliency of health systems today. In ongoing efforts to combat breast cancer, the healthcare community remains committed to early detection by leveraging methods, like screening mammography, that have proven to be effective in identifying early breast cancers and reducing breast cancer-specific mortality.

However, with breast cancer now surpassing lung cancer as the most commonly diagnosed cancer worldwide, clinicians are seeking tools that can address issues related to access, burnout, variability, equity, and cost in breast imaging to elevate and enhance the detection and diagnosis of breast cancer. The introduction of MyBreastAI Suite aims to address these challenges by providing an all-in-one platform that can seamlessly deploy AI to breast imaging workflow. With this initial release, MyBreastAI Suite integrates three AI applications from iCAD's ProFound Breast Health Suite, including:

ProFound AI for DBT: Trained with one of the largest available 3D image datasets,

ProFound AI for DBT provides radiologists with crucial information, such as lesion Certainty of Finding and Case Scores, which assists in prioritizing caseloads, clinical decision-making, and may help reduce burnout.

SecondLook for 2D Mammography: The SecondLook Computer-Aided Detection (CAD) system for mammography is intended to identify and mark regions of interest on screening and diagnostic mammograms from GE HealthCare's full-field digital mammography (FFDM) systems to bring them to the attention of the radiologist after an initial reading.

#### Philips

Philips announced the expansion of its enterprise imaging portfolio and AI-enabled solutions at RSNA 2023. Philips HealthSuite Imaging is a cloud-based PACS enabling radiologists and clinicians to adopt new capabilities faster, help improve operational efficiency and enhance patient care. HealthSuite Imaging on Amazon

**Using AWS Bedrock, Philips is exploring opportunities across its portfolio to automate administrative tasks.**

Web Services (AWS) offers new capabilities such as high-speed remote access for diagnostic reading, integrated reporting and AI-enabled workflow orchestration, all delivered securely via the cloud to ease IT management burden.

"The pace of customer migration to Philips HealthSuite Imaging highlights the value of cloud-enabled PACS in meeting the demands of modern day radiology departments," said Shez Partovi, chief business leader Enterprise Informatics at Philips. "HealthSuite Imaging brings AI-enabled workflow orchestration with fast remote access and integrated reporting to radiologists, anytime, anywhere."

Philips has already migrated over 80 sites in the U.S. and in Latin America to its HealthSuite Imaging PACS running on AWS. These customers can now scale their AI-based workflow orchestration capabilities and read studies anytime from anywhere. Other healthcare systems are now planning their migration to Philips HealthSuite Imaging to take advantage of

the new AI-enabled clinical and operational workflows.

Through HealthSuite Imaging, Philips continues to extend its clinical innovation focused on enhancing the radiologist experience. HealthSuite Imaging diagnostic workspace streamlines study interpretation and reporting into a single seamless application, enhanced through AI, while also enabling sophisticated image processing and simplified clinical workflows.

Moreover, the cloud-based nature of HealthSuite Imaging delivers faster access to medical studies from both the hospital or remote locations. Health systems can also reduce on-premises hardware and IT management costs by moving to a secure, cloud-hosted storage platform.

Philips will continue to work with AWS to innovate on behalf of radiologists and advance AI in healthcare by applying foundation models – solutions used to create new generative AI applications. Using Amazon Bedrock, Philips is exploring clinical workflow applications across its portfolio in order to automate administrative tasks and enable more accurate diagnoses.

#### Merge by Merative

For its part, Merge by Merative highlighted a recent development in pathology. The company signed an agreement with Indica Labs, a leading provider of AI-powered digital pathology solutions. This partnership will enable healthcare organizations to seamlessly integrate digital pathology into Merge imaging solutions.

Traditionally, anatomic pathology teams collaborated by sharing glass slides of tissue specimens, which can be a manual and time-consuming process. However, the field has rapidly evolved to embrace more efficient and secure options to share high-resolution digitized images of slides, enabling nearly instantaneous access for primary diagnosis and other digital pathology workflows.

HALO AP from Indica Labs is said to be a state-of-the-art platform for anatomic pathology, with the tools pathologists need to conduct accurate, standardized diagnostic evaluation in an environment capable of deploying off-the-shelf and third-party AI and image analysis tools. HALO AP supports primary diagnosis, streamlines second opinion requests and consultations, and manages clinical trials all within a unified platform. HALO Clinical AI algorithms, including the CE-IVD marked HALO Prostate AI, integrates seamlessly into HALO AP and provides automated, AI-based decision support tools for identifying and grading cancers, standardizing IHC expression analysis, and more.

