FEATURE REPORT: INNOVATIVE HEALTHCARE PROVIDERS – SEE PAGE 16

Publications Mail Agreement #40018238

CANADIAN
Healthcare Technology

CANADA'S MAGAZINE FOR MANAGERS AND USERS OF INFORMATION SYSTEMS IN HEALTHCARE | VOL. 21, NO. 8 | NOVEMBER/DECEMBER 2016

INSIDE:

INFOWAY AWARDS
PAGE 8

Newfoundland's EHR
Newfoundland and Labrador are leading the way to a fully connected provincial EHR. By April, the province plans to have all four of its regional authorities feeding data into a central repository.
Page 4

The power of analytics
A team at the University of Ontario Institute of Technology has been developing the Artemis analytics system. It anticipates problems en-

countered by infants in NICUs, and saves lives. Now the team is expanding the scope of Artemis.
Page 6

EMR for mental health
Psychiatrist and computer scientist Dr. David Gotlib found that traditional EMRs didn't suit the needs of mental health professionals. He produced KoNote, which is optimized for charting free-form notes and logging numbers.
Page 4

ImagineNation hits 5 years
Infoway's ImagineNation Challenges program is now five years old. We look at some of the program's successes, which include

improvements in prescription dispensing and tracking, and an app that helps expectant parents navigate pregnancy.
Page 8

PHOTO: DOUG NICHOLSON, SUNNYBROOK HEALTH SCIENCES

MyChart PHR serves growing number of patients

MyChart, a Personal Health Record system developed by the Sunnybrook Health Sciences Centre, is gaining momentum and now has 140,000 users. In addition to Sunnybrook's patients, MyChart is available to patients, families and clinicians at many other hospitals. In future, the system may be used by facilities outside Canada. Pictured are Sunnybrook team leaders Sarina Cheng and Sam Marafioti. SEE STORY ON PAGE 10.

Osler shows benefits of managed equipment agreement

BY JERRY ZEIDENBERG

BRAMPTON, ONT. – It has been almost a year-and-a-half since William Osler Health System launched the first-ever, Managed Equipment Services (MES) deal for a Canadian hospital. As the pioneer in this area, the agreement was something of an experiment, but it has produced solid benefits for Osler, one of the country's largest community hospitals.

"We've replaced about 30 pieces of diagnostic imaging equipment in the past year," commented Joanne Flewwelling, Executive Vice President, Clinical Services and Chief Nursing Executive at Osler. "The agreement has allowed us to stay on the leading edge of clinical advances."

Osler went live with the MES agreement, in partnership with Siemens Canada, in June 2015. Since then, others have followed. The new Humber River Hospital in Toronto, which opened in October 2015, implemented an MES with GE Healthcare, and Mackenzie Health announced an MES deal with Philips for its upcoming Mackenzie Health Vaughan site, as well as its existing facility.

> **The deal helped alleviate a cash-flow crunch, and provides Osler with the appropriate equipment.**

Flewwelling observes that Osler was on the verge of refreshing dozens of pieces of imaging equipment when it awarded the MES contract to Siemens Canada. The hospital's Brampton Civic site had opened as a brand new facility in 2007, with equipment that was due for a refresh after eight to 10 years.

The DI and cardiology systems at Osler's other site, Etobicoke General, just outside Toronto, was also ready for an update.

"It was going to create a cash-flow issue all at once," says Flewwelling. "A lot of equipment was going to reach the end of life at the same time."

In addition, in early 2017, Osler would be opening a brand-new outpatient hospital – the new Peel Memorial Centre for Integrated Health and Wellness – which would require all new equipment.

So after issuing an RFP and going through the evaluations, Osler signed a 15-year contract with Siemens to replace and maintain

CONTINUED ON PAGE 2

William Osler Health System shows benefits of first-ever MES deal

CONTINUED FROM PAGE 1

190 pieces of imaging equipment throughout the hospital.

It meant the organization could replace its aging equipment without taking a major hit on capital resources – instead, the costs would be spread over the next 15 years.

At the same time, it would receive ongoing equipment replacements and servicing over the life of the agreement for all three of its hospitals – the Brampton Civic, Etobicoke General and Peel Memorial sites.

And with Siemens, it felt it had a partner with deep experience in medical imaging and managed equipment agreements, which it has conducted in Europe and around the world.

"We wanted someone with global experience in MES," says Flewwelling. "We did have a relationship with Siemens in the past, but when it came to choosing a partner, we had a robust RFP process. We had a fairness advisor, too, as we didn't want others to feel excluded."

Perhaps the greatest success story to date has been the replacement of an aging MR machine at the Etobicoke site with a state-of-the-art 1.5T scanner.

"It was a seamless transition," says Joe-Anne McCue, Director of Diagnostic Imaging and Laboratory, noting the new Siemens machine was installed and quickly made operational in November 2015. While the old scanner was removed, and before the new one was up-and-running, Siemens supplied a portable scanner at the site.

As a result, nearly all patients could have their exams done on schedule at the Etobicoke site. "Only one patient couldn't be accommodated, and that patient was transferred to another Osler site," says Flewwelling. "It was a real testament to the project management skills of the partners."

Of course, other modalities that have been replaced have ensured the hospital is state-of-the-art in additional areas, too, including Computed Tomography.

A key part of the MES agreement is that not all of the equipment is to be supplied by Siemens.

"It was important for the stakeholders to have this assurance," says Flewwelling. "They wanted to know they would be getting leading-edge equipment."

William Osler's Flewwelling, Kelton and McCue.

For example, Osler is switching from CR to DR in its portable X-ray devices, and has opted for Carestream as the vendor. Similarly, it is replacing its general purpose ultrasound systems across the three hospitals, and has chosen Philips as the preferred supplier.

However, in many areas, Osler will be opting for Siemens equipment. "We know that Siemens is a leader in the market for MRI and CT," says McCue.

Osler is currently focusing on a major refresh of systems at its Brampton Civic site, where $50 million to $60 million worth of equipment is nearing its end of life. This will be followed by a major investment in DI and cardiology equipment at the new Peel Memorial, in 2017, and by ongoing upgrades at Etobicoke General.

The team at Osler has focused on diagnostic imaging and cardiology equipment in its MES with Siemens – unlike other hospitals, which have created blanket agreements for all types of equipment, including surgical rooms, environmental systems and various types of software.

"We purposely limited it to DI and cardiology," says Dr. Joseph Fairbrother, Osler's Chief of Diagnostic Imaging and the architect of the MES strategy. He said that if too many areas are included in an MES, the project can become difficult to manage, with too many competing priorities.

"In some regions, MES hasn't worked well," says Dr. Fairbrother. He and members of the team examined the experiences of hospitals that have implemented MES agreements in the U.S. and U.K.

By maintaining a focus on DI and cardiology, Dr. Fairbrother believes the Osler MES has produced a manageable and effective strategy. It is delivering state-of-the-art equipment, with the features and capabilities that are needed.

It is also bringing the appropriate equipment into the hospital, at the right time, resulting in additional cost-savings.

"We're not procurement experts, we're imaging experts," he notes. "Now, we've got people shopping the market for us, and they are experts."

That's proven to be a huge time-saver for Dr. Fairbrother and his colleagues.

"We were spending too much time advocating for equipment," observes Dr. David Kelton, Site Chief of Diagnostic Imaging at Osler's Brampton Civic Hospital and specialist in Interventional Radiology. That included researching equipment, attending meetings and making pitches for various types of technologies.

And with so many modalities involved in modern-day patient care – MRIs, CTs, ultrasound, general and portable X-ray, angiography and others – Dr. Kelton says that kind of advocacy "just isn't possible anymore."

The MES has been a huge advantage on this front, says Dr. Kelton. "It frees up your time, and allows you to focus on clinical care."

In particular, this year Osler launched a new stroke program, called Code Stroke, and it opened a new vascular program – the Endovascular Therapeutics Program – before that.

By reducing the time spent on equipment procurement, physicians at Osler have had more time to develop and fine-tune these programs for patients.

CANADIAN Healthcare Technology

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

Volume 21, Number 8 Nov/Dec 2016

Address all correspondence to Canadian Healthcare Technology, 1118 Centre Street, Suite 207, Thornhill ON L4J 7R9 Canada. Telephone: (905) 709-2330. Fax: (905) 709-2258. Internet: www.canhealth.com. E-mail: info2@canhealth.com. Canadian Healthcare Technology will publish eight issues in 2016. Feature schedule and advertising kits available upon request. Canadian Healthcare Technology is sent free of charge to physicians and managers in hospitals, clinics and nursing homes. All others: $67.80 per year ($60 + $7.80 HST). Registration number 899059430 RT. Send all requests for permission to Jerry Zeidenberg, Publisher. **Publications Mail Agreement No. 40018238.** Return undeliverable Canadian addresses to Canadian Healthcare Technology, 1118 Centre Street, Suite 207, Thornhill ON L4J 7R9. E-mail: jerryz@canhealth.com. **ISSN 1486-7133**.

Allscripts®

LEAD THE CHANGE TO **SMARTER CARE**

In the ever-changing world of health care, Allscripts can help you master the future. Our solutions improve care and operations across your organisation — to take you as far as you want to go. We put precision and power in your hands.

Drive the health care of tomorrow.

allscripts.com

Newfoundland and Labrador on the verge of a province-wide EHR

BY JERRY ZEIDENBERG

By April, Newfoundland and Labrador will have 100% of its community pharmacies connected and delivering data into HEALTHe NL, its provincial electronic health record. Moreover, it will have all four of the province's health authorities feeding various types of data into the record by next summer.

