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Newfoundland and Labrador are accelerating the use of telehealth to provide better service to patients across the province. The plans include increased use of video to help patients with psychological disorders.

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PHOTO: COURTESY OF SICKKIDS

Instead of sending out voice files to transcriptionists, clinicians at the Hospital for Sick Children can now open a patient's chart and dictate directly into the record, make edits, and sign off. The M*Modal dictation technology is integrated with the new Epic charting system, and has proven popular. Pictured above are project leaders, nurse practitioner Joanne Bignell and Karim Jessa, chief medical information officer.

Dictating directly into the electronic patient record

BY VANESSA MILLAR

TORONTO – The Hospital for Sick Children (SickKids) has integrated a new version of M*Modal's dictation solution, equipped with high-accuracy speech recognition, with its newly installed Epic patient record system.

Providers can now open a patient's chart and simply dictate their notes, make edits, sign off and finalize their notes in one workflow. Recipients of the notes, such as other consultants or primary care providers, also get timely access to these important communications.

Dictation isn't entirely new to SickKids. Providers have been using back-end dictation software at SickKids for the past 12 years.

The process would start with the

provider picking up a phone and dialing the number for the dictation service. After selecting a few different options, they would then speak into the phone to record their note, just as if they were leaving a voice mail message.

The audio message would then be sent back to the provider to edit and sign off be-

With mobile apps, providers can use their smartphones to dictate anytime and anywhere.

fore being transcribed. This process could end up taking days to weeks.

Using the new Epic/M*Modal solution, providers can now dictate directly into the patient record, eliminating the need for

transcription and shortening the time it takes for documentation to reach the patient record and referring providers.

Furthermore, with the ability to use Epic's mobile apps to access the patient chart remotely, and M*Modal's microphone mobile application, providers can use their smartphones to dictate anytime, anywhere.

"Front-end dictation is a feature that we were really excited to introduce to SickKids and it has been wildly successful," says Dr. Karim Jessa, Chief Medical Information Officer.

"To be able to dictate your notes directly into Epic, make your edits and sign off on those notes in one workflow is very helpful, particularly in our outpatient clinics," says Dr. Jessa. "Our frontline providers have

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SickKids integrates a new version of M*Modal's dictation solution

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commented on how accurate and quick the system is.”

SickKids invested in over 600 remote microphones, strategically placed in inpatient areas and outpatient clinics and some providers' offices. Gone are the days of paper documentation and calling in to record a note for transcription.

The ability to watch the words appear on the screen is not only impressive but much more efficient and productive. While SickKids launched M*Modal to be used with Epic, the M*Modal application can also be used with other applications, like e-mail.

Front-end dictation is not only saving time for physicians, but also for the other members of the care team who add notes to the charts.

Joanne Bignell, Nurse Practitioner at SickKids, says, “I used to take handwritten notes and spent a lot of time typing out my detailed documentation. Now I can speak into my microphone or iPhone and as soon as I finish speaking it is saved into the patient's chart, available imme-

diately for other clinicians who require access.”

Not only does the tool document word-for-word what the provider says, it also allows for the provider to customize commands.

For example, if a physician often says the same phrase, perhaps a description of a diagnosis, they can program M*Modal so that they only need to say “insert ‘x’ diagnosis” and it will automatically pull a pre-determined phrase.

Abbreviations can also be set to type out the entire word or phrase.

The microphone hardware allows for additional commands, beyond the verbal commands already mentioned. Many providers choose to program the rewind button on the remote to mimic the “ctrl-z” function, which will undo the last word they said.

The success of M*Modal hinges on users training their profile. While the tool will work right out of the box, it will get better and better over time, as the user speaks. That's because the application learns their voices and adapts to their surroundings.



Carey Silverstein, VP Operations (l), and Paul Silverstein, VP Finance, lead M*Modal in Canada.

For example, if the provider always dictates in a noisy area, the more they dictate in that location, the better the application will be at picking up their words.

“We are only just scratching the surface with what's possible with front-end dictation and Epic,” says Dr. Jessa. “We look

forward to using the tool to provide physician feedback on ICD-10 codes, gaps in documentation quality, variance in patient care, best practices and more. We also plan to introduce more advanced features, like creating macros in order to decrease mouse clicks.”

“It is an honour to be able to partner with SickKids as they are a leading world class hospital and teaching facility,” says Carey Silverstein, VP of Operations for M*Modal Canada. “This was a very large project for M*Modal Canada, as the decision was made to go live with Epic, Fluency Direct (our front end speech application) and Fluency for Transcription, (our transcription platform with back end speech recognition) at the same time.

Silverstein noted that since the go-live, physicians are rarely picking up a phone and dictating their reports to be transcribed or edited, as was done in the past.

Between the combination of Epic and Fluency Direct, all physicians, as well as a multitude of other hospital staff, are now documenting directly into Epic without the need for transcription services.

“This change in documentation is not only saving SickKids significant money but is also allowing hospital providers to document at the point of care and immediately have their patient reporting available in Epic,” he said.

Paul Silverstein, VP of Finance for M*Modal Canada, notes that the success of this project between SickKids and M*Modal Canada is due to a solid partnership. “The next phase of the project is the launch of the M*Modal CDI or Clinical Documentation Improvement technology. The M*Modal CDI will be utilized at the time of dictation for their physician group, which will improve both clinical documentation and help their coding department.”



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Biomedical Zone gives startups place to validate in clinical settings

BY NEIL ZEIDENBERG

TORONTO – The Biomedical Zone – a unique partnership between Ryerson University and St. Michael’s Hospital – is Canada’s first physician-led, hospital-based health technology incubator, helping early-stage companies validate their solutions in a hospital setting.

ManagingLife (managinglife.com) is one of the Biomedical Zone’s emerging success stories – in 2011, the company launched a first-of-its-kind pain management app on Android. “The goal was to help people suffering from chronic pain to understand what they were experiencing, so they could better communicate with their doctors,” said Tahir Janmohamed, the company’s Founder and CEO.

By tracking how they felt in a daily journal, users of the app can better describe their pain to their doctors.

“Patients unable to properly describe their pain make it more difficult for their doctors to find a treatment that is effective at managing their pain. As a result, they often end up being prescribed an opioid to help them get some relief,” said Tahir.

“If you can provide doctors more accurate information about a patient’s pain and their response to treatment, you may be able to curb prescription of opioids through alternative treatments.”

In 2015, ManagingLife partnered with Toronto General Hospital (TGH) and built a remote monitoring portal. With a patient’s consent, data from the app can be seen remotely by a physician in real-time. According to the company, it’s the only pain management app with a remote monitoring capability for clinicians.



Jonathan Davis, Trealta’s founder.

TGH’s Transitional Pain Service has used it for 1-1/2 years, registering 55 of its patients. The Manage My Pain project at Toronto General Hospital is funded by the Health Technologies Fund (HTF), which was created by the Government of Ontario’s Office of the Chief Health Innovation Strategist (OCHIS). It’s administered by the Ontario Centres of Excellence.

Starting in September, Toronto Western, Centenary Pain Clinic at Rouge Valley Hospital, and Iroquois Falls FHT at Anson General, will also begin deploying the application.

