



Publications Mail Agreement #40018238

# CANADIAN Healthcare Technology

CANADA'S MAGAZINE FOR MANAGERS AND USERS OF INFORMATION SYSTEMS IN HEALTHCARE | VOL. 26, NO. 5 | JUNE/JULY 2021

## INSIDE:

### DIAGNOSTIC IMAGING

PAGE 23

#### SHREWD patient monitoring

Northern Montreal is implementing a new, decentralized system that enables it to monitor, analyze and improve patient flow throughout its healthcare facilities.

Page 4

#### Clinician communications

A mobile alerting and communication system at the Markham Stouffville Hospital, supplied by Connexall, is enhancing collaboration and teamwork among clinicians.

Page 8

#### Smart bots for health

The eHealth Centre of Excellence, in Kitchener, Ont., is leading the way in the creation of bots for medical offices. The software can automate medical coding, alerts, and the sharing of information, improving efficiencies and reducing clinician burnout.

Page 10



PHOTO: ISLAND HEALTH

British Columbia has become a Canadian leader with its Hospital at Home project, one of the first in Canada to treat a wide-range of acute-care patients in the comfort of their own homes. There are many advantages, such as taking pressure off traditional hospital facilities. Pictured are Dr. Shauna Tierney, Medical Lead and Dr. Sean Spina, Research Lead and Evaluation Co-Lead. **SEE STORY BELOW.**

## BC project manages acute-care patients in their own homes

BY JERRY ZEIDENBERG

**V**ICTORIA, BC – British Columbia has rolled out its Hospital at Home pilot in three different communities – two at Island Health and one with Northern Health. The project is already demonstrating that acute-care patients can often be managed as effectively in their own homes as in hospitals.

The project was announced last fall by the BC government with an investment of \$42 million. The plan is to test the concept to see if it can be expanded throughout the province as a way of reducing pressure on “brick-and-mortar” hospital facilities.

Under the Hospital at Home program, patients with a variety of ailments such as pneumonia, heart failure, and COPD are managed at home with daily visits from a nurse, physician, and/or clinical pharmacist. They’re also outfitted with instruments for taking vital signs and medical equipment for treating their illnesses; the equipment in-

cludes oxygen and IV-pump-delivered and balloon-driven medication systems.

Participation in the program is voluntary, and patients are only enrolled if they’re keen to try it. Patients are checked into a particular hospital – the Victoria General or Royal Jubilee, both of which are on Vancouver Island, or the University Hospital of Northern

**The program is open to all acute care patients who can be safely cared for in their own dwellings.**

British Columbia, in Prince George. They are cared for, however, in their own homes.

Since last fall, clinicians at the Victoria General Hospital and the Royal Jubilee Hospital, each of which has nine “virtual beds”, have together cared for over 175 patients.

Each of the nine-bed units is staffed by one physician, three nurses and a clinical pharmacist during the day. Both a nurse and

a physician are scheduled to be available to patients at any time of the day or night.

“We’re not limited to a certain patient population or disease state,” said Dr. Sean Spina, the research leader of the project. “We’re open to all patients who can be safely cared for in their homes.”

Dr. Spina, PharmD, is also the Coordinator of Clinical Pharmacy Services at Royal Jubilee Hospital.

Quite unusually, and to its credit, the BC Hospital at Home pilot has already achieved a 100 percent approval rating from patients who have received treatment at home through the program.

“100 percent of the patients we’ve interviewed have told us that if the opportunity to go through the program came up again, they would do it,” said Dr. Spina. “They loved the independence of being at home and in their own beds. They also benefited from the help and presence of their loved ones, something

CONTINUED ON PAGE 2



# British Columbia pilot project manages patients in their own homes

CONTINUED FROM PAGE 1

they don't always have at the hospital, especially during the pandemic."

Each patient is admitted to hospital, but their "beds" remain in their own homes.

Dr. Spina noted that based on early evaluation results, the bed turnover, or length-of-stay, for patients at home is similar to that of hospitals, with an average stay of about five days.

In addition to taking pressure off hospitals, there are other advantages to caring for patients in their own homes.

Of course, during the pandemic, it has promoted infection control for both the patients and hospital staff, as it's important to reduce patient traffic through large institutions.

Even when the pandemic is over, it's believed that home-based care can reduce infection rates, as patients are less exposed to hospital-borne pathogens, such as MRSA and *C. difficile*.

