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How to use social media?
A team at Sunnybrook Hospital is using Twitter, YouTube and other forms of social media to inform patients and the public. The systems are also showing the hospital what patients want.
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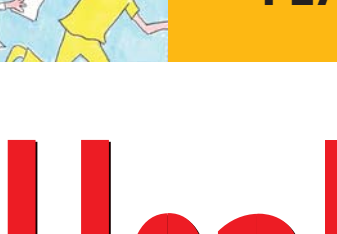
A new home care EMR
Toronto-based VHA Home HealthCare, a provider of home care services, was using the Pixalere software system for wound care man-



agement. The two organizations have worked together to produce a complete EMR, which is now being used by VHA's team.
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eReferral in Alberta
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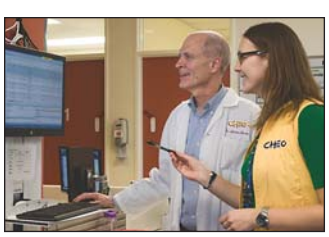
An Epic project at CHEO
CHEO plans to fast-track its usage of the Epic information system. The system has proven its worth, and before the end of 2017, the plan is to have it up and running



throughout the hospital, including emergency, inpatient care, the medical day unit, pharmacy, radiology and oncology.
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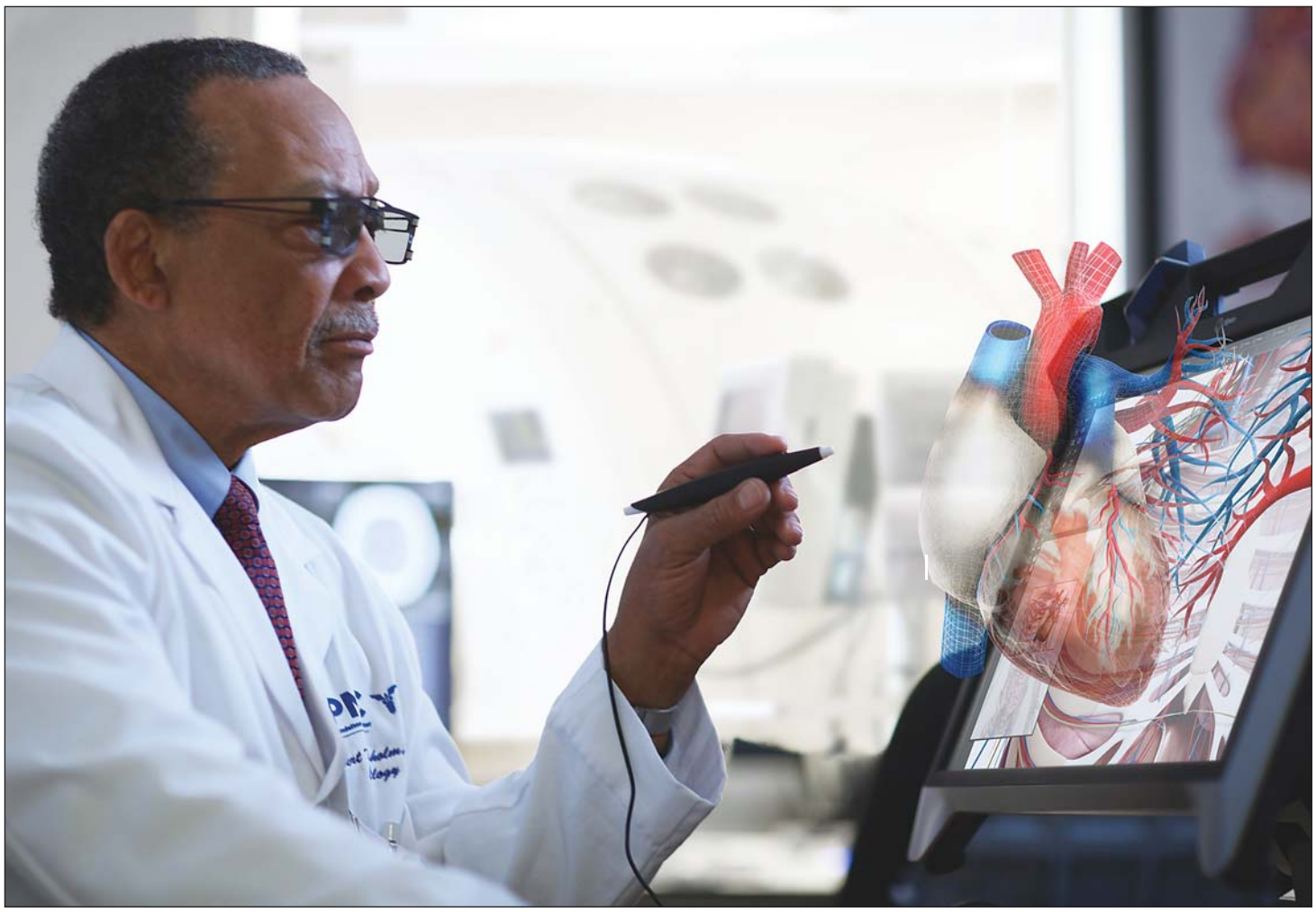

PHOTO COURTESY OF HP

Virtual reality assists surgeons and radiologists

Surgeons and interventional radiologists are now using interactive virtual reality (VR) to plan surgeries and procedures. The technology enables them to visualize the intricate anatomy of their patients before conducting operations, so there are fewer surprises during the actual procedures. Clinicians at the Toronto General Hospital and the Hospital for Sick Children have been testing the technology. **SEE STORY ON PAGE 8.**

eHealth Saskatchewan revvs-up hybrid cloud

BY JERRY ZEIDENBERG

REGINA – eHealth Saskatchewan has begun activating a hybrid cloud, an integrated mixture of private and public cloud technologies.

A high-powered private cloud will consolidate the data centres that are running in the province's 13 health districts, making the delivery of computer services much more efficient. At the same time, the enhanced abilities of the cloud will improve access to information for authorized doctors, nurses and other clinicians.

Meanwhile, the province is also testing the use of a public cloud, called the Citizen Health Information Portal (CHIP). This system allows patients to track a portion of their electronic health record and to upload various kinds of information – such as results from tests and encounters in clinics and labs.

"We're working to achieve a balance between the two clouds," said Wilbour Craddock, VP of Information Technology at eHealth Saskatchewan. "We're providing a web front-end that allows patients to update their information and upload information like blood glucose results, calorie intake, and other important data."

> **eHealth Saskatchewan will create a balance between the private and public clouds.**

CHIP also allows members of the public to see the results of their lab tests, hospital visits, immunizations and pharmacy records, all in a secure manner.

The public cloud is currently a pilot project that will enrol about 1,000 patients and will run for six to eight months. At that point, eHealth Saskatchewan will conduct an evaluation to see which features are most used, what more is needed, and, generally, how it can be optimized.

In future, additional public clouds from top-tier vendors like Microsoft and Amazon could be tied to the system. eHealth

CONTINUED ON PAGE 2

Saskatchewan's hybrid cloud integrates public and private technologies

CONTINUED FROM PAGE 1

Saskatchewan has worked with its key data-centre vendor, EMC, to implement technology that will allow various systems to be integrated in a secure manner.

"We were early into our thinking on this, and built a data centre that supports modern healthcare users," said David Dimond, Chief Technology Officer for EMC's Global Healthcare Business. "There is enormous growth of patient data and today, a hybrid approach is needed," he said, noting the popularity of apps and new kinds of devices that people are using to track their health.

"Patients are using all types of devices, with apps on their iPhones and Android devices that are continuously updated, and the location of the data not necessarily known. But it can still be connected to our cloud."

Saskatchewan is one of the first jurisdictions in Canada to deploy a private/public cloud strategy to better manage its health information.

While the public component of the system is still in the testing phase, the private portion of the cloud is being rolled out in full force. Earlier this year, eHealth Saskatchewan moved from the use of a single data centre to twin centres, one in Regina and the other in Saskatoon.

The twin data centres have full failover abilities – if one is temporarily down, the other can take over and serve clinicians and administrators across the province. "We can shut off one data centre and never miss a beat," said Craddock.

Moreover, the new, private cloud is being used to consolidate the computerized applications used in Saskatchewan's 13 health authorities, along with those of the Ministry of Health. The ministry's solutions include birth and death registrations, vital statistics, and a health-card registry, along with others.

There are multiple benefits. In addition to the disaster management capabilities, the system centralizes the software solutions that are used by the 13 regional health authorities. "They were all supporting their own applications," and running separate data centres, said Craddock.