They will ask their patients to use the app to record what they’re feeling; view the reports during clinical visits and use the monitoring portal to take action if a patient goes off course from their normal pain dosage.

“For Iroquois Falls, it’s exciting because they’re a rural-based clinic and there’s less opportunity to physically interact with pa-



Tahir Janmohamed, CEO of ManagingLife

tients,” said Tahir. Rural communities tend to have higher opioid use.

The company hopes that patients using the app as part of their regular clinical care will see improved outcomes in terms of satisfaction with their pain management, and a reduction in opioid medication.

More recently, ManagingLife announced a partnership with Green Shield Canada (GSC). It’s the first health plan in Canada to offer a digital health tool to its members specifically for pain management. GSC began inviting eligible plan members to download the app starting in July, at no cost to the member.

Manage My Pain is used by over 30,000 patients across the globe, and it’s supported in seven different languages. The platform helps patients track their pain levels over time; records the meds they’ve tried for pain, along with the strength and dosage, and their effectiveness.

Trealta (www.trealta.com), another rising Biomedical Zone start-up, is a training and support tool for family members caring for aging loved ones at home. “It provides evidence-based, professional-level education and training tailored to the needs of a family caregiver,” said Jonathan Davis, company founder.

The average life expectancy of Canadians is now over 80 years, but many are living with chronic disease, including Alzheimer’s and dementia. As our healthcare system continues to promote aging-in-place for frail and elderly Canadians, there will be a greater reliance on family members to provide safe and competent care.

With his background in training, certification and continuing education for healthcare professionals, Davis looked at ways of adapting those skills to helping people care for family at home.

On average, family caregivers provide about 24-hours per week of care while juggling a career and family responsibilities. Despite being time constrained, family caregivers often ask for more information and education. “That’s why we make our content bite-sized and easy to consume. You can watch it on your mobile or desktop at a time that’s convenient for you,” said Davis.

These five-minute clips – available by way of e-learning, animation and video – can teach caregivers how to provide quality care to their loved ones at home. Topics include: managing difficult behaviors in patients with Alzheimer’s and dementia; wandering; safely transferring an elderly person from bed to chair, and lowering the risk of falls in the home.

To determine what content to include in

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Workflow platform improves patient experience while reducing costs

BY JERRY ZEIDENBERG

TORONTO – Enter the Magenta Health family clinic on Queen Street, in downtown Toronto’s east end, and the first thing you notice is that there’s no dedicated receptionist.

Instead, there’s touch screen kiosks for patients to check in or to summon assistance. It’s easy to check in because the system knows who to expect.

You then take a seat and wait to see your doctor. A large screen on the wall tells you how long you will likely wait; and when it’s your turn, the system displays the information, announces your name and tells you which exam room to go to.

The alert is both visual and by voice – albeit a computerized voice.

Not that help isn’t available when needed. There are assistants at the busy clinic, who check on arrivals and conduct follow-ups and referral bookings on the phone.

But for the most part, patients are guided by computerized alerts, using a system called CHIME.

“We’ve created a workflow system called CHIME for the clinic,” said Keith

Chung, Co-Founder of Chime Technologies Inc. “It’s a clinical communications and collaboration platform.”

Indeed, the 12-doctor Magenta Health clinic is acting as a test-bed for both the new CHIME workflow system and Veribook, a smart scheduling system that enables patients to book their own appointments developed by a sister company also co-founded by Chung.

By eliminating dedicated receptionists and patient escorts, the system brings down the cost of running a medical office considerably.

Moreover, by automating the flow of patients through the clinic using alerts and prompts, Chung says Chime can increase the capacity of a medical office by 40 percent to 60 percent.

He explains that a traditional 10-room medical clinic may have five physicians, but they each have two dedicated exam rooms at any one time. While seeing a patient in one room, staff bring another patient into the second room to minimize downtime between patients.

That means up to 50 percent of exam rooms aren’t being actively used at any given time, when breaks and gaps between appointments are factored in.

But with Chime, more physicians can share the exam rooms simultaneously – up to seven or eight.

As soon as a doctor finishes seeing a patient, a tablet computer mounted outside the room tells him where to head next, and the name of the patient.

At the same time, an alert goes to an



Chime Technologies’ Dr. Ben Shah and Keith Chung.

assistant to clean the room that was just used.

As soon as it has been readied, the system prompts the next patient to proceed to that exam room.

“You’ve increased capacity by intelligent room sharing,” said Chung. “You’re not shortening the patient encounter, you’re improving it. You’re us-

ing real estate more effectively.”

The Magenta Health clinic, for example, where 12 doctors work, is functioning smoothly with 11 exam rooms. In the past, a clinic of this size might have required 18 to 20 exam rooms.

Chung observed that about a third of a clinic’s costs are related to real estate. So, by reducing the need for space, or by increasing patient throughput in an existing medical office, the financial viability of a clinic can be improved. Another big cost is taking phone calls, especially if a busy clinic needs to assign multiple staff to this task. Veribook can further reduce the cost of running a clinic by another 10-15 percent by automating the scheduling of appointments by patients. Veribook ties into the schedules of the physicians who are on duty on a particular day.

So, if there is no pediatric specialist available on a certain day, it won’t make an appointment. As well, it is aware of physician preferences. A doctor may prefer to do physicals on Fridays, for example, and so Veribook will only schedule that kind of appointment on that day, for that particular physician.



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Prone breast biopsy table enables faster, more comfortable procedures

TORONTO – North York General Hospital, known as a technological innovator, has become the first hospital in Ontario (and the second across Canada, after the McGill University Health Centre) to implement a prone breast biopsy table that makes use of 3D mammography for needle guidance.

The new system provides better accuracy, shorter procedures and improved patient comfort in comparison with traditional breast biopsy systems, most of which are performed in the upright position.

The Affirm Prone Biopsy System was installed at the Toronto-based academic community hospital this March. (Hologic is the manufacturer of the system, and it's sold and implemented in Canada by Christie Innomed.)

"We're committed to innovative imaging with compassionate care," said Mike Sharma, Director of Clinical Diagnostics at North York General. "That's exactly what we've done with the new Affirm Prone biopsy table."

The technology certainly enables more compassionate care, as in the prone position the breast is placed through an opening in the table and the needle-based procedure occurs out of the patient's view, helping reduce anxiety. That's unlike the upright procedures, where the patient directly observes the needle as the biopsy is performed.

Accuracy is also improved with the Affirm Prone Biopsy System. Using 3D imaging for biopsy guidance, the radiologist obtains a more accurate location of the lesion, including complex biopsies – whether it's a faint calcification or a subtle distortion – in contrast with conventional 2D systems. This marks one of the most significant advances in biopsy technology



NYGH registered technologist Afsaneh Mohammad Nejad and director of clinical diagnostics, Mike Sharma.

since the first prone biopsy system was introduced more than 20 years ago.

Dr. Ryan Margau, Chief Radiologist at NYGH, commented: "Over the past few years, there has been a significant advance in breast imaging technology. Specifically, the principles involved in CT scanning are now being applied to mammography, so that radiologists can see three-dimensional mammographic images. This is called tomosynthesis or 3D mammography."

Dr. Margau explained further that, "The technology will help radiologists to sample potential cancers in a more accurate way, and facilitate earlier detection of tumours, when they are easier to treat."