Moreover, many patients prefer staying in their own homes, when possible, rather than going to a hospital.

Dr. Spina commented that patients in

hospital tend to stay in bed and do less each day. In contrast, "At home, people get up in the morning, they get dressed and go on with their day. They're much more mobilized."

That mobility can lead to better mental and physical health, and results in a person who is still productive, even though he or she is technically in a "hospital bed".

The BC Hospital at Home project was launched in conjunction with a public engagement strategy led by Dr. Spina's team. The engagement included interviews with a variety of key stakeholders, a survey open to patients, family caregivers, clinicians, and health system decision makers. It was feedback from the patients who suggested an important component of the technological platform, the "virtual call bell".

"The call bell hadn't been on our radar," said Dr. Spina. "It was only because of patient involvement that we discovered it."

When asked whether they would participate, patients answered that in order to have confidence in the project, and to feel safe while being cared for at home, they'd like to have a device that could alert a clinician if immediate attention was needed.

Dr. Spina explained that this is much like the bedside call-bell that a hospital patient uses to alert a nurse.

The project found a wireless device that can be used at home; when the button is pressed by the patient, a clinician is immediately alerted by an operator and the two parties are connected.

"Now, even if the patient is in the garden or the shower, they can contact someone for help," he said.

Using this system, patient and clinician can be quickly connected by voice. If the patient needs an ambulance, the operator can immediately connect to 911.

The device also has the capability to detect falls, but the teams haven't activated that feature yet.

Since the start of the project last fall, the

Hospital at Home program has developed a whole technological platform that is used to connect caregivers and patients.

The backbone is the Vocera network, which provides a secure and private communication system linking clinicians to one another. It can be used by nurses visiting patients at home, where it connects to the cell-phone system. When used in hospital, it connects to the local Wi-Fi network.

The Vocera system can be used by clinicians to send quick messages to each other, or to groups of peers. Each of the participating clinicians is using an iPhone, which has been integrated into the technology platform.

In the home, patients are outfitted with a tablet computer and several devices that are used for taking vital signs, such as blood pressure, heart rate, temperature, blood oxygen levels, and weight.

In many cases, it's the visiting nurse who helps take these measurements and loads them into the tablet, where they can be transmitted back to the central server. Some patients, however, are able to take their own vital signs and send them in.

The program is using video-visits between the patients and care team, and integrated video is part of the IT platform. There are also electronic records for the patients, just as in the hospital.

Dr. Spina noted that the program is still in the early stages, and that its organizers want to refine it further. In particular, they'd like the equipment to become even more "patient friendly", so that it's more intuitive for the patients and nurses to use.

For example, he said, one of the goals is to further integrate the vital signs equipment so that it loads automatically into the tablet computer and into the central server.

The team is also looking into better ways of alerting patients that their doctor, nurse, or pharmacist wants to talk to them by video. This could be done first by a phone call, but Dr. Spina believes there might be more streamlined methods, where a patient sees a flashing red light on the tablet, for example. Just by pushing a button, he or she would then be online with a clinician.

Something being bandied about, as well, is the idea of continuous monitoring of vital signs. A patient might only need to wear a patch or bracelet that automatically takes measurements and feeds them into the system.

Dr. Spina said it would also be useful to know if patients were taking their medications as directed. A device might be introduced that lets clinicians know if daily medications were dispensed.

Overall, however, he asserted that "tech-

CONTINUED ON PAGE 30



## Digital Health. Digital Experience.

Introducing Canada Health Infoway's Virtual Partnership Series & Conference.

Cutting-edge health care needs cutting-edge content. Especially now. Canada Health Infoway's new and unique Virtual Partnership Series & Conference features monthly practical 1.5-hour learning sessions and culminates in a full-day virtual conference on Dec 1.

You'll learn about the health care landscape, partnering for success, fostering innovative digital health technologies in Canada, safer prescribing practices and more. Don't just think digital health. Immerse yourself in it.