"Adoption of digital pathology is growing as healthcare organizations bring more disparate imaging service lines into a single, digital patient record," Merge general manager Ashish Sant said. "Combined with our Merge Imaging Suite VNA (Vendor Neutral Archive), a cloud native SaaS, the addition of digital pathology means Merge clients will have a more comprehensive view of all imaging content so their clinicians can deliver better, more efficient patient care."

Merge by Merative is now able to resell HALO Clinical Solutions for digital pathology with its Enterprise Imaging and PACS solutions to enable an integrated ecosystem.

# RealTime's DI network can support hospitals in the event of an outage

BY NORM TOLLINSKY

**R**ealTime Medical (RTM), a Mississauga, Ontario-based company providing radiology collaboration services for hospitals across Canada, is now offering a business continuity solution to ensure uninterrupted diagnostic imaging operations during a ransomware attack or any other unexpected downtimes.

The idea for the company's business continuity solution took shape when several of its regular customers experienced a cyberattack that took down their PACS.

"Because they were existing clients of our teleradiology service, they were already connected to our cloud instance and could use our infrastructure to continue to provide diagnostic imaging services," said Maynard. That meant that any hospital connected to RTM for teleradiology support also had a ready-made backup if their own infrastructure was compromised.

"We saw the ability to assist our hospital-based radiology colleagues in a ransomware attack as a natural extension of our radiology collaboration service," said Ian Maynard, CEO and co-founder of RTM. "We have your back under normal circumstances. We help to improve work-life balance, cover holidays and address the typical issues of not having enough radiologists, but now we also have you protected in an emergency situation."

"In today's environment," said Maynard, "it's important to have a plan in place for the unfortunate occurrence of either a cyberattack or other unexpected downtime."

With RTM's subscription-based business continuity solution in place a hospital hit by a ransomware attack can continue to image patients, provide reports to referring physicians, archive images and minimize the impact on patient care. The company's turnkey infrastructure includes a cloud-based PACS, voice recognition and much more.

"Of course, if it's a complete internet

outage and there's no way to connect to the outside world, there's nothing we can do about that, but for other modes of failure, our backup service has you covered," said Maynard.

In the absence of backup from RTM during a ransomware attack, hospital radiologists would normally have to read exams at the modality workstations. That would be especially disruptive for radiologists working from home on weekend and overnight shifts because they would have to drive to the hospital.

"That's a terrible waste of time and a huge inconvenience with an obvious impact on reporting timelines which could be extremely detrimental to patient care, especially in the case of time-sensitive diagnoses such as stroke, or pulmonary embolism," said Maynard.

With limited archiving capacity on the modality workstations and no access to a hospital's PACS, images would also be lost, preventing physicians from being able to track a patient's condition over time.

"That really jeopardizes a hospital's ability to provide continuity of care because even if you can get a current exam read, six months from now when the patient re-presents, you won't be able to review prior exams to do a comparison and see, for example, if a tumour has grown or regressed."

"One of our clients took upwards of 13 months to rebuild their PACS database," recalled Maynard. "That would be a huge disruption for a diagnostic imaging department. Fortunately, they didn't incur that impact because they were able to use our infrastructure."

Hackers know how disruptive a ransomware attack can be and count on hospitals not being able to tolerate that kind of impact.

RTM stores exams and reports in a highly secure public cloud protected by an army of security engineers and is able to transfer them back to a hospital's PACS once it's rebuilt.

Maynard advises hospitals not to wait

until after a ransomware attack or other disruption of service to subscribe to its business continuity solution.

Getting connected to the service is very straightforward. Working with the hospital's IT department, "a hospital would either download the secure gateway to our cloud infrastructure or we would do a direct VPN to your site," he explained. "That establishes a DICOM node on the hospi-



Ian Maynard, CEO and co-founder of RTM.

tal's network to which exams can be sent directly from the modalities."

Using RTM's backup infrastructure and its automated critical results reporting system, referring physicians have secure access to reports at bedside on their mobile devices. The company's portfolio of software tools also includes what it calls context-aware dynamic workload balancing.

Traditional worklists distribute exams based on a radiologist's specialty and the amount of time it takes to read a case. "But what happens if you get stuck on a more complex case?" asked Maynard. "With a typical worklist, the next stat case is going to have to wait until whenever you can get to it. There may be a timer or a reminder that you're running beyond your target

service level agreement but there's nothing you can do about it. That's sub-optimal. You don't want a patient being adversely affected because you happen to be doing your best for another patient."

