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Healthcare Technology

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Solutions for public health

Dissatisfied with the data management system available in Ontario, and under pressure to track the course of COVID-19 more effectively, public health agencies in Toronto and Ottawa have launched new platforms.

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Care providers and companies specializing in the treatment of wounds for patients in the community have banded together to provide enhanced services.

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The fire that destroyed the famed Notre Dame cathedral in Paris a year ago offers lessons for disaster planning in healthcare. Hospital managers can learn a great deal about how to improve their own procedures.

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PHOTO: COURTESY OF HAMILTON HEALTH SCIENCES

Testing virtual care for recovering post-op patients

Researchers and clinicians in Hamilton, Ont., are leading a pan-Canadian trial of remote monitoring technology for post-operative patients. The multi-site study involves 900 patients, and aims to assess how virtual care can keep patients healthy at home while reducing ER visits and readmissions to hospital. Pictured are project leaders Dr. Michael McGillion and Dr. P.J. Devereaux. **SEE STORY ON PAGE 4.**

Sunnybrook and OMA devise an interactive platform

BY JERRY ZEIDENBERG

TORONTO – Sunnybrook Health Sciences Centre and the Ontario Medical Association are collaborating to extend the functionality of the MyChart patient portal, to support patients and doctors communicating online more easily, saving both time and effort.

MyChart, created by Sunnybrook and shared with other hospitals across Canada, is the largest patient portal in the country. In Ontario, it's used by 658,000 patients in more than 70 of the province's hospitals and labs.

The goal now is to give doctors access to those records, with permission of the pa-

tients, so they're not flipping from one system to another for the data they need.

"Doctors are spending too much time opening multiple systems, searching in one place for lab information and in another for

The goal is to turn the MyChart portal into an interactive system linking doctors and patients.

encounter or discharge information," said Dr. Sohail Gandhi, a family physician and former President of the Ontario Medical Association. "It gets to be ludicrous."

Instead, it would be so much easier to

have one source of patient information, where the patient's data has been consolidated, he said. The idea is to have MyChart serve that purpose, and to continue adding patients and functionality to the patient portal.

"It's already the largest patient portal in the country, so it makes sense," said Dr. Sohail. "The next biggest is only one-sixth of its size."

And while MyChart has, to date, been largely a static warehouse, where patients could view their medical records data, enter personal data such as self-monitoring and provide access to trusted friends, family

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Sunnybrook and OMA work to make MyChart an interactive platform

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members and physicians, the goal now is to make it more transactional and interactive.

One significant step will be to incorporate videoconferencing into MyChart, so that patients can set-up and conduct video chats with their doctors. Payment for video visits is not yet supported by the Ontario government, except through the Ontario Telemedicine Network, but many believe it will be coming in the near future.

Also in the works are communication systems, as well as online prescription renewals and requests for forms, such as sick notes.

For uninsured services, beyond what is covered by the provincial government, like various forms, physicians will be able to charge patients online. "It's a carrot for the doctors to use the system," said Dr. Gandhi. "We're building secure payment handling into the system, so it's easy for the patient and for the physician."

The idea is already proving popular with doctors. Dr. Gandhi said that when his team raised it with the OMA's members, they hoped to receive expressions of

interest from 200 to 300 physicians. "We've already heard from 800 of them, that they're in support," he said.

For his part, Dr. Gandhi got the ball rolling on the project while he was President of the OMA. He has since stepped down, but remains on the Board, and is still committed to the project.

He also has a good deal of experience with online systems. In the past, he was part of an e-Prescribing pilot in his home region of Georgian Bay, where 50 physicians working in a family health team consolidated on one EMR, sharing patient records with themselves and local pharmacists.

As well, he was part of a project that connected doctors to local nursing homes, dramatically enhancing the level of care for residents.

The project with Sunnybrook and MyChart is now under way and Dr. Gandhi expects it to go live this fall.

Sam Marafioti, VP, Capital, and CIO at Sunnybrook, said the initiative with the OMA is a significant one for MyChart, too.

"It's our top priority at MyChart," said Marafioti, noting that while MyChart



Leading the project are OMA past-president Dr. Sohail Gandhi and Sunnybrook's EVP Sam Marafioti.

continues to expand into additional hospitals, it's also targeting greater integration with front-line physicians and community care providers.

"We have a strong community care inte-

gration going on," said Marafioti. "We're developing a whole community care platform."

He noted that until now, MyChart has been largely "hospital-centric" and a system for viewing and sharing records.

In this next phase, it will broaden its scope into the healthcare continuum and also become more interactive, allowing exchanges between patients and care-givers.

In this way, MyChart could become the portal for information exchange for the new Ontario Health Teams, which are seeking to integrate various tiers of health providers – from acute and complex care hospitals, to nursing homes and retirement residences, to pharmacies and various medical and health clinics.

One of the problems to date, however, has been how to connect the disparate systems used by these care providers. From Marafioti's perspective, MyChart could become the glue that binds them all together.

And for the consumer, MyChart has been working on an app that makes it easier to connect by using mobile devices such as smartphones, and to conduct transactions from this ubiquitous platform.

On the physician front, MyChart would like to integrate with the EMR systems used by doctors, so the connection would be even more seamless, with data loading back and forth automatically.

"We've already started doing this with physicians [in clinics] at Sunnybrook who are using Accuro," said Marafioti. He and Dr. Gandhi would like to continue this work and get more of the EMR vendors on board.

By doing so, it would make so much more information quickly and easily available to doctors. "We should really be doing this," said Marafioti. "It's one of my hopes that we get it done."

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Public health in Toronto and Ottawa switch to newer data solutions

BY NORM TOLLINSKY

Ambitious but complex data collection and reporting solutions for communicable disease outbreak management are fine in theory, but during a pandemic, simpler and user-friendly systems may be the best solution.

That's the conclusion public health units serving Toronto and Ottawa came to when staff using the province's integrated Public Health Information System (iPHIS) were unable to keep up with skyrocketing cases of COVID-19.

On March 30th, after eight of its employees tested positive for coronavirus, Toronto Public Health ordered most of its staff to work from home. By that point, there were 1,463 laboratory-tested cases in the city, delays in reaching out to them and discrepancies in the number of cases reported by the city and the province.

Something had to be done and on April 16th, Toronto Public Health announced the deployment of its own internally developed Coronavirus Rapid Entry Case and Contact Management System (CORES).

"While iPHIS has served us for many years, for the purposes of the current COVID-19 emergency, we at Toronto Public Health quickly realized that this provincial information system was not well-equipped to deal with the data we need to quickly input," remarked Dr. Eileen de Villa, Toronto's Medical Officer of Health. "When we realized these limitations and that we needed a more nimble technology for our response, we quickly worked with our city partners to develop a new information technology tool to keep up with our evolving contact tracing demands."

CORES allows Toronto Public Health "to quickly and easily document each indi-



Dr. Eileen de Villa, Toronto's Medical Officer of Health

vidual case investigation efficiently and share data with the provincial Ministry of Health," said Associate Medical Officer of Health Dr. Vinita Dubey. "It will allow TPH to better keep up with the volume of new reports and prioritize individual cases such as healthcare workers that require urgent follow-up. Importantly, it also allows our front-line staff to work remotely from home."

Additionally, the software has been designed to capture socio-demographic and ethno-cultural data "to help us understand if this pandemic is disproportionately affecting certain groups in our community, and help inform ways to address these potential inequities," she noted.

Given the urgency of the need, Toronto Public Health turned to the City's IT department to develop the solution.

By mid-May, Toronto was reporting close to 8,300 cases and had more than 500 staff working on case investigations and



Dr. Vera Etches, Ottawa's Medical Officer of Health

contact tracing. Using CORES, the city is closing in on the province's target of contacting 90 percent of cases within 24 hours.

A similar scenario played out in Ottawa, culminating in an April 29 press release announcing the abandonment of the iPHIS case management and contact tracing module and the deployment of its own COVID-19 Ottawa Database (COD).

"The new Web-based, secure system allows our team to more quickly and easily document each individual case investigation and share data with the provincial Ministry of Health," said Medical Officer of Health Dr. Vera Etches. "This transition will position Ottawa Public Health to better manage COVID-19 case volumes, facilitate remote work options for the case management team and continue to uphold provincial reporting obligations."

At a May 15 media briefing, Dr. Etches told Canadian Healthcare Technology that Ottawa Public Health "is able to grow our

case and contact management team with training that is able to be accomplished in a couple of days given the ease-of-use of the system. Previously, it was harder to bring people on to train them how to use iPHIS. Also, we no longer have to use paper to keep track of the details of cases until we can get that information into iPHIS through data entry staff, so it's definitely improving our efficiency."

Seven online iPHIS user guides totaling 396 pages are indicative of the software's complexity and the challenges around onboarding new staff in the midst of a pandemic.

The COD software, acquired from Newfoundland and adapted by City of Ottawa IT staff, can also "make connections between cases and add new variables to track things like ethnicity," said Dr. Etches.

The Province of Ontario began using iPHIS in 2005, but concerns about it were raised as early as 2007 in a report by the Office of the Auditor General of Ontario.

"By the time Ontario implemented iPHIS, the technology was 15 years old," the Auditor General reported. "The federal government stated that it would no longer provide technical support for the system after 2008 and that a newer system would be made available to all provinces and territories in that year."

The 2007 audit also detailed "significant quality problems with the system," including inconsistent and incomplete data, and "two-to-three week delays from the time local public health units first received case reports to the time the cases were entered into iPHIS."

Panorama, the new system the federal government planned to make available to the provinces and territories in 2008, was

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Multi-site study tests virtual care for post-op patients

BY JERRY ZEIDENBERG

HAMILTON, ONT. — Researchers and clinicians at Hamilton Health Sciences are leading a multi-hospital study to determine if the numbers of discharged surgical patients who return to hospital in the first 30 days after discharge — a critical period for recoveries — can be significantly reduced through the use of remote monitoring technology.

The project is called PVC-RAM, short for "Post discharge after surgery Virtual Care with Remote Automated Monitoring" technology.

It launched in May, and it's rapidly recruiting 900 patients at hospitals across Canada — including Hamilton General, the Juravinski Hospital, St. Joseph's Health Care, London Health Sciences, Kingston General, the Ottawa Hospital, as well as facilities in Edmonton and Winnipeg.

Spurred on in large measure by the need to keep patients out of hospitals after surgery due to the COVID-19 pandemic,

Hamilton Health Sciences wished to implement the project quickly. "It's a trial on steroids, when it comes to the starting times and recruiting timelines," said Dr. P.J. Devereaux, director of the Division of Perioperative Care at McMaster University and one of the project leaders.

"If we can reduce the numbers of re-admissions, we can increase our capacity to do more elective and urgent surgeries," said Dr. Devereaux. "We may also reduce the spread of COVID-19 by keeping people out of hospital, whenever possible."

Using advanced technologies, the researchers are confident that patients can be effectively cared for virtually, from hospital-to-home. The real question is determining how effective the system can be — how many patients will have better outcomes using remote monitoring, and how many won't have to return to hospital.

"We know that 15 to 20 percent of post-op patients will come back to the emergency room or be re-admitted in the 30-day period after discharge," said Dr. P.J. Devereaux. "But if we can reduce that, we can free up beds and increase the capacity of hospitals to do more

elective and urgent surgeries. We can also reduce the risk of patients becoming infected with COVID-19."