So instead of multiple data centres, there will soon be just two. That means hardware and software can be more easily managed, with upgrades done at the same time, instead of on different timelines at many different locations.

The province-wide applications include the Allscripts Sunrise electronic patient record and an EHR viewer from Orion Health that allows clinicians across Saskatchewan to see the records. There are also common applications used for registration and pharmacy, as well as a Cerner radiology information system.

> **The private cloud will consolidate the many systems used in Saskatchewan's 13 health authorities.**

Most of the community physicians across the province are using QHR's Accuro electronic medical record; it, too, will be integrated into the private cloud, making the management of patient records for physicians much more efficient.

An outlier is the province-wide Picture Archiving and Communication System (PACS), which is supplied and managed separately by Philips. The company maintains its own servers in the data centres, and runs the province-wide PACS on behalf of the health system.

An innovative feature of the eHealth Saskatchewan cloud is the inclusion of virtual desktops and 'follow-me' technology for clinicians. This means a doctor who leaves a computer in one exam room or ward can jump back to wherever he or she was in the next system simply by swiping an ID card over a reader.

"They can return to their last session, wherever they are," said Craddock.

This will save a lot of time and trouble for doctors when moving around a facility. It means that clinicians don't have to carry a tablet around, as they can easily reach all the information they need, wherever they happen to be.

Craddock's team will be enabling 6,000 desktops in this way over the next few months; the uptake by clinicians will take place over the next year.

In all, the rollout of the hybrid cloud has been the result of two years of hard work and a substantial investment, Craddock said. The new data centres each have 600 square feet of 'heavy density' computing power, with 3,000 servers and terabytes of storage capacity.

"We've built a robust infrastructure," said Craddock.

Coming in June/July: Directory of suppliers

THE JUNE/JULY EDITION of Canadian Healthcare Technology will contain our annual directory of leading suppliers of health information technology to the hospital, continuing care and clinic sectors. The directory is a popular guide for managers in these organizations, as they look to see who is offering solutions in a variety of areas. The Resource Guide will be printed in the June/July issue, and it will also be replicated on the Canadian Healthcare Technology website, where it will appear for the next year. Visit our our website for a free listing. Company logos can be added for a modest fee.

The June/July issue will also contain our regular coverage of topical news events – developments that are having an impact on the delivery of healthcare in Canada and around the world. The articles include a look at a Vancouver company that has created an easy-to-use EMR. The company is quickly winning new customers.

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Wound management system transformed into an EHR for home care

TORONTO – How do you coordinate patient care among hundreds of healthcare providers who work independently in communities scattered across a province? Creating an electronic health record system has been VHA Home HealthCare's response to this challenge – and it is revolutionizing the way the organization's nurses deliver client care.

VHA staff and service providers deliver healthcare and support services in homes, the community and long-term care facilities across Ontario. Its large records management team processes the paper health records produced by more than 800 nursing and rehab service providers.

This paper-based system created gaps in care coordination, and limited the organization's ability to measure quality and promote best practice. The solution – moving to an electronic health record (EHR) – not only offered productivity gains within records management, but also aligned with VHA's commitment to continuous improvement, client safety, and quality of care through accurate and complete clinical documentation.

"VHA places a strong emphasis on technology and its ability to improve the way we work," says Drew Wesley, VHA's Director, Information Management and Technology. "You see it in our strategic plan and in communications from our leadership. The message has been clear and consistent that technology is our future, and our service providers were ready to embrace the change."

VHA's EHR implementation team selected Pixalere as its technology partner, after piloting the company's wound care management system with a small group of nurses for 10 months. "We have been focused on improving wound care for over 10 years," says Pixalere's CEO Ken Hendsbee. "VHA purchased our healthcare application and they recognized that it could be modified for other uses within their health services. We're agile, so we welcomed the opportunity to create an expanded, customized system."

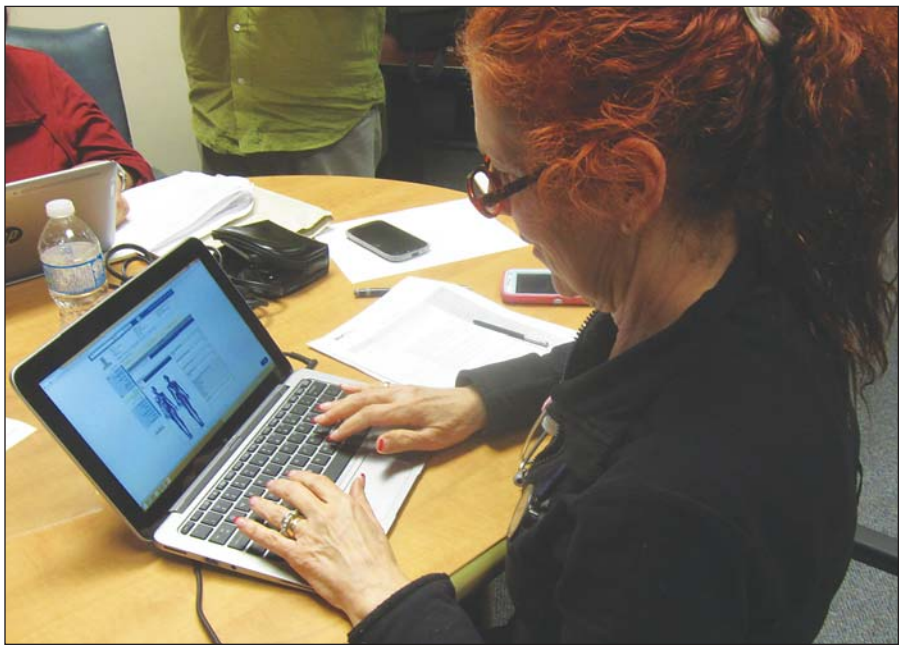
Over the course of 18 months, Pixalere developers enhanced the tool to meet VHA's internal procedures – expanding on the existing features to incorporate VHA's required forms, including client assessments, medication management forms, pain assessments and physician orders.

"The evolution is ongoing, but our implementations have been successful because of our agile collaboration, and continuous review of current and future feature development," says Hendsbee.

VHA reviews Pixalere's builds while they are being developed, and provides immediate feedback. The resulting EHR features enable VHA nurses to document their full range of client services through photos, free-form text, check boxes, and decision support, to meet the organization's accreditation and other best practice standards.

"Pixalere has been a tremendous technology partner," says Wesley. "They have been very responsive and worked with our team to significantly expand and evolve their cloud-based platform into a fully-functional, community-focused nursing EHR."

VHA's EHR implementation team also leveraged the knowledge of point-of-care staff at all stages of the EHR's development. "Our nurses have been very involved in the design of the system so its interface is intuitive for them. They were also engaged in the selection of the mobile device – a laptop with detachable touchscreen and built-in SIM card," says Kartini Mistry, Professional Practice Specialist, Clinical Informatics, whose role on the team is to ensure the EHR design promotes good use,



Pixalere's wound care management software formed the core of a full-fledged electronic health record.

professional practice and quality care for the client.

Over the course of the rollout, all VHA nurses received mandatory computer literacy training, an intensive five-hour workshop on the application, and a one-hour online exercise to complete at home. "The at-home exercise gave the nurses an opportunity to practise using the system, and gave us the opportunity to provide feedback where there were shortcomings. We could promote best practice right from the start," says Mistry.

The EHR is now used province-wide with all adult nursing clients. It is used to capture client information in real time, and allows all nurses involved in a client's circle of care to receive accurate data, make better care decisions, and allocate resources strategically.

"It has definitely improved accessibility and consistency of our client data. Things like lost faxes or illegible charts have been eliminated," says Mistry.

Moreover, "The system pre-populates some information from other IT systems, which ensures consistency, and there are mandatory areas for nurses to complete, enabling us to shape clinical practice," adds Mistry.

"It's also exciting to see the documentation process is proving to be faster than with paper once users get over the learning curve."

Having a mobile device with decision-support tools also encourages users to do their documentation right at the point-of-care. This allows VHA supervisors to do live audits and provide immediate real-time feedback on performance.

Sunnybrook Hospital shines in its use of Twitter and other social media

BY JERRY ZEIDENBERG

TORONTO – Sunnybrook Hospital now has the most watched YouTube channel of any hospital in Canada, says Sivan Keren Young, the medical centre's chief of web and social media. She added, "We couldn't say that when we first started," as the organization had to learn how to use social media effectively.