That means healthcare professionals across the province – from St. John's in the east to Labrador City in the northwest – will have access to critical patient information in a matter of seconds.

These developments are just some of the latest in Newfoundland and Labrador's journey to the province-wide, electronic health record, a goal it calls, "One Patient, One Record."

"In the next 12-18 months, we will have one of the most comprehensive provincial EHRs in the country," says Gillian Sweeney, VP of Clinical Information Systems and Quality at the Newfoundland and Labrador Centre for Health Information, the lead agency for implementing the system.

On tap for the near future: e-referrals, e-prescribing and a patient portal. "We are scoping them out," says Sweeney.

The province has already achieved a great deal. Sweeney outlined the progress that's been made and the plans for the future in a recent webinar, titled "The Holy Grail of Healthcare: One Patient, One Record." (It can be accessed at: http://web.orionhealth.com/holy-grail-of-healthcare-registration.html)

Of course, the investments in HEALTHe NL have been made to enhance patient care. By providing accurate clinical information, clinicians will be able to make faster and better decisions about patient treatments and care plans. Almost one-third of Newfoundland and Labrador's 6,500 healthcare professionals have signed onto the system, and more are expected as the capabilities of the solution quickly grow.

Currently, there are six sources of information that feed into the clinical data repository, which has been built for the province by Orion Health. It is at the heart of Healthe NL, along with the viewer, which was also supplied by Orion Health. The six sources of data include:

- Client Registry
- Pharmacy Network
- Provider Registry
- Community health (such as immunizations)
- Hospital Meditech systems (includes lab results, DI reports, encounter notes, etc.)
- PACS (for diagnostic images)

"We were the first in the country to introduce a client registry," observes Sweeney, noting the solution accurately identifies patients and links data between systems. "It provides real-time authentication at the point of care."

The province was also one of the first in Canada to have a PACS repository; about 99 percent of the imaging in Newfoundland and Labrador is digital, and 55 million studies are stored in the provincial PACS each year.

Meditech is used at hospitals in each of the four Regional Health Authorities, but different versions have been implemented. That has created an integration challenge, but the NLCHI intends to have them all connected to HEALTHe NL by next summer.

Pharmacies have proven to be a very important source of data. Of the province's 202 pharmacies, 136 are now feeding data into HEALTHe NL, and the goal is to have them all in the system by April.

On another front, the NLCHI has also launched a physician EMR project, which is designed to link physician systems to HEALTHe NL. EMRs for doctors in the province are supplied by Telus Health. Sweeney said co-leaders in the project are the Department of Health and Community Services and the Newfoundland and Labrador Medical Association.

"Partnerships with vendors, professional associations and RHAs have all been critical to getting the project off the ground."

Gillian Sweeney

The EMR program is known as eDOC-SNL, and the first phase of integration with the EHR includes the client and provider registries, laboratory results, diagnostic imaging and clinical documents. The plan calls for a November 2016 rollout of this initial phase.

For its part, HEALTHe NL is currently experiencing robust usage, with 260,000 transactions per month being exchanged between the four RHAs and the client registry.

Sweeney notes that constantly checking and maintaining the integrity of data is a crucial function. As far back as 2002, the province created a registry integrity unit to ensure data quality and accuracy. In one six-month period in 2016, the unit resolved 11,000 tasks to maintain the accuracy of information – which goes to show how important this activity really is.

NLCHI is continually tracking how clinicians are using HEALTHe NL. Interestingly, the major users are nurses. Indeed, fully 75 percent of the users are nurses, followed by physicians (10 percent), pharmacists (8 percent), licensed practical nurses (4 percent) and nurse practitioners (3 percent).

To date, the system has been used mostly to obtain DI reports (41 percent) and medication profiles (23 percent). Significantly, the volume of requests for medication data has recently overtaken DI reports, Sweeney notes.

The addition of many community pharmacies this year has helped drive up the requests for medication profile information, as more patient information was available.

As one nurse told the NLCHI, "I have been using HEALTHe NL for the list of medications on a daily basis and printing them for the physicians. It really helps to have access to this information in the ER."

Access to lab reports (14 percent) was next, followed by clinical documentation (7 percent) and immunization records (3 percent).

Health professionals have benefited hugely from the availability of DI reports, as in the past, these reports were often sent out by mail. Now, they are available to clinicians as soon as radiologists have entered their reports.

Of the 6,500 healthcare professionals in the province, 2,007 are currently using HEALTHe NL. Of them, 623 are considered 'active users', those who have logged on at least three times in the last three months.

Sweeney expects to see usage jump next year when all four RHAs are connected and more hospital information is available. "That's when we will see even greater benefits."

Physician-created KoNote makes it easy to chart notes and numbers

BY JERRY ZEIDENBERG

TORONTO – Dr. David Gotlib has worked with plenty of EMRs in his career as a psychiatrist, but was never very pleased with them. "They were all too structured," he says. "They're basically glorified spreadsheets with a Windows front-end."

This was especially evident in his area, psychiatry and mental health. "I can work much faster using paper than an EMR," he says.

That's because mental health charting is so dependent on notes and narrative. "The traditional EMR isn't so good at organizing narrative information," he observes.

At the same time, psychiatry and social services records, in general, require a great deal of counting and numeric information to track the performance of a patient. Unfortunately, most EMRs do not help doctors and nurses with this challenge, either.

So Dr. Gotlib decided to create a program that could do a better job. Luckily, he has a background in computer science – in fact, he did a degree in computer science before becoming a physician, and was well acquainted with the ins and outs of software.

With the help of a talented programmer, in 2014 he launched a system called KoNote. (See http://www.konote.ca/)

The solution helps mental health professionals with both charting and counting. In fact, the program reminds users to count various things in the notes, and will automatically generate graphs showing how the patient is doing in different areas.

"The progress note prompts you to fill in a number," says Dr. Gotlib.

It's also designed for group work, and shows the notes that others have entered and the reasons why treatment changes were made. "It's designed to be multi-disciplinary, and it can be used for in-patients and out-patients," says Dr. Gotlib.

Doctors, nurses and social workers at St. Joseph's Health Centre, Toronto, used a prototype of the system on a psychiatric inpatient unit for three years with much success. "It's the compass that aids us to map our care," one nurse told Dr. Gotlib.

The users like it, said Dr. Gotlib, because KoNote "guides you to chart in a way that you treat people. It also takes less time to chart electronically than on paper."

And it's easy to use. Dr. Gotlib says the "most technophobic person as the Griffin Centre liked it the most."

When you look at the KoNote system, you immediately notice that it has a spare, elegant appearance. That's intentional. One of the problems with traditional EMRs, says Dr. Gotlib, is that they're over-engineered and cluttered: "Many doctors hate EMRs because they're too big, with too many things they don't need."

Dr David Gotlib

In contrast, KoNote has a simple interface. "It's designed for my grandmother to use," he quips.

It also makes use of a different design philosophy. Dr. Gotlib says he was inspired by the work of Dr. Lawrence Weed, creator of the "problem-oriented medical record". Instead of highlighting the sources of patient information, such as diagnostic images, prescriptions, physician notes, Dr. Weed's record focuses on a well-defined list of the individual's problems.

(Dr. Weed was also the progenitor of the SOAP method of medical charting – subjective, objective, assessment and plan.)

When it comes to the problem-oriented record, Dr. Gotlib says he differs from Weed in two respects.

First, KoNote is flexible and allows you to determine how much structure you want. For mental health, this is important, says Dr. Gotlib. "You really want to maintain a level of uncertainty until you are sure about what you're dealing with."

Second, the system is multi-disciplinary and can be used by a wide range of healthcare professionals – from doctors and nurses to social workers and community care workers. By having everyone chart in a unified way, and documenting what is relevant to patient-care, more accurate diagnoses and more effective treatments can be made.

"You don't want to see car-loads of documents," says Dr. Gotlib. "And you don't want to have to reconstruct everything in your head."

EPSON®
EXCEED YOUR VISION

WorkForce DS-530
35 ppm/70 ipm 50 Pg ADF

WorkForce DS-560
26 ppm/52 ipm 50 Pg ADF
Built-in WiFi

WorkForce DS-760
45 ppm/90 ipm 80 Pg ADF

WorkForce DS-860
65 ppm/130 ipm 80 Pg ADF

WorkForce DS-6500
25 ppm/50 ipm 100 Pg ADF

Freedom of Choice

Epson® document scanners can bring an entirely new level of efficiency to your business:

- **Choose from 19 different models**
- **Compatible with over 70 software packages**
- **Simple setup and easy networking**
- **Built-in cloud integration**
- **Models with speeds up to 65ppm**

From travel-friendly portables to workgroup and departmental solutions, there's an Epson document scanner that's ideal for every need.

See all your Epson document scanner choices at
epson.ca/docscan

The Artemis Project: Pushing new frontiers in healthcare analytics

BY DR. CAROLYN MCGREGOR

OSHAWA, ONT. – In summer 2016, we were excited to announce a new $3 million project to develop a market-ready version of Artemis to be used at bedside by clinicians. This will initially be deployed at our new partner hospital Southlake Regional Health Centre in Newmarket, Ont., with support from my long-time research partner IBM Canada.

Dr. Dave Williams, Southlake's President and CEO, is leading the Health Ecosphere Innovation Pipeline Project (HEIPP), a great initiative to enable Southlake to be a hub for demonstrating health technology innovation. My research at the University of Ontario Institute of Technology (UOIT) is part of HEIPP, along with research partners at York University and the University Health Network.