While just getting off the ground, the project has already helped patients at home through the use of technology. Dr. Devereaux cited the case of one cardiac patient who was discharged from hospital with the equipment. On just the second day at home, the monitoring

The project involves patients, clinicians and researchers at hospitals across Canada, using advanced technologies.

equipment discovered a heart rate of only 32 beats per minute and low blood pressure — triggering an e-mail notification to a nurse.

The nurse followed up with a doctor, who asked the patient's wife to show a view of her husband by using video on a tablet computer. "It was clear that the patient was in trouble," said Dr. Devereaux. "The patient was brought back

to hospital and was found to have had a complete heart block."

Surgery was quickly performed, which likely saved the patient's life.

Dr. Devereaux is working in tandem with Dr. Michael McGillion, assistant dean, Research, School of Nursing, McMaster University. The scope of PVC-RAM includes all types of urgent, semi-urgent and emergency care patients. Examples include oncology patients, as well as patients who have suffered hip fractures or aneurysms.

The team has received funding from Hamilton Health Sciences, along with pharmaceutical giant Roche, and it's seeking additional funds from various sources.

The technology is being supplied by Cloud DX, an award-winning Canadian company with headquarters in Kitchener, Ont.

The system, called Cloud DX Connected Health, beams the data gathered by a suite of Health Canada-licensed, vital-sign devices through a tablet computer (supplied by Bell Canada) from the patient's home back to monitoring

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The pandemic is fast-tracking the transformation of healthcare technology

The use of virtual meeting platforms is just the tip of the iceberg.

BY LISA CARROLL

As the COVID-19 pandemic unfolded earlier this year, healthcare facilities across the country found themselves – like so many other organizations – having to urgently reinvent ways to operate, provide patient care, manage supply chains and deploy resources, with many of the usual ways of doing things suddenly off the table.

Personnel found themselves having to work from remote locations, yet still needing to closely collaborate with colleagues, sharing ideas and updated information in real-time. Quick response, immediate implementation and nimble redeployment of precious resources became imperative, with every second counting.

Numerous hospitals and other healthcare centres quickly moved to or significantly expanded their use of virtual meeting platforms, enabling teams to collaborate “face to face” no matter where they were located. But this was just the tip of the iceberg in terms of accelerating digital transformation across Canada’s healthcare sector.

ON THE EAST COAST, NUMEROUS HEALTHCARE ORGANIZATIONS found themselves under strain and looking for new ways to provide care, while also ensuring the safety of their employees and patients. The eHealth shared services organization, The Newfoundland and Labrador Centre for Health Information (NLCHI), saw an opportunity to bridge this gap by leveraging technology to support resources and assets while minimizing the use of PPE.

NLCHI partnered with Microsoft, and within five days moved nearly 4,000 healthcare workers to an Azure Virtual Desktop Environment and Microsoft Teams. This shift to a digital environment enabled them to rapidly expand their unified communication platforms providing their teams with a secure centralized repository for all COVID-19-related guidance, data and information.

This means their staff can screen patients for COVID-19 virtually, their supply chain department can order supplies remotely ensuring frontline workers have the resources they need to stay safe. Each Regional Health Authorities Emergency Operations Centre continues to collaborate over Microsoft Teams to address responses to the pandemic. This digital shift ultimately enabled NLCHI to reduce its overall technology management costs, enhance workforce productivity and transform patient care using technology, all while maintaining safe and secure practices to reduce the spread of the virus.

Robert Drover, Regional Director & CIO Central Health says that their success really stemmed from the dedication of their senior leadership team, specialists, and the strong direction of management who quickly pivoted and pulled together a team of dedicated high-quality employees who worked diligently with Microsoft to make this transformation happen.

Drover says this shift to digital has been “remarkable, and, possibly even an everlasting story” that continues to play out as these technologies change how care is being delivered during the pandemic. “Being able to connect to the health system using any device to retrieve information and virtually meet



with colleagues to treat patients has been truly transformational for NLCHI.”

THEN THERE IS THE STORY OF CBI HEALTH, one of the largest community healthcare providers in Canada. The company normally provides in-person care and treatment to clients through its network of Rehabilitation Services clinics, but COVID-19 changed everything.

The pandemic impacts made them move quickly to put all staff on a single communications platform, Teams – which saw an incredible 3,000 clinicians and administrative users set up in less than ten days.

Teams was chosen for its security, data residency, privacy, and its alignment in the Microsoft stack. CBI

Personnel found themselves having to work from remote locations, yet still needing to closely collaborate with colleagues, sharing ideas in real time.

Health was able to quickly begin video calls and virtual client treatment sessions, continuing to manage its business seamlessly despite the pandemic disruptions.

“The pandemic required us to quickly shift to a primarily virtual care/telehealth model for remote assessment and treatment to protect the health and safety of both our staff and our clients, while also ensuring our clients receive the care they needed in the safety of their own homes,” said Jon Hantho, president and CEO of CBI Health.

Now, CBI Health is averaging approximately 100,000 virtual sessions per month. The company says as its virtual care/telehealth program matures, Teams will allow it to potentially expand its reach and access to clients in underserved areas.

Hantho says the COVID-19 outbreak expedited the rapid deployment of Teams and other Microsoft services, and the resulting impact means a permanent shift to virtual care in CBI Health’s business model.

“This is not a ‘pandemic fix,’ this is a fundamental shift in how we are doing business, at all levels, and it’s here to stay.”

The virtual care/telehealth model is proving very popular with patients as well. CBI Health says it has surveyed more than 1,000 clients since the new model was put into place, and satisfaction rates are higher than 90 per cent positive.

THESE ARE JUST TWO EXAMPLES of the truly dramatic digital transformation Canada’s healthcare providers have become immersed in since the pandemic took hold. Longer term plans for new digital infrastructure have become urgent deliverables. Unification of previously diverse patchworks of technology is happening at breakneck speed, while staff and management alike have been singing the praises of the benefits being delivered by these solutions for their own organizations and, most importantly, to the patients who are relying on them.

Ironically, the disruption which the pandemic has caused across our healthcare system will, in many cases, prove to be a beneficial catalyst going forward. The digital transformation it has initiated will only strengthen the operations of these crucial care providers long into the future. So, perhaps there is a silver lining in this part of the COVID-19 cloud.

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Lisa Carroll is the Canadian Public Sector Lead at Microsoft Canada.

Northern BC health authority sets up online COVID clinic in two days

BY DANIEL RAMCHARRAN,

When a pandemic strikes, healthcare organizations need to react quickly. As a result, remarkable things can happen.

Northern Health is the health authority serving Northern BC. In March 2020, it set up an online clinic and COVID-19 information line in only two days. With thousands of callers since inception, this service has been crucial for Northerners.

“We were definitely building a plane in flight,” says Dori Pears, regional manager, Primary and Community Care, one of the leads in developing the Northern Health COVID-19 Online Clinic & Information Line.

In early March, Northern Health’s Executive tasked a small team to create a combined help line and online clinic. The service would provide information and advice, helping reduce the transmission of COVID-19 and decreasing pressure on emergency rooms and other health services.

For two days, the team “locked down” in an intense process to plan and implement the new clinic.

The first challenge was space. The Brunswick building in Prince George was chosen – but it was fully occupied by IT staffers. Thanks to Jeff Hunter, chief information officer, within hours all 200 staff were sent home to work remotely.

“I was amazed at how quickly they vacated their building so we could set up the new clinic,” said Pears.

A small team stayed behind to install equipment. Twenty-six workstations were initially created. As call volumes increased, new workstations were added.

The team used Tableau software to track wait times, call lengths, and call volume. It provides heat mapping to deter-

mine peak hours, which helped inform ongoing staffing and process changes.

“From an IT equipment perspective, the amount of effort by IT staff to move the virtual clinic from concept to production was immense,” says Joan Vanderlee, regional manager, Acute Care Solutions, Information & Technology Services.

Now that the infrastructure was ready, they needed staff. David Williams, VP of Human Resources, and his team put out a call for staff willing to be redeployed.

“There were many who stepped outside their normal roles to ensure we had suc-

cess. Nobody said, ‘this isn’t my job,’” says Vanessa Kinch, regional manager, Clinical Informatics.



Kara Hunter



Dori Pears



Dr. Dietrich Furstenburg

also provided up-to-date information and escalation procedures.

“The first week was absolutely crazy. I couldn’t have asked for a better team to support this,” says Dr. Furstenburg, Northern Interior rural medical director, and one of the leads of the project. “Everyone did a vital role in very short order.”

To keep everyone healthy, strict cleaning protocols were set up to ensure everything was sanitized between shifts.

The service, which initially operated 24/7, provides three tiers:

- Tier 1: Screens calls, provides informa-

tion. Transfers medical questions to Tier 2.

- Tier 2: Nurses assess callers, transferring those with COVID-19-related symptoms or other complex medical issues to Tier 3.

- Tier 3: Physicians and nurse practitioners provide immediate help and advice.

Before launch, practice calls and tests ensured everything was working. Information technology experts also provided on-the-spot support to each tier.

On March 14, the service “soft-launched,” initially seeing a few calls. But

Northerners were anxious about COVID-19, and when word got out, over 800 calls flooded in the next day.

“People simply needed information,” says Kelly Gunn, VP Primary and Community Care and Clinical Programs.

There were over 4,430 calls the first week, with 70 per cent about COVID-19.

To keep up, staff worked round the clock – some working 20 hours a day. They also balanced training new staff, managing technical requirements, and implementing evolving messaging. All of this required constant adjustments.

“There were changes every day,” says Pears. This initially strained the line’s response time, which started at 30 minutes. But after two weeks, it was only six minutes.

“It was great to provide the wraparound support until we figured out what we needed,” says Kara Hunter, Lead, Nurse Practitioners.

Since then, the Northern Health COVID-19 Online Clinic & Information Line has added other functions, including providing information on mental health and substance use; working with BC Housing and the First Nations Health Authority; and connecting local businesses with Public Health Protection.

Now that Northerners are more informed and call numbers are dropping, the service’s hours have been slightly reduced.

The service is still available for Northern communities, but with many doctors’ offices now offering virtual healthcare, Northern Health continues to advise people to call their primary care providers first.

As of June 10, the service had received nearly 14,000 calls in total – impressive for a “plane built in flight” in only two days!

Daniel Ramcharran is Communications Advisor, Planning, Quality and Information Management, Northern Health.

Nurse Practitioner in rural Nova Scotia embraces virtual care for patients

BY DEIDRE TAYLOR

Susan Savage joined the collaborative family practice team at North Queens Medical Centre in Caledonia, N.S. – 100 km west of Halifax – two years ago as a nurse practitioner with Nova Scotia Health Authority.

The collaborative practice’s two nurse practitioners and family doctor provide primary care for residents of the small, close-knit community, along with those living in the surrounding areas.

At the end of March, Savage began providing virtual appointments for patients using Zoom for Healthcare, like many others, once it became available for healthcare providers in Nova Scotia. Currently, more than 3,200 healthcare providers in the province are using Zoom for Healthcare in response to the pandemic.

“When it was indicated that we should limit in-person appointments due to the spread of COVID-19, our

practice adopted virtual care overnight,” said Savage. “We talked about using Zoom one day, and the next day we were doing it. I’ve been providing many of my appointments with patients online.”