Keren Young spoke at the recent Mobile Health Summit, a two-day conference that was organized by the Strategy Institute.

Take a look at Sunnybrook Hospital's YouTube channel and you see a broad array of polished videos, and they're refreshed regularly with new ones offering tips to patients and the community, as well as news about the hospital's medical triumphs and research breakthroughs.

A two-minute video about exercise for babies, for example, has garnered over 665,000 views. One on the hospital's recent breaking of the blood-brain barrier has elicited over 43,000 views.

Meanwhile, Sunnybrook's Twitter feed has a whopping 29,000 followers. People are cottoning on to the hospital's menu of health tips and cutting-edge news.

Keren Young says it took a while to learn how to use social media effectively. "Six years ago, Sunnybrook was likely to tweet out a press release. But that's boring. Nobody wants to read that."

Now, the tweets have punchy headlines and colourful photos. And through trial and error, and by carefully monitoring reactions and comments, Sivan and her team have a good idea of what patients and the public want to read.

"What are people interested in? You've got to listen first. See what the conversation is about, and then add value.

"When you do have something important to say, people will listen."

And they'll watch you on their computer screens and smartphones. That was certainly the case when Sunnybrook live-tweeted a heart surgery. "It got immediate attention, as it was the first time anyone had done this," she said.

"It led to an increase of 5,500 Twitter followers in three days." The hospital repeated the exercise with a live cancer surgery.

It's important to respond quickly to comments, too. This kind of interactivity with patients and the community will foster a closer relationship. Look on the hospital's Twitter site and you'll see the social media staff responding to questions with polite and helpful comments and suggestions.

> **Sunnybrook's two-minute YouTube video about exercise for babies has garnered over 665,000 views.**

Sunnybrook has learned how to become more effective, as a hospital, through its use of social media. It recently conducted a patient care survey through Twitter as a way of finding out what patients like and dislike.

For example, when phoning patients, Sunnybrook used to have "unknown name" show on the phone's ID screen, as a way of maintaining privacy. However, many patients were ignoring the calls, as they didn't know who was calling and didn't want to be bothered. As a result, they were missing appointments and care instructions.

When asked whether they'd prefer the ID to read "Sunnybrook Hospital", over 85 percent of the Twitter users who participated in the survey said yes. As a result, the hospital changed its phone ID – presumably leading to higher patient satisfaction and better care.

Accomplishing all this, however, took time, effort and an investment. Keren Young joked that many people think because you're using the web, it's all free. "It's not," she asserted. "Your investment in people is large. And it has to tie into your corporate strategy. Nobody would say that's free."

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CHEO expands use of Epic to improve safety, quality and outcomes

BY MAUREEN VAN DREUMEL

OTTAWA – When Allerject – a commonly prescribed epinephrine injector used for the emergency treatment of patients with severe allergic reactions – was recalled in October 2015, the Children's Hospital of Eastern Ontario (CHEO) used its Epic health information system to do several things not possible before.

It could run a report of how many Allerject scripts were written and notify providers; create a system alert to prevent providers from submitting future orders, with a link to the Health Canada recall notice online; and recommend a substitute.

This is just one example of how CHEO is using Epic to introduce key clinical improvements across the hospital.

CHEO is fast-tracking its Epic implementation to realize system-wide benefits like this as soon as possible.

"Epic represents a fundamental change in how we communicate and how we deliver care," said Tammy DeGiovanni, Director of Ambulatory Care at CHEO. "It offers continuous quality improvement and that's how we've chosen to implement it."

Before the end of 2017, CHEO will expand its current use of Epic from ambulatory care, admission/registration, and its main lab and genetics program throughout the hospital to include emergency, inpatient documentation and ordering, the medical day unit, pharmacy, radiology and oncology.

CHEO is also leveraging the Epic Haiku/Canto apps to go mobile.

CHEO is the first Canadian hospital to achieve HIMSS EMRAM Stage 6 in ambulatory care and within the next two years, CHEO plans to be one of the first Canadian hospitals to achieve HIMSS Stage 7 throughout its organization.

So far, CHEO has implemented Epic across 44 services, including 80 separate clinics with more than 900 physicians and staff.

Dr. Jim King, Medical Director of Informatics at CHEO, noted, "Most CHEO physicians are already using Epic in outpatient clinics and, while there is a steep learning curve and working with the system takes effort, they are eager to use Epic in all aspects of care."

As its use spreads throughout the hospital, clinicians are finding it easier to coordinate their care across multiple disciplines.

Epic is also helping CHEO meet the changing expectations of a digital generation. Patients and families expect seamless access to personalized health information and services, realized through one single electronic health record per patient. For those with complex medical histories whose paper charts can number multiple volumes, an EHR means their full story is at the fingertips of each member of their care team and they no longer need to repeat their story or wait for physical charts to follow them from clinic to clinic.

It means real-time information sharing between clinics. "I think my favourite thing about Epic is that the chart's always available," said pediatric ENT specialist Dr. Matthew Bromwich. "That's a game changer in that you can always make decisions, whether you're on the floor or in clinic or in emergency, based on the most up-to-date information."

Starting in April 2016, CHEO also began offering instant, 'view-only' access to Epic MyChart – a secure, online portal that gives patients, parents or legal guardians access to parts of their medical record. MyChart also provides the information they need to keep on top of appointments, make decisions and be true partners in care.

Business systems analyst Jennifer Gillert works with Dr. James Jarvis as CHEO launches Epic in orthopedics.

CHEO also offers 'interactive' MyChart access in its diabetes, ENT and endocrinology clinics to allow two-way communication between clinicians, patients and families. During the next two years, CHEO will gradually expand interactive MyChart access to other areas of the hospital.

CHEO was one of the first hospitals to use Epic, back in 1993, for patient scheduling, registration and hospital billing. It has been an early innovator and investor in electronic health records because it believes in the value information systems bring to patients, the hospital and the health system as a whole.

"We chose Epic as our electronic health record because it frees us up to focus on our passion, which is caring for kids, not searching for information," said Alex Munter, president and CEO of CHEO. "It will mean that all patient information is in one place and readily accessible as a patient moves through the hospital."

As CHEO physicians and staff become proficient with Epic, they're seeing the impact of what it can do. "Epic provides us with timely, evidence-based information that we are already using across the hospital to identify trends, find issues and continuously improve care," said Mari Teitelbaum, vice-president of technology and chief information officer at CHEO. "It's also helping us tackle challenges such as a growing patient population, increasing patient complexity and the need for more efficient and effective care."

Better data has enabled CHEO to more quickly and accurately track and assess the nature and quality of its care.

Since CHEO started implementing Epic in its outpatient clinics in October 2013, physicians and staff have seen 78,269 patients and documented 421,196 clinical encounters. This preliminary snapshot – made possible through its use of Epic – reveals that CHEO provides over 40 percent of its patient care closer to home through phone calls (33 percent), prescription refills, etc. About one-quarter of all outpatients now receive an after-visit summary documenting the outcome of their clinic visit.

Staff and physicians across the hospital are learning to use this data to analyze and streamline their clinic workflows. Orthopedic physicians, for example, have used Epic data to help revamp their schedules, smooth volumes and decrease appointment time for families.

And Epic referral management has enabled CHEO to track, measure, report on – and reduce – initial consult wait times for new outpatients. Referrals are triaged when received and referring providers notified of patient referral status.

Maureen van Dreumel is a communications advisor for strategic initiatives at the Children's Hospital of Eastern Ontario.

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VR is tested for surgical planning at Sick Kids and Toronto General

BY JERRY ZEIDENBERG

To the 3D printing that's taking the medical world by storm, we can now add another innovative, three-dimensional technology – interactive virtual reality. Wearing special goggles and manipulating instruments, clinicians can examine diagnostic images that appear to float in space in front of them.

Not only can they view organs, like the brain, heart and colon, but they can also turn them over, dissect them, and make all kinds of precise measurements – of blood vessels, aneurysms, tumours, and other areas of interest.

The technology is showing great potential in a number of areas, including surgical planning. When faced with a challenging surgery or interventional procedure, such as closing off a ballooning aneurysm in the brain of a patient, a clinician can use 3D virtual reality to view the anatomy of the patient beforehand so there are no surprises when the actual operation is being conducted.

A leader in the field of 3D virtual reality is EchoPixel, Inc., of Mountain View, Calif., in the heart of Silicon Valley. EchoPixel's True 3D technology is the first FDA approved virtual reality system for medical-image processing.