"Another key benefit to this new tomosynthesis technology is that the images can be obtained without high radiation

dose compared to older systems," he added. That's because it replaces the need for several 2D imaging exposures with a single 3D imaging exposure.

Overall, the procedure is faster, too, as a result of automation and better design. With older breast biopsy systems, the tube head of the imaging device had to be positioned manually. The new Affirm Prone Biopsy System does this automatically, which saves time.

The software streamlines workflow, as needle parameters are automatically calculated so the procedure goes faster and opportunities for error are greatly reduced.

Sharma noted that biopsies using the new system generally take about 10 minutes, compared with 20 minutes for older systems.

The rotating biopsy arm facilitates lat-

eral access to the breast, if needed. This allows clinicians quick and easy access to hard-to-reach lesions and thinly compressed breasts, therefore reducing the number of patients that would otherwise be sent to the OR for a lumpectomy.

The system's computer calculates the x, y coordinates for the lesion and automatically positions the needle. The doctor is responsible for placing the needle into the breast, so the doctor can control needle penetration according to the patient's comfort level.

Already, in its first five months of use, there has been an overwhelmingly positive response from women to the table. Sharma noted that about three to five patients per day are being treated using the new table, a volume that's sure to increase.

Most of them are telling their technologists that the procedure was less frightening than they expected, and that they'd recommend it to friends and family who need a breast biopsy. For its part, North York General has achieved the Breast Center of Excellence status for both imaging and surgeries. Every breast cancer patient's case is reviewed by a multidisciplinary group of radiologists, surgeons, oncologists, pathologists, geneticists and nurses – an approach that's unique in the Toronto area, and perhaps across Canada, too.

Biomedical Zone gives startups place to validate

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the solution, the Biomedical Zone set up a focus group where the company could meet in person with a dozen discharge planners at St. Joseph's Hospital in Toronto.

"It provided additional perspective on what discharge and transition teams believe families need to stay out of the hospital and remain at home," said Davis.

Tualta is free to use for all caregivers; the costs will be shared by the insurer and healthcare provider.

"We are building the business case for healthcare payers and providers to offer Tualta to families because the training and support resources will lead to reduced costs and improved outcomes," said Davis.

Headquartered in downtown Toronto at St. Michael's Hospital, the Biomedical Zone companies address significant healthcare challenges, with the goal of improving patient outcomes and quality assurance while lowering costs.

Through the Biomedical Zone's concurrent clinical validation and business model refinement process, hospital-embedded start-ups are able to accurately identify and validate their value propositions.

"We feel that our unique model, which provides access to clinicians, patients, scientists and others, coupled with clinical validation and business development support, is a key driver in accelerating the success of our companies," said Dr. Linda Maxwell, founder and managing director of the Biomedical Zone.

"Ultimately, it gets transformative technology and solutions into the hands of patients and providers."

MUHC leads the way in breast biopsies

Having a breast cancer biopsy is a frightening experience. But it can be made easier by reducing the amount of time a woman spends having the procedure performed.

In October 2017, Montreal's McGill University Health Centre installed Canada's first prone table for 3D image-guided breast biopsies. The Affirm Prone Biopsy System, with 3D mammography, was installed by Christie Innomed. (The system is itself produced by Hologic, in the U.S.)

A stereotactic breast-tissue biopsy is a type of procedure performed to sample microcalcifications. The system can also be used to biopsy suspicious findings like distortions and small masses.

Stereotactic biopsy tables usually use a 2D mammography technique to localize the calcifications. When biopsies are performed with the 2D technique, the coordinates of the lesion can be calculated in three planes, but it necessitates more manipulations by the technologist.

Using 3D imaging, the radiologist can biopsy calcifications and lesions

more quickly and precisely, resulting in faster procedures overall.

"The calcifications are easily seen due to the better quality of the images. We can identify grouping of calcifications, and also the detection of the distortions and masses is even better compared to the 2D images," said Dr. Mélanie Thériault, a radiologist at MUHC who specializes in breast and women's imaging.

Using 3D imaging, the radiologist can biopsy calcifications and lesions more quickly and precisely.

"As we can identify the site of the biopsy more easily, the procedure is faster and it is a better experience for the patient," commented MUHC technologist Nancy Infusini.

"The system is highly automated," she said. "Once the technologist positions the patient and locates the area of interest by 3D imaging, a target is marked and transmitted to the computerized

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Sunnybrook first in Canada to combine radiation with high-res MRI

BY ALEXIS DOBRANOWSKI

TORONTO – Doctors and radiation therapists at Sunnybrook Health Sciences Centre will soon be able to gauge the effects on patients – in real-time – as a focused radiation beam hits a

tumour, thanks to a new machine, the Elekta Unity.

The new device is the first in the world to combine radiation and high-resolution magnetic resonance imaging (MRI). The hybrid technology will provide unprecedented precision as the team will be able to

see exactly where the radiation is striking the tumour.

It will also give clinicians an instantaneous look at how effective the radiation was in combatting the tumour, through the use of MR imaging. As a result, patient therapies will be able to be adapted much more quickly.

“This is an MRI capable of running diagnostic imaging sequences and images to look at how tumours behave and metabolize, combined with a linear accelerator, which delivers radiation,” said Dr. Arjun Sahgal, radiation oncologist and head of Sunnybrook’s Cancer Ablation Therapy Program.

Sunnybrook is the first hospital in Canada to install the machine, and is one of the founding members of a seven-member global consortium. Made up of medical physicists, research scientists, and radiation oncologists, the consortium is testing and refining the MR-Linac and preparing the machine for the first human clinical trials.

For radiation therapists like Mikki Campbell, the new technology means some changes in how she and her colleagues work.

“We’ll now be able to see daily changes to the tumour during the course of a patient’s treatment,” she said. “We’ll be able to adapt the treatment to that specific tumour and patient after seeing what is happening to the target and the surrounding tissue each day.”

This means the opportunity to reduce the level of radiation toxicity to the patients and enhance tumour kill as the radiation beam will more accurately hit the target tumour and spare healthy surrounding tissue.

It also means a huge educational undertaking for the radiation therapists.

“We will need major training for our therapists to fully understand the MRI safety aspects and to train them to execute daily MRI-guided adaptive radiation therapy for our patients,” Campbell said.

There’s been a substantial investment in infrastructure to get to this point with the machine, Dr. Sahgal noted.

“To bring in a unit like this, set it up, evaluate it and bring it to the point of clinical treatment involved a major investment in human resources, including hiring new types of specialists, like MR specialized physicists and MR scientists,” Dr. Sahgal said. “We have come so far and there’s still so much to be done, but we are ready to take the next steps.”

This past summer, the team took the first images on the MRI, ceremonially using some quintessential Canadian objects – hockey sticks and maple syrup.

Next, once Health Canada approves, the team will take MRIs of current patients in order to create a database of images and calibrate the machine.

“We will collect these images to help make sure the kinds of images we get from this machine are clinically applicable, and we can move forward to designing clinical uses,” Dr. Sahgal said. “We have to do the groundwork that will build that future research.”