Savage found it easy to adapt to virtual appointments, as she routinely provides appointments for her patients by phone.

“I have been providing telephone appointments for patients all along, as many healthcare providers do. Some patients are not able to afford to travel to the clinic, so I will speak with them by phone to ensure they receive the advice and care they need.”

Sometimes an appointment by phone just isn’t enough, and that’s where a virtual appointment with a video component can be helpful.

“As a primary care provider, there is so much you gather through observation. By adding video, you can see the patient’s rash, wound, droopy eye lid or issues with mobility, which you can’t get from a telephone call.”

Savage does note that there are

physical assessments that can’t be completed virtually, and in-person appointments are arranged for patients as clinically warranted.

As a relatively new provider to the collaborative family practice team, Savage has been accepting new patients into her



Susan Savage on Zoom for Healthcare.

practice from the Need a Family Practice Registry. She finds that the initial appointment with a new patient can be done virtually with Zoom for Healthcare.

“Virtual care is a way to make appointments in family practice more ac-

cessible for patients. The patient population that I am really interested in using virtual care with are those who find it difficult to come in to the office, such as a mom with several young children, or an elderly patient who doesn’t drive.”

Access to Wi-Fi or a data package on a mobile phone is another consideration that needs to be weighed when offering a virtual appointment. “High-speed internet is supposed to be coming to this area later this year, so that will make a big difference for this community, and hopefully it will be affordable.”

Overall, adopting virtual care appointments has been well received.

“There have been some growing pains, but that’s the case with anything new. This will possibly be the new normal in my practice, as there is huge value for clinic patients, as well as for primary care providers. For example, when the weather is bad and the roads are poor, rather than reschedule, a patient’s appointment can be done virtually; it really will change how we deliver care.”

Contact tracing: Advanced analytics can help uncover patterns in the spread of COVID-19

Visualization, analytics and data management from SAS provide new tools for coronavirus tracking.

BY GREG HORNE, GLOBAL PRINCIPAL, HEALTH CARE, SAS

Test, trace and treat is the mantra of communicable disease fighters, and it's no different with COVID-19. However, across Canada and the United States – and in many parts of the world – health authorities have discovered they're hamstrung by a shortage of staff able to do the work of tracing.

The goal of contact tracing, of course, is to break the chain of transmission by identifying people who've come into contact with those who have contracted the disease, to test them, and if needed, isolate them or provide them with medical treatment.

In April, the Canadian government asked for volunteers to learn the art of contact tracing, and an astounding 27,000 people applied. For its part, the state of New York recently unveiled a contact tracing plan that calls for the hiring of as many as 17,000 contact tracers. And Belgium is hiring 2,000 "corona detectives" for a population of about 11.5 million people. Not all of these tracers are in the field. Some will be at call centres, others will work with incoming data, and some will be public health experts.

These modern contact tracing efforts can be enhanced by using data visualization and analytics to understand:

- Missing or unexpected linkages in contact data.
- Who should be tested.
- Where the virus is spreading.
- Which communities are at greatest risk.

This increased awareness is a valuable tool that enables epidemiologists and healthcare officials to respond faster in instituting containment measures and issuing public alerts to COVID-19 "hot zones".

Contact tracing: A history of disease tracking

One of the most famous cases of contact tracing is that of "Typhoid Mary" in New York City at the beginning of the 20th century. The source of contagion turned out to be an asymptomatic carrier who was a roving household cook for a number of the city's wealthy families. Only through the scientific and diligent work of George Soper (considered by many to be the first epidemiologist) were authorities able to not only identify the source but also realize that some people could carry and pass on the disease while appearing to be healthy.

Soper's detective work, interviewing typhoid patients and their families, became the foundation for modern contact tracing. Much of the work has remained unchanged and contact tracing has become a preventive medicine cornerstone.

Contact tracing in today's world

A journalist's standard set of questions – who, what, when, where and why – are the same that a contact tracer uses when interviewing someone who has been diagnosed with a contagious disease, like COVID-19. They seek information directly from the source to help determine who the individual contacted, when these interactions happened and where they took place. Ultimately, the goal is to establish linkages to help slow the spread of the virus. But that's easier said than done.

What happens if patients can't recall all of their movements over the last two weeks? What if a patient is incapacitated and can't respond to questions? Peo-

ple who were unknowingly exposed to the infected individual might carry on with their lives, unaware that they, too, could be infected and further spread the disease. This is precisely where modern technology – such as analytics and machine learning from SAS – can play a pivotal role.

A once cumbersome process that relied on an individual's often incomplete or inaccurate memory, contact tracing has entered the digital era. Thanks to advanced analytics and data visualization, public health officials and investigators are finding new channels to quickly identify (with their consent) people who have been exposed to COVID-19 so they can self-isolate, seek treatment if needed and impede the spread of infection.

The new role of data management and analytics

The latest data management capabilities and cutting-edge analytics give contact tracers a new set of tools to work with. There are four areas where analytics can help.

Contact transaction databases with entity resolution

These databases are the home for contact tracing data. They enable entity resolution that, for example, links multiple records in perhaps multiple databases to the same person. This is a huge timesaver when speed is important – as it is with contact tracing. Us-

text/SMS messages or emails. Based on the likelihood of close, extended contact, such as a work colleague, they may be notified to get a health assessment.

Public health insights

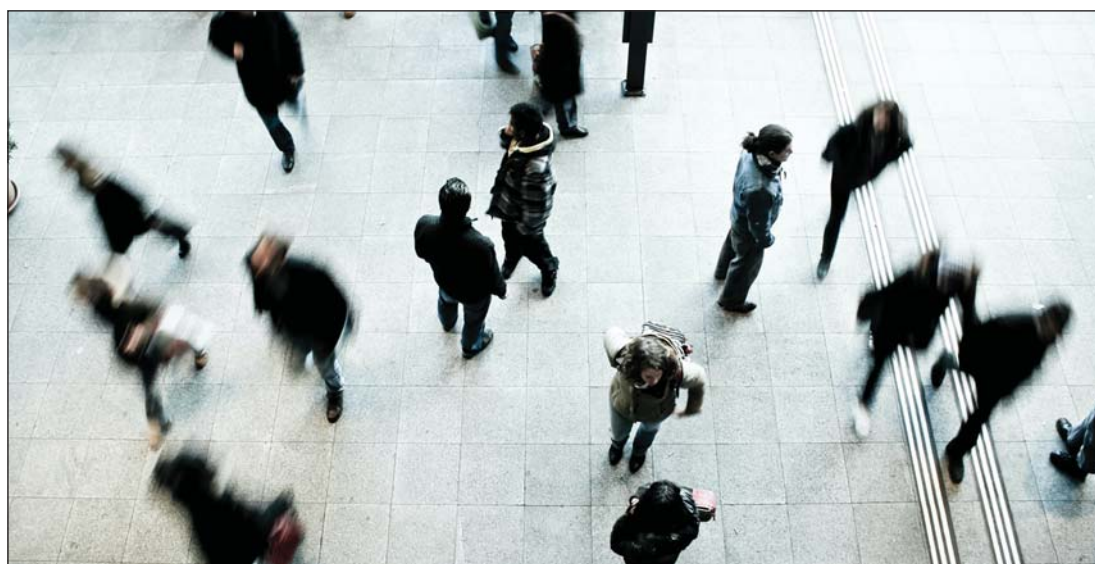
When assessing a patient's network, public officials can rely on analytical insights from the data to fill in some of the gaps to answer questions such as: Who should be tested? Who is most likely to spread the virus? How do I find missing or unknown linkages? Which communities are at greatest risk? Is social distancing working?

How we can help

Analytics software can integrate data from a variety of external sources to deploy the right data quickly to our cloud-ready investigation and incident management solution. From there, users can easily create, triage and manage their efforts to make contact tracing more complete.

Advanced analytical modeling tools help health officials and governments answer the critical questions needed to implement smart public health policies. With data visualization abilities, users can perform deeper investigations of contacts and data to uncover hidden patterns and share them across various health agencies.

Once links have been determined, you can generate alerts that public health officials can dispatch to



ing data management solutions means you can establish and display linkages between patients, their contacts and the places they might frequent to narrow and focus the efforts of contact tracing resources.

Enriched contact tracing data

Using analytics and machine learning gives health officials new and important insights into each patient's network. Analytics can help determine who might be linked to a patient – such as family, friends and neighbors – but also employer rosters, passenger manifests and school rosters. Machine learning can help automate that effort by building analytical models that reflect real-world data and conditions.

Intelligent alerting

Once the contact tracing team has sufficiently identified a patient's links and network, it can begin the task of automatic notification of people in that network via

communicate with contacts for a given patient. These alerts can convey health risk warnings and can be customized for each recipient, such as directing them to obtain a COVID-19 test at a specific facility or to self-quarantine for a specific number of days. They can be sent via automated channels, such as text/SMS messages and emails.

Greg Horne is the SAS Global Principal for Health and is based in Toronto. He joined SAS in August 2012. In this role, Greg focuses on healthcare strategies and outcomes, as well as on the cost, quality and other challenges that any modern health system faces. He is a thought-leader on the future of healthcare and the introduction of patient focused technology. To learn how SAS is enabling contact tracing for public health, visit SAS's Contact Tracing For Public Health Resource Hub: sas.com/ca/contact-tracing, or contact Greg Horne, Global Principal Healthcare greg.horne@sas.com to learn more.

Tele-wound care helps patients recover at home during the pandemic

BY NEIL ZEIDENBERG

With COVID-19 infections continuing in great numbers, social distancing is still one of the most effective strategies for containing the spread of the virus. However, physical distancing has severely affected highly vulnerable wound patients, who have been unable to see their wound care specialists. Without quality and timely access to care, an untreated wound can quickly lead to infection, amputation, hospitalization or death.

To address this challenge, leading health-care and health-technology organizations have banded together to form the Telewound Coalition, a trusted, best-practice collective of clinical experts, care providers, and innovators who aim to provide immediate access to remote wound care experts throughout the COVID-19 crisis.

And at the core of the coalition is a virtual visit technology that allows wound care professionals to effectively treat patients while at a distance.

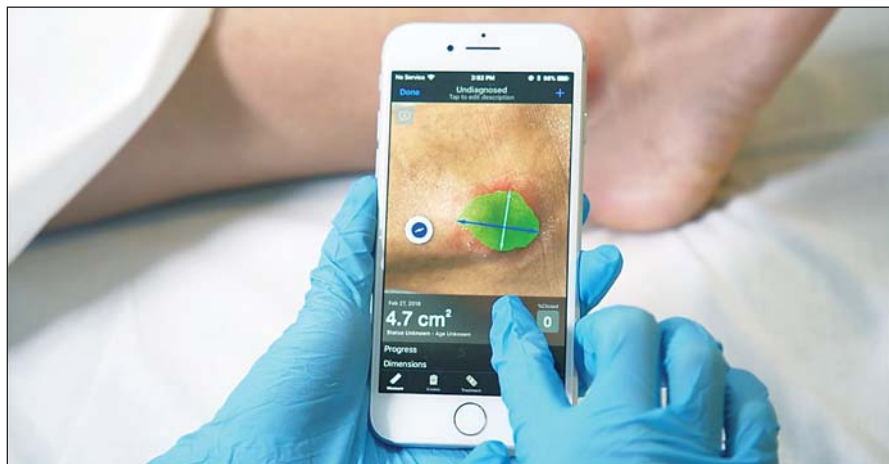
Coalition members include: Swift Medical, SE Health, AlayaCare, Woundpedia, the University Health Network's Michener Institute, and more than 20 other organizations. The Coalition connects patients with wound specialists and facilitates development and dissemination of remote wound care best practices – bringing immediate telehealth relief to thousands of Canadians in need.