In addition to Stanford University, the Cleveland Clinic and the University of California, San Francisco, EchoPixel is now testing the technology in pilot projects with the Hospital for Sick Children, in Toronto, and the Toronto General Hospital's cardiac centre.

"Doctors can dissect tissue and take things apart, all in 3D, on the screen in front of them using reconstructions of the patient's actual anatomy," said Sergio Aguirre, chief technology officer and founder of EchoPixel.

He explained the company's technology turns the data sets collected from CT and MRI scanners, as well as ultrasound devices, into three-dimensional images that can be manipulated in a far more realistic manner than regular 3D reconstructions.

After all, traditional 3D constructions are still displayed on two-dimensional monitors. In contrast, virtual reality images appear to the eye as objects, just as they would when the clinician is conducting a procedure.

And using the True 3D system, clinicians can probe, cut, push and pull at tissue and structures to see what happens, all in real-time. That gives them a better idea of what to expect when they conduct the actual operations.

Using EchoPixel's technology and tools, they're able to better plan a surgery. "In the case of an aneurysm," said Aguirre, "you can see how to approach the aneurysm, which structures need to be avoided, how much coil will be required to fill it, what size of coil is best, and the size of the catheter that should be used."

Aguirre noted this allows for more accuracy and better outcomes: "It reduces the mistakes that are made. You don't have to take out and replace implants afterwards, for example, because the wrong size was used."

For some clinicians, virtual reality planning may be an alternative to creating 3D printed models, which can take days or weeks to produce. And with 3D printing, mistakes are sometimes made and the process begins over again.

"Our technology speeds up the surgical planning and the surgery itself," said Ron Schilling, PhD, the CEO of EchoPixel. "And it gives clinicians the confidence they need to do the surgery."

For clinicians who like working with 3D printed models, EchoPixel's technology can also be used to help with the printing. Schilling said the software helps produce more accurate models, and it turns them out of the printer much faster.

That's because a lot of the work in 3D medical printing involves the processing of images; EchoPixel's True 3D performs the job much more quickly than other software packages, Schilling said.

Alberta scores success with e-referral pilot program, now readies a bigger rollout

BY GARY FOLKER

An e-referral pilot program in Alberta has shown how doctors' offices can become more efficient and also how they can collaborate more effectively. To build on this success, the province now plans to expand the e-referral project beginning later this year.

As Dr. Allen Ausford, who is with the Lynnwood Family Practice in Edmonton, puts it: "When more than two-thirds of clinical users say that eReferral has improved the quality of care and continuity of care, that's when you know you must be doing something right."

The eReferral pilot was launched in July 2014 by Alberta Health Services (AHS) and Alberta Health. Powered by Orion Health's portal solution, called Alberta Netcare, the eReferral pilot aimed to improve the coordination of patients transitioning across Alberta's continuum of care.

The project started with three early adopter groups: lung cancer; breast cancer; and the hip and knee joint replacement specialties.

Gary Folker

Through eReferral, the status and essential documentation from referrals are distributed to specialists and referring healthcare providers in a faster and more consistent manner.

On average, specialist clinics receive 45 to 50 referral faxes every single day. Some of these arrive late, many are sent to the wrong providers and often times, the referral forms are simply incomplete.

According to Jodi Glassford, Director of Closed Loop Referral Management, eReferral and Alberta Referral Pathways at AHS, "the biggest portion of one clerk's job every day is calling the referring doctors' offices to get a copy of the ECG."

Incomplete referral information not only leads to frustration, but it also results in a number of issues that are resource-intensive and continue to burden the system financially: increased referral volume; transition of care delays; and, ultimately, rising healthcare costs.

Dr. Ausford notes that most referrals continue to be done via fax, "despite the fact we have a robust enterprise EMR with integrated access to the provincial EHR Netcare."

The eReferral project has standardized a method of sending the information needed for a referral, eliminating the troublesome faxes.

"Most EMRs already have a patient summary sheet with all the pertinent information," explains Dr. Ausford. "Using Netcare, we can attach this summary sheet to the eReferral, which only takes a second to do. Having access to the right patient information helps us to make better care-plan decisions."

The eReferral solution includes the option for requesting advice rather than a full consult, as there are many times where the patient doesn't actually need an in-person meeting with the specialist.

The entire process of completing an eReferral request for service takes an average of three minutes. Early results have shown that the eReferral solution fosters more collaborative patient care while helping to reduce unnecessary visits, duplication of tests and administration time.

Since the pilot's launch, a total of 4,008 eReferrals have been submitted, with the bulk for breast cancer (2,484), hip and knee referrals (1,191) and lung cancer (333). The majority of clinical users (81 percent) say that eReferral has increased efficiency in the referral process, and an overwhelming 87 percent of users believe it has improved transparency.

Gary Folker is the Executive Vice President for Orion Health North America. For more information on Orion Health, visit www.orionhealth.com

Managed equipment services gaining acceptance in Canadian hospitals

BY DENIS CHAMBERLAND

In Canada, hospitals are under tight financial constraints, and in some provinces, they are required by law to maintain balanced budgets.

At the same time, the pressures to improve patient care continue to drive up costs.

Traditional purchase, rental and leasing arrangements for medical technology – such as MRIs, CT scanners and ultrasound equipment – are increasingly uneconomical and generally unsatisfactory, as equipment rapidly becomes obsolete. Budgets constraints and technology obsolescence are serious problems for most health systems globally.

Managed equipment services (MES): MES addresses many of the challenges faced by hospitals in relation to medical equipment. MES involves the outsourcing of all aspects of a portfolio of medical equipment to a third party that specializes in providing managed services.

The MES provider procures, installs, trains users, manages and maintains the portfolio of medical equipment for a long-term, typically ranging from 15 to 25 years.

The MES provider owns the equipment for the entire term and makes it available to the hospital as an integral part of a managed service, which includes all of the necessary elements to support effective use of the equipment.

The portfolio of equipment is replaced by the MES provider on a predictable, pre-arranged basis, in accordance with terms set out in a comprehensive legal agreement. MES ensures that patients and clinicians always have access to the highest standard of equipment, thereby reducing clinical risks and increasing productivity.

With MES in place, the availability of in-scope medical equipment is never a problem.

MES converts a traditional asset purchase deal into a services offering, marked by predictable annual service payments and no capital outlay. Because of its significant market presence and narrow focus on medical equipment, the MES provider provides a much higher standard of service at a cost-effective price, often at much below the hospital's existing cost structure.

Denis Chamberland

Today the outsourcing of non-core activities is a standard practice with most larger organizations. It allows for both a transfer of risks to a specialist organization that is better positioned to manage those risks, and for the hospital to focus on its core role of providing a high standard of clinical services to patients. The platform that MES creates is also often a catalyst for other hospital-wide reforms.

Some of the benefits of MES include:

- Allows hospital staff to focus entirely on improved patient care;
- Ongoing access to up-to-date medical equipment – no technology obsolescence. Up-to-date equipment also improves patient safety.
- Continuously well-maintained medical equipment, with procedures that are administered more quickly.
- More rationale and predictable working environment that facilitates long-term budget planning.

Recent MES success story: Several MES arrangements have now been put in place in Canada. The most recent and perhaps the most advanced is Mackenzie Health's MES deal with Philips Healthcare, announced in November 2015.

The deal, worth over $300 million over 15 years, will provide Mackenzie Health with access to state-of-the art medical equipment under a flexible, single payment structure that allows for both lower

costs and better cost management over the term of the deal.

Philips will be accountable for the procurement, installation, systems integration, maintenance and timely replacement of equipment in accordance with a pre-defined investment plan and the terms of a robust legal agreement, which is structured to ensure accountability, drive continuous improvement and provide Mackenzie Health with ongoing access to Philips' healthcare innovations. Solutions from outside vendors will also be part of the mix.

Some of these innovations focus on systems interoperability, diagnostic imaging equipment utilization, radiology practice management, and patient-centric design, among others.

"We want to expand the quality of care we offer in our region, and MES's flexible payment model makes that possible by making the cost of the procurement and the maintenance of the equipment more predictable and allowing us to better manage annual costs," says Terry Villella, Mackenzie Health's Deputy Chief Financial Officer, who was directly responsible for the MES procurement process.

The MES model enables the hospital to focus its efforts on better patient care, instead of procurement and maintenance.

A distinctive feature of MES is its 'multi-vendor' nature. While contractually ensuring that it will provide a pre-set percentage of the equipment with the MES portfolio, Philips will also procure and take full responsibility to manage and service equipment from other manufacturers during the term, thereby ensuring clinical choice at Mackenzie Health.