Register now: [infoway-inforoute.ca/partnership](http://infoway-inforoute.ca/partnership)



# HEALTHCARE TECHNOLOGY

CANADIAN

CANADA'S MAGAZINE FOR MANAGERS AND USERS OF INFORMATION TECHNOLOGY IN HEALTHCARE  
Volume 26, Number 5 June/July 2021

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



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  
[dcreative@yahoo.ca](mailto:dcreative@yahoo.ca)  
Dianne Daniel  
[dianne.l.daniel@gmail.com](mailto:dianne.l.daniel@gmail.com)  
Dr. Sunny Malhotra  
Twitter: [@drsunnymalhotra](https://twitter.com/@drsunnymalhotra)  
Norm Tollinsky  
[ntollins@rogers.com](mailto:ntollins@rogers.com)  
Dave Webb  
[dwebbmedia.ca@gmail.com](mailto:dwebbmedia.ca@gmail.com)

#### Art Director

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

#### Art Assistant

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



# AI innovation will make thyroid ultrasounds faster and easier

CONTINUED FROM PAGE 23

estimated 8,600 Canadians were diagnosed with thyroid cancer in 2020.

The current approach is for a sonographer to slide an ultrasound probe from top to bottom and side to side on the neck, taking multiple side-view and transverse-view pictures of the bowtie-shaped thyroid gland, while locating, measuring and characterizing any nodules.

The process is time-consuming and the next step – interpretation by the radiologist – is complicated and potentially error-prone.

Jaremko said inconsistency in describing nodules and interpreting ultrasound results can lead to confusion and false negatives or positives. False positives can result in unnecessary biopsies, the next step in determining whether a suspicious nodule might be malignant. False negatives

**MEDO's software analyzes the scans and locates, measures and characterizes any significant nodules for further review.**

could mean a malignancy isn't discovered.

"It's very frustrating because most of the nodules are benign, but occasionally there is a needle-in-a-haystack one that's malignant," said Jaremko, who holds the Alberta Health Services Endowed Chair in Diagnostic Imaging at the U of A and is a member of the Women and Children's Health Research Institute.

MEDO's software analyzes the scans taken by a sonographer, locating, measuring and characterizing any significant nodules and selecting optimal images for analysis. The system produces a preliminary report, giving a score for each nodule indicating whether it is likely benign or malignant. The radiologist is free to edit the report if they have a different opinion on the findings.

"This will make scanning thyroids much

simpler and more reliable, especially in people with complex thyroid glands who need follow-up," said Jaremko. "We are avoiding confusion, making things simpler, faster and easier for patients and clinicians."

MEDO is doing an investigational trial of its thyroid ultrasound tool at a Sherwood Park clinic run by MIC Medical Imaging, scanning several patients a day using the software, as well as using conventional ultrasound as a backup. The pilot was scheduled to continue until the end of June, with Jaremko and his team then analyzing the results. If they are comfortable with the findings, they hope to be using the software in all 10 MIC clinics in the Edmonton area by the end of the year.

The company will then begin marketing the system to other radiology groups, starting in Western Canada, as well as busy endocrinology clinics that could use the tool to do their own scans.

The Singapore arm of the company hopes to piggyback on the FDA approval to get the go-ahead to roll out the tool there soon. Marketing will also begin in the U.S. and eventually in Europe once approvals are obtained there.

This is not MEDO's only AI-based ultrasound tool. They have a total of four, three of which have been approved by the FDA, including MEDO Hip, a tool to screen newborn babies for hip dysplasia, a common hip joint problem that leads to osteoarthritis but is easily fixed if detected early.

"We realized that the three of us shared

the same vision of democratizing medical imaging through simplifying the use of ultrasound," said Zonoobi, who was the motive force behind the startup and is now CEO.

The new tool is already being used by specially trained nurses in two clinics in the Westview Primary Care Network in Spruce Grove. Jaremko expects it will soon be used in other primary care clinics in the Edmonton, Alberta area and hopes to then move into clinical practices throughout Alberta.

The company is also developing other applications, including lung and fracture ultrasounds, and has recently done several trials scanning patients with COVID-related pneumonia in ICUs.

MEDO has 25 employees working out of the U of A Health Hub & Accelerator space in Enterprise Square in downtown Edmonton, but Jaremko says that number could easily grow to 100 over the next few years, making the company one of the high-tech engines in Alberta.

## SOPHIE gives start-ups access to expertise

CONTINUED FROM PAGE 12

surprise to those that have been watching the evolution of life-science companies in Hamilton.

Muggah calls Hamilton a "goldilocks-sized city" for health innovation that has a "foundation of research, clinical care, health education and training that is pound for pound unrivaled in the rest of Canada."