The Telewound Coalition aims to:

- Ensure accessibility and continuity of wound care throughout the crisis;
- Preserve the health and safety of vulnerable patients and care providers; and
- Alleviate hospital capacity pressures by supporting patients in the community.

“By preventing healthy people from going into hospital, we can prevent further risk of exposure,” said Carlo Perez, CEO, and co-founder, Swift Medical.

Currently, there are more than 20



Coalition members across North America, and that number is continuing to grow. The Coalition ensures tight coordination of care between patients, their care team, and wound specialists, enabling the best course of treatment to be determined without travel or in-person visits.

This collective of experts and thought leaders from across North America also creates a network for new knowledge creation and sharing to accelerate and advance the adoption of virtual wound care.

Swift Medical is providing the key technology, a new Telewound module, accessible to patients at no cost. It will enable thousands of virtual visits between patients, their care providers, and wound specialists

– every day – keeping patients healthy and in-place, and out of the hospital.

The Telewound module is a secure, specialized telemedicine system for use at the point-of-care, while a patient is at home. It has two parts: one that's used by a provider and the other that's used by the patient in their home.

Wound care is a visual specialty that demands a high level of precision in images. That's why basic videoconferencing and standard telehealth platforms just don't cut it. Video images are highly compressed and they easily pixelate when you try to enlarge them to examine details. Also without colour calibration, lighting bias can make a healthy wound look green and infected.

“You use the app on any smartphone to scan the wound,” said Perez. “It uses machine vision to capture a scientifically calibrated image of the wound, including measurements, with an accuracy of over 96-percent, and then transmits that information to a wound expert remotely, who uses this data to inform vital care decisions.”

“The app also tracks data over time, storing the complete history of the wound. This is essential in understanding how it's healing, to determine if additional or more urgent intervention is required.”

Patients gain access to the app through their healthcare provider and use it to not only scan the wound and provide images and measurements to their caregiver, but to also connect in real-time to discuss the care plan.

Wound care is challenging at the best of times, said Perez. However, being forced to conduct it virtually due to a pandemic takes it to a new level.

“If you miss your wound care appointments a patient faces a greater risk of harm, re-admission, or worse – death,” commented Perez.

Wound care is a highly visual discipline that requires high-resolution images with sub-millimeter accuracy. This means that common virtual visit solutions are inadequate and inappropriate for remote wound care – and thus the need for a specialty solution with a medical-grade, AI-powered visioning system to support precision wound images.

Toronto, Ottawa switching to simpler, user-friendly systems

CONTINUED FROM PAGE 4

finally deployed in British Columbia in 2011, but it too has come in for harsh criticism. A 2015 audit by British Columbia Auditor General Carol Bellringer reported over 11,000 defects.

“It is difficult to navigate, complicated,

and confusing. It uses clinically incorrect and counter-intuitive terms and different terms for the same function in different parts of the system,” she noted.

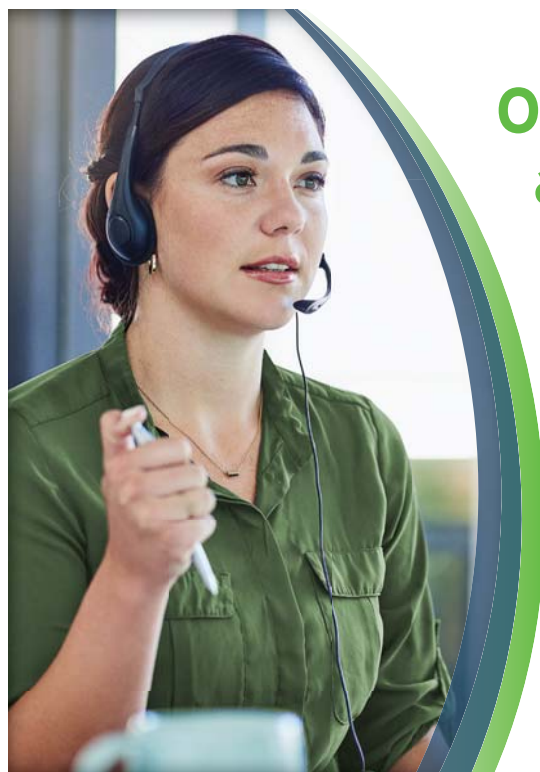
Co-sponsored by the Government of British Columbia and Canada Health Infoway, Panorama was delivered by IBM three years late and close to \$30 million

over the \$37.7 million budget for the national build. “Panorama was a difficult and complex undertaking,” commented Bellringer. “The system needed to meet the needs of numerous jurisdictions of varying sizes with different public health processes, and be translated into two languages. B.C. alone has spent \$115 million, and will spend a further \$14 million per year on a system that is not fully functional.”

As recently as November 2017, then Ontario Ministry of Health chief information officer Lorelle Taylor acknowledged the challenges British Columbia had with Panorama's Investigation and Outbreak module, which is probably why Ontario and several other provinces and territories chose not to deploy it.

“We will have to invest more money in order to get a modern investigation and outbreak management tool – yes, in all likelihood,” she told the Legislative Assembly's Standing Committee on Public Accounts. “I don't want to predetermine the conclusions from the analysis that will be done up to and including the spring (of 2018), but if you were to ask me my best estimate, my best guess today, it will require a financial investment to implement a new province-wide investigation and outbreak management solution.”

Today, the iPHIS system is still in use but Ontario's two largest public health units have taken the initiative to go their own way. However, the province's Minister of Health Christine Elliott conceded the need to prioritize the development of a new system once the pandemic is behind us.



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*Cloud DX Connected Health is Health Canada licensed and FDA cleared.

“Remote automated monitoring of vital signs after discharge - post surgery - is the way of the future. This technology gives health care providers the ability to detect early signs of complications and optimize medical management, offering the potential to keep patients out of the hospital and in the process facilitate more elective and urgent surgeries and reduce the spread of COVID-19.”

- **Dr. PJ Devereaux**, Professor, Director, Division of Cardiology and Scientific Leader of the Anesthesiology, Perioperative Medicine and Surgical Research Group at PHRI, McMaster Health Sciences.

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Critical communication lessons from the Notre Dame cathedral fire

BY BENJAMIN KANTER, MD

Just over a year ago, on April 15th, 2019, one of the world's architectural and spiritual treasures was nearly destroyed when fire razed the Notre Dame Cathedral, in Paris. The fire devastated an iconic monument that had stood for more than 800 years, leaving a burnt-out husk. How could such a thing happen? Are there lessons that we in healthcare can learn from such an event?

As it turned out, the potential for fire in the cathedral was anticipated, almost expected, given that much of the structure beneath the heavy, lead-shingled roof was a nest of ancient oak beams affectionately called "The Forest".

To head off such an event, tremendous efforts were expended to craft a highly customized detection and response system – in a hospital what we'd call an "early warning system" – a system used to trigger a rapid response or medical emergency team. And yet, the cathedral was all but destroyed. What went wrong?

The cathedral did have an alarm system, yet a root cause analysis of the fire revealed several gaps in communication. Alarms did not go to the right people. Messages were unclear, and there were no systems of backup or escalation. For healthcare leaders who want to avoid disaster of their own, there are lessons to be learned by the fire at Notre Dame Cathedral.

Root cause analysis: It is useful to examine what happened when the blaze started at Notre Dame, and how it was



handled. We will then look at how the situation could have been more effectively controlled.

Here, in brief were the sequence of events that took place that day in Paris.

- The cathedral's smoke detection system went into an alarm state at about 6:10 pm. It did what it was meant to do: sense that smoke was present and sound an alarm to notify someone.

- The notification was sent to a single station manned by a single attendant – a single point of failure. As bad luck would have it, the employee on duty that evening was new – it was his third day on the job.

- The smoke detection system message that the monitor attendant received was a mix of

common language and numeric codes. The information had to be manually decoded and subsequently communicated to a single security person within the cathedral.

- Once the message was decoded and relayed to the security guard at the cathedral, the guard responded by going to the wrong location – to the Sacristy, a building used for storage that was attached to the side of the Church. This misdirection likely occurred because the decoded alarm notification indicated that smoke had been detected in the Attic Nave Sacristy – a location that did not actually exist.

- Upon arriving outside the Church and looking into the Sacristy, the guard called the alarm attendant back, stating no fire

was present. But the smoke detection alarm persisted.

- The attendant tried to reach his boss to clarify the situation but was unable to connect with him. Approximately 10 minutes later, his supervisor called back and instructed the attendant to tell the guard to go up to the church nave's attic – a steep and lengthy climb into the forest – where the fire's presence was subsequently confirmed.

Manual confirmation of the fire was delayed, and so was the notification of the Parisian fire department – by 30 minutes – 30 minutes the great cathedral did not have to spare.

Mapping gaps in healthcare communication: The disaster at the Notre Dame Cathedral was primarily due to breakdowns in communication. For healthcare leaders, it is especially important to note because communication errors are among the most common precipitating factors in hospital sentinel events. A communication delay, missed information, or a miscommunication can lead to a cascade of events increasing over time the degree to which the system fails. It happened at Notre Dame and it happens in hospitals, where patients are at risk.

Monitoring systems – or what I will call incident detection and response systems – are designed to shorten the time-to-act in response to an event. In your hospital's systems, how many events are constantly taking place, and how many clinical and operational systems are sending alerts about these events? Too many to count.

CONTINUED ON PAGE 23

Digital resources support mental health clinicians and patients

BY IMAN KASSAM, MHI
AND GILLIAN STRUDWICK RN, PhD

TORONTO – Each year, one in five Canadians is affected by a mental health problem or illness and one in two Canadians is at risk of developing a mental health condition, according to a report prepared for the Mental Health Commission of Canada. Despite the high prevalence of mental health problems and illnesses in Canada, the Canadian healthcare system is ill-equipped to meet the growing demand and need for mental health services.

In early March, the World Health Organization declared COVID-19 a pandemic. The growth of COVID-19 cases in Canada, and globally, has at times created a parallel fear, anxiety and depression for those who are directly impacted by the virus and those suffering from the economic, emotional and social uncertainty.

Given the detrimental impact this crisis has created on the mental well-being of individuals, the demand for mental healthcare services is expected to rise.

This, coupled with an already overburdened mental healthcare system, will force mental healthcare providers to seek alternative methods of care.

Currently, with the rapid onset of

COVID-19, many mental healthcare professionals have had to alter their delivery of care to limit face-to-face interaction with clients. Mental healthcare professionals have opted to employ the use of digital health technologies, such as video conferencing, to continue providing quality care to their clients.

As mental healthcare providers are accepting and adopting digital health tools as suitable solutions for care delivery, now more than ever they and their clients need guidance on the digital mental health resources and tools that are accessible to them.

Although some digital mental health tools are being created to support clients through their care and recovery journey, there remains a surplus of similar and effective technologies that currently exist but would benefit from increased promotion and use.