The importance of advisors: Putting an MES arrangement in place tends to be a complex undertaking because it involves a wide range of expertise typically unavailable within the hospital or the vendor organizations. This makes extensive reliance on the advice on the vendors problematic given the differing financial interests.

As Ms. Villella observes, "Working with advisors who are highly specialized and knowledgeable about MES and the hospital sector greatly assisted the development of the RFP, the evaluation process and the final selection of the successful proponent."

And she adds, "By structuring an efficient and effective approach to the negotiation process, the skills our advisors brought to the table ensured that our healthcare team has ongoing access to the best medical technology available, on the best terms available in the marketplace."

Above all, the MES must be customized to the hospital's specific objectives and needs if it is to be effective and achieve the value the hospital is hoping for.

Mackenzie Health was able to achieve a wide range of highly advantageous benefits that are not typically available to hospitals. These include significant financial benefits, comprehensive risk transfers in several important areas, project delivery on time and in line with the original business case, and a highly complex procurement process conducted without a challenge or complaint from any of the proponents.

Given the rapid pace of change in medical technology, hospitals can no longer by themselves hope to keep up with what is required to improve clinical outcomes for patients while at the same time meet the financial and other pressures that confront them daily. The managed equipment services model can be an important part of the solution for many organizations, as it is at Mackenzie Health.

Part 2 in this series, which will be published in the June/July edition of Canadian Healthcare Technology magazine, will focus on the ICAT (Information, Communication, and Automated Technology) component of the project, which is intended to transform Mackenzie Health into a 'Smart' hospital.

Denis Chamberland is a member of a multi-disciplinary advisory group that works with health systems in Canada on a wide range of managed services projects, including MES and Managed ICAT Services (MIS). The group worked with Mackenzie Health on the hospital's MES project and was also fully engaged on all earlier successful Canadian MES transactions. He can be reached at dachamberland@gmail.com

VIEWPOINT

New parents can alleviate their stress using the latest generation of smart sensors

Sensors help monitor babies and toddlers, giving parents a better understanding of their child's health.

BY DR. SUNNY MALHOTRA

Expecting parents are always very anxious about the health of their new infants, especially as the delivery date nears. They usually make a special effort to find out about child-rearing and the newest ways of improving that traditional process.

They are also among the most likely to disregard budgets and will be selfless in their personal finances to sacrifice for their children. The concept of frequent infant surveillance with baby monitors and real-time video equipment has allowed for improvements in monitoring over the years to track sleeping habits, breathing rate, skin temperature, blood oxygen, heart rate and Sudden Infant Death Syndrome (SIDS).

Interestingly, a new generation of 'smart nursery products' has recently emerged for staying connected with your child. These products are suitable for children from birth to 18 months and allow parents to monitor real-time data, including the baby's breathing, sleep activity, body position and skin temperature with their smartphone or tablet.

Connected clothing has become a fundamental for the smart nursery. A smart baby monitor called Mimo is a real-time audio feed that allows you to listen to your baby via machine-washable onesies and a monitoring device. Monitors are also used along with sensors that attach to your baby's clothing with Monbaby Smart Baby Monitoring.

There are wearables that monitor temperature, heart rate, motion and positioning such as Sproutling Baby Monitoring and the Owlet. Alarm alerts can allow you as a parent to leave your child more comfortably in the hands of grandparents, nannies or the babysitter while helping you prevent diseases such as SIDS.

Sensors can be utilized for toddlers transitioning from a crib to beds, as smart lighting in the hallway can be automatically triggered outside the nursery. This is also helpful if your child gets the urge to wander at night, as it becomes harder to do it in the dark.

Sensors can be a great addition to your front and back door, kitchen cabinets, the front yard gate and drawers to prevent toddlers from leaving the nursery and exploring new areas without your knowledge.

There are sensors that can act as medication or activity reminders. Security sensors can also let you know when someone enters your child's room. This can be done via Mother and 4Motion Cookies Versatile Sensors. Dropcam wireless video monitoring cameras can assist you in monitoring your child as part of a more manually intensive solution.

> **There are wearables that monitor temperature, heart rate, motion and positioning, alerting parents when something seems to be wrong.**

Creating an environment with optimal lighting and music for routine stimulation have been underutilized. The Belkin Wemo Light Switch and "smart lightbulbs" allow you to manage your child's lights from anywhere in the world via a mobile app, and they help save energy by setting timers or turning on before you need to enter the room.

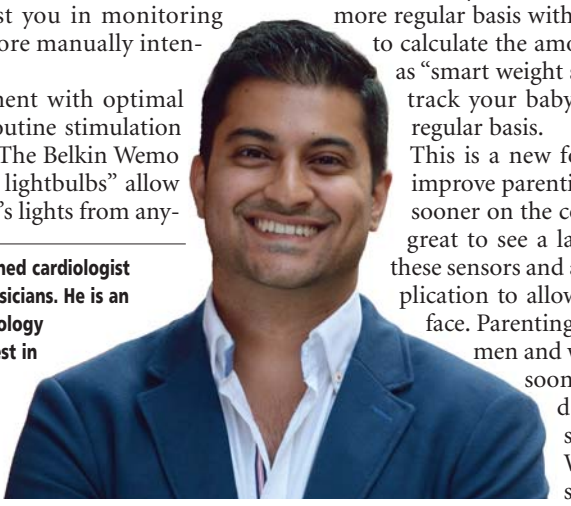
This can also help when you sleep train your child during those initial sleepless nights as part of a comprehensive sleep training plan. Monitoring the temperature, humidity and light levels in your child's room via mobile device has been an area of development with climate control sensors such as Wimoto.

There are smart play toys such as Kumki, which are Bluetooth-enabled, and play music and tell stories. These "white noises" can also help block out the sounds in the house that may wake your baby.

Smart devices include smart bottles, smart clothes, smart measuring devices and improved wearables/video monitoring to keep mothers and fathers closer to their children. The development of your child is managed with intermittent weight monitoring among other clinical indices noted by your pediatrician.

There are ways to collect further information on a more regular basis with the use of "smart bottles" to calculate the amount of milk intake as well as "smart weight scales" such as Withings to track your baby's weight gain on a more regular basis.

This is a new form of actionable data to improve parenting and diagnose problems sooner on the consumer level. It would be great to see a layering app to connect all these sensors and applications under one application to allow for a simpler user interface. Parenting gadgets can help facilitate men and women going back to work sooner, if they choose to, or in different countries with shorter maternity leaves. Welcome to Nursery Version 2.0.



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. Twitter: @drsunnymalhotra

What does it take for doctors to change their working methods?

BY JERRY ZEIDENBERG

What would it take for physicians to alter their traditional working methods and modernize? Three things, says Farzad Mostashari: First, a personal reason – the change must give doctors more independence or more time with their families. Second, a financial reason – the change or technology should result in more income. And third, a professional reason – the new method must result in better care for their patients. Hit all three and physicians are likely to adopt change in a New York minute.

Mostashari spoke on this topic at HIMSS in Las Vegas in March.

During the hour-long talk, the humorous and engaging former National Coordinator for Health Information Technology at the U.S. Department of Health recounted a telling incident that occurred shortly after his government agency had ushered EMRs into many New York doctors' offices.

On a visit with his boss to a small practice that had recently computerized, Mostashari asked the doctor if she liked the new EMR. "No," she bluntly answered, "It slows me down."

It was an embarrassing moment, receiving that kind of answer in the presence of one's boss. But it demonstrated something to Mostashari. The physician didn't like the system because it slowed her down, which meant she couldn't see as many patients. Which in turn meant she couldn't bill as much.

So right away, the EMR failed on the financial front. Instead of helping the doc, it hindered her. Change wasn't going to happen.

As well, many physicians find that EMRs are not easy to use. And they're not so sure they help their patients.

> **When EMRs include simple alerts, they can improve patient health and physician satisfaction.**

Mostashari observed that EMRs must be constructed more intelligently. Not only must they be easier to use, they must also contain the wisdom and experience of real clinicians. "EHRs on their own do nothing to improve quality," he said.

But if you tweak the systems to include smart alerts, you can improve outcomes. He talked about a pilot project that reminded doctors to give vaccines for pneumonia when they gave the elderly their flu shots in the fall. "Four years later, 67 percent of the elderly had received their pneumonia vaccine." It was a terrific improvement.

Using simple alerts, you can easily enhance the health of your patients. You also make more money. And if the system is well-designed, it's not hard to use, meaning you don't waste your time fighting with technology.