We first deployed Artemis in 2009 as a pilot research study to demonstrate how data collected by medical devices in hospital neonatal intensive care units (NICU) can be harnessed and utilized for new approaches to providing care to fragile premature and newborn infants.

Traditional healthcare involves human beings taking the vital readings of patients intermittently over long intervals. Artemis takes a 'big data' approach by applying technology to constantly measure a wide range of vitals. We wanted to show through Artemis that it was technically possible to do this.

Artemis can take 500 electrocardiograms readings a second, along with measures every second for heart rate, respiratory rate, blood-oxygen saturation and blood pressure metrics. With this enhanced data available for each patient, there is great potential to improve clinical practice and outcomes.

Our clinical research study explored what we could see in these very fast patient signals, particularly about infants being impacted by an infection.

Clinically, Artemis was able to see changes in the variability of heart rate to confirm a change in health status. However, because we were able to easily look at other medical information concurrently, we discovered a way to classify different health-status changes based on both the variabilities of heart rate and breathing rate, without any other clinical information.

We have reported on how we can see potentially different health status changes for infants who went on to be diagnosed with infection, compared to those who were receiving certain drugs at the time such as morphine, as both situations can lead to changes in heart rate.

Artemis has supported research students in the NICUs of The Hospital for Sick Children in Toronto, Ontario; Women and Infants Hospital in Providence, Rhode Island; and The Children's Hospital of Fudan University in Shanghai, China. Our initial clinical research has detected patterns for conditions that infants in the NICU can develop, such as:

- Apnoea of prematurity (pauses in breathing due to prematurity)
- Retinopathy of prematurity (eye damage from premature birth)
- Anemia of prematurity (often from blood loss for medical tests)

We have also been able to demonstrate the potential of new approaches to examining the way the brain is developing based on sleep patterns, assessing pain in these infants and assessing the impact of drugs they receive as part of their care.

Dr. Carolyn McGregor and her team have been deploying Artemis to help infants in neonatal intensive care.

We have also demonstrated how we can monitor NICU 'graduates' after they move home using Artemis Cloud to provide Health Analytics as a Service to people in a non-hospital environment. I have partnerships with Toronto-based AlayaCare to work on new approaches to home-based monitoring funded through a research grant with Ontario Centres of Excellence.

I have been collaborating in research with IFTech Inventing Future Technology Inc., a tech start-up in Durham Region that invented the ARAIG (As Real As It Gets) haptic garment. I have also been collaborating in research endeavours with someone trained in military/police tactical operations teams.

The ARAIG haptic garment allows players to feel what is happening in the game while they play. We believe there is great potential to learn more about the brain's development during tactical training to potentially help prevent the onset of Post-Traumatic Stress Disorder. These findings could eventually be integrated with training for other first responders.

The University of Ontario Institute of Technology's Dr. Carolyn McGregor is the Canada Research Chair in Health Informatics and a Professor with the university's Faculty of Business and Information Technology.

Better data collection and analysis needed to combat opioids epidemic

BY JERRY ZEIDENBERG

How do you solve a problem like the overuse of opioids? We know this is a serious issue – a recent series of articles by the Globe and Mail newspaper points out that Canada is the world's second-largest per capita consumer of opioids. The results are deadly. Between 2009 and 2014, no fewer than 655 Canadians died from fentanyl overdoses. And that's just one type of opioid.

Once they're hooked, many addicts start doctor shopping. They seek continuing highs from their drug, instead of realizing they're addicts and that they need treatment. They obtain multiple prescriptions and fill them at different pharmacies.

In some cases, desperate patients make high-quality copies of the scripts to pass to multiple pharmacies.

So what to do about this? How do we find out which patients are abusing the system? In theory, prescribing patterns are already being tracked, as pharmacies are required to submit reports when they write prescriptions for opioids.

Trouble is, across Canada, the reports tend to be on paper.

"The paper goes into a drawer for days or weeks, and by the time they're filed, the patient has collected five or 10 prescriptions," observes Greg Horne, Healthcare Lead for SAS Canada, in Toronto. "There's too much of a time lag."

That contrasts with the situation in the United States, where most states are now collecting opioid prescribing information through electronic networks, comments Jen Dunham, Principal Solutions Architect with SAS Institute Inc., in Washington, D.C.

That's allowing state health authorities to monitor prescribing patterns on a daily basis. In at least one state, Oklahoma, the data monitoring and collection for opioids is being done in real-time, at the 'point-of-sale'.

Canada will soon start to rectify the problem, notes Horne, with the launch of a national e-prescribing network. The system will connect doctors and pharmacies, and will make use of electronic prescriptions. "The patient never gets a prescription in his hand," says Horne.

The national e-prescribing program is being implemented under the auspices of Canada Health Infoway, and is called PrescribeIT. It's expected to start in 2017 in Alberta and Ontario, and will be then be rolled out to other provinces.

By connecting doctors, pharmacists and health authorities, the system will be able to monitor the number of prescriptions that physicians are writing and that patients are filling.

PrescribeIT is also expected to help with adherence – physicians will be able to tell if patients have filled their prescriptions. If not, they can find out why.

Analytics enable experts to spot 'atypical' prescribing and dispensing among physicians, pharmacists

When it comes to the opioids epidemic, it will speed the collection of data that's needed to find out who is receiving too many pills.

And as Horne notes, with the use of analytics, PrescribeIT will also enable authorities to detect "atypical prescribing patterns".

"You will be able to see which doctors are pushing out a lot of business to pharmacies," says Horne. Similarly, it's much easier to spot errant pharmacists, those who are dispensing unusually high volumes of opioids.

Dunham observes that with the help of analytics, the same techniques used in detecting fraud or financial crime can be applied to opioids. "You can spot the pill-mill pharmacists," she says.

Horne notes that the opioids epidemic hasn't been handled effectively to date. While governments have cracked down on the use and sale of some drugs, effectively delisting them from provincial formularies, this technique has only spurred the use of other opioids.

"You simply create a new black market by doing that," he says. "People try getting the drugs somewhere else, or they turn to other opioids."

That observation is supported by the evidence. In 2012, the year OxyContin was delisted from provincial drug plans, 18.3 million opioid prescriptions were dispensed in Canada. Last year, that figure jumped 18.6 per cent to 21.7 million, according to IMS Health, a healthcare information services company.

CONTINUED ON PAGE 19

EMPOWERING HEALTH

Microsoft and its partners can enable your digital transformation. With Microsoft's powerful and intelligent cloud platforms, you can better engage your patients, empower your care teams, optimize your clinical and operational effectiveness, and transform the care continuum for your organization. Together, we all can realize a healthier future today.

For more information on Advanced Analytics for Healthcare, download the e-book at Microsoft.ca/health/analytics

Microsoft.ca/health/analytics

Microsoft

Infoway ImagineNation Challenges celebrate five years of digital health innovation

Thousands have participated since the Challenges were launched in 2011.

Canadians might have to think long and hard to determine the last time they saw an X-ray image printed on film. It took time and a lot of hard work, but for thousands of healthcare providers, the efforts to move from paper to digital were well worth it.

Across Canada today, healthcare providers are instantly and securely retrieving digital health information such as diagnostic images, lab test results and drug information to make informed care decisions, leading to improved outcomes.

With foundational elements in place, Infoway recognized an opportunity to further promote innovation and in 2011, the organization launched the Infoway ImagineNation Challenge series, in a bid to inspire, provoke, and promote innovation in health and healthcare, and to foster a community of innovators in Canada.

"There are very talented people in Canada, and we wanted to encourage them to innovate to advance digital health," said Fraser Ratchford, a Group Program Director at Canada Health Infoway who leads the Challenge series. "Friendly competition to spark innovation through Challenges was a relatively new concept at the time, but it didn't take long for Canadians to embrace it."

Five years and a total of 11 Challenges have created an innovation momentum that is still going strong. Thousands of participants have stepped up, contributing ideas, measuring use, and describing the impact digital health has had in Canada. Their experiences weave a story of a country of innovators who are determined to use technology to improve the health of Canadians. So far, they have logged more than 74 million uses of digital health, always with an eye to improving patient outcomes.

"Thousands have participated since the Challenges were launched in 2011. For example, the Ideas Challenge, our first one, drew submissions from Canadian clinicians, patients and researchers from across the country," said Ratchford. "I think that's reflective of the talent, imagination, and passion we share for improving care through digital health innovation."

That initial Ideas Challenge asked Canadians for bold new ideas to transform healthcare – how would they enhance access to services, improve quality of care delivery or make the system more efficient?

Submissions were received from across Canada, including one from the Niagara Region Public Health Unit, who submitted an idea for an app to help expectant parents navigate pregnancy. They wanted to place useful information about the various stages of fetal development at the fingertips of expectant parents and provide them with the ability to log progress. The idea won the Canada's Choice award, and since then, it has been developed and downloaded more than 17,000 times.

The Data Impact Challenge is another example of one of Infoway's successful Challenges. The goal here was for participants to demonstrate the knowledge that can be uncovered by analyzing the data stored in digital health systems.

"The information is already there, in digital format," said Ratchford. "It's more important than ever to analyze the information that we collect to inform health policy and practice."

One such example is the submission by the MOXXI (Medical Office of the XXIst Century)-McGill team, which reported on the number of prescriptions that are written each year, but for a variety of reasons, are never dispensed, or picked up by the patient. Having this information informs medication management practice and policy. Influencing practice and policy to improve outcomes for patients has always been a central tenet to the Infoway Challenges.