"Systems should be smart enough to understand, monitor, see what's happening and dynamically rebalance these cases," said Maynard. "We don't want cases sitting on a worklist that are delayed any more than necessary because that has a direct impact on patient outcomes and patient lives."

RTM's dynamic workload balancing software will reassign an exam to another onsite radiologist with the required specialty in such a situation, or direct the exam to one of RTM's 25 radiologists if the hospital's onsite radiology group also wishes to take advantage of RealTime's radiology collaboration service on an as-required basis.

RealTime Medical's software portfolio also includes an AI-powered KnowledgeEnable tool that serves up relevant research from peer-reviewed radiology journals.

A keynote speaker at a conference Maynard attended estimated that radiologists would have to spend 120 hours per week to stay current in their specialty because of the number of new findings published every day.

"That means the gap between what the patient thinks you know and the latest information you could apply is turning into a gaping chasm. He felt strongly that we should do all we could to help radiologists close that gap."

With support from the National Research Council's Industrial Research Assistance Program, RTM developed AIKnowledgeEnable to help radiologists make better informed decisions for their patients by curating the most relevant research from multiple, trusted, peer-reviewed medical data sources. The system then compounds this benefit with the collective intelligence of your physician peers in an easily accessible interface available at the time of diagnoses.

## INFINITT announces expansion into Canadian medical imaging

**K**ITCHENER, ONT. – INFINITT North America, an enterprise imaging partner for medical institutions, is pleased to announce its strategic expansion in the Canadian medical imaging market. As a wholly owned subsidiary of INFINITT Healthcare, a powerhouse in global healthcare IT, the company boasts world-class research and development capabilities, and an extensive portfolio of robust sub-specialty solutions.

With a legacy dating back to 1997, INFINITT North America prides itself on its in-house research and development that crafts multi-facility solutions spanning across radiology, cardiology, digital pathology, ophthalmology, dental, oncology, and more. The company's deep understanding of its product range enables customization at a facility level

to enhance workflow efficiency, promising top-flight service delivery.

Medical imaging is a critical component of the Canadian healthcare system, aiding in accurate diagnosis, treatment planning, and monitoring of diseases. By expanding its reach in this sector, INFINITT North America aims to facilitate improved patient care, enabling faster diagnoses, and subsequently, quicker treatment initiation.

As part of its growth strategy, INFINITT North America is advancing attention in our cloud-based hosting solutions. This move heralds a new era for secure, medical data storage, allowing seamless access to patient records and medical images anytime, anywhere. This advancement is expected to revolutionize patient care by ensuring that healthcare providers have the necessary data at their fingertips,

regardless of their geographical location.

The most recent step forward in this expansion journey involves the appointment of Jay Marteniuk as the vice president of Sales for Canada. Jay arrives with a rich background, having held significant positions at Bureau Veritas and Thermo Fisher Scientific. During his ten-year tenure at Thermo Fisher Scientific, he spearheaded Canadian



Jay Marteniuk

teams, leveraging his expertise to fuel robust growth in the Canadian Life Sciences and Healthcare sectors, resulting in annual revenues exceeding \$50 million.

INFINITT North America's first successful Dental PACS deployment at the University of Western Ontario (Schulich School of Dentistry) in 2016 stands as a testament to the company's commitment to innovation. The team is poised to seize all forthcoming opportunities, aiming to broaden their footprint across the territory in 2024 and beyond.

With this exciting expansion, INFINITT North America reaffirms its commitment to delivering superior healthcare technology solutions and looks forward to impacting more lives positively through enhanced medical imaging capabilities in Canada.

For additional information, please contact: Shannon Spak, senior marketing manager, [sspak@infinittna.com](mailto:sspak@infinittna.com) or Jay Marteniuk, vice president of Sales Canada, [jmarteniuk@infinittna.com](mailto:jmarteniuk@infinittna.com)



# Australians showing the way in large-scale AI deployment for radiology

CONTINUED FROM PAGE 2

came from the CEO, indicating that top management was backing the project. Moreover, short videos were sent out with messages, and webinars were available to radiologists who had time.

"We made all of the reference material available online," said Dr. Jones. She added that all the key radiology leaders were made part of the project.

Importantly, to win over dubious radiologists, "we also had evidence that the tool would help us with our problems, because it's very hard to rationally argue with evidence." Still, she noted, "People will irrationally argue, but there's not much you can do about that."

As well, there must be feedback mechanisms. And she emphasized that you must show people that you are listening to them and responding to their feedback.