Again, you've got to hit all three factors – personal, financial and professional to make change happen.

Four ways to create value with healthcare information technology

BY JENNIFER MACGREGOR

As I visit with healthcare leaders across Canada, one thing is clear: their focus on outcomes is paying off. They're improving patient safety and efficiencies throughout their organizations with electronic health records (EHRs) and other health information technologies.

Several clients using Allscripts solutions have demonstrated outstanding clinical and financial results. They've created value with their investments in technology in a variety of ways, including:

Simplify complex calculations for better accuracy and efficiency: At Alberta Children's Hospital (ACH) in Calgary, intelligent order sets have helped clinicians with complex calculations when ordering medications or intravenous nutrients, which is also known as Total Parenteral Nutrition (TPN). Many of these are weight-based calculations, which can vary widely in a pediatric environment that cares for 500-gram premature newborns, 90-kilogram teenagers and everyone in between.

Jennifer MacGregor

Order sets have simplified the TPN ordering process. Once the clinician selects the appropriate birth weight and dose per day, the order set auto-calculates required additives, run rate, vitamins, amino acids and sodium dextrose.

ACH neonatologists send about 30 to 40 TPN orders every day. Prior to the order set it would take 5 to 10 minutes for each baby, but now it takes less than 30 seconds to order. This efficiency saves two or three hours every day, reducing the amount of time by 90 percent and saving 700 to 1,000 hours per year at ACH.

Successfully manage diabetic populations: Diabetes is a substantial area of concern for healthcare organizations. Controlling the disease by helping patients maintain control of blood sugar levels reduces patient risk and financial cost. Up to 40 percent of Alberta Health Services Calgary Zone patients admitted to some of the medical wards have glucose intolerance or diabetes.

AHS initiated a pilot project to compare different methods of controlling blood sugars. Many physicians were using a method known as Sliding Scale Insulin, which triggers variation in blood sugar levels. The second method, known as Basal-Bolus, requires patients to take a regular base dose of insulin every day, then intermittent short-acting insulin is given with meals according to calculated need.

AHS built order sets that would encourage clinicians to choose the Basal-Bolus method for more stability in blood sugar levels. The pilot population showed promising results. Patients with controlled, in-range blood sugars increased from 38 percent to 66 percent. In this small group of diabetic patients, AHS was able to reduce their average length of stay by two days.

Automate bed management for better patient care: Regina Qu'Appelle Health Region (RQHR) is the largest healthcare delivery system in southern Saskatchewan and faces the same occupancy management challenge as many other healthcare organizations. Both hospitals in the system have very busy surgical and emergency services with occupancy of core patient beds typically at least 100 percent.

By automating bed management, RQHR is now able to assign new patients to beds within 15 to 20 minutes, which is in the 90th percentile for similar sized hospitals. RQHR has also realized financial benefits from automating bed management. For example, RQHR finds that patients' length of stay is typically 42 percent longer if they are not placed on the appropriate medical or surgical floor, costing the organization $400,000 per year.

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Improved processes for e-referrals are gaining traction among physicians

Solutions like ezReferral and Novari's eRequest are reducing delays and keeping patients better informed.

BY DIANNE DANIEL

When Dr. Denis Vincent showed up at an Edmonton Hackathon event sponsored by Hacking Health in November 2013, his idea was simple. He wanted to solve the "humongous waste of time" spent on negotiating patient referrals to specialists by phone or fax. He also wanted to ensure no patient suffered as a result of a lost or delayed referral.

A family doctor with a practice in Bonnie Doon, a neighbourhood in south-central Edmonton, Dr. Vincent believed it was possible to create a light, secure, web-based service to facilitate the exchange of information between physicians and specialists, leveraging a subscription model. Over the course of a weekend, and with the help of eight volunteers, he hammered out a prototype. Nearly three years later and backed by a team of highly skilled IT industry veterans equally intent on solving the problem, that initial product is now gaining momentum as a viable electronic referral (e-referral) solution.

"If we can get doctors to show leadership, and all pitch in a little, we can solve the referral problem today," says Dr. Vincent, noting that his business model is simply to be self-sufficient and not rely on taxpayer money at all.

Called ezReferral, the software-as-a-service is accessed through any web browser and is hosted in Canada. It operates as a communication hub, allowing important referral information to be exchanged between medical offices regardless of the electronic medical record (EMR) used at either one.

An office without an EMR scans paper documents and attaches them to the referral as PDFs. At a rudimentary level the goal is to replace phone and fax with a more reliable and efficient communication vehicle, but the service also features functionality aimed at modernizing the entire health referral process, including the ability for patients to be included in the loop.

To use ezReferral, medical offices must sign up for an account and pay a modest fee – a vastly different approach from larger, government-funded efforts that attempt to get all providers on one e-referral software system hosted by a health authority or local health integration network (LHIN). The ezReferral service is typically accessed by medical office administrators who login to manage referrals, which includes attaching letters and relevant patient information as well as requesting appointments and tracking status.

When a specialist accepts a referral, the system notifies the requesting office as well as the patient. Patients who have Internet access are sent a message with a secure link and PIN so they can access their own referral information online and confirm their appointments. Patients who do not have Internet access – estimated at 10 percent and shrinking – are telephoned.

"It provides much better care to patients," says Dr. Vincent. "They know when the letter's been sent, when it's accepted, when everything's been booked. They're in the loop rather than sitting on the sidelines anxiously waiting and wondering if it fell through the cracks."

Since launching in 2015, ezReferral is steadily gaining a user base in the Edmonton area, including family doctors in the South Side Patient Care Network, cardiologists, gynecologists, psychiatrists and surgeons. Becky Michalowski, operations manager at Gateway Medical Clinic in South Edmonton was among the first to sign up.

"When we first started with ezReferral there weren't that many offices on board, but as we've grown it's been instrumental," says Michalowski, who handles referrals for the clinic's five doctors. "Rather than sending over a fax and following up weeks later to make sure the referral didn't get lost, with a click of a button you can follow the whole process right there in front of you. It's incredible."

At first Michalowski worried the extra step of logging into a separate service would prove cumbersome. But she soon realized how easily she could cut and paste between her office's EMR and ezReferral. The dashboard interface is simple to follow, she adds, and will alert her to any changes in the status of a referral, eliminating the guesswork.

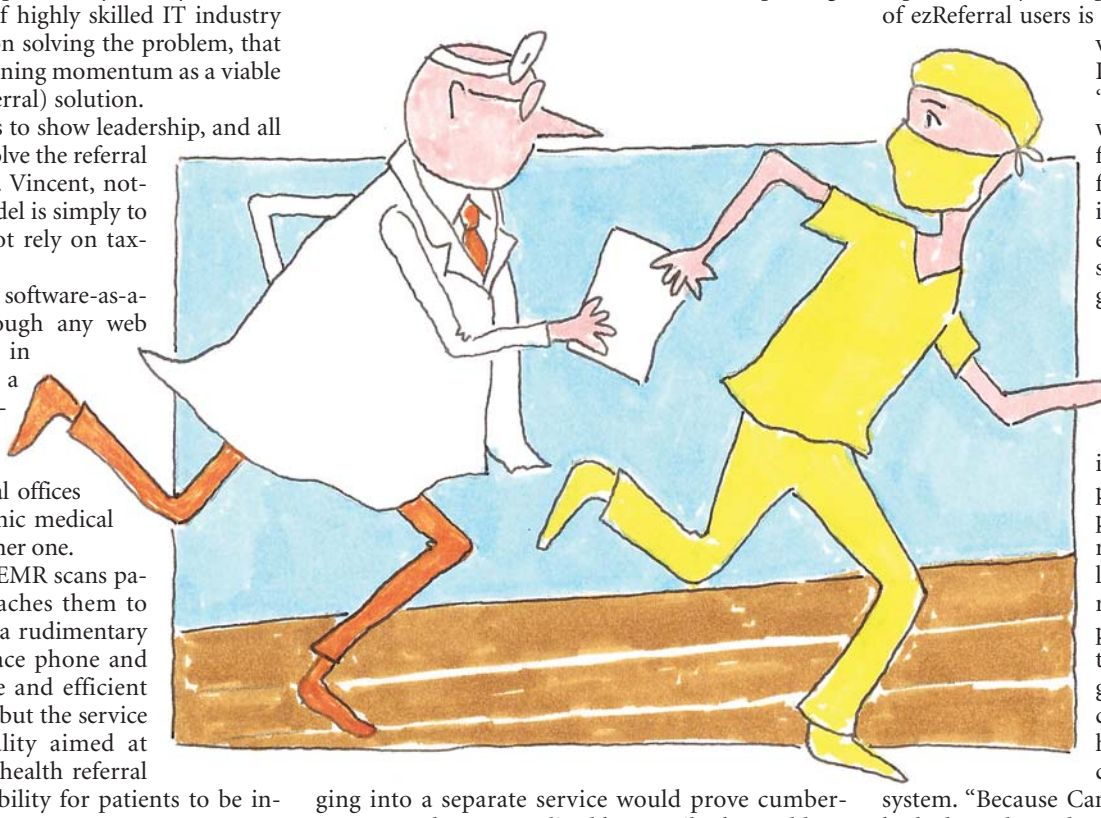

ILLUSTRATION: LINDA WEISS

"Once they've accepted the referral it goes to 'waiting to book' or 'under review,'" she explains, noting that a specialist can request additional information at any time, which she simply uploads to the referral record. "A little red envelope will come up next to it so you know there's been a change," she says.