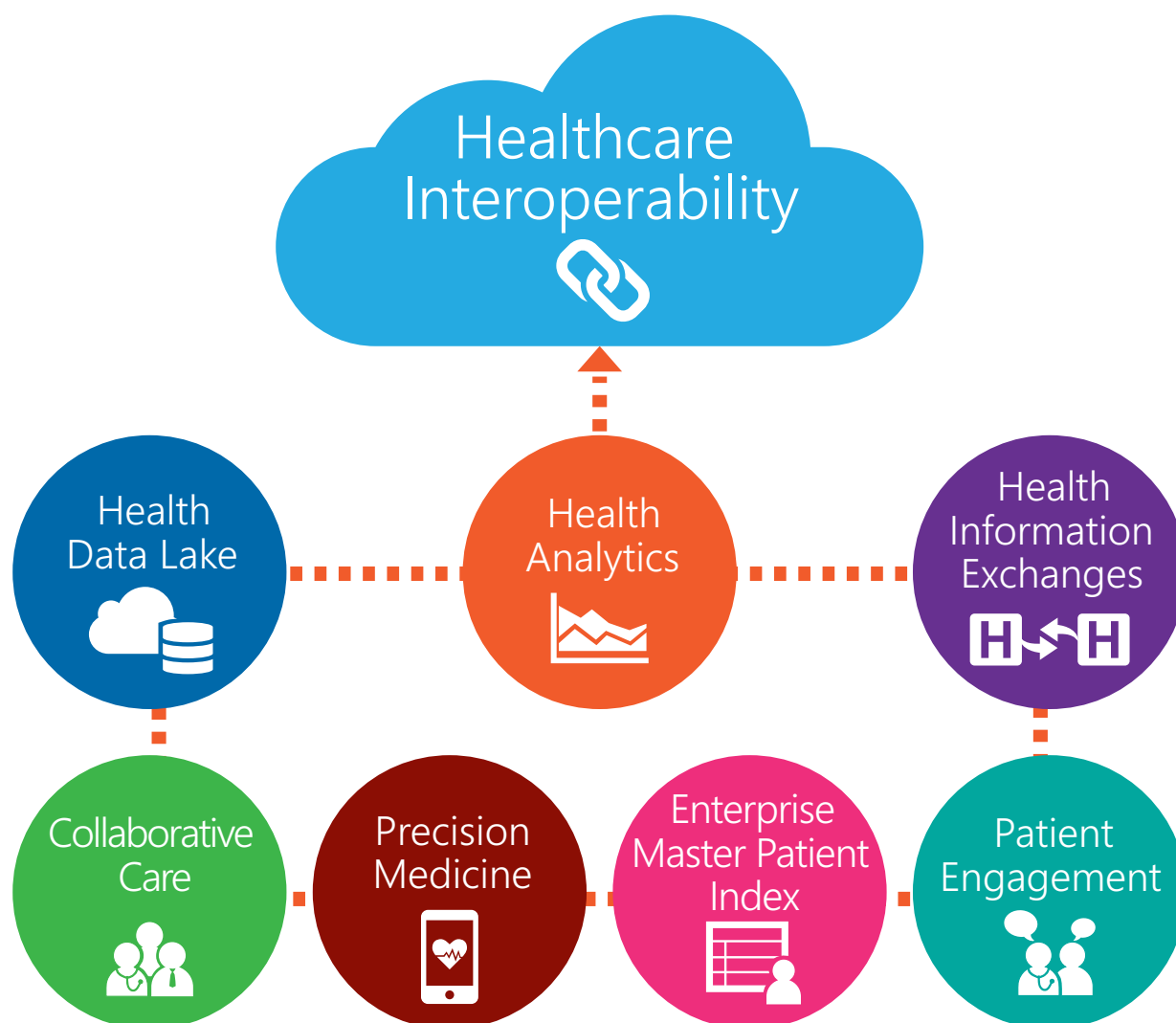
The team will create an imaging database of tumours in order to establish benchmarks for treatments in the future.

“It’s a huge amount of work to determine exactly how we are going to use this new technology to treat patients,” Dr. Sahgal said. “We have to tweak the software and the sequences so that the quality of the image is appropriate for clinical application. We are working together with our consortium partners to make this a reality.”

It’s a whole new ballgame for the radiation oncologists too, he said.

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AGFA HEALTHCARE ADVANCES GREENVILLE HEALTH'S IT STRATEGY

The go-live of the latest version of AGFA HealthCare Enterprise Imaging is enhancing patient care and clinician workflow at one of the most innovative health systems in the U.S.

AGFA HealthCare and Greenville Health System – based in Greenville, S.C. – have announced the successful implementation of a comprehensive Enterprise Imaging system. The solution will facilitate greater efficiencies in clinical operations, improve clinical confidence, and enable cost reduction through convergence of systems and timely access to medical images and diagnostic tools.

The solution consolidates access and allows for care-team collaboration with Radiology, Cardiology, and other medical images while converging multiple legacy picture archive communication systems (PACS) onto a single platform. The result is the creation of one of the United States' largest integrated digital imaging systems in the prestigious HIMSS Electronic Medical Record Adoption Model (EMRAM) Stage 7-awarded health network.

VNA (vendor neutral archive) services facilitate Visual Intelligence – rapid cross-enterprise access to clinically relevant imaging information – and leverage diagnostic information from Enterprise Imaging PACS' advanced task-based workflow. Merging the familiarity and functionality of PACS with the power, access, and scalability provided by a single standards-based technology platform, the



solution is designed to improve both the delivery of patient care and operational efficacy throughout multiple locations and clinician groups.

ADVANCING CONNECTIVITY

The recently implemented system has converged multiple PACSs onto a single platform, allowing the 1,627-bed multi-hospital system to seamlessly connect over 400 imaging modalities across 50 individual provider facilities to patients' medical imaging data. Nearly 4,000 clinicians are now relying on the Enterprise Imaging system to deliver patient care daily throughout the greater northwest South Carolina region.

Greenville Health System is renowned for its clinical efficiency improvements and commitment to transform the quality of care and patient safety using innovative information technology. The healthcare system recently achieved the prestigious HIMSS Electronic Medical Record Adoption Model (EMRAM) Stage 7 Award, the highest achievement level awarded. The near paperless environment achieved by GHS harnesses the integration of EMR and Enterprise Imaging technologies to advance the clinical, operational, and financial vitality of the health system.

The complex implementation exemplifies recognition given to AGFA HealthCare recently by KLAS Research, the healthcare research and insights firm. The KLAS Enterprise Imaging Performance Report 2018 identifies AGFA HealthCare as a 'strong and guiding partner' and cites strategic guidance, strength of the new platform, and integration as keys to the company's success in driving desired outcomes for clients. No vendor scored higher than AGFA HealthCare as a strong partner to create and/or develop an organization's enterprise imaging strategy. The study found that organizations seeing

the most outcomes are those using AGFA HealthCare VNA and universal viewer, both of which GHS elected to rollout in their initial stage of the multi-year deployment

"We are proud of the technical and clinical enhancements accomplished across the Greenville Health System that will help improve the care we deliver to the patients we serve. The Enterprise Imaging platform integrates with our EMR to benefit our growing network's clinical, operational, and fiscal health," said Richard Rogers, vice president and CIO, Greenville Health System. "In reducing complexity and cost – and increasing efficiencies across our clinical and operational processes – we view AGFA HealthCare's solution as key to our digital health strategy. The AGFA HealthCare team has been an excellent business partner and their guidance and collaboration have been instrumental to our controlled rollout's continuing success."