"You have the capabilities, the capacity, and the resources that you would find in Toronto or Boston, but we aren't so big that it's challenging for a company to access the equipment or expertise you need," he said. "You aren't waiting in a queue for two or three years to get a meeting."

And while the expertise and network start in Hamilton, the scope is global.

"My phone has been ringing off the hook since this was announced," Carter said. "And that's because this isn't about businesses that were created in Hamilton and sell in Hamilton. We're building businesses for a world market."

VoxNeuro's Elliot agreed. The company just expanded into the U.S. market.

"We want to globally change the way brain health is managed and treated," she said. "Ultimately, we are driven to become the gold standard of cognitive assessment, an integral part of every brain health assessment, worldwide."

That was the intention of SOPHIE funding, to support the concentrated expertise found in the Hamilton Region in companies like VoxNeuro and deliver it to people around the world.

## British Columbia pilot project manages patients at home

CONTINUED FROM PAGE 2

nology does not provide the care, technology allows us to be more efficient." Ultimately, patients need to know they are in the hands of caring nurses, doctors, and clinical pharmacists, and that these clinicians are actively managing their diagnoses and treatments.

ing on the need. Overall, it takes no more than five minutes per week for the patient to answer quick questionnaires.

By doing so, a nurse or social worker can see how the patient is doing, and whether quick action and support is needed.

Working with Microsoft, IBM and Roche, moreover, TryCycle has devised algorithms that use artificial intelligence to detect problems – even without the input of the patient or caregiver. For example, if there is a change in the pattern of the patient's responses, the system will flag it.

Similarly, the system can detect changes in the usage of a patient's smartphone that can be associated with mood changes, such as depression or anxiety. This, too, can be used to alert a caregiver. "We want to avert problems before they happen," said MacBeth. "We look for behavioural insights to determine if the patient is at risk of harm or not." Said FSIN vice chief Heather Bear, in reference to her colleagues' deployment of TryCycle: "Less people will suffer because of what you've done."

To expand the Hospital at Home program, the managers of the project also want to answer important questions. They are actively conducting research, said Dr. Spina, to find out:

- How patient friendly is the technology, and what needs to be improved?
- How safe is the care? How do the outcomes and length-of-stay compare with in-hospital care?
- What are the hospital readmission rates? How do they compare with conventional care?
- How do the costs of acute care at home compare with those in the hospital?

Dr. Spina said all of this has been made more urgent by the COVID-19 pandemic, as hospitals and health regions continue to care for patients during the global crisis.

"There has been a lot of development going on, and a lot of new solutions are being tested," he said.

This accelerated pace of technological change and modernization, he said, has

**Ultimately, patients need to know that they're in the hands of caring nurses, doctors and clinical pharmacists.**

been something of a silver lining in the midst of the COVID-19 crisis.

To follow BC's Hospital-to-Home journey or to learn more, please see the website at <https://www.islandhealth.ca/our-services/hospital-home-services/hospital-home>

## Semantic Health uses machine learning

CONTINUED FROM PAGE 12

for medical coding and auditing," said Dr. Sahar.

Semantic Health's software engine also converts the data into structured information that can then be used for other purposes, such as research.

To create the Semantic Health system, he said, the company assembled a team of experienced coders and auditors, as well as machine learning experts. Moreover, the company has been working with the Vector Institute, in Toronto, a centre of excellence for the advancement of artificial intelligence.

The company now has projects under-

way or completed at Humber River Hospital, Unity Health Toronto, and Southlake Regional Health Centre.

"Our goal is to improve the efficiency of the coding process," said Dr. Sahar. "We're making it faster and more accurate."

The pilots were funded in part by the Coordinated Accessible National (CAN) Health Network with support from the Federal Economic Development Agency for Southern Ontario (FedDev Ontario). Semantic Health continues to work with the CAN Health Network and other healthcare organizations in the network to deliver improved healthcare data quality across Canada.

## First Nations

CONTINUED FROM PAGE 4

and has since expanded its capabilities to cover a wide variety of social and mental health issues, including depression, substance abuse and self-harm.

Company president John MacBeth, speaking at the announcement in

**The app is customized for each user, and can be set up to check-in with patients daily, every few days or weekly.**

Saskatoon, said it will soon be used in Australia and South America, too. The strength of the system is that it tethers patients to skilled professionals, in a compassionate way, and in the language of the user.

MacBeth explained that the app is customized for each patient and can be set up to check-in with patients daily, every couple of days or weekly, depend-