Michalowski estimates roughly half of the office's referrals are now completed through ezReferral, including obstetricians, gynecologists, dermatologists, rheumatologists, cardiologists and a few ear, nose and throat specialists. Two groups she's hoping to see jump on board soon are urologists and orthopedic surgeons.

Since its launch, ezReferral continues to operate as a social enterprise; after expenses are covered, additional revenue will be put back into further research and development efforts. Its team of 20 developers is largely made up of former telecom experts who are dedicated to the cause and are well positioned to ensure the system is secure and scalable.

"Every one of us knows someone who's been messed up by the referral process," says ezReferral general manager Justin Hookins. "We just feel it's something that needs to get done and we want to make it happen."

By keeping it simple – and maintaining a strong focus on transmitting and tracking relevant information – ezReferral aims to be a speedier solution to the e-referral challenge than large-scale efforts that often get bogged down in efforts to integrate with EMRs or lose their funding due to budget cuts.

Dr. Vincent is hopeful the subscription service model can complement e-referral efforts under way at the provincial level in Alberta, like the first phase of Netcare's e-Referral, which was intended to target hip and knee joint replacement. Once a critical mass of ezReferral users is reached in Edmonton, the service will be launched in Red Deer and Calgary.

"There's skepticism. People who've been wrestling with this for a long time say 'How can a family doctor come up with an idea at a hackathon over a weekend?'" he says. "A lot of it is serendipitous. I'm not a brilliant genius. A lot of things just fell into place at the right time."

Kingston, Ont.-based Novari Health is another company seizing an opportunity to tackle inefficiencies in the e-referral process. Its Novari eRequest platform is a web-based, e-referral management system that acts like an air traffic control centre, routing referrals directly from point A to B or managing them through a central intake program. The company focuses exclusively on access to care and helping patients to navigate successfully through a healthcare system. "Because Canada was late to the game, we looked at what other jurisdictions are doing in the area of e-referral and lessons learned," says Novari Health president John Sinclair. "From that, we were able to use the latest cloud-based technology from Microsoft. We've created a next-generation e-referral system; we skipped the first generation altogether."

Novari eRequest is a configurable platform built on the Microsoft technology stack and marketed to provincial governments, health authorities or LHINs. In March, Novari Health announced that the Central East LHIN in Ontario selected eRequest for its Centralized Electronic Referral & Routing Initiative (CERRI).

The goal is to provide a central point of access that will make referrals for multiple pathways across multiple organizations and care sectors. CERRI is leveraging the experience of the Central Intake Program at Ontario's Mississauga Halton LHIN, which implemented Novari eRequest in 2014.

The objective of a central intake model is to be a common denominator for referrals, to "have that

third party and neutral person who's really trying to standardize the referral process and also the playing field, in terms of getting a patient to the right place based on what their care needs are," explains Nala Sriharan, manager of the Central Intake Program for Mississauga Halton.

When the program was created in 2013, it started with diabetes referrals and continued to handle them manually. The focus was placed on revamping processes instead. Multiple referral forms were replaced with one standard form, and all diabetes referrals were rerouted through central intake where a clinician triages each case to determine acuity and decides which of 10 available diabetes programs is most appropriate.

"We're taking the guesswork out of the physician's office," says Sriharan. Centralizing the process also enables the LHIN to identify standards and room for improvement. For example, the region collectively agreed to standardize on three types of bloodwork required to initiate a diabetes referral. It is also working to set standards around how long it should take to process a referral marked urgent.

"Prior to central intake, every program was doing their own thing. Now, because we're that common denominator, we were able to bring them together to work on things together as a region," she says.

Implementing Novari eRequest took those workflow gains a step further, removing the inefficiencies associated with tracking paper and e-mail referrals. At this point, physicians log into the web-based application separately to submit a referral. Central intake then manages the referral in eRequest and forwards it to the appropriate diabetes program which also uses the application to book the patient appointment.

"We can see exactly where the referral is sitting, what has happened to it and who's touched it," explains Sriharan, adding that Novari Health is currently working on EMR integration to further streamline the process.

One benefit is that the software can be configured to flag overdue referrals, alerting administrators to take action. It's those types of quality improvements that are helping to ensure patients don't get lost in the system, says Sriharan.

"I think the model we have implemented and proven is that the referral process needs to be streamlined and there needs to be standardizing," she says. "I think the most important aspect for anyone considering an e-referral strategy is to have their processes in place first. Technology will create efficiency in terms of time and gaps in communication, but your process has to be efficient to begin with."

The Mississauga Halton Central Intake Program also handles foot care, as well as addictions and mental referrals. Foot-care referrals were added to Novari eRequest last year and addiction and mental health e-referrals are expected to go live later this year. Sriharan believes the model is applicable to any referral.

"You're creating efficiencies in processes, you're reducing the burden at the referring source in terms of where to send the referral, and you're also streamlining and standardizing processes in terms of access," she says, noting that no referral sits with the central intake program for longer than one month.

Novari Health works with clients to determine the routing rules and pathways for each referral type, and any standardized forms are embedded directly into eRequest. In addition to working on EMR integration – so that the e-referral application launches from within the EMR – the company is working to integrate with provincial client and provider registries. The software can also be configured to send and receive information from existing patient portals.

"In Ontario, we've begun the work of that integration, to be able to integrate to those e-health assets," says Sinclair. "Our corporate philosophy is that the general practitioner, having invested in his or her EMR, that's where they live and breathe ... To ask them to exit their EMR to go to a third-party solution to kick off a referral, for some that's problematic."

In Edmonton, Dr. Vincent believes that philosophy is changing. "We do get resistance from people who say 'I don't like to bounce from one app to another.' But you know, young people have no problem with that. They can bounce between 10 apps," he says. "The old idea that one piece of software has to do everything is going out. The new approach is that you have very specific pieces of software that do their job well and you just use them concurrently."

Island Health improves staffing efficiency using automated solution

Vancouver Island Health Authority, an organization that oversees more than 18,000 employees, has successfully deployed Auto Shift Callout (ASC) from Vocantas. The new system improves the way Island Health contacts staff members to offer shifts, and it integrates easily with Kronos ESP.

Previously, keeping hospitals within the authority fully staffed could be a tricky task. When a relief shift became available, schedulers would need to call all eligible employees and offer them the shift – one by one.

These requirements, in place to ensure fairness and equal opportunity for Island Health employees, were time consuming for schedulers. Occasionally, employees would not be notified that they had been awarded the shift until just hours before they needed to be at the hospital, or worse, the shift would not be awarded at all – increasing risks to patient safety due to insufficient staff.

Island Health deployed Vocantas' Auto Shift Callout (ASC) system to solve this problem. As soon as a shift is available in ESP, the ASC system is automatically updated so that schedulers can launch a callout to all eligible employees.

Shift-offer calls with Vocantas' signature cheery, professionally recorded, automated voice can be launched to many employees simultaneously, as well as in text and email format – dramatically reducing the amount of time needed to inform employees of an available shift.

The time-saving is so significant that schedulers are offering not only relief shifts, but advanced bookings to employees that are days and even weeks ahead of time.

After just one month in live production, the ASC system made more than 269,893 phone calls, delivered 312,546 texts and sent 71,230 emails. During this same time period, more than 10,790 relief shifts were successfully awarded.

The ASC solution provides employees with a sophisticated web portal, where employees can edit their contact information and preferences, review and bid on available shifts, and review shift offer histories.