Moreover, the resources to support the uptake of these digital mental health tools are not widely known nor have they been consolidated into a single document. Additionally, not all providers are well-equipped with the digital knowledge or capacity to recommend, direct or engage their clients in the use of clinically beneficial digital health resources and associated tools.

To address this, a Digital Mental

Health Resource Document (<https://tinyurl.com/digitalMH>) was created by the Centre for Addiction and Mental Health (CAMH) in collaboration with Canada Health Infoway. This resource document was developed to support the increased use of digital mental health tools in mental health clinical practice in Canada and to assist healthcare providers in empowering their



Gillian Strudwick

Iman Kassam

clients and caregivers to use digital mental health tools.

Through consultation with experts in digital mental health across Canada and a search of academic and grey literature, 18 resources were identified that can be used to facilitate the integration of digital mental health tools into the patient and provider interaction.

The resource document provides

mental health professionals and clients with information about how to use the identified digital mental health resources, who the resource would be most useful for, whether the resource is designed for use in the client interaction and the technological requirements of the resource.

The document further highlights how the identified resources can be implemented into clinical practice by outlining the barriers and facilitators that may influence the uptake of digital mental health tools. Considering the COVID-19 crisis, this document is well suited to support providers and clients in navigating the use of digital health technologies during these uncertain times.

By ensuring that providers are aware of the appropriate resources to support the integration of digital mental health tools into the client and provider interaction, access to mental healthcare and quality of care delivered during these times may be improved.

Gillian Strudwick RN, PhD is an Independent Scientist, Centre for Addiction and Mental Health, Toronto, Assistant Professor, Institute of Health Policy, Management and Evaluation, University of Toronto, and President, Ontario Nursing Informatics Group. Iman Kassam, MHI, is a research trainee at CAMH.



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Medtronic team uses data and analytics to reduce wait times at hospitals

BY MELICENT LAVERS-SAILLY

Winston Churchill famously said we should never waste a good crisis. The COVID-19 pandemic may have imposed massive short-term changes on Canada's healthcare system, but the silver lining may be that the pandemic could also help expedite the adoption of new tools and processes that will allow for long-term, sustainable improvements benefitting patients, healthcare providers, and the healthcare system.

Prior to the emergence of the COVID-19 virus in Canada, hospitals already operated in a complex, high-pressure environment. They strived to provide the best care possible to a growing number of patients while dealing with strained resources, crowded hallways, and lengthy wait times for procedures.

The road ahead is only going to get more challenging. Hospitals will need to determine how to effectively resume services that were paused during early stages of the pandemic – such as elective surgical procedures – while navigating new safety protocols and infection control measures that are further straining capacity and staffing, and increasing wait times.

Hospitals will also need to adapt to new expectations from patients who have been exposed to the convenience of virtual care and may be anxious about staying in a waiting area for too long.

Several hospitals across Canada have already risen to the challenge. For example, Fraser Health in British Columbia is now doing pre-admissions assessments virtually for surgical patients. In Ontario, vir-



tual care is being used for over 50 percent of patients at the Peter Munk Cardiac Centre. And in New Brunswick, Vitalité Health Network has set-up a drive-thru pacemaker clinic to address a growing backlog of patients waiting to have their cardiac devices checked.

"The new hospital environment will be significantly more complex than what it was before the pandemic and it was already extremely complex," says Gene Macdonald, director of Integrated Health Solutions (IHS) at Medtronic. "Life post-COVID-19 isn't about returning to normal in healthcare. It's about helping hospitals regain control of their caseloads, while accounting for new expectations from patients."

The Medtronic IHS team specializes in

helping hospitals improve wait times by taking a deep dive into operational data such as staffing variables, bed availability, processing times, government guidelines, and changes in supply, including personal protective equipment. Medtronic IHS data science and analytics experts design custom simulation and modeling tools to review process flows, identify bottlenecks, and determine solutions to improve care pathways and patient outcomes.

"In healthcare, everyone is doing their best to provide optimal care and achieve the best outcomes for patients," says IHS Senior Program Manager Morteza Zohrabi, MD. "However, there are many system-related issues that need to be analyzed and improved. Our job enables

healthcare professionals to improve outcomes by working side by side to find solutions. And because we guarantee our results over the long-term, we support the implementation of solutions and help with course-correcting."

One example that helps contribute to problem solving is a simulator that can be customized for specific situations. The simulator can turn raw data into useable insights that can help save staff from overtime, reduce length of stay, and improve design flow for such issues as safety protocols.

For example, in Newfoundland, IHS helped Eastern Health reduce inpatient wait times for the catheterization lab by 56 percent across the province. The simulator tool was integral to understanding how process improvements would improve wait times without increasing costs.

"In many ways it's like watching a movie," says IHS Project Manager Farbod Abolhassani. "It's a really good tool to power decision-making. The simulation helps our clients understand the changes we are proposing and the impact of making those changes."

Other considerations hospitals will have to make in the wake of COVID-19 will include physical redesigns to limit transmissible infections within the hospitals and optimizing the flow of patients to reduce time on site. Providing more remote monitoring of patients with chronic conditions will also help improve safety of both patients and caregivers.

Melicent Lavers-Sailly is Senior Manager, Stakeholder Engagement & Strategy, Canada, at Medtronic.

Scarborough develops order set for discharging COVID-19 patients

BY GENEVIEVE TOMNEY
AND DANAE THEAKSTON

For patients admitted to hospital with COVID-19, the road to recovery can be harrowing. People with severe illness can undergo intubation, ventilation, and paralytic drugs.

The patient's recovery continues after discharge, and the coaching and preparation they receive from front-line healthcare professionals is critical.

"These patients have been very sick and they may still have a long recovery ahead of them," said Dianne Tomarchio, manager of Quality Improvement and Clinical Standardization at Scarborough Health Network.

"Families may worry that we're sending patients home before they're necessarily fully recovered," said Tomarchio. "People wonder if patients may still be contagious. Securing transportation home often proves difficult. There are so many variables and concerns to address to ensure a successful transition home."

That's why Scarborough Health Network decided to develop a clinical playbook, called an order set, to specifically address how to discharge COVID-19 pa-

tients. And through a partnership with Think Research, a Canadian health technology and clinical content company, this crucial information will now be available through that company's cloud-based clinical content library, to every hospital in its network.

The order set works as a checklist for doctors, nurses and other hospital staff who are responsible for ensuring that a patient can safely go home. It helps to organize communication to the family doctor and others who will be supporting the patient when they leave the hospital.

If they still need to self-isolate, the order set asks the clinician to confirm that the patient is able to arrange safe transportation home and that their living situation will allow them to follow proper isolation practices.

"Speaking to many doctors and nurses working on the frontlines, they've told us what trips them up with COVID is not having any clear standards around when it's safe to send someone home," said Kirsten Lewis, vice president of Research and Development for Think Research. "Many people who've been affected by COVID are from vulnerable groups – people who have economic challenges, or mental illness and they

may have inadequate housing.

"So, if that's the case, the hospital can help connect patients with the community and bridge them into appropriate housing, and this order set prompts those conversations."

Standardizing the discharge process in this way also means providing peace of mind to frontline healthcare workers who are already facing an exhausting workload, under the added strain of facing infection risk every day.

"People are struggling with information overload at the frontline," says

The order set works as a checklist for doctors, nurses and others to ensure that a patient can safely go home.

Tomarchio. "Having a guided tool at the point of discharge that answers those questions and makes sure that we're providing the standard of care for our patients is so important. There's a lot of anxiety around taking care of these patients, about providing the best care, and keeping everyone safe."

"It's a very difficult time to be work-

ing as a frontline care provider. There's enough stress just coming to work during this time, so developing a tool that can keep staff informed of any changes as things evolve relieves additional stress."

By making the order set available through the Think Research network and delivering it right to the fingertips of those frontline healthcare workers, Kirsten Lewis' hope is that more hospitals will be able to provide that support.

"With appropriate planning, we can help prevent patients from falling between the cracks of the system. And that's where the Discharge Order Set comes in. This tool allows us to ensure that all of the people in the patient's circle of care, including their family doctor, are aware of what happened to them in the hospital, what treatment they were provided with and what the next steps are."

"All the information and follow up management is organized through the order set and ultimately this can decrease the likelihood that the patient will return to Emergency because of a preventable issue." To learn more about the COVID-19 Discharge Order Set and the Think Research clinical content library, visit www.thinkresearch.com/ca/covid-19-tools/.

Virtual care after the pandemic abates: Maintaining the momentum

BY DR. RASHAAD BHYAT

Prior to the COVID-19 pandemic, 10 to 20 percent of healthcare visits in Canada were conducted virtually. That number is now about 60 percent, according to statistics tracked by Canada Health Infoway. My clinic group, located in the Greater Toronto Area, is currently “seeing” more than 90 percent of our patients through phone appointments, alongside some additional “visits” conducted through video chat.

Virtual care has enabled Canadians to continue to access healthcare while maintaining physical distancing and safety as much as possible. The uptake has been rapid, but we need to make sure it’s sustainable beyond the pandemic. Four policy themes can help ensure that virtual care remains part of Canada’s “new normal.”



Dr. Rashaad Bhyat

Clinical and political leadership: Clinical groups and the provinces and territories have shown remarkable leadership and collaboration in implementing virtual care swiftly and broadly. The policy work of several years has

been accomplished within a few weeks, but it must continue. Individuals and organizations such as hospitals, clinical and industry groups and associations can work with jurisdictional leaders to influence policy at the provincial, territorial and national levels.

Patient advocacy: Patients’ voices are indispensable. Individual patients and patient organizations can provide significant support for maintaining the virtual care services that not only keep them safe during a pandemic, but also represent a modern approach to healthcare.

Infoway’s 2018 and 2019 surveys of Canadians found that patients with access to their personal health information feel more confident and involved in managing their healthcare. The benefits of modernized access to healthcare will last far beyond COVID-19, and it is critical that patients share their experiences.

Support for clinicians using modern tools to benefit patients: Clinicians are making do with existing resources – primarily the telephone – along with a host of video visit apps and digital work-arounds that mostly do not fit into our workflow. While this is sufficient to weather an acute crisis, our tools and processes must be refined if virtual care is to last beyond the pandemic.

It will take an enormous effort to manage this change process. This might mean supporting clinicians with modern, integrated, easy-to-use tools to privately and securely deliver optimal virtual care. It could mean making interoperable remote monitoring tools as commonplace and inexpensive as a thermometer.

But it’s not really about the technology. Education, training and clinician peer networks are needed to refine, teach and reinforce best practices regarding the use of virtual care. We will need adequate invest-

ment in these resources.

Modernizing remuneration: Clinicians’ remuneration structures (commonly equated with billing codes in fee-for-service arrangements) are perhaps the biggest factor when considering long-term adoption of virtual care. Prior to the pandemic,

most regions had some codes for remuneration for care provided virtually, in limited and restricted clinical settings. That has changed rapidly across the country, as virtual care billing codes were opened-up temporarily. Jurisdictions that recently introduced fee codes for virtual care services

will need to refine them to best determine how they can support quality virtual care and continuity of care afterward.

Dr. Rashaad Bhyat is Clinician Leader, ACCESS Health at Canada Health Infoway and a family physician.

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PocketHealth sends images from one hospital or clinic to another

BY JERRY ZEIDENBERG

Patients have been using the PocketHealth software platform to easily gain access to their diagnostic images in various hospitals and to keep them in a secure, cloud-based repository. Using the system, patients can take ownership of their images and provide online access to caregivers when and where the images are needed.