A team from Sunnybrook Health Sciences, in Toronto, was one of the winners of Infoway's ImagineNation Challenges.

Similarly, the Patient Impact Challenge, held in 2013, reinforced the fact that an overwhelming number of patients want access to digital health tools and capabilities for themselves.

Patients like Cheryl-Anne from Beaconsfield, Quebec, summed up the value of what many Canadians want in her submission to the Patient Impact Challenge: improved communication with their care providers.

According to her submission, "Access to my specialist through email has helped me tremendously in being fully engaged as a patient."

In fact, the availability of digital health tools for Canadians has doubled in the last two years, prompting Infoway to launch the Engaged Patient Challenge, its latest, which recently ended.

Entrants were asked to describe what being an empowered patient means to them and why it's important. Judges will choose the best five submissions and invite their authors to Toronto to participate in activities during Digital Health Week, which is held every November to raise awareness of the value and benefits of digital health, and the role it plays in supporting healthier Canadians and families.

As part of Digital Health Week (November 14-20), the Better Health Together community of more than 40 healthcare organizations, along with patient partners, is coming together to help shape a future of healthier Canadians through innovative digital health solutions. Anyone can join the conversation throughout the week via #ThinkDigitalHealth.

As for future Challenges, Ratchford says, "We're proud of what our community of innovators has accomplished in five years, and we're looking forward to what is yet to come."

About ImagineNation Challenges: The ImagineNation Challenges seek to inspire, provoke, and promote innovation in health and healthcare and foster a community of innovators in Canada. While each ImagineNation Challenge is different, they all share the same ultimate goal: to improve the quality of care and the patient experience. Since 2011, the ImagineNation Challenges' has run 11 Challenges, with 469 entries from over 410 individuals/organizations participating nation-wide. The community of Challenge participants has answered healthcare questions, adopted and spread the use of new technologies and put their best ideas forward in 11 different Challenges.

ImagineNation Challenges by the Numbers:

Five years of ImagineNation Challenges

469 entries representing over **410** organizations in **11** Challenges

Over **200** judges contributed to reviewing and scoring Challenge

More than **74 million** uses of digital health solutions

$2.3 million in awards distributed

Over **1000** clinicians, health professionals, academics and Canadians submitted ideas or cast votes in the Ideas Challenge

Over **3.6 million** log-ins to the Outcomes Challenge

More than **120** stories submitted in the Patient, Career and Business Impact Challenges

The Accelerate Challenge helped push teams to reach **20,000** users

30 million social media impressions in the Public Health Social Media Challenge, with an additional **80,000** social engagements

Teams in the e-Connect Impact Challenge exceeded **71 million** uses of digital solutions

Over **50** responses were received in the Data Impact Challenges, answering pressing healthcare questions

Find documents faster

Improve document efficiencies, management and patient care.


fi-7160


fi-7260


fi-5950


fi-6800


fi-6400


fi-6770


fi-6670

For more information on Fujitsu scanners, please visit **www.fujitsu.ca/scanning**.

shaping tomorrow with you

FUJITSU

Sunnybrook's MyChart PHR has 140,000 users in Canada and abroad

BY ANDY SHAW

TORONTO – Now over 10 years in the making, Sunnybrook Health Sciences Centre's MyChart Personal Health Record Service (PHR) is now gaining the momentum its innovators dreamed of – this year, eight new member sites will go live, with eager patients joining not just from Sunnybrook but also from many other healthcare providers. As well, MyChart is experiencing a sharp increase in use by doctors.

"I'm thrilled by MyChart's growth, but I had hoped this would have happened a lot sooner," says Sarina Cheng, Sunnybrook's Director of Health Records and the visionary Director of the MyChart Program. "Twenty years ago, I was inspired personally because I had a very sick daughter with Kawasaki disease (since fully recovered).

"It was a rare and unknown disease then, so I kept pushing for more information. But clinicians weren't talking to me and I realized then that the patient was not really part of the healthcare equation. Luckily, many years later joining Sunnybrook Hospital, I met the right CIO at the right time who agreed that what we had to do was to empower the patient and give them a voice in the circle of care".

Today, patients who sign up for MyChart can assure themselves of a continuity of care from all who care for them – be they physicians, physiotherapists, pharmacists, or family and friends. In other words, they can share their health records with anyone they choose.

As the first patients used MyChart and they found both what was useful and not so, its developers listened and added new empowering tools to its make-up. Most recently in 2012, for example, Sunnybrook added MyChart mobile so patients could quicken their access through any smartphone, iPad, or tablet.

In 2013, Sunnybrook partnered with the Canadian MedicAlert Foundation, so that any MyChart patients wearing MedicAlert devices could provide paramedics or other first responders with immediate access to their critical personal health information.

That same year, Sunnybrook also partnered with their Family Practice Health Team so patients could speedily book and see appointments with their family physicians, as they do with other hospital appointments, all in one place.

And most recently, in 2014, MyChart added a tool with the mental health community in mind, called the 'Mood Tracker'. Developed in partnership with Sunnybrook's Psychiatry leadership, the Mood Tracker allows patients to record their feelings throughout the day and it can visually illustrate to doctors a patient's mental health status over periods of time.

"It's clear that the patients and clinicians behind these additions to MyChart are the innovators; they truly understand the importance of the patient voice," says Sam Marafioti, Sunnybrook's CIO and VP of Corporate Strategy and Development. "So they are the drivers in MyChart's development now.

"We, as technical support, of course embrace Ontario's PHIPA legislation (Personal Health Information Protection Act) that underpins the movement to a more patient-centred healthcare system, but quite frankly, it is patients and clinicians in MyChart's case that are driving this momentum now."

Today, MyChart has 140,000 users and the numbers are steadily growing. About 90 percent are patients and 10 percent doctors or family members.

With MyChart, users stay connected to all their personal health records. They can share them with not only individual physicians but with multiple healthcare teams from multiple hospitals and healthcare services within and outside of the country.

In addition to mental health monitoring tools, they can use MyChart's shareable daily logs and diaries with nurses, doctors, family or friends who can make their own contributions to the record.

They can also help patients to monitor

symptoms and support treatment for sleep difficulties, high blood pressure, diet, weight loss, cancer and other serious diseases, as well as watch their overall health status.

"All that information is available, seamlessly, to everyone the patient permits to see it. That's what makes MyChart unique," observes Marafioti.

Of course, there were lessons to be learned when the system was first launched in 2006: "We entertained the idea that patients and physicians would be equal participants at the same time, and so, register together," says Cheng. "But we learned quickly that was not the right model.

"As soon as we went live, we were getting calls from both sides but especially from clinicians saying, 'Well this doesn't work for me. Or that sure doesn't work for me.'"

What Cheng and Marafioti both realized was the big challenge of implementing MyChart effectively for physicians was not technical, but human.

"It was the challenge of change management," says Marafioti. "The best example has to do with time-stamping of when test results could be released to MyChart subscribers. 'You mean you want patients to have information before I get it?' was a typical response. So we worked with the doctors and now almost all of that resistance has gone away."

Adds Cheng: "Its to the point now, that the only results participating physicians hold back are cancer pathology results, so the physician can review them first before discussing them with the patient. And that's understandable."

Physicians, along with patients, are using MyChart, as it helps create better collaboration between doctors and patients.

Moreover, in the early MyChart days, physicians at Sunnybrook saw it as a threat. But as more and more patients come forward through MyChart to present themselves with better knowledge and more relevant data about their conditions, doctors now see the advantages of personal health records and have increasingly started to embrace them.

"We have a gastroenterologist, for example, who now makes so much use of MyChart he says he runs half his practice on it," says Marafioti. "And that kind of realization on the part of physicians has been the tipping point for MyChart. So now we are seeing very real collaboration with patients happening more and more."

Even back in a 2014 survey, 91 percent of 70 physicians using MyChart reported they believed their patients' access to MyChart improved the patient experience.

More specifically, they replied that it supports collaborative disease tracking and better medication compliance, reduces adverse drug events, and eliminates duplication of lab work and other tests.

Perhaps most importantly, physicians recognize that personal health records like MyChart help them focus on actually delivering care, and not on retrieving information.

That success has not gone unnoticed. MyChart's participating partners now include Mount Sinai Hospital, Mackenzie Health, MedicAlert Canada, Lifelabs (CML), Toronto EMS, Michael Garron Hospital, William Osler Health System, Headwaters Health Care Centre, University of Ottawa Heart Institute, The Ottawa Hospital, Central CCAC, Baycrest Hospital, and most recently St. Michael's Hospital.

On the immediate horizon, as MyChart extends its network beyond hospital walls, is a plan to have family doctors come into the fold, as well as other allied health professionals and community services.

In order to subscribe at mychart.ca, you need to be or have been a patient at Sunnybrook or one of the participating partners above. The good news is that unlike some other PHR systems, MyChart is free.

And if Sunnybrook has its way, MyChart might one day soon be available to all Ontarians and perhaps others far beyond.

"Well, first of all, you don't have to be a Canadian citizen or resident here, only a patient, so we are already international in that respect. MyChart can be accessed now from 160 countries worldwide," points out Marafioti.

Closer to home, the hope also is that MyChart becomes endorsed as the recommended PHR for the province by eHealth Ontario, the provincial government's agency that's facilitating the spread of a standardized electronic health record system.

eNotifications mean faster follow-up for Ontario patients after hospital stays

BY KATHERINE TUDOR

Communication between hospitals and community-based family physicians used to be a challenge in Ontario. Physicians often had no idea that a patient was in the hospital until days or weeks later.