During rollouts of the technology, there were staff dedicated to gathering feedback available. Super-users were also trained, so they could assist others.

Metrics were of paramount importance. The organization had to decide what it wanted to measure during the trial, to prove the AI software was useful.

It turned out that the chest X-ray tool was even more useful than anticipated, which impressed the radiologists and turned skeptics into believers.

What especially won over the radiologists was the ability of the software to spot problems that they had missed. "Other radiologists said they would have missed them too," said Dr. Jones. "The issues were later confirmed by CT and MRI," adding that these problems included cancers.

It was gratifying for Dr. Jones and her colleagues when radiologists were asked if the trial changed their opinion of the CXR tool. "There was a very positive response,"

she said. "They reported a much higher approval of AI, in general, because of the trial."

She added, "Those radiologists who were the most opposed to AI became its biggest supporters after they had used it for six weeks."

After the chest X-ray tool was rolled out across Australia, I-MED conducted another survey. It found that 93 percent of radiologists were using the tool for every CXR they did.

Additionally, 75 percent said the AI tool did not slow them down, and 25 percent said it speeded up their work.

And 90 percent said the AI tool had positively impacted their CXR reporting; the company expected this to be only 50 percent.

Dr. Jones said I-MED does regular sur-

veys across the entire group and has metrics that are reported back every month.

The metrics include accuracy of the software and turnaround times of urgent

**Dr. Jones said I-MED surveys the entire group regularly and metrics are reported back every month about software accuracy.**

cases. "We also look at how often the software fails to provide a result," she said.

The organization also assesses the impact on workflow and on patient outcomes.

Dr. Jones said the AI deployment was challenging and that a lot could have gone

wrong. However, in the end, "It actually went as well as it could," she modestly commented.

But preparation and having a good framework were necessary prerequisites, she observed. Moreover, constant communication with the users and stakeholders underpinned the success of the deployment.

"Implementing AI tools can be done," she said. "If we can do it in our very diverse network, almost anyone can. However, you need to have a framework and a project plan."

In addition to communicating the plan, she said that "evidence is a powerful ally in convincing your colleagues and the IT department, as well as your executives, that there is going to be a successful outcome."

"When you've done all of this, the benefits are enormous."

## AI enables patients to create evidence-based care plans

CONTINUED FROM PAGE 6

Horizon Inc. to build internal privacy policies and procedures, train staff, and develop disaster and recovery protocols, a continuous process that includes monthly access to a privacy coach to stay abreast of emerging threats.

"A lot of entrepreneurs in the digital health innovation space treat privacy as an anchor, a task that slows or inhibits their technology journey," said Privacy Horizon CEO Patrick Lo. "Loreen uses privacy and security to differentiate her company by developing an inherent privacy culture that is constantly maturing. Her team knows privacy is good for people, it's not just an annoyance."

A firm believer in relying on external expertise when needed, Wales also enlisted the services of Tectonic Advisory Services Inc. to solidify the platform's value proposition and identify target markets.

"We recognized right away that this technology is not a simple app to help people manage their diabetes, heart disease or other chronic health condition," said Tectonic president and CEO Glenn Lanteigne. "It's a robust digital workflow that is excel-

**Last fall, the company announced a landmark strategic partnership with LMC Healthcare for patient support.**

lent at supporting patient engagement and behavioural change, while increasing efficiency in both the public healthcare and employment sectors."

Since launching in 2016, My Viva Plan has been on a gradual adoption path that is currently hitting an inflection point due to increased brand awareness, he added.

Last fall, the company announced a land-

mark strategic partnership with renowned diabetes and cardio-metabolic care provider LMC Healthcare to implement an LMC-specific "white labelled" instance of My Viva Plan that is being marketed as My LMC. The collaboration is expected to create an unprecedented patient support system for better self-management of diabetes and other cardio-metabolic diseases.

"The combination of our technology with LMC's educational modules, researched and built by their clinical team, has the potential to bring specialty diabetes care to the doorstep of every single Canadian who is at risk of the disease. That's transformational," said Wales.

Heading into 2024, My Viva is finalizing the development of a digital avatar to serve as a self-care buddy to hold people accountable to their wellness goals. Staying true to their evidence-based principles, the company is currently clinically validating the avatar before releasing it.

## CHIMA gets credit

CONTINUED FROM PAGE 12

seeing how it all relates to each other. How registration affects records, how records affect forms, and how the standardization of forms brings it all together. I like things going to the right spot, things being organized and in the proper location, and things done properly with no errors. I just love it."