In just a few years, PocketHealth, a Toronto-based company, has become an international success story with its innovative solution. In April the company raised \$9.2 million in venture funding and announced plans to rapidly grow its footprint across Canada and the United States, where CDs are still the primary form of image exchange. Already, some 500 hospitals and clinics across North America are using the cloud platform to provide patients with quick and easy access to their own medical images and reports.

Now, moreover, clinicians are also using the system to quickly move patient images to each other using its 'Provider-to-Provider Sharing' functionality. It's especially useful when they are caring for a patient who is going from one institution to another, and the diagnostic images are needed for the follow-up care.

The rapid transfer of images through the PocketHealth secure cloud eliminates a big problem – namely the slow process of burning images onto CDs, which has been the traditional method of sending images from one organization to another.

Indeed, it often happens that a patient is about to be transferred from one site to another, but both the patient and care-teams must wait for his or her images to be printed and packaged.

In other instances, outpatients needing follow-up care at a second hospital or clinic will often return to the hospital where they originally received care, in order to obtain copies of their images.

They must arrange for the images to be burned onto CDs, which can involve per-



Aimee Langan (L) and Dr. Marc Ossip have been leading the implementation of the image sharing solution.

sonal visits to pick up the disks, as well as time and expense for all involved. And with the COVID-19 crisis, hospitals are trying their best to keep all but the most urgent cases out of their premises, to control the spread of infection.

Here, too, it is easier – and safer – to send the patient images electronically, via the Internet. It's a faster process, and it eliminates the need for the patient to physically visit a hospital.

"With COVID-19, it became obvious to us that this was the way to go," said Dr. Marc Ossip, chief of Radiology and medical director at William Osler Health System, a three-hospital organization with sites in Brampton and Etobicoke. Osler implemented the Provider-to-Provider version of the PocketHealth platform in March, just as the coronavirus pandemic spurred hospitals to restrict access and focus on caring for COVID-19 patients.

But even before the pandemic hit, said Dr. Ossip, there were good reasons to install the image sharing system. If patients needed treatment at several different hospitals, they would require multiple CDs,

which would be time-consuming to create and difficult to keep track of. All too often, patients and organizations lose the disks.

In some instances, patients will seek care in other provinces or countries, and disks need to be shipped via courier – adding more time to the process.

As well, said Dr. Ossip, "New computers don't even have CD players anymore. The rest of the world has moved on from CDs and faxes, and we're still using them."

He added, "[PocketHealth] appeared to be a much better method."

Just one month after implementing PocketHealth for provider-to-provider sharing, Osler had already used it in 85 patient transfers. That represented about half of the image sharing for patient transfers, versus about 50 percent with the traditional CD burning.

Dr. Ossip mentioned several scenarios where the PocketHealth solution has been useful.

For its part, Osler provides a wide range of medical services, but not all. For things like neonatal intensive care, patients are often transferred to Toronto's downtown

hospitals. Images used to be prepared on disk and sent with patients.

With services like neurosurgery, or when its own trauma bays are full, patients are usually transferred to peer hospitals. In these cases, Osler may have done imaging that needs to go with the patient to the new site.

"In the past, we'd sometimes have to wait for the images to be printed and sent with the patient," said Dr. Ossip.

With PocketHealth, an 'Access Page' can instead be generated and sent to the receiving hospital or clinic, either by email, electronic fax or as a printed page. At that end, a healthcare worker can enter a code on his or her computer and access the appropriate images. The DICOM imaging and reports can then be downloaded into the new institution's PACS.

Aimee Langan, director of Diagnostic Imaging and Laboratory Services at Osler, said the PocketHealth system is easy for users to learn.

She mentioned that other organizations are steadily adopting the solution as well, and once both sides understand how to use it, it's much easier to transmit images and reports than to print disks. And in this time of COVID-19, it helps keep "non-essential" visitors out of the hospital.

For his part, PocketHealth co-founder and CEO Rishi Nayyar, said 86 hospitals and imaging clinics across Canada have adopted the Provider-to-Provider Sharing functionality of the platform, including North York General Hospital, St. Michael's Hospital and Sault Area Hospital.

With COVID-19 increasing the need for virtual image sharing, he predicts several hundred more sites across Canada and the United States will be using it by the end of 2020.

Langan added that Osler's radiology and lab departments are trying to modernize when it comes to CDs, which she regards as an antiquated technology that has been superseded by newer solutions – such as web and cloud-based systems. "We'd also like to eliminate faxing," she said, but noted the process will take some time.

Virtual care

CONTINUED FROM PAGE 4

stations at the various hospitals.

Software designed by Cloud DX, and customized for PVC-RAM, monitors the vital signs and notifies trained nurses if there are unusual readings, so that nurses can immediately get in touch with the patients or their families for rapid assessment.

If nurses believe the help of a physician is needed, they can escalate to an on-call doctor. In most cases, nurses with training in tele-health will be able to help the patients in the moment, thereby keeping them healthy at home.

The Cloud DX platform can send a survey to patients every day, and automatically scores the answers. A secure, medical-grade version of Zoom has been integrated into the Cloud DX platform,

so that nurses can video-chat with patients every day for the first 15 days, and every two days for the following 15 days.

Secure two-way text messaging is also available on the tablet so that patients are able to contact the nurses 24 hours a day, seven days a week, if they feel unwell or need support or reassurance.

"When patients hear they can have 24-hour, around the clock access to nurses, it's plain and simple – they want it," said Dr. McGillion. "We really believe this is going to become part and parcel of healthcare in the future."

The virtual care support, day and night, can help on many fronts. "There have been night-time issues which require immediate intervention," said Dr. McGillion, "such as adverse drug reactions or the urgent need to adjust medications." In many cases, nurses and physicians are able to resolve the issue remotely, keeping the patient healthy.

Dr. McGillion noted that six to 10 nurses will be managing patients at the majority of the hospital sites, and that 20 are already working on the project at the Hamilton General and Juravinski hospitals.

It should be noted that PVC-RAM is enrolling a total of 900 patients, of

A follow-up project called Vision 2 will enrol 20,000 and use AI to predict bleeds, sepsis, and other problems.

whom half will be given the Cloud DX monitoring technology, while the other half will be discharged home and cared for in the traditional manner. The project will evaluate the outcomes of one randomized group versus the other.

Dr. McGillion and Dr. Devereaux are

already planning the next study, called Vision 2. In it, they intend to enrol 20,000 patients worldwide to test the technology, which will progress to the use of automatic, continuous monitoring of vital signs using a next-generation version of Cloud DX technology called the Vitaliti continuous vital sign monitor.

As well, the system will incorporate artificial intelligence. "By applying this to 20,000 patients, it will allow us to collect Big Data. And using that data, we'll be able to develop algorithms that can predict bleeds, sepsis, surgical site infections, injuries to the heart muscle, and other problems," said Dr. Devereaux.

He explained that often, readings of vital signs, taken individually, do not appear significant to human observers. But machine learning can take a more nuanced approach, and detects how seemingly insignificant, multiple factors may together indicate the onset of a serious problem.

MIIT 2020: a virtual IT radiology and AI conference in the time of COVID

BY DR. DAVID KOFF

This year is not like any other year. COVID-19 has brought disruption and havoc to our routines, pushed four billion people on the planet into confinement, stalled the global economy, grounded airlines, and pushed many people to the brink of bankruptcy.

It has underlined several weaknesses in hospitals worldwide, such as limited access to critical care beds and equipment. We did a good job in this country in flattening the curve, through rigorous planning for the surge, and we scrambled to create capacity in our crowded hospitals. Even if we started relatively late to close our borders, we've been able to avoid the worst, thanks



Dr. David Koff

to the responsible and engaged behaviour of most of the population.

Like all other conferences this year, MIIT 2020 was impacted too. With Don Denison, my co-Chair, we decided very early on to move the conference to a virtual format, long before the major conferences were cancelled. MIIT is designed for an audience of medical imaging informatics professionals and fills a unique niche in Canada. Each year, the conference brings opinion leaders and subject matter experts to give an update on a variety of topics, from standards to new technology, workflow integration and to share real-life experiences.

So, for its 15th edition, MIIT went virtual and it worked really well. Together, 10 speakers and 115 audience members participated, with sponsorship from Real Time Medical, GE Healthcare and Sectra.

With all the hype around Artificial Intelligence, it's no surprise that we spent most of the morning talking about issues related to AI development and implementation. However, the tone was different and more practical than last year, showing that AI is finding its role in the diagnostic imaging workflow.

Dr. Adam Prater, a neuroradiologist at Emory University and director of Imaging Informatics at Grady Memorial Hospital, told us about the hurdles in implementing Artificial Intelligence in practice and how important it is to engage and communicate, and also to figure out data policies and legal ramifications.

Dr. Vamsi Narra, professor of Radiology at the Mallinckrodt Institute of Radiology talked about the key concepts and theories behind Change Management, the role of behavior and culture and common barriers to change.

Dr. Tessa Cook, assistant professor of Radiology at University of Pennsylvania and co-director, Center for Practice Transformation, gave us an interesting perspective on the role of AI in radiology, stating that it may not be the image component which holds most value, but rather how AI can improve the pre and post-imaging workflow.

Dr. Christian van der Pol, assistant

professor of Radiology at McMaster University reported his experience developing an AI solution to automate the LIRADS classification for liver malignancies.

In the afternoon, we covered topics highlighting new trends in our profession. To start with, we had a discussion panel

where Dr. Cree Gaskin, professor of Radiology, associate chief medical information officer, University of Virginia and Dr Les Folio, lead CT radiologist at the National Institute of Health (NIH), Bethesda, shared with us their experience with interactive multimedia reporting technology in

clinical practice, and how it improves the experience of referring physicians, patients and radiologists.

Kevin O'Donnell, senior research and development manager at Canon Medical Research, our Standards anchor at the

CONTINUED ON PAGE 23

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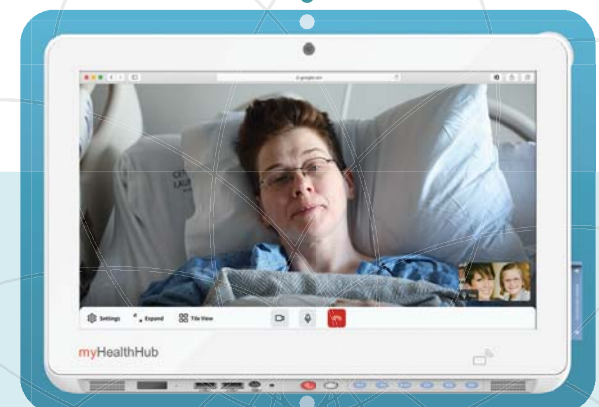
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Physicians create HaloHealth to invest in Canadian health-tech innovators

The company is already working with more than 40 startups across the country.

BY DR. SUNNY MALHOTRA

Canadian healthcare is ready for disruption as we move towards value-based care. The evidence is clear, physicians are often exhausted due to antiquated systems in place that take time away from allowing them to do what they do best – providing quality care to sick patients in need.

This frustration was in fact part of the reasons why HaloHealth M.D. founders started searching for technological answers to effectively improve the healthcare system and to produce sustainable results.