This lack of integration between hospital information systems and primary care electronic medical records (EMRs) meant that family physicians could not follow up with patients after their hospitalization as quickly as possible for any necessary continuity of care.

Now, thanks to OntarioMD's eNotifications, physicians receive real-time electronic messages in their electronic medical record (EMR) systems whenever their patients are discharged from a hospital emergency department or are admitted or discharged from an in-patient unit.

eNotifications flow securely through OntarioMD's Hospital Report Manager (HRM), the provincial electronic report solution. eNotifications not only let physicians know that their patients were in the hospital, but also signal the imminent electronic arrival of hospital reports to EMRs – discharge summaries and other medical record and diagnostic imaging reports – which include important, up-to-date information about the care the patient received in the hospital.

Over 6,500 family physicians use HRM and 3,500 of them have adopted the eNotifications feature. In a recent survey, 75 percent of these physicians reported that eNotifications allow for follow-up with patients sooner after their hospital visits.

"My practice has been receiving eNotifications and it's been a positive experience. I followed up with one of my patients shortly after I received an emergency department discharge eNotification and the patient was blown away that I was able to follow-up with him so quickly," says Dr. David Kaplan, a family doctor.

eNotifications support Health Links, an Ontario Ministry of Health and Long-Term Care initiative to provide more coordinated, efficient and effective care for patients with complex conditions in 69 communities across Ontario.

Complex care patients, who represent five per cent of Ontario patients, spend more time in hospitals and in emergency departments than other patients and account for two-thirds of health care costs.

Letting family physicians know about these events has been critical to coordinating timely follow-up care and reducing the potential for unnecessary hospital readmissions for these patients.

eNotifications include a Health Links patient identifier and the patient's Community Care Access Centre. This information is very useful in coordinating care with Community Care Access Centres after hospital stays. Physicians are able to be proactive instead of reactive when they are notified about their patients' hospital visits because they have the necessary information they need to support timely decisions in the management of their patients.

eNotifications have been recognized for their contribution to the Health Links objective of better coordinated and effective care in the patient's community and have resulted in eNotifications being identified as a Leading Practice by Accreditation Canada.

eNotifications have also been recognized for their value in transforming primary care and improving follow-up care for patients in Ontario with finalist status for the Information Technology Association of Canada's 2016 Ingenious Awards.

eNotifications are expanding to physicians and nurse practitioners across Ontario and the number of users is growing every day. The only requirements for physicians or nurse practitioners to receive eNotifications are the access and use of an OntarioMD-certified EMR and a connection to HRM. There is little change to the physician's workflow and no need for added training.

Katherine Tudor is Director of Communications and Marketing at OntarioMD, in Toronto.

Cancer treatment data is no longer isolated in the London region

BY DIANNE DANIEL

LONDON, ONT. – Every day, more than 400 cancer patients receive treatment through the London Regional Cancer Program (LRCP) and its partners throughout southwestern Ontario. Up until recently, they were an isolated group – not literally, but because the system used to manage, track and adjudicate their comprehensive cancer care plans was standalone.

Following the successful implementation and rollout of Cerner PowerChart Oncology, that's no longer the case. Cancer patients are now integrated with London Health Sciences Centre's hospital information system, meaning their complex medication record and information related to their cancer journey is available for any treating clinician to see in one comprehensive health record.

"Our paradigm was that the cancer program had to be part of the overall hospital information system," says Neil Johnson, vice-president, Cancer Care and Corporate Strategy, LHSC. "We're plugging into that and making it work from a cancer perspective, as opposed to using a cancer system and hoping the hospital can connect."

The decision to move to Cerner PowerChart Oncology was driven by a steering committee made up primarily of clinicians, and including a cancer patient and the parent of a child with cancer.

After evaluating the software extensively, they decided it provided several benefits over Cancer Care Ontario's (CCO's) Oncology Patient Information System (OPIS). Though 'tested, tried and true,' and used in the LRCP's adult oncology program for more than a decade, OPIS is a siloed system, forcing clinicians to rely on two systems when treating cancer patients.

"When an adult patient came into our chemotherapy suite, their chemo was entered in one system (OPIS) but if they needed other medications associated with their chemo, those were entered into the hospital information system," explains Glen Kearns, LHSC CIO and integrated vice-president, Diagnostic Services. "We were entering drug information into two different systems in order to serve the patient, so we didn't have cross-checking to ensure a drug ordered in one system wasn't in conflict with the dose or volume of another drug." Lack of an integrated approach often created delays in workflow, he added.

LHSC, along with St. Joseph's Health Care London, is a long-time user of the Cerner PowerChart electronic medical record, as well as computerized physician order entry (CPOE) and barcode medication administration at bedside.

The ability to integrate its adult and pediatric cancer programs into that environment, which encompasses 11 hospitals, is a huge benefit, says Kearns.

For example, if a cancer patient undergoes surgery at an ancillary hospital site and receives follow-up care there as opposed to LHSC, the treating surgeon will have access to the integrated care plan, including a complete medication profile. Similarly, if a cancer patient shows up at their local emergency department, doctors will know exactly where they are in their treatment plan without having to wait for information to be faxed.

As part of its PowerChart Oncology implementation, the LRCP built approximately 800 highly detailed electronic oncology order sets, aligned with best evidence. An important feature is the electronic claims link which automatically submits treatment plan information to CCO, which in turn authorizes payment.

"All of our funding for operations in our chemotherapy suites is predicated on that, so if we don't have good information going to the funder, the program doesn't get paid," says Johnson.

Bob Knust, Cerner's oncology solution results manager, calls the order sets "very complex, multi-phase power plans" that integrate pharmacy, imaging, laboratory

CONTINUED ON PAGE 19

VIEWPOINT

Re-imagining audiology and endoscopy: new technologies are re-inventing ENT care

Shoebox Audiometry is the first clinically validated audiometer that runs on an iPad.

BY DR. SUNNY MALHOTRA

Audiology, which involves the testing and treatment of poor hearing, is an expensive field. That has made it a target for new technologies that offer cheaper solutions and excellent results. Entrepreneurs, including physician-innovators, have been leveraging the power of modern technology to reimagine how audiology services can be delivered.

Before 2014, 60 youngsters a year were flown from Iqaluit to Ottawa to have their hearing tested at the Children's Hospital of Eastern Ontario. This is because Iqaluit, like many rural communities or developing countries, have limited access to specialty care and equipment.

Dr. Matt Bromwich, co-founder of Clearwater Clinical, decided to bring audiology testing to the kids instead of the kids to the test. As a result, Shoebox Audiometry, the first clinically validated audiometer that runs on an iPad was born.

The solution is comprised of a tablet, software and calibrated headphones. This technology can be used to administer a full diagnostic hearing test and can be deployed anywhere in the world. From remote communities across Canada to developing countries, this validated audiometer on an iPad is changing how hearing health is managed.

Shoebox Audiometry offers two testing methods, manual and automated. In manual mode, a system functions like a traditional audiometer and is controlled by the tester, most likely an audiologist or an ENT physician.

Automated mode utilizes gamification, where patients virtually test themselves using pre-set configurations; dragging and dropping an image on the screen based on whether or not they hear a tone presented at various frequencies.

Traditional audiometer testing can be expensive, due to the equipment that is used. Shoebox Audiometry changes this by using an iPad.

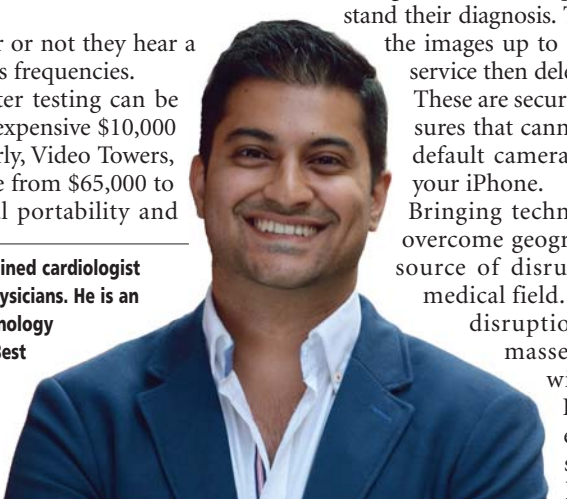
Traditional audiometer testing can be cost prohibitive, due to expensive $10,000 sound chambers. Similarly, Video Towers, which can cost anywhere from $65,000 to $100,000, have minimal portability and limited availability. They are used for documentation of an endoscopic procedure.

But Dr. Bromwich realized that he carried around an HD recording device every day. Connecting the endoscope to a smartphone could replicate a video tower that could be carried in a lab coat pocket.

Used with a companion app called Modica, it securely captures photos and video of procedures directly on a mobile device.

Through the app the video can easily be shared with other specialists for consulting, with residents for teaching, and even with patients to help them understand their diagnosis. The app automatically backs the images up to a HIPAA-compliant storage service then deletes the file from the phone. These are security and patient privacy measures that cannot be achieved by using the default camera that comes standard with your iPhone.

Bringing technology to the consumer to overcome geographical barriers is a major source of disruption, irrespective of the medical field. This is an example of ENT disruption being brought to the masses. Developing products with Health Canada and FDA clearance to safely empower patients represents the new age of digital health.



Dr. Sunny Malhotra is a US trained cardiologist working at AdvantageCare Physicians. He is an entrepreneur and health technology investor. He is the winner of Best in Healthcare - Notable Young Professional 2014 and the national Governor General's Caring Canadian Award 2015. Twitter: @drsunnymalhotra

REBOOTING eHEALTH

Information security is really a human problem

BY DOMINIC COVVEY

Once upon a time in the 1970s, members of the Krever Commission, charged with assessing the status of the protection of health information, decided to see data facilities firsthand.