"Two years ago, GHS and AGFA HealthCare embarked on a journey together with a shared strategic vision of leveraging an integrated patient data platform and it is wonderful to see this come to fruition," commented Frank Pecaitis, senior vice president, North America, AGFA HealthCare. "The implementation of Enterprise Imaging with Greenville Health System continues validation of the platform's scalability, convergence power, and the fundamental contributions Enterprise Imaging can deliver to a health network's transformation to standardize and personalize care."

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ENTERPRISE IMAGING PLATFORM

The Enterprise Imaging system implemented at GHS includes the following suite of applications on a single platform:

- Enterprise Imaging for Cardiology (PACS) – improves clinical productivity and reduces application overload by using a single user interface supporting all cardiology clinical workflows.
- Enterprise Imaging for Radiology (PACS) – a highly customizable diagnostic workflow tool designed to help radiologists achieve optimal efficiency in reading radiological studies.
- Standardized Departmental Workflows – allows all image-producing service lines, including Point of Care Ultrasound, Dermatology, photo capture for Wound Care, and Ophthalmology to capture and associate imaging studies with an episode of care and drive enterprise-wide efficiency.
- Enterprise Imaging Vendor Neutral Archive (VNA) – consolidates all imaging data from multiple systems, departments, and vendors into a central clinical data foundation.

Saint Elizabeth Health Care's chatbot offers enhanced family support

BY DAVE WEBB

Family caregivers, meet Elizzbot. She's your sounding board, your resource, someone to vent to, and a source of constructive solutions when you're burned out.

She is, in her way, a daughter and a granddaughter, tracing her family tree to the first chatbots. But the project of Elizz, the online brand of home-care provider Saint Elizabeth Health Care, is very much her own bot.

Elizzbot is still be refined before her im-

minent rollout to Saint Elizabeth staff before being made available to the general caregiving public.

"We know Elizzbot is unique because she was designed for family caregivers," says Allyson Kinsley, senior vice-president of strategy for Elizz, Saint Elizabeth's on-

line brand, launched in 2016. The brand's persona permeates the bot.

"We had a personality we wanted to come out for the brand," Kinsley says – optimistic, curious, smart, vital, gutsy, persevering, quirky.

Chatbots – computer programs that interact with users in a near-human way, thanks to various artificial intelligence technologies like natural language processing, pattern recognition and neural networking – are quickly displacing apps as the tool of choice for interacting with online brands.

Research firm Gartner predicts that chatbots will power 85 percent of customer interactions by 2020. By then, the average person will have more daily conversations with bots than with their spouses.

Already, in fact, 27 percent of Americans aren't certain whether their last customer service interaction was with a chatbot or a human, according to PricewaterhouseCoopers.

While 80 percent of companies have bot plans on their radar, healthcare is a few years behind, says Zayna Khayat, a future strategist who joined Saint Elizabeth in February.

But it's a field ripe for bot-based innovation. Bots can serve as medical assistants, both personal (managing appointments and medication compliance) and clinical (smart triage). There are condition-based bots for cancer patients, palliative care, and diseases like Chronic Obstructive Pulmonary Disease (COPD) – the breatheAgain bot from Toronto's University Health Network being one example.

Bots can be aimed at particular demographics (Eve for women's issues, Vivibot and emojiHealth for teens).

In Japan, cross-bred chatbot/physical robots – Paro, Jibo, Pepper, Autom – serve as companion robots in most senior citizen homes, says Khayat. Bots serve up reminders, answer questions, and guide users to online resources relevant to their condition or situation.

Elizzbot can trace her lineage to the first generation of chatbots. In 1966, Massachusetts Institute of Technology professor Joseph Weizenbaum built ELIZA, a computer program that could engage in dialogue with a human, responding to "patients" with scripted, non-directional questions. (For example, ELIZA would ask, "How does that make you feel?")

The system was built by parsing input for weighted keywords and using pattern recognition and substitution rules. Though ELIZA was a parody of a Rogerian psychotherapist, test users quickly began to credit her with humane attributes like insight and empathy.

But Elizzbot is more directly related to Tess, a psychotherapy and psychoeducational chatbot engine developed by Silicon Valley startup 2XAI, which specializes in using AI and automation to expand mental healthcare services.

The startup was founded in 2014 by Eugene Bann, a programmer working on sentiment analysis algorithms when he met partner Michiel Rauws. The pair developed a counseling program, Karim, to help Arabic-speaking Syrian refugees at a camp in Jordan, where mental health issues were rife and resources to help cope virtually non-existent.

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Surgeon creates 'neobladder' in patient via less invasive robotic system

BY DIANNE CRAIG

TORONTO – Traditionally, a radical cystectomy, involving removal of the entire bladder, with creation of an intracorporeal neobladder, would be completed through open surgery. But

when the opportunity arose in April to perform that surgery using minimally invasive, robotic-assisted surgery, Dr. Girish Kulkarni, Urologic Surgeon, Department of Surgical Oncology at Princess Margaret Cancer Centre (PMCC), was ready.

Dr. Kulkarni, who is also an Associate

Professor with UofT's Department of Surgery, had performed many robotic-assisted surgeries.

But this marked the first time in Ontario that a radical cystectomy involving removal of the whole bladder, and creation of a functioning neobladder from the large

intestine, was performed using a robotic surgery system.

"The robotic procedure does it with less blood loss, and a shorter incision," said Dr. Kulkarni. In addition, it gives the surgeon "better dexterity over pure laparoscopy," he said.

In fact, the tiny instruments bend and rotate at a range far greater than the human hand.

Dr. Kulkarni said many things can be performed better using the robotic system, which uses finger controls, accompanied by a foot pedal which generates a current for electrocautery to activate the dexterity devices. With scissors operated by one hand, and graspers by the other hand, a surgeon can control the precise movements needed to cut, cauterize and sew.

This recent surgery, performed at Toronto General Hospital, where the da Vinci robotic system – one of two operated by the University Health Network (UHN) is located – was successful. The patient was "discharged, in good spirits, and is doing well," reported Dr. Kulkarni.

During robotic-assisted surgeries, the surgeon sits at a console while looking at a high-definition screen showing a 3D image of the patient's target anatomy. The surgeon's hand wrist and finger movements at the console translate to precise, real-time movement of the instruments attached to four robotic arms.

While this robotic surgery can take much longer than using traditional open surgery – sometimes about 10 to 12 hours vs. about five hours in open surgery, although the time spent on robotic surgeries gets shorter with experience, said Dr. Kulkarni.

"Many of us are far along in a learning curve for (robotic) surgery," he said. "For prostate surgeries, urologists (at UHN) are very comfortable," he said, adding that robotics are also used frequently for hysterectomies, as well as for head and neck and thoracic surgeries. While robotic surgeries offer many benefits, cost-effectiveness is the one area in question. Dr. Kulkarni concedes it may not always be the most cost-effective option, but cites many benefits like shorter hospital stays, and fewer complications in most instances.

The University Health Network acquired the da Vinci system, made by Intuitive Surgical Systems of Sunnyvale, Calif., in 2008. Currently the health network has two of them – both at Toronto General Hospital, where Dr. Kulkarni performed the cystectomy and creation of the neobladder.