Fully understanding this need to support innovative Early Stage Healthcare Startups (ESHS) that can help fix the broken healthcare system, Drs. Ben Fine, Sam Elfassy, Dan Nayot, David Kelton, Michael Varenbut, and Jeff Alfonsi took matters into their own hands and founded HaloHealth – a not-for-profit physician angel group that acts as an infrastructure to connect, advise, and invest in ESHS.

The founders have collectively invested \$1.2 million into 15 different startups over the course of roughly a year. Throughout this journey, the need for such an organization became clear from the feedback received from the startups:

“HaloHealth is an intersection of clinicians who understand the full picture and gives flexible support that is not as prescriptive as other VCs or angel organizations,” said Jonathan Ng, founder & CEO of Iterative Scopes.

“HaloHealth is unique in the depth of insight and support that clinician angels can provide. This allows

them to make decisions quickly, connect companies with other expert clinicians, and credibly introduce them to the major medtech companies,” said Robert Brooks, founder & CEO of Forcen.

“Finding product-market fit and defining value for payers, providers, and patients is critical for early

HaloHealth was formed so that physicians can invest in the innovations of other physicians. They provide advice, financing and introductions to others.

stage health tech companies. I can’t think of a better way to do this than partnering with HaloHealth, which allows me to work with providers who are also my investors,” said Derek Sham, founder & CEO of COSM.

What was even more incredible to learn was that organizations in the ecosystem – such as healthcare incubators, academic accelerators, VCs, family offices, and other angel groups – saw the need for an organi-

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



zation like HaloHealth to provide the physician-enabled due diligence to make meaningful investments. They were looking for the emergence of such a group.

Furthermore, it was the demand and organic fit that allowed HaloHealth to syndicate with two major VCs in the Toronto area, work collaboratively with other angel groups and ecosystem partners, and become a destination for health incubator graduates to help them secure funding faster, and on-board key opinion leaders that was the right fit to help them grow.

Just a few months out of the gate, HaloHealth as of today has 127 physicians ready to advise, invest, and connect.

In addition, after the first HaloHealth Live! event in late January of this year, where ESHS were invited to pitch in front of 60+ HaloHealth MD members in the audience, HaloHealth has been receiving requests from MDs from Vancouver to New Brunswick wanting to join to aid in the mission of helping propel Canadian health tech startups to the next level.

With the help and support from ecosystem partners such as the National Angel Capital Organization, Ontario Center of Excellence, H2i, York Angels, Maple Leaf Angels, BDO Canada, HVE Healthcare assessments, and Macadamian, HaloHealth is currently in the process of helping 40+ ESHS from across the nation grow and work towards advancing Canadian healthcare innovation.

EMR connects COVID-19 patient data across continuum of health

BY SONIA PAGLIAROLI

On Vancouver Island, local health authority Island Health is using its integrated electronic health record to help clinicians diagnose and treat patients efficiently while maintaining patient and staff safety during the COVID-19 pandemic.

Island Health leverages Cerner Millennium to communicate each patient’s status and treatment plans. The EHR also helps support clinicians in reaching out to the community to provide in-home care and monitoring, as well as public health surveillance in communities and residents who can be difficult to reach.

“Outreach, testing centers, assessment centers, community health and public health – they all connect with our acute care system,” said Amy Williams, director of Clinical Informatics for Island Health. “No matter where a patient ends up in their journey with COVID-19, that information will be at the fingertips of

any healthcare worker interacting with that patient.”

When a patient first demonstrates symptoms, they often reach out to a primary care provider.

If the patient needs a COVID-19 test, the primary care provider connects them to a central registration service organized by Island Health, which arranges an appointment time and provides directions to the screening location. While results are pending, an order triggers alerts to any clinicians interacting with the patient. Those alerts provide information about the testing status and precautions that should be taken.

Test results are returned in real-time to the primary care provider and are made available to the patient via Island Health’s patient portal, MyHealth, enabled by Cerner’s HealtheLife solution. If the patient tests positive, the EHR alerts public health surveillance officers, so they can quickly begin the contact tracing process and determine if the patient needs additional monitoring.

For patients who require monitoring while isolating at home, Island Health has developed an intensive home monitoring program, where community health nurses follow patients’ progress remotely via reporting from biometric equipment in the home.

That data integrates with the EHR and populates a special MPage with

COVID-19 test results are returned in real-time to the primary care provider and to the patient, via a portal.

the pertinent COVID-19 information. If the patient needs to visit an emergency department, clinicians have full access to that information in the MPage.

When the pandemic first hit, Island Health leaders realized they needed to improve communication. While all the information was there, it wasn’t readily apparent unless

someone went looking for it.

“We had a patient being managed for COVID-19 symptoms [at home], who had some cognitive impairment and ended up in the ED,” said Williams. “The patient was unable to tell us about their history and didn’t meet the criteria for a swab test. As a result, our care team did not initiate isolation precautions and continued as if there was minimal risk. We took this incident seriously and looked for solutions to better protect our healthcare workers as well as provide efficient, appropriate care.”

Island Health leaders implemented new rules and logic to automate processes and make COVID-19 information more readily apparent.

“It’s freed up our staff time. They trust things have already been done and don’t have to reorder tests or do certain assessments again. They can see if they were completed a day or even just hours ago,” said Williams.

Sonia Pagliaroli is Chief Nursing Officer at Cerner Canada.

Ontario doctors receiving COVID-19 notifications can act sooner

BY SARAH HUTCHISON

Ontario's frontline providers – across all healthcare settings – have quickly leveraged digital health technologies to protect their patients and themselves during the COVID-19 pandemic. OntarioMD worked with government and vendor partners to adapt our Health Report Manager (HRM) digital health tool to notify community-based physicians and nurse practitioners in their EMRs when COVID-19 test results are available in the province's Ontario Laboratories Information System (OLIS).

HRM COVID-19 notifications provide a prompt to clinicians to check OLIS through the EMR-integrated patient query to support timely follow-up with patients based on the results. HRM also delivers discharge information from hospitals that are COVID-19 assessment centres to EMRs.

This is in addition to the 2 million other reports per month it delivers from more than 500 hospital and specialty clinic sites across Ontario to EMRs whenever patients are discharged. Reports that are COVID-19 related are clearly identified to get the clinician's attention.

We continue to work with hospitals to identify any COVID-19 related encounters and deliver these reports to family physicians' and nurse practitioners' EMRs through HRM. These clearly labeled reports enable them to monitor patients who may have the virus – even if they have not yet tested positive.

Hospitals that are offering dedicated COVID-19 Assessment Centres, such as the Michael Garron Hospital and Guelph General Hospital, have created notifications to be delivered through HRM to primary care when patients are assessed.

"HRM is a very useful tool in helping our patients during the COVID-19 pandemic. Receiving notifications electronically in my EMR about COVID-19 test results being ready and receiving reports about COVID-19 related encounters in hospitals, also in my EMR, helps me deliver excellent ongoing patient care, particularly when I need to communicate virtually with my patients," said Dr. Daniel Glatt, a family physician in Napanee.

On another front, OntarioMD manages a curated list of nationally available virtual care tools for clinicians on OntarioMD.News. This resource helps them select tools that they and their patients would be comfortable with and that use common devices and apps.

While we currently don't endorse any tool, we recognize the value of consolidating and presenting the options to make easier for clinicians to navigate. As we move forward together with clinicians and the vendor community, we will increasingly be focussed on integration and workflow to advance how seamlessly and comprehensively care can be delivered considering the needs of clinicians and their patients.

OntarioMD has been working with community-based physicians and nurse practitioners and their practice staff for the past 15 years to equip them with digital health tools to enhance the excellent patient care they provide and help them gain some practice efficiency. When COVID-19 hit Ontario in early March, demand for not

only HRM, but OLIS, ConnectingOntario ClinicalViewer, eConsult and the Insights4Care Dashboard began to surge as clinicians realized that these tools would be useful during this critical time and beyond.

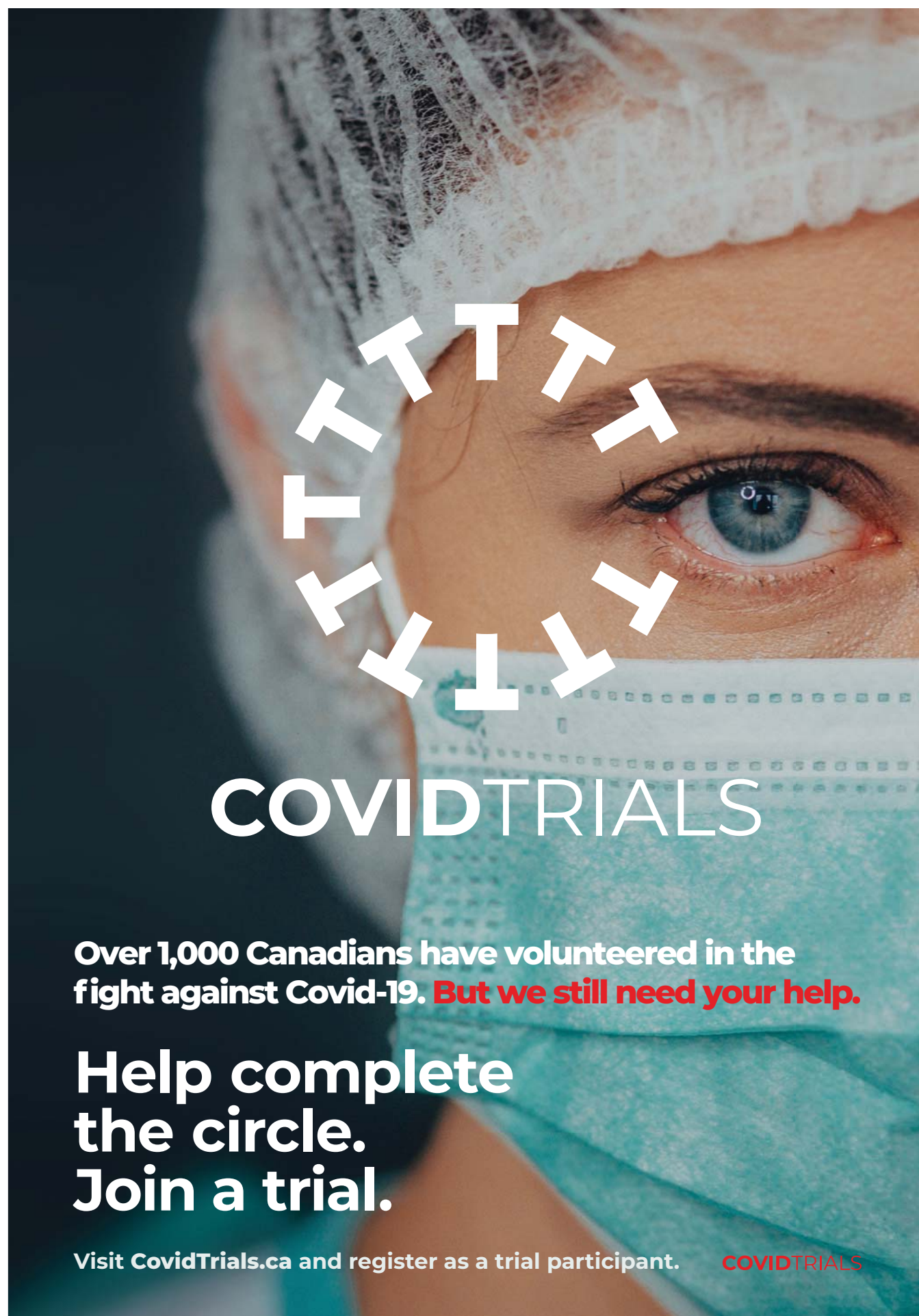
HRM is contributing to the integration of Ontario's health system by removing

barriers to information flow between hospitals and other healthcare provider sites, and clinicians.