Although much information at the time was paper-based, the computerization of records was becoming commonplace. We have already seen what happened at the government data centre – see my last article in the October issue of CHT.

In that instance, it was clear that staff adherence to security procedures left a lot to be desired! It was too easy to engage in a little bloody-mindedness to show that fancy software was not the ultimate protection mechanism for records. But, here is another story illustrating yet another human issue.

We'll de-identify this story. A major medical department at an academic medical centre, which saw about 100,000 patients a year, had its (independent) computer system in the basement of the hospital.

One good thing was that there was no sign saying "Computer Room". However, the door to the computer room was always unlocked and anyone could walk in. Further, that room was on a heavily-traveled corridor.

This open wound in the security of the institution resulted in a visit being made to the hospital Security Office. The Chief of Security was informed and requested to do something about the matter. Months later, when the Commission wished to visit computer facilities, this seemed to be a natural one that would bring the issue of security into bas-relief. Pause here to guess what happened.

A small group of Commission staff went to the computer room and, lo and behold, the door was still unlocked. So, in we went. We symbolically removed several disk packs, briefly walked out into the corridor, and then, avoiding a felony charge, returned the packs to the room.

As a last step, we symbolically kicked the computer to demonstrate that we could have, if we wanted, simply destroyed it. We all then left, heads bobbling with dismay. That was one demo that succeeded!

But, of course, you can also guess the sequel to the story: after our little visit, the Security Office was again informed and told what we did. Weeks later, the door was still unlocked.

This, yet again, illustrates the dependence of security on humans, their policies, their actions (or lack thereof) and their belief that security is so important that it deserves their attention and dedication. Years later, I had set up a consulting company that provided IT-related services. We were engaged by the CEO at the Hospital for Sick Children to perform a review of their systems and personnel. This was a carefully designed and executed process to determine technical capabilities, personnel competence and performance, and, of course, the status of computer security.

Dominic Covvey

We formalized this process and called it an "Information Systems Audit". The audits were modeled on management audits. They were carried out by three carefully-selected reviewers, according to a documented protocol. Of course, we dealt with matters like those just mentioned and all the other things surrounding computerization.

Security was a key aspect of the audit and it was almost always found to be deficient. Sometimes, simple matters, like having a sign and directions to the computer room were remarkable.

Other times it was a lack of physical security, such as locks on doors. In some instances it was the location of the computers in a place where they would be flooded in a storm or by failed plumbing.

Lack of fire protection, backup facilities, inappropriate removable-media storage, and many other factors were also often found. The last time we performed one of these audits was at least 20 years ago, so writing

CONTINUED ON PAGE 19

New approach to procurement finds vendors for e-referral solutions

The System Coordinated Access (SCA) program is leading an exciting initiative to remove inefficiencies and barriers to care by creating a secure, system-wide electronic referral (eReferral) process that will allow information to flow across the continuum of care in Waterloo Wellington.

In order to realize this vision, the SCA program needed to find a partner that could not only design and implement the technological platform, but who also had an understanding of the local health care environment and the ability to use this knowledge to build out a solution that supports the diverse and complex needs of the system. The SCA program is funded by the Waterloo Wellington Local Health Integration Network (WWLHIN).

In a collaborative effort, the SCA program, the Waterloo Wellington Community Care Access Centre (WWCCAC) and the WWLHIN set out to secure an eReferral solution using a new approach to procurement.

Sharon Baker

"We felt we needed a new and different process to find the right partner, a partner that would work with us to build a system that is sustainable and who would be able to introduce innovation as the solution scales," says Sharon Baker, Director of Innovation Procurement. "We are creating something to achieve certain outcomes, and it's something that is going to evolve as both technology and the healthcare system changes."

Based on these unique needs, the evaluation team opted to use an innovation procurement process to find a vendor that met the menu of qualifications. These processes were identified and promoted by the Ministry of Government and Consumer Services (MGCS) through the Innovation Procurement Initiative under the OntarioBuys program.

OntarioBuys makes investments to support innovation, facilitate and accelerate the adoption of integrated supply chain, back-office leading practices and operational excellence by driving collaboration and improving supply chain processes in Ontario's broader public sector (BPS).

The pre-procurement phase included early market engagement to assess market interest and capacity to respond to a Request for Proposals (RFP), and to seek vendor input on the vision and process.

These included Market Sounding in which the team used a document posted openly on MERX with background and specific questions designed to gauge interest and seek feedback on the proposed approach, followed by in-person market engagement events.

Members of the evaluation team, which included representation from the SCA program, WWCCAC, WWLHIN, Langs, physician community, Community Support Services and other system leaders across the region, partnered with Communitech (the innovation hub in Waterloo Wellington) and the Information Technology Association of Canada (ITAC) Health committee to design two days of facilitated engagement with large and small vendors (including startups).

This helped the evaluation team to better understand the market and create interest in the plan to design a regional eReferral system. One of the key things raised by the vendors at these sessions was the likelihood that a consortium would be required to address all elements of the RFP.

For the RFP, the evaluation team opted not to use the traditional approach of providing a long list of functional requirements and specifications. Instead, proponents were asked to describe how their solutions would help achieve the SCA program's outcomes and high level requirements.

An evaluation tool was used to assess the vendors' capacity for innovation and also to provide insight into the potential fit

CONTINUED ON PAGE 19

Regions consolidate patient data to improve management of hospital resources

Predictive analytics and population data are helping hospitals plan days and weeks in advance.

BY DIANNE DANIEL

When you're managing capacity in a hospital setting, yesterday's news isn't going to solve today's problems. What's needed is a real-time picture based on trusted data – a daunting task for healthcare organizations. An even bigger challenge is turning that data into an accurate prediction of what's to come.

"In healthcare, we've been pretty good at analyzing historical trends. What we haven't been necessarily good at is proactive planning," says Sarah Padfield, chief operating officer at Chatham-Kent Health Alliance (CKHA), a 200+ bed community hospital operating two campuses in southwestern Ontario.

"We know what happened in the last six months and, yes, that is important. But when you're trying to manage beds on a day-to-day basis, what you want to figure out is what's coming at you today and in the next couple of days, as opposed to what happened yesterday."

To provide that real-time snapshot into hospital utilization, CKHA engaged the services of Waterloo, Ont.-based Oculys Health Informatics, a company focused on developing practical, operational visibility solutions for healthcare professionals.

The company's core product, Oculys Performance, is a mobile tool that displays operational data from disparate information systems in a simple format, providing information such as bed availability and patient flow. After a one-time implementation fee to establish key data points, the service is offered at an affordable monthly subscription fee.

Padfield calls the visualization tool a "real-time utilization dashboard" configured specifically for CKHA. Hospital staff access it through either a BlackBerry 10 smartphone or desktop, there are screens at every nursing station and it is also widely deployed through a web-based link so users can access it from anywhere. At a glance they can see how long each patient has waited and what's happening with bed availability – for example, making adjustments to optimize capacity and reduce wait-times on the fly.

CKHA's initial goal was to positively influence the time from when an ER patient is admitted to hospital to when they are actually moved into a bed. "When we started we were averaging well over 14 to 15 hours. Now we're consistently under eight hours," says Padfield. It has since expanded the tool to include housekeeping, enabling housekeepers and porters to prioritize cleaning and maintain up-to-date bed availability status.

Though the end result is a simple-to-understand view, the engineering behind the Oculys solution is complex. Formed in 2011 and known for developing a real-time emergency department wait clock in conjunction with St. Mary's General Hospital in Kitchener, Ont., the company also works closely with academics at the University of Waterloo.

The algorithm that drives its real-time utilization tool is now garnering attention from California's Stanford University, says Oculys president and CEO Franck Hivert, and the company is adept at leveraging the expertise of data scientists.

But its real focus is on the end-users, the hospital clinicians and managers.

"The reason we've been successful is because we have worked with users in understanding what information they need to make better decisions (and extracting it), instead of getting the data first and seeing what analysis we can run on it," says Hivert. "We're not the tool they're going to use to analyze the last six months of data. Our philosophy is: Let us give you the information right now, today, so you can do something about it."

CKHA is one of five hospitals that make up the Erie St. Clair local health integration network (LHIN), all of which will be using Oculys Performance once Leamington District Memorial Hospital goes live with its implementation this fall.

The deployments, created with the help of Oculys, mean there will soon be a LHIN-wide real-time utilization view – a real achievement. Phase One is currently being rolled out and will provide as many as 20 LHIN employees with a snapshot of activity across the whole region, an "unprecedented" development, according to Hivert.