Employees can access this portal from any device that supports web browsing, enabling employees to log in anytime, anywhere.

Employee responses are automatically sent back to ASC in real time; once the response window closes, ASC will automatically indicate that the shift is ready for award.

Four ways to create value with healthcare IT

CONTINUED FROM PAGE 13

Connect data and coordinate care across settings: Fraser Health Authority is working to make all relevant clinical information from multiple source systems available at the point of care. The provincial health system is currently exchanging information across its continuum of care from acute to community settings.

One example of clinical benefits comes from the Fraser Health Psychosis Treatment Optimization Program (PTOP). Its treatments often include Clozapine, which aids clients with psychosis who have not previously responded well to other psychotropic drugs.

The interoperable clinical network enabled PTOP pharmacists to review and more effectively evaluate lab results for a small group of patients receiving Clozapine. Technology enabled the Clozapine program to reduce hospitalization and emergency room visits by up to an 80 percent savings, or about $30,000 per patient and most importantly improves the lives of these patients.

By investing in adaptable technology on an open platform, these organizations are excelling. They're proving that technology can help create value and drive success for the entire healthcare industry.

Jennifer MacGregor is Managing Director, Canada, at Allscripts.

Why FHIR interoperability won't be putting Canada on fire anytime soon

BY DR. KARIM KESHAVJEE

There has been a lot of hype about how FHIR, HL7's new interoperability darling, will revolutionize healthcare. Indeed, FHIR has a lot going for it. Easier to implement than HL7 v3, FHIR comes with a lot of new tooling, lots of support and a ton of passion behind it. And sure enough, it is making great inroads in the United States. Still, however powerful FHIR is, its benefits are likely to stay firmly entrenched South of the border.

Why is that, you ask? It's simple. Canada is not America. Our healthcare ecosystem is organized and structured very differently from that of the Americans. And that makes all the difference.

As an example, the State of New York has run out of patience with its fragmented health system and insurance industry. So, they've taken matters into their own hands and have started to manage the healthcare system for the entire state themselves. They're analyzing data, making policy decisions based on that analysis and allocating resources accordingly. To do that, they are gathering data from all sources and combining them in their own data warehouse. Ontario's Ministry of Health won't be doing that anytime soon. And, while Alberta and some other provinces are moving in this direction, they have a long way to go.

Dr. Karim Keshavjee

The large managed care organizations in America, like Kaiser Permanente and Geisinger, own all the assets for producing health outcomes. They own clinics and hospitals and they own the insurance risk that is an inevitable part of healthcare in the US.

They manage hospitals, primary care clinics, specialty clinics and negotiate drug pricing with pharmacies. They can enable primary care clinics, hospitals and pharmacies to share data. They also get access to all the lab results from every one of their patients. They can and do analyze their own data for improving patient care, setting policy, driving outcomes and cutting costs.

Their house is on FHIR! However, it is interesting to note that both Kaiser and Geisinger got frustrated with the interoperability merry-go-round and switched to a single-vendor system for their organizations, letting the vendor figure out how to get key departmental systems working together and getting on with the work of taking care of patients.

Yes, they do use HL7 and FHIR. But the point is that they are moving away from using them as a 'plug-and-play' system. They have decided to govern and manage how the information will flow and they have outsourced interoperability to the professionals, so they can focus on their core business - patient care.

Meanwhile, north of the border, Canada's healthcare non-system is a loosely coupled set of fiefdoms that are forbidden from sharing data with each other, other than through very stylized and historic document sharing arrangements.

Even then, timeliness and quality of information are not characteristics that spring to mind when speaking about existing information sharing. Canada does not have the legislative framework nor the regulatory flexibility to allow a single organization to combine and manage risk and care coordination under one umbrella.

Even in the one area where Canada might be able to use FHIR - in the Ontario Health Links programs that are trying to coordinate care for complex patients across the continuum of hospital, primary and home care, most care coordination plans are written on paper because the data sharing agreements are too complex to navigate in an inflexible regulatory regime.

Dr. Karim Keshavjee is a Family Physician and CEO of InfoClin, a primary care informatics consultancy practice.

Want safe, healthy data? Prevention and protection are the keys

BY ANANTH BALASUBRAMANIAN

Security and patient safety have always been of the utmost importance in the healthcare industry; however, cyber-extortion is now on the rise. According to McAfee Labs' August 2015 Threats Report, ransomware in particular is spiking rapidly, growing 58 percent in the second quarter of 2015, compared with Q2 of 2014.

Yes, despite many hospitals being increasingly diligent in keeping up with the latest endpoint security tools, such as anti-malware, personal firewalls, file encryption and more.

The fact that ransomware is on the rise has been evident in recent media. One recent high-profile attack includes Hollywood's Presbyterian Medical Center, which recently paid out $17,000 in bitcoin to obtain a decryption key to recover its stolen healthcare data. On the other end of the spectrum, The Ottawa Hospital was recently able to avoid paying ransomware fees as a result of having proper data management practices in place.

What sort of data management practices should be considered to help protect against cyber-extortion?

Maintaining a secure, regularly-scheduled backup (a.k.a. data copy) of your organization's laptop and desktop files is a good place to start. With data copy, your laptop and desktop files are preserved and can easily be restored if a ransomware attack occurs. Without a secure data copy, your only option is to pay the criminal's ransom price and hope it'll be enough to get your data back.

Experian predicts in its 2016 Data Breach Industry Forecast that sophisticated attackers in 2016 will continue to focus on insurers and large hospital networks where they have the opportunity for the largest payoff. Also according to the forecast, more hackers will likely look to access data for extortion purposes or other scams in 2016 as the value of payment records decrease on the black market.

In fact, 38 percent of organizations are already reporting that they've been targeted by cyber-extortion. Hospitals and other healthcare practices can avoid this threat by ensuring data is regularly and securely backed up.

Ransomware isn't the only threat currently facing the healthcare industry. Though we might traditionally think of a criminal remotely stealing and ransoming critical health information before selling it on the Internet, we must also consider another vulnerability scenario – like a physician's laptop being left unattended.

In fact, lost and stolen devices account for 45 percent of all breaches, according to Verizon's health information data breach report. This was the case in 2015 when a laptop was stolen from a physician's car at The Medical College of Wisconsin in Milwaukee. Even though The Medical College has firm policies in place prohibiting the downloading of patient information to portable media, that policy had been broken by the physician and information pertaining to one patient was indeed stored on the laptop.

Ananth Balasubramanian

Given physicians are often on the go and it's sometimes necessary that certain patients be treated at multiple facilities, collaboration and information sharing is a large part of today's healthcare ecosystem. As such, it is critical that physicians can access and organize healthcare data quickly and easily. If The Medical College of Wisconsin had a solution in place that offered remote data wipe capabilities, for example, they may have been able to avoid a breach of data.

Plus, geolocation features that use an endpoint IP address on the last connection can provide location details such as the country, state, city and even street of the missing device. This helps ensure that stolen property can be retrieved quickly.

Whether threats come in the form of cyber-extortion or more traditional thievery, endpoint data backups help ensure critical files stored on laptops and desktops are preserved and can easily be restored if an attack occurs.

Endpoint data backups should be seen as a type of insurance in the event that all of your other security tools have failed. Prevention is always better than cure, and protecting your data before it is stolen or quarantined helps prevent serious consequences for your credibility, patient safety and legal liability.

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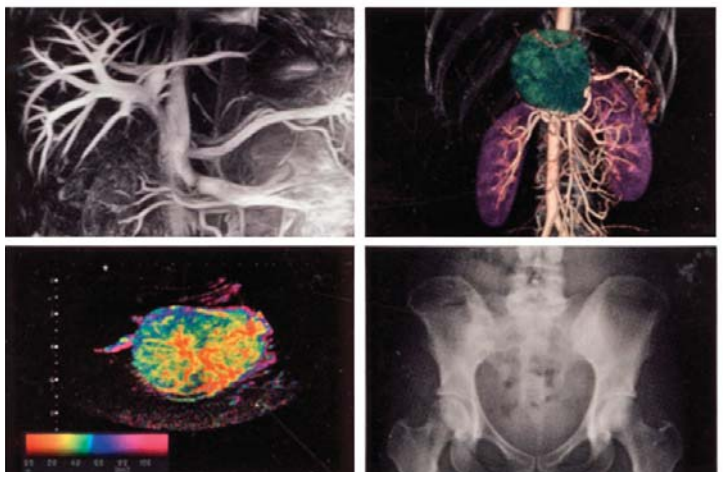

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