Karen has held a variety of roles within Nova Scotia Health over the past 16 years. In order to enroll in the CHIMA program she needed to first upgrade with a biology course, so the entire effort took five years to complete. At the time, her children were very young at just one, five, and six years old. Karen says the hardest part was maintaining balance. "I had to find the proper balance between studying and family to ensure all my assignments were completed on time and I was prepared for the exams. It involved a lot of planning ahead and studying during my lunch hour and breaks at work."

Crediting Nancy as her biggest support, Karen says she simply couldn't have done it without her. "I would have quit in

year one. I was already struggling with the upgrading, and she always kept me on track, gave me confidence to keep going because I may have given up before actually taking the main course. If it wasn't for Nancy, I wouldn't have gotten that biology course. And then once we started, it was a lot. I mean mentally, it was so much and without her support there's no way I would have completed it."

Karen did complete the course gaining CHIMA certification in August of 2022 and by February of 2023 she had landed her dream job of becoming a coding classification specialist.

"Right now, I code day surgery charts so when a person comes in, I read and decipher all the codes attached to that visit."

This skill set has room for movement as well. Karen says eventually she'd like to code obstetrics and newborn charts. A big driver for Karen in taking the course was to find a job where she could work from home. "My mom ran a post office out of our house when I was a kid, so as a busy mom myself having a home office with flex hours works well for raising my family."

Nancy, whose kids were four and nine years old at the time she started the course, says the self-directed nature of

the CHIMA program is tough. Putting in 15-20 hours a week during her lunch hours, weeknights, and on weekends over the four years, she agrees with Karen that balance was really important.

"I ate while studying whether it was the library, the car, my desk, whatever space I could use that was quiet enough. It was a lot, especially with the young children to try to have a work life and school balance and not let anything get neglected because if something failed,

**CHIMA certification was a demanding challenge, but both women say it was well worth the effort.**

then I had to let something else fail while I got caught up with that thing."

But, she says Karen was always there when the going got tough, adding that the relationship was a huge part of her success. "We were really each other's cheerleaders when one of us was struggling. We were there to support each other because we were going through the same things, you know, both parents of young children, and both with full-time

careers. When I really was down and didn't know if I could go anymore, she encouraged and pushed and got me through it, and I'd do the same for her."

While it was a demanding challenge for both women to achieve, they both agree it was well worth the career advancement that followed.

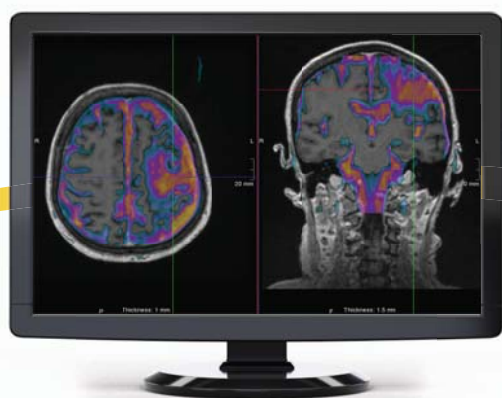
A total of seven IMIT staff in Health Information Services at Nova Scotia Health have received CHIMA certification in the past two years. In addition to Nancy and Karen, Tara Deruelle, a coding and classification specialist and Hunter Haas, who is assistant manager for Health Records in Western Zone received CHIMA certification in 2022.

Marci Strong, assistant manager for Admitting, Registration and Switchboard in Western Zone, as well as Miriam Lagunas-Carbajal and Irene Vassallo, who are coding and classification specialists, received their certification in 2023.

CHIMA advocates for the health information profession, monitors industry trends, and provides continuing education. The theme of last year's Health Information Professionals Week, held in October, was Knowledge made Visible, something Nancy, Karen, and all the other CHIMA graduates are modelling daily.

Less time waiting  
for images to load.

More time for your  
next adventure.



Enterprise Imaging for Radiologists.

Enterprise Imaging Streaming Client – a ground breaking leap forward for health systems. Experience a new era of patient care where diagnoses are made faster, access to information is heightened, and confidence soars. Say goodbye to routing data to different systems and welcome real-time streaming technology that brings you directly to the information. Experience a super-fast display of even the largest studies — all within seconds, empowering you to get out of the office and back to your favorite activities on schedule. **Experience fast firsthand: [agfahealthcare.com/streaming](https://agfahealthcare.com/streaming)**

That's life in **flow.**

**AGFA**   
HEALTHCARE