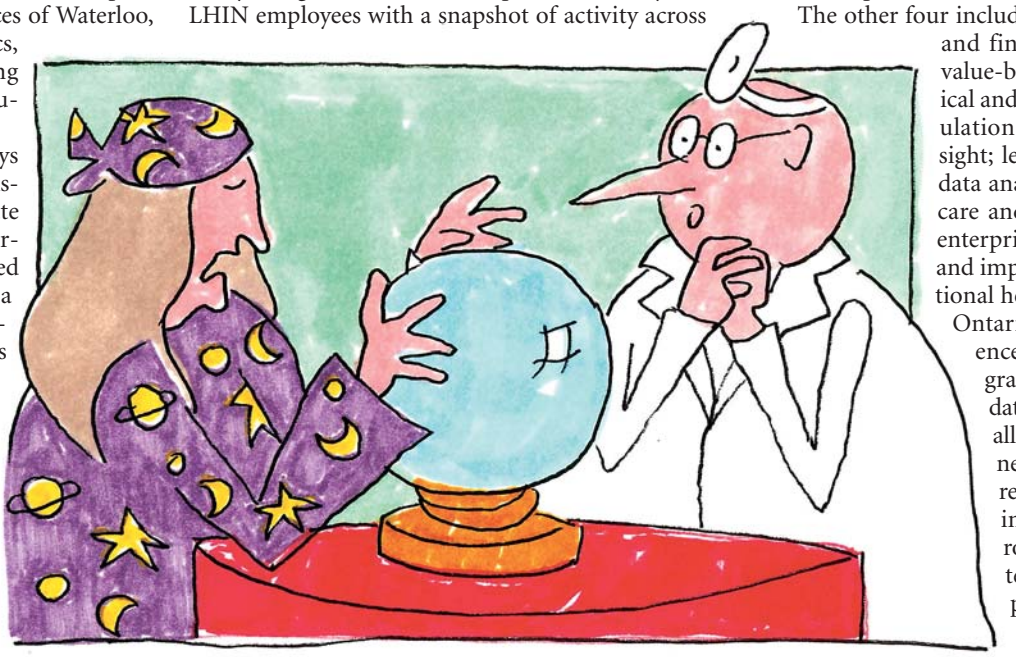


ILLUSTRATION: LINDA WEISS

"We are presenting to the LHIN a consolidated view of exactly what's happening so they can make better decisions," he says. "That's something only four years ago was deemed to be impossible without an investment of millions of dollars."

The tool will be key to helping the LHIN manage surge capacity across the region, particularly in the event of an emergency. It will also provide information about operating room schedules and patient wait times, information that can be shared between hospitals to assist in managing daily capacity.

"When we started working with hospitals and told them we would be extracting information from their feeds to come into a regional view, the biggest concern was that we didn't want to miss things," says Erie St. Clair LHIN health system manager Rashoo Brar. "Technology is an enabler, but sometimes it can be a hurdle, too."

To ensure data integrity, the LHIN performed rigorous validation and testing of components, sending the data back to each hospital for further testing. The result is a high level of trust in the data presented by the tool. And if there's any discrepancy, it's checked right away, she says.

Padfield anticipates the regional tool – referred to as Oculys Performance LHINView – will help to reduce bottlenecks in healthcare delivery and result in better system planning. In a proposed phase two implementation, the LHIN is considering adding a Community Care Access Centre link, as well, so that decision makers will know how many patients are waiting for rehabilitation or long-term care beds, as well as what services and beds are available.

"We have other systems we can use to go back and look at our admissions and census to do historical analysis. This is giving us a real-time snapshot," says Padfield. "We didn't build it to look at using it as a big, data analytics tool. We looked at it as a way to manage behaviour and performance in real-time."

According to a list of top healthcare analytics trends for 2016, compiled by Perficient Inc. of St. Louis, Mo., achieving actionable data-driven insights is in the top five.

The other four include: aligning clinical, quality and financial analytics to enable value-based care; integrating clinical and claims data to enable population health management insight; leveraging cross-continuum data analysis for improved patient care and outcomes; and, growing enterprise intelligence to measure and improve patient and organizational health.

Ontario's Hamilton Health Sciences (HHS), with its Integrated Decision Support (IDS) data store, is working towards all five. Hosted in HHS's partner environment, the central repository currently contains information related to roughly 37 million encounters for 6.5 million unique patients. It is managed by a team of 15 IT professionals, including support analysts, business intelligence analysts, content experts, quality assurance experts and a user experience analyst.

The SQL-based repository collects data from six LHINs in southwestern Ontario: Erie St. Clair, South West, Waterloo Wellington, Hamilton Niagara Haldimand Brant, Toronto Central and Mississauga Halton.

Every day, the team applies reporting and analytics tools from Microsoft, as well as data visualization tools like Tableau, to deliver visibility into the full patient journey. It starts with patients identified through Ontario's Health Links initiative as having multiple, complex conditions – the top 5 percent of patients who account for two-thirds of healthcare costs.

"Because we have all of this data, and it's linked, we can really get the visibility of those patients to see how many ER visits they've had, the admissions they've had, the reasons for the admissions, and how many readmissions they are having," explains Wendy Gerrie, HHS director, Regional Integrated Decision

Support Services. "It's very beneficial to see what has happened in the past and then to use predictive modeling to determine what we think might happen in the future."

The view into the longitudinal patient record also supports the transition from volume-based funding to value-based funding, she adds. HHS is currently involved in a pilot project to examine an integrated funding model for congestive heart failure (CHF) and chronic obstructive pulmonary disease (COPD) patients. "A group of hospitals and CCACs put money into a virtual pot and we are having the dollars follow the patients in this bundled payment pilot to see how that works," says Gerrie. "You really can't do that until you can follow the patient."

Each LHIN pays an annual fee to HHS to belong to IDS, essentially to cover costs. Information is exchanged through a secure portal and users only have access to the type of information available to them based on credentials and in accordance with privacy legislation.

In addition to a number of fill-in-the-blank report templates related to popular queries, which are returned in minutes, users can also leverage the knowledge of the HHS team to ask more specific questions with reports generally taking two to three days to complete.

One exciting development, says Gerrie, is the ability to apply the information stored in IDS to examine population health. Census data, including postal code and socioeconomic indicators, is included in the patient files, meaning it's possible to group patients according to where they live and look for trends that might help to identify what she calls "rising risks," people who are at risk of developing one of the 54 chronic conditions identified through Health Links.

"Right now we've exhausted the analysis we can do on the top 5 percent of our users," she says. "Can we get to that next large pocket and prevent them from becoming that 5 percent? IDS is allowing us to get to that next step faster."

Earlier this year, HHS announced a collaborative research initiative with IBM that will see a healthcare innovation hub created in downtown Hamilton. Under the partnership, IBM is providing access to its Watson cognitive and analytics software while HHS offers practical industry expertise and serves as a real-world test environment.

As Gerrie explains, the partnership will be instrumental in helping HHS to tap into unstructured data. While the structured, multi-LHIN IDS repository spans outward and provides visibility into data beyond a hospital's four walls, HHS also maintains an internal repository that includes hospital-specific information related to diagnosis and procedures, including unstructured pieces of data such as clinical notes or electronic feeds from digital equipment. Watson is intended to mine that data in new ways, she says.

According to a news release announcing the IBM partnership, one project will explore adding a mobile component to "HHS's early warning system, which electronically monitors a patient's vital signs for subtle changes indicative of a worsening condition or pending medical event." Lilian Vasilic, HHS manager, BI Solutions and Products, anticipates that the combination of Watson's analytical capabilities and HHS's rich data set will remove the limitations of IDS's SQL environment.

"What we have is not well suited for totally unknown analytics," says Vasilic. "We can do visualizations and descriptive analytics … but we've realized the relational database world is not really suited for plugging in a million lines of data and letting you data mine."

IDS is already crossing the continuum of care by storing hospital data (acute inpatient, rehabilitation, complex continuing care, ER visits, same day surgery, mental health) as well as CCAC and community health centre data. Primary care data is missing, but pilot projects are under way. In the end, the goal is to provide a longitudinal view of patient outcomes and to try to "standardize the way all organizations are looking at transactions in the healthcare system," says Vasilic.

"This type of information really can be used to influence changes in policy," adds Gerrie. "You can look at the full picture for a patient and ask, 'Why is my readmission rate so high when I look at it across the spectrum of the six LHINs?' We can start to add that quality and value piece to the discussion and factor it into policy."

Next generation testing of wearables under way at Rockyview General

BY WAQAAS AL-SIDDIQ

Physicians at Rockyview General Hospital in Calgary are working with Redwood City, California-based Biotricity Inc. to develop the next generation of smart, wearable and medically relevant biometric remote monitoring solutions.

Building upon and moving beyond the simple exercise, heart rate and activity tracking monitors currently available, Biotricity's solution will also incorporate Heart Rate Variability (HRV) monitoring, a well-researched physiological monitoring tool.

HRV monitoring has demonstrated the ability to track the changing balance between sickness and wellness in multiple disease processes through diagnosis, treatment and rehabilitation, including cardiac ischemia and failure, sepsis, diabetes, as well as cerebrovascular and neurological illness.

A healthy person's heart rate varies continuously from minute to minute throughout the day and night, and over longer time periods in response to both environmental and internal factors. As disease takes hold, measurable changes in that continuous variability develop as an individual's physiology responds to various stresses placed upon it, and as that individual becomes less active and less capable of effective rest.

Then, as treatment is administered, that beat-to-beat variability returns towards normal as both the internal environment improves and as the individual is able to resume normal activities and schedules.

This simple observation makes heart rate variability monitoring an ideal way to track both sickness and wellness, which is particularly effective when combined with other sorts of activity tracking.

Although Heart Rate Variability monitoring has a well-researched history of success in monitoring and tracking sickness and treatment in myriad of disease states, the utility of Heart Rate Variability monitoring as a clinical tool has long been hampered by a variety of impediments including inconvenience, restricted connectivity and limited computing power.

The Biotricity device has been designed to address all those challenges simultaneously, by using a small, convenient to wear and technologically sophisticated high-fidelity (1000 Hz) heart rate tracker capable of providing true instantaneous inter-beat interval derived heart rate information coupled with robust connectivity.

This combination of solutions will immediately transform the health-based wearable technology milieu, equipping the healthcare consumer and provider both with the next generation in smart data.