Without private donations, the cost of robotic-assisted surgeries like this one could be prohibitive. Dr. Kulkarni cites philanthropy, and specifically a large private donation from a generous donor who helped launch this robot-assisted surgery program for Princess Margaret.

Asked if patients were ever hesitant to have their surgery performed using a robotic system where the surgeon is seated metres away from them at a console, Dr. Kulkarni said, "No. They come in requesting it – there is a long track record of successes.

"Each of us (surgeons who perform robotic surgeries) has our niche in which we operate," said Kulkarni, adding, "I've been helping to bring it into the bladder cancer world."

Still Waiting After All These Years

Canadians cherish their healthcare system. It has become part of our national fabric; one of the defining characteristics of our country. We value the principle that our access to health care depends fundamentally on need rather than on the ability to pay. Our national heroes include the founders of our modern system, like Tommy Douglas.

For all its successes, however, our health care system also has its significant flaws. Chief among them is our persistent problem with wait times. According to The Commonwealth Fund – a respected think tank in the US – Canada persistently ranks dead last in wait time performance when compared to 10 peer countries.

How is it that our cherished system has come to be ranked dead last in wait time performance?

Nearly every Canadian family has a wait-time story. We wait in emergency departments. We wait to see family physicians. We wait for tests, procedures and surgeries. We wait to see specialists. We even wait to get out of hospital – an increasing number of Canadian seniors find themselves in acute care hospital beds not because they are sick, but because they cannot live independently and have nowhere else to go.

Are long wait times simply the price we have to pay in order to uphold our Canadian values of equity and fairness?

The answer to this question is a resounding, "No".

In fact, there is good evidence that Canadians' wait time experience is not equitable at all. How long you wait for medical care depends a great deal on your postal code. Even within provinces, the Wait Time Alliance (WTA) found that there are considerable disparities in wait times and access to care in general depending on where you live.

There are many reasons why Canada's medical wait times have stretched to unacceptable levels. One is siloism. Our federated model has created provincial and territorial silos, and our attempts at integration and reform have largely fallen flat. Monique Bégin famously said that we are a country of perpetual pilot projects, lamenting our inability to scale-up and spread new ways of doing things.

Another is the fact that the health care landscape is increasingly one of chronic disease. In the 1960s, the health care system was designed to care for people who develop acute illness.



Today, however, we typically see patients with multiple chronic diseases who need access to care across the entire spectrum, from primary care through to hospital and restorative care and finally to long term and palliative care. The typical patient experience is no longer just an episode of care, it is a trajectory of care that spans time, caregivers, and venues. And these trajectories are peppered with multiple transitions that tend to be poorly managed. It is at the transition points where mistakes are made, inefficiencies are generated, and suboptimal outcomes are born.

And the third is that we don't manage the wait time experience for people very well at all. Any Canadian can walk into a large hardware store and a sales associate can quickly (and electronically) locate any item they want, but that same Canadian cannot find out quickly and easily where they are on a surgical wait list. They can book their car for service online with a few clicks but most cannot electronically book appointments with their family physician. Canadian patients cannot easily compare centres or providers to see where care can be provided fastest. And caregivers and hospitals too often do not have access to real time wait time data to manage patient flow and resources efficiently and equitably.

Information technology (IT) can facilitate many of the solutions to our chronic wait time problem, as its use in other sectors has shown. Seemingly simple solutions, like common wait lists – first shown to reduce waits in bank lines and at Wal-Mart – are easily implemented with the aid of IT.

The healthcare sector lags behind other industries in the adoption of IT solutions, making IT truly the low hanging fruit that can pay large efficiency and performance dividends if we can catch up with other industry sectors.

Novari Health is solely focused on IT solutions that improve patient access to care. Importantly, we recognize that health is a journey for patients, not just an episode of care. Our software modules reflect our understanding of this journey, with solutions ranging from virtual primary care through to e-referral and e-consult, to surgical booking/wait list management and provider relationship management.

Canada won't fix its wait time problem overnight. It will take new political and policy work, targeted investments, and patient flow innovation. But as the old saying goes; we can't fix what we don't measure. IT solutions that provide real time data coupled with providers and organizations who are dedicated to improving the health care experience for patients and their families can produce real, lasting improvements.

Our goal should be nothing less than the restoration of the health care system to one that is truly worthy of Canadians' confidence and trust.



Dr. Chris Simpson
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Newfoundland and Labrador extend use of remote patient monitoring

Eastern Health, the largest health authority in Newfoundland Labrador (NL), has been a pioneer in the use of telehealth and most recently implemented a Remote Patient Monitoring (RPM) solution that provides telehealth in a patient's home. This medium for telehealth has enrolled

over 1,200 patients, of which 240 are being actively monitored at any given time. The RPM solution provides coaching for patients to self-manage chronic disease and monitors physiological parameters to trigger alerts to notify case managers when an intervention is required.

To date, Eastern Health has concentrated on Type II Diabetes, Chronic Obstructive Pulmonary Disease (COPD), and Congestive Heart Failure (CHF).

Building on its success, the RPM program is expanding to all integrated health authorities in the province, while adding ad-

ditional chronic diseases, including Chronic Kidney Disease and Mental Health.

"This is a tool in a clinician's tool box and as such we are aggressively reviewing more use cases for this type of telehealth," said Steven Lockyer, Regional Director of Healthcare Technology at Eastern Health, who spoke at the Internet of Things in Healthcare conference, held in Toronto in May 2018.

Remote Patient Monitoring enables clinical experts from Eastern Health to provide education, support and coaching for patients with chronic disease by monitoring vital signs, such as blood pressure, blood oxygen levels, weight, etc., enabling patients to better manage their chronic diseases.

The idea is to flag problems before they get serious. "The goal is to provide educa-

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Steve Lockyer, Regional Director, Healthcare Tech

tion and prevent the flare-ups that often lead to Emergency Department visits and hospital readmissions," said Lockyer.

The expansion will use new technologies and techniques that widen the scope of care that can be provided. It will make use of video, allowing clinicians to observe patients and detect problems through speech and visual cues.

This is especially useful for Mental Health, as sudden changes in observed behavior will likely alter the treatment plan.

"A recent telehealth program, called Jasper, uses Skype and has enabled clinicians to observe how autistic children interact and play in their own environment. It's saving travel time for those who live hours away from the service offered, if they had to visit in person," said Lockyer.

Due to the success of the RPM program, Eastern Health is preparing to extend this type of telehealth outside Chronic Disease Management to other areas of the organization;

"We're now driving telehealth right into the patient's home," said Lockyer. "It's much more convenient for them."

It also frees up space in the hospital, as well as in the facility's parking lot, he noted.

And of course, it leads to better outcomes for patients. RPM improves access and allows patients to receive the appropriate level of care, by the appropriate clinician, in the most appropriate setting. The mission, overall, is supporting health at home.

In tandem with telehealth in the home, Eastern Health has been proactive in the use of technologies that protect clinicians, such as geolocating apps to protect workers who work alone visiting patients in their homes.



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The new unicorns: We may all need to become AI experts and Deep Learners

The AI revolution is requiring software engineers and clinicians to update their skills.