HRM delivers patient information from more than 500 hospital and specialty clinic sites to the EMRs of more than 11,000 clinicians across the province.

If you're a clinician using a certified EMR, OntarioMD staff can help you implement HRM. Contact us at support@ontariomd.com to get started.

Sarah Hutchison is Chief Executive Officer, OntarioMD.



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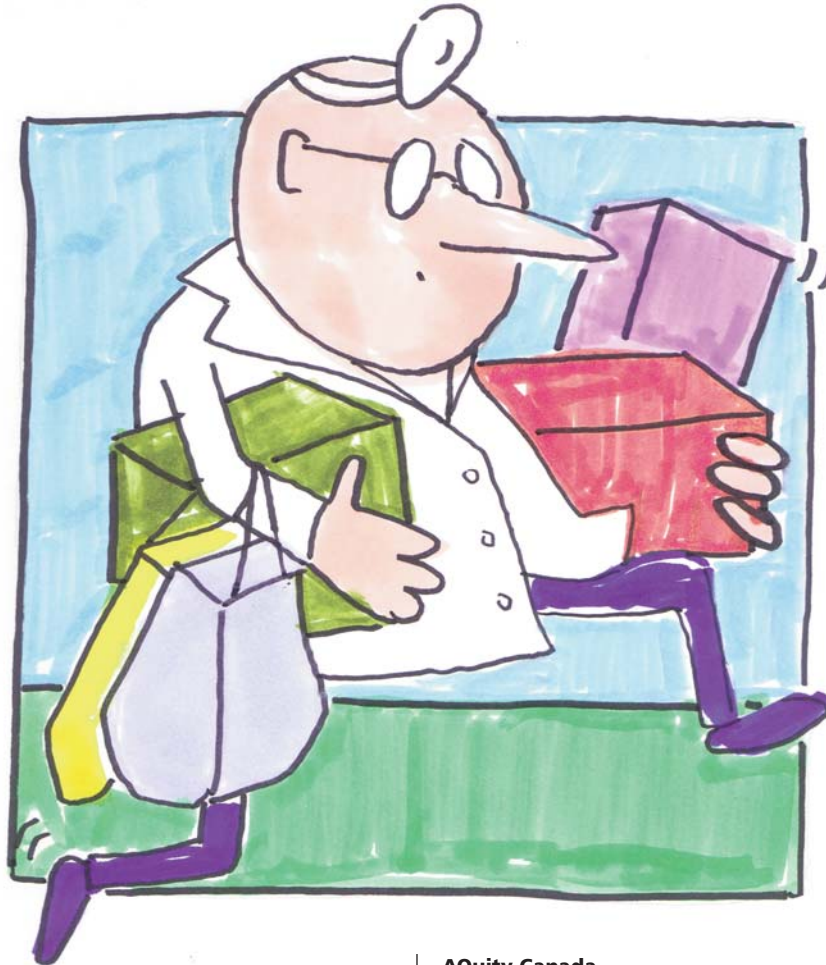
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BY MAURIZIO BEVILACQUA

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The City has a long-held funding strat-

egy in place to help fund, build and complete construction. My commitment to seeing it through explains why I chair the Mackenzie Health Foundation's \$250-million Ultimate Campaign. I am proud to announce that \$177 million has been raised toward reaching our goal.

The provincial government made the right decision to ensure construction presses ahead during these uncertain times. This new hospital will double access to healthcare in southwest York Region. In 2021 doors are expected to open. Citizens will be able to access care, and nurses and physicians will be there to help.

The new hospital is also the catalyst for the Vaughan Healthcare Centre Precinct Project – a first-of-its-kind initiative. In October 2019, the City entered a memorandum of understanding (MOU) with York University, Mackenzie Health and ventureLAB – a commercialization hub.

The City is leading a collaboration to

transform an 82-acre parcel of land at Jane Street and Major Mackenzie Drive into a cluster of enterprise, opportunity and innovation in the life sciences sector.



Maurizio Bevilacqua

The feasibility study will determine how best to create a world-class health experience. It will examine various options, including a new space for ventureLAB to expand and create another regional innovation hub in Vaughan, in addition to opportunities for collaboration between Mackenzie Health and York University in the field of health sciences.

The goal of this unique partnership is for the Vaughan Healthcare Centre Precinct to leverage resources to bring

healthcare, innovation and jobs to our growing community. This site has the potential to be a place that will connect people and spaces and bring together different sectors to become an epicentre of healthcare excellence felt across Canada.

A consultant has now been retained to complete the study. A report is expected by the year's end.

As part of our efforts, I led the City's business mission to Israel. Our delegation included partners from the Vaughan Healthcare Centre Precinct project.

We met with Dr. Rafael Beyar, an experienced, accomplished and trusted leader with the world-class Rambam Medical Center – one of the largest medical centres in Israel. Dr. Beyar discussed his country's extensive efforts to bring together startups and academic institutions to create medical breakthroughs and enhance front-line health services.

Our meetings followed a study tour of the Rambam Medical Center and The Ruth Rappaport Children's Hospital. We saw first-hand the cutting-edge technologies that are improving patient care. Rambam Hospital provided a significant opportunity for us to learn of proven best practices.

This global pandemic is felt here at home and in communities around the world. Now more than ever, we need the Vaughan Healthcare Centre Precinct to come to fruition.

Maurizio Bevilacqua is the mayor of Vaughan, Ont.

Critical communication lessons from Notre Dame cathedral

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Lab systems are constantly churning out results (think COVID-19 test results as but one example) that need to be monitored, messaged, and acted upon. Patient monitors, radiology systems, and more have similar responsibilities.

And then there are the host of operational systems for throughput, bed availability, and the like. If we look closely, are there communication weaknesses that could result in a disaster?

Notre Dame Cathedral had only one major system to monitor and it failed. What makes a hospital 'smart' is its ability to coordinate and make use of multiple interrelated detection and response system simultaneously, so that your clinical and administrative operations are optimized. The only way to accomplish this is to have a communication platform that can interoperate between various clinical and operational systems, aggregating the data from the disparate systems and putting rules around that information.

By doing it this way, data is turned into actionable information, which can be communicated directly to the person who needs to know it. Data integration, aggregation, transformation and communication are hallmarks of the modern communication and collaboration platform, including the Vocera Platform. The communication and collaboration system is a fundamental component of a smart or real-time health system.

Designing a real-time health system: How does an intelligent communication platform work? Interoperability is key. Data from the EHR, nurse call, location systems, lab, pharmacy, etc., are all considered inputs to the platform. The data is aggregated and subsequently integrated and rules written that transforms individual pieces of data into meaningful and actionable information.

In the case of COVID-19, an intelligent communication platform enables the following workflow to take place: A patient has been admitted from the emergency department with a presumptive diagnosis of COVID-19. It is very important that staff get

the result of his diagnostic test back as soon as possible, whether positive or negative.

When the COVID-19 test has been resulted and added to the patient's EHR record, it triggers an automatic communication. The Vocera platform knows which room the patient is in from the EHR ADT feed, and it also knows which nurses are currently caring for the patient based on role assignments made at the beginning of the shift. It also knows which nurse is actually available based on presence information.

The test result can be immediately sent to the patient's available nurse along with other relevant clinical information. If there is no confirmation of receipt by the first nurse, the message can be automatically escalated to one or more people until the delivery has been confirmed. This automated process gets the information into the hands of

Alerting systems should be integrated, and staff members should be given the equipment they need to work effectively.

someone who can act on it as soon as possible, and it eliminates the burden of the nursing staff from needing to constantly look into the EHR to see if the result is back yet.

Applying lessons learned: Fire to pandemic: Okay, so what exactly can we learn from what happened in Paris and apply it to our current situation? While it might be tempting to lay the blame on the alarm attendant, it was really system design that led to the disastrous fire.

- Eliminate single points of failure. Build in smart automatic escalations for critical communications. And include clear concise contextual information. In order to make decisions, staff need not just the alarm result, they need immediate access to the context. At Notre Dame, the context of the alarm was the location information, which was neither clear nor precise.

- Send the right information to the right person on the right device. Using modern digital systems, communications can be made almost instantaneous by using multiple modalities. There is a time for voice

chats and a time for text chats, and both need to be available.

- Automate the delivery of critical information. Alarms are just one source of decision-support messaging. We can reduce points-of-failure in the chain of communication by automating the delivery of critical information to those who are best prepared to react.

In Paris, the smoke alarm did not go directly to the fire department. The information could have been sent directly to both the fire department and the internal security person on his or her mobile device.

- Simplify processes. At Notre Dame, the sensing system, monitoring person, escalation paths, and responders were not united on one communication platform. This makes handoffs more complicated, and post-hoc analysis of events more difficult. In a hospital, if your nurses receive information about labs on one system but have to use another to contact physicians about the result, information must be retyped – increasing work for the nurse and bringing in the potential for errors of both omission and commission.

- Provide the right equipment to your staff members. There was no reason the alarm information could not have gone directly to the guard inside the cathedral through a smartphone app or a dedicated device. Similarly, the message could have gone to the guard for action and to the fire department as a 'tap on the shoulder' – modern systems can be customized to meet specific needs.

Finally, COVID-19 places an additional burden on you to provide communication options while protecting your staff and preserving your supply of personal protective equipment (PPE). In the midst of the pandemic, it has never been more critical to keep staff and patients safe and connected with each other.

Benjamin Kanter, MD, FCCP, is the Chief Medical Information Officer at Vocera, where he works closely with clinicians and engineers to co-design the next generation of real-time communication and collaboration solutions for hospitals and health systems.

MIIT 2020: a virtual conference

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conference, showed us that DICOM is alive and well with many relevant additions to the standard.

Brittany Tomlin, business analyst with Alberta Health Services, informed us about the ambitious, province-wide Connect Care project, which aims to implement a single clinical information system.

Michael Toland, director of Enterprise Radiology Imaging Systems, University of Maryland, discussed with us his experience transitioning departmental application support to centrally managed enterprise support for imaging informatics.

Dr. Ted Scott, vice-president Research at Hamilton Health Sciences, told us about CREATE, the innovative health informatics service that HHS is implementing.

In conclusion, the conference shed a new light on the new directions that our industry is taking, from the integration of Artificial Intelligence to the move to Enterprise Imaging.

It is very encouraging to see how our field keeps evolving and improving; I can't wait until MIIT 2021 to hear the stories and experiences our speakers will share with us.

Dr. David Koff is Chair, Department of Radiology, McMaster University, and a Staff Radiologist at HHS.



TO RECONNECT, WE MUST BREAK THE CHAIN.

Contact tracing is crucial to slow the spread of COVID-19.

We're working with global health organizations and governments to automate contact tracing capabilities, creating links between patients, contacts and places. When we can identify those who are most at risk, we can ensure the safety and health of all citizens and pave the path to economic recovery.

sas.com/ca/contact-tracing