Currently, physicians at the Rockyview General Hospital are engaged in developing what has been called a "crystal ball with a pulse", collecting long-term heart rate data from healthy volunteers and critically ill patients in the hospital's Intensive Care Unit, in order to identify the best manner in which to process and display the data that Heart Rate Variability provides.

The intent of this preliminary work is to produce an optimally designed, full monitoring and data display package combined with the pre-existing cardiac rhythm evaluation capabilities already included in the Biotricity "Bioflux" monitor. The use of data from both healthy and critically ill volunteers will accelerate the development of disease and treatment specific algorithms in conjunction with A.I. capabilities.

Once the development of that monitoring and display solution has been finalized, physicians at the Rockyview General Hospital will initiate follow-up investigations utilizing Biotricity's next-generation wellness monitor to optimize the recovery of major surgical and post-cardiac event patients.

Waqaas Al-Siddiq is CEO and Founder of Biotricty Inc., a healthcare technology company dedicated to delivering innovative, medically relevant biometric monitoring solutions. For additional information, visit www.biotricity.com or email the author at info@biotricity.com.

New approach to procurement finds vendors for e-referral solutions

CONTINUED FROM PAGE 15

between the SCA program team and the vendor teams.

The top two vendors emerging after the first five steps of evaluation were invited to participate in a design phase as the final evaluation step. The design phase involved three collaborative sessions over a three-week period between each vendor and the evaluation team.

During this time, the vendors were asked to simulate a rapid-prototyping design exercise and develop a solution mock-up. This turned out to be extremely valuable to the overall evaluation and really allowed the evaluation team to see how ideas on paper and in presentations translated into real life products and delivery styles.

The process resulted in the selection of an Ontario-based consortium of Think Research, CognisantMD, and the Centre for Effective Practice (CEP) to lead the design and deployment of a ground-breaking eReferral platform for the Waterloo Wellington community.

"Rather than using a traditional procurement approach to find a technology solution, we used an innovation partnership approach to procure a partnership with a supplier to design and develop an innovative solution that meets our needs," says Baker. "By entering into a phased contract, we are establishing what we think will be an exciting long-term collaborative relationship with Think Research Group and their partners."

As part of the System Coordinated Access (SCA) program, this partnership of vendors will work with family physicians, specialists, community service providers, patients and family caregivers across the region to build a technological ecosystem that will enable faster links between patients and healthcare providers and create a more seamless experience when moving from one part of the system to another.

"By using new and innovative approaches, you create the opportunity for new and innovative solutions," says Lori Moran, SCA Program Manager. "A large part of the success of this procurement is a product of the RFP evaluation team's incredible hard work and commitment to upholding the integrity and fairness of a truly innovative procurement process that produced results that we feel checked all the boxes we set out to achieve".

Better data collection needed to combat opioids epidemic

CONTINUED FROM PAGE 6

In some cases, addicts resort to street drugs, which networks like PrescribeIT are not able to monitor.

Analytics, however, can still be used to combat the misuse of street drugs.

"You can monitor where the overdoses are occurring," says Horne. "That tells you where the street drugs are being used." With the help of police and health professionals, you are then able to find out who is bringing the drugs into the community and distributing them illicitly.

"It's similar to monitoring flu outbreaks," says Dunham.

Of course, the key to reducing overdoses and drug deaths will be eliminating the improper prescribing of opioids to begin with, so that patients do not get hooked.

Physicians who were once taught that opioids were a first-line therapy for pain are now being instructed to screen their patients as a way of determining who might become addicted. They are also being trained to deploy other therapies before prescribing opioids, if possible.

Canadian veterinarians receive far more training in pain management than do Canadian physicians in medical school.

And patients who are found to be high-volume users of opioids, through the use of analytics, can be directed into other therapies – such as alternative drugs that are less lethal.

Education and training of physicians is an important factor. Dunham recently co-authored a White Paper called 'Data and Analytics to Combat the Opioid Epidemic'. In it, she notes that U.S. doctors typically received only nine hours of education devoted to pain management in medical school. In Canada, it's double that. However, Canadian veterinarians receive an average of 87 hours of training in pain management.

Clearly, there is a lot of work to be done.

With treatments for addicts, too, we need more data and better analytics, says Dunham. "We don't do a good job of tracking treatments. We need more data to determine the best outcomes, based on the evidence."

Overall, to reduce addiction and tragic deaths, we will need better strategies for monitoring the misuse of opioids. We will also need more information about the best treatments for pain and for opioid addictions. "It's possible to collect better data, but it still has to be interpreted," says Dunham.

Pointing to the U.S. experience, Dunham says that combatting the opioid epidemic requires the use of tools like data surveillance and analytics. But the strategies must be put in place by public policies and legislation. "It all hinges on legislative changes and funding," comments Dunham.

Cancer data is no longer isolated in the London region

CONTINUED FROM PAGE 13

and scheduling information so that everything from prescribed drugs to blood test results to follow-up appointments is available in one integrated view.

"They don't have to build it from ground zero. They can say this is the disease, this is the treatment for it," says Knust.

Some of the biggest benefits following implementation of an integrated system are showing up in the pediatric oncology program, which was largely paper-based.

By automating the flow of information between pediatric oncologists, the laboratory and pharmacy – so that information passes seamlessly to each stakeholder in real-time – LRCP has shaved as much as 25 percent off of the amount of time a child and his or her family has to spend at hospital to receive chemotherapy.

"Now, because we're capturing all of this information, the system is visually tracking the workflow of the different orders so that as a patient is at LHSC for their outpatient visit to receive their chemo ... we can start to see bottlenecks and gaps," says Kearns. "It is absolutely improving overall patient care because the information is now comprehensively available at the point of care."

In addition to operational benefits in the clinic setting, where patients are seen more quickly, the system also provides enhanced safety.

Quality assurances are built into PowerChart Oncology to not only ensure order sets are executed correctly, but that they are accurate to start with. Similarly, if a patient's bloodwork indicates a change in blood count and their chemotherapy is delayed by a day, the system automatically adjusts the treatment plan and workflow, reducing the likelihood of errors or further delays. As an added benefit, because cancer data is now comprehensively available in a single system, LHSC academic researchers are starting to aggregate information across different patient types, gleaning valuable insights from pre-determined reports produced by the Cerner system. "They're able to get a different picture of both individual patients, but even more importantly, some of the outcomes and results from groups of patients," says Kearns.

Moving forward, the LRCP is meeting with each of its cancer disease teams to identify opportunities for "tweaking and tinkering" the integrated system to further optimize patient care. Appointment scheduling on the adult oncology side is one area that requires improvement; the program is also investigating how to mine data in the system to better identify potential candidates for clinical trials.

"How can we get at that data to find out the kinds of patients we have coming in our door who might qualify for a clinical trial that we're doing?" says Johnson. "That's good for them. It's good for science. It's good for the whole organization."

Dominic Covvey

CONTINUED FROM PAGE 14

authoritatively about the status of matters like this isn't possible.

Human nature, being what it is though, wouldn't lead to a fatal arrhythmia if these things still happened. To test this, you can snoop around and discover security weaknesses, if any, in your organization.

Let's call this a Personal Audit. Your mission, should you accept it, is to come up with a list of questions that you should consider. Here are only a few seeds to your own thinking:

- Is it possible to find the computer room or the location of any storage media? Worst case, is there a sign indicating their location?
- Are computer facilities and media storage facilities locked, accessible only through card or equivalent keys, and is access recorded electronically and periodically reviewed?
- Is there documented and published policy regarding who can enter secure facilities, and do staff who use the computer facilities have pass cards (or the equivalent) that they carry all the time?
- Have the information system staff been trained in security and given written policies and procedures for access to facilities and access to information? Are staff reviewed regarding this?
- Are there documented policies and procedures related to records access? Are all personnel imbued with this knowledge and the penalties for violations?
- Are computer and media storage facilities protected from fire and flooding, as well as electrical faults or failure? Are there fire extinguishing facilities?
- Are firewalls in place to prevent illicit remote access and monitor attempts? Are logs regularly reviewed?
- Is there a person whose primary responsibility is security? Is this person fully competent, having been educated and trained in security procedures?

It is clear that the frontline of security is properly trained people, solicitous of the privacy of patients.

A full list of these questions would go on for several pages, as they did in our security audits. Certainly it would be worthy of your time to make the list more comprehensive. Maybe, in fact, a national organization should provide a detailed security protocol that is standard for all healthcare institutions, and audit results tracked and reported both provincially and nationally.

Yet again, it becomes clear, that the frontline of security is properly trained people, operating in a disciplined manner, and willing to be heroic for the sake of the privacy of those we care for. That sounds like what our soldiers do, doesn't it? Here is where we all can be heroes!

Dominic Covvey is President, National Institute of Health Informatics, and an Adjunct Professor at the University of Waterloo.

TOSHIBA
MEDICAL

Made For life

Continuing our Legacy

Toshiba Canada Medical Systems

Thousands of minds and millions of hours over a century of time have built a legacy of innovation that continues to evolve as we do. From our collaboratively rich research and development past, we advance towards a bright future of technological innovation that is "Made for Life."

Toshiba Canada Medical Systems continues to serve the Canadian healthcare community as its own organization reporting directly into Toshiba Medical Systems Corporation (TMSC). This provides close ties to our research, engineering and product specialists, enabling the Canadian team to influence product decisions and delivery for the needs of our customers.

www.toshiba-medical.ca

To learn more about us, visit our booth at RSNA 2016 | North - Hall B: 7334

ULTRASOUND CT MRI X-RAY SERVICES