BY DR. SUNNY MALHOTRA

It is important to remember that physicians are entering a world that is becoming inundated with artificial intelligence applications. The AI revolution is requiring software engineers as well as non-software engineers to update their skills. People are moving towards becoming data scientists and learning about the concepts of machine learning and artificial intelligence.

Due to the rising demand for healthcare experience in the application of artificial intelligence, I sought to build a data scientist skillset and become more proficient in machine learning/artificial intelligence programming.

My goal was to increase a skillset over a part-time, six-month period, with the combination of online skills training, a structured machine learning curriculum and YouTube lectures.

One of the first questions I came across was, "Where do I start in this vast field?" I started off by finding YouTube videos that provide basic introductions to machine learning and artificial intelligence concepts. There are some courses from Brainstation, Udemy and Edureka online that break down the concepts with the aid of visuals.

After being introduced to the concepts, I needed to decide which programming language would be the best one to start out with. Python became the clear winner as it has been growing at the fastest pace and is the core language that is used in machine learning and artificial intelligence coding.

Python is a scripting language that can be used for web programming and desktop applications as well.

It is user-friendly and has an intuitive coding-style. It has relatively easy syntax and is often recommended to programming newcomers. There are

Python tutorials on YouTube by users such as Jayanam, as well as online tutorials from the University of Waterloo. (<https://open.cs.uwaterloo.ca/language-independent-lessons/>)

There are multiple online courses that allow you to practice online, helping you to master the information and skills. I would look into Codecademy,

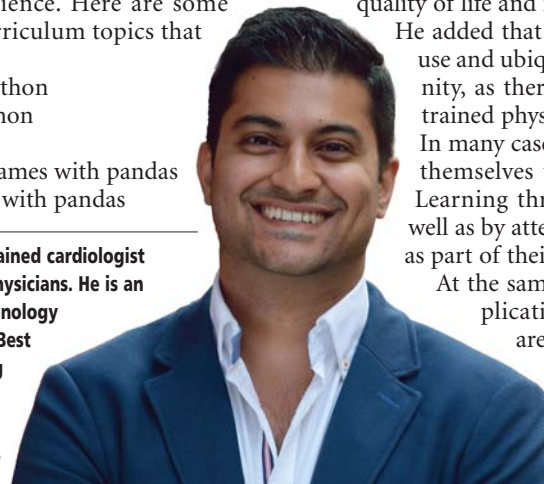
In many cases, clinicians will have to bring themselves up to speed on AI and Deep Learning through their own initiatives, including online courses.

FreeCodeCamp, Udacity, Treehouse, Udemy and Pluralsight as options to get practical experience.

They provide Nanodegrees, which are online certifications that will qualify you for your future professional career while also providing an accelerated educational experience. Here are some examples of Python curriculum topics that are available:

- Importing Data in Python
- Cleaning Data in Python
- pandas Foundations
- Manipulating DataFrames with pandas
- Merging DataFrames with pandas

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



- Intro to SQL for Data Science
- Introduction to Databases in Python
- Statistical Thinking in Python
- Joining Data in PostgreSQL
- Supervised Learning with scikit-learn

I recently had the opportunity to speak with Dr. David Koff, Chair of the Department of Radiology at McMaster University and Chief of Radiology at Hamilton Health Sciences. Dr. Koff has special expertise in medical informatics, and has received significant grant funding from the government for research and development initiatives in diagnostic imaging informatics.

He noted that there are significant gains to be made through the use of Artificial Intelligence and Deep Learning in medical diagnostics. But for organizations creating new AI-based applications, there are key issues to understand on the clinical side. They include identifying the clinical need, as well as providing improvements in patient outcomes, patient quality of life and reducing medical system cost.

He added that these tools need to be easy to use and ubiquitous in the medical community, as there are no artificial intelligence trained physicians in Ontario.

In many cases, clinicians will have to bring themselves up to speed on AI and Deep Learning through their own initiative, as well as by attending workshops and lectures as part of their professional development.

At the same time, developers of new applications will need to ensure they are solving real clinical problems with their technologies, without creating difficult to use solutions.

Good luck on your AI journey!

Why hospitals should negotiate with suppliers

BY DENIS CHAMBERLAND

"Let us never fear to negotiate."

— John F. Kennedy

Negotiating the right deal with a supplier can generate huge benefits for a hospital. Those who sit across the table from suppliers, however, often find negotiations difficult, complex, and sometimes intimidating. There's also the fact that negotiations take time, and time is always in short supply.

Not surprising that in most cases the winning bid gets accepted as-is, with no improvements made to it, financial or otherwise. The result is a colossal loss of value to the hospital, coupled with a significant increase in risks.

Unlike buying a commodity good or product in a standard commercial establishment or online, negotiating is the best way to optimize value for

money in hospital procurement. Almost all hospital procurement activities should end in negotiations.

The simple act of adding a negotiations step to the hospital's evaluation process will reduce the risks of failure, improve the quality of the proposals selected for negotiations, improve the hospital's understanding of the substance of the proposals targeted, and in most cases, substantially lower the price – often by as much as 25 percent.

Despite the enormous benefits brought about by negotiations, hospitals in Canada have traditionally had an aversion to negotiating procurement processes, sometimes even believing that negotiating an RFP or any other bid call document was illegal. That was never the case. The courts never said that negotiations were illegal as a matter of principle.

Negotiations were always avail-

able to the public sector in Canada, but the topic is worth revisiting now because the newly implemented trade agreements have something novel to say about negotiations.



Denis Chamberland

that might lead to the unequal or unfair treatment of a bidder.

Article 512.2 of the Canadian Free Trade Agreement (CFTA), which came into force on July 1, 2017, emphasizes that the elimina-

tion of bidders during negotiations must be consistent with the evaluation criteria set out in the bid call document.

In other words, while the hospital does enjoy a great deal of flexibility to set the rules of the negotiations process, the CFTA does not allow for the type of free-for-all negotiations typical in the private sector. Procedural fairness principles dictate consistency with the published evaluation criteria.

Article 512.2 adds that if negotiations are conducted concurrently with multiple suppliers, there must be "a common deadline for the participating suppliers to submit any new or revised tenders".

Concurrent negotiations with multiple suppliers is not an easy thing to do. It calls on a lot of resources within the hospital for an

CONTINUED ON PAGE 22

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FUJITSU

Virtual care isn't just a concept anymore, as hospitals and doctors deploy platforms

Patients are benefiting with faster discharges from hospital and improved care and outcomes.

BY DIANNE DANIEL

After decades of going to the doctor, Canadians are letting the doctor come to them. Just as Ernst & Young Global Ltd. implied in “The Upside of Disruption: Megatrends Shaping 2016 and Beyond”, digital innovation is bringing about enormous change in the way healthcare is delivered: “Patients will become empowered consumers, with more information and control over their health decisions. Instead of being delivered only in hospitals and clinics, healthcare will be available wherever patients happen to be.”

From apps that connect patients to clinicians, to wearable devices that monitor vital signs from home, to platforms that assist in triaging symptoms and maintaining patient-centric medical records, digital technologies are supporting a new, virtual model of care, said cardiologist Dr. Sacha Bhatia, director of the Women’s College Hospital Institute for Health Systems Solutions and Virtual Care (WIHV), in Toronto.

“What we’re trying to do now is reimagine the way care can be delivered such that it works for patients,” said Dr. Bhatia. “It has to work for the right patient at the right time, and it has to work with the provider’s workflow.”

Launched in 2013, WIHV is a place where researchers, clinicians, patients and the private sector come together to evaluate emerging digital technologies. The goal is to examine effectiveness and utility in the clinical environment, as well as change management and health policy implications.

Some of the key questions investigated are: Is this technology actually improving people’s health? Is it reducing the cost of care? Is it improving patient satisfaction?

“The technology is really one component of a broader change management need,” explained Dr. Bhatia, noting that there are funding, private fee and safety implications associated with innovation, among others. “There’s all of that and then, at the end of the day, there’s the impact of that change on the way a patient experiences care and their outcome.”

WIHV currently has more than 20 projects under way in the digital health space, which includes virtual care platforms. Dr. Bhatia stressed that implementation criteria are just as important as design issues.

One example of a virtual care platform found to be successful is Big White Wall, a mental health peer support application designed in the U.K. to support people suffering with anxiety, depression, post-traumatic stress disorder and other conditions. The site is a 24-hour, seven-day service that provides a safe, anonymous outlet to share experiences, learn coping strategies or take self-assessments.

Clinically trained “wall guides” are constantly monitoring the site and will intervene if a user of the service is considered to be at risk.

After evaluating the platform with 1,000 patients across three Ontario hospitals – Women’s College Hospital, Ontario Shores Centre for Mental Health Sciences in Whitby, and Lakeridge Health Oshawa – WIHV found that patients who were given access to the wall recovered faster from depression than those who didn’t have access. As a result, the province of Ontario procured the site and is making it available to anyone who wants to log on, said Dr. Bhatia.

Another technology assessed by the institute,

called aTouchAway, is a communication and information sharing platform developed by Aetonix Systems of Ottawa that easily connects healthcare providers, patients and family members using photo-based contact lists similar to social media apps.

Earlier this year, Women’s College Hospital became the first in Canada to offer same-day knee replacement in an outpatient setting, using aTouchAway as the platform to connect patients to a virtual care team after discharge.

“Usually people stay in hospital for three to four days. We’ve got it such that they go home after knee replacement within five hours,” said Dr. Bhatia.



“They don’t go home alone; they go home with a suite of virtual care services.”

Patients enrolled in the same-day surgical program are provided with a computer tablet as well as an activity tracker and other Bluetooth-enabled wearables as required to monitor vitals. As the anesthetic wears off, they can connect with their care team through the aTouchAway app, configured specifically for the knee replacement program and its workflow.

In the face of hospital bed shortages, the innovation is expected to free up urgently needed beds for other patients. According to published reports, the cost savings are estimated to be between \$2,000 and \$5,000 per patient.

The success of the program – which is being extended to include hip replacement this fall – depends on selecting the right patient population to partici-

pate, typically former athletes and generally healthy people whose cases have less medical complexity.

“The key thing with virtual care is that you’ve got to know, who are the right patients, and who will benefit the most,” said Dr. Bhatia. “Patients need to be motivated, they need to be willing to do rehab quickly and they need to be comfortable with these sorts of technologies.”

Aetonix CEO Michel Paquet said his company set out to simplify the complexity of care at home, particularly for chronic disease sufferers and patients whose care coordination plans are complicated.

The easy-to-use app has two main components: a care supporter interface used by anyone who manages or supports the care of someone with health issues, including family members, and an interface for the person receiving care. Provided on iOS and Android devices, it is used by families to ensure the circle of care network supporting their family member is constantly in the loop; and by enterprises to provide more efficient and effective care to patients at home.

The app’s functionality includes customized alarms, reminders and alerts; self-reporting tools; videoconferencing, text messaging and group chat; a fully integrated fall bracelet; and, additional integrated devices to measure oxygen saturation levels, heart rate, blood pressure, blood glucose, body temperature, weight and activity levels. Once coordinated care plans are developed, they are modified and reviewed in the app, which will send alerts to everyone in the circle of care network whenever a change is made.

Dynamic workflow is supported so that developing a clinical protocol is as easy as outlining steps and logical paths to follow in plain English.

The software engine translates the instructions to machine language for implementation and will trigger specific actions based on predefined conditions. For example, if a diabetic with COPD is discharged from hospital, the app would alert the patient’s respirologist to ensure the appropriate medications are prescribed.

It would also remind the patient to measure their oxygen saturation levels at regular intervals. Based on the results entered, further actions might also be prompted.

“We have the platform as the engine and you as a professional decide what to build as a clinical protocol,” explained Paquet.

Lennox and Addington County General Hospital in Napanee, Ont., for example, is using aTouchAway to remotely monitor and support chronic obstructive pulmonary disease (COPD) patients from home with the goal of being preventive versus reactive. In addition to using the app, patients are also provided wireless devices to measure oxygen saturation and activity levels.

Laura Schauer, a registered nurse with the Thamesview Family Health Team in Chatham, Ont., is using aTouchAway to monitor chronic patients remotely, reducing the hours she needs to spend driving each week to make home visits.

One of her clients, a patient with chronic heart failure, routinely uses the app to share their weight and blood pressure with Schauer each day. When she noticed a trend towards lower blood pressure readings, she contacted the patient to discuss and learned that they had been feeling dizzy. She also

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e-Health 2018: Innovative telehealth projects provide benefits across Canada

Among the many tracks at e-Health 2018, held in Vancouver last May, were a number of presentations examining the important role that telehealth plays in Canada. What follows is a sample of telehealth topics discussed at e-Health 2018. Each of the presentations is available from the e-Health Virtual Library at <http://www.e-healthconference.com/virtual-library/>.

Mixed Method Exploration of Telehealth for Autism Intervention Services

Peggy Hancock, Nurse Educator, Western Regional School of Nursing, Corner Brook, NL; Karen Tulk, Regional Telehealth Coordinator, Western Health, Corner Brook, NL

Children diagnosed with autism spectrum disorder (ASD) within the jurisdiction of Western Health are eligible to receive early intervention services in the form of Applied Behavioral Analysis (ABA) therapy. Traditionally, orientation and follow-up are provided face-to-face, requiring travel by family members and healthcare providers (HCP). This modality has many limitations for families and HCPs due to the rural nature of the area as well as needs of families who care for vulnerable children.

Telehealth has been implemented to ensure access and efficiency at three distinct phases of the Western Health ABA delivery process, including the three-day ABA training, mentorship and support for healthcare providers, and to facilitate evaluation/communication with the family and home therapist in the child's home. The research team leading this mixed methods study have followed a patient-engagement perspective utilizing the Patient Provider Expectations Model which focuses on improving care/health/value through the initiation of better healthcare access.

Results from surveys of over 60 participants of the ABA training include 87% satisfaction rate among participants; significant cost savings (up to \$2,000 per participant); and emotional benefits (avoidance of travel and separation from children for training). Telehealth is now used to assist in the delivery of all sessions of the three-day ABA training.

Development of a Provincial eConsult Program: The Ontario Experience

Dr. Erin Keely, Co-Executive Director, eConsult Centre of Excellence, The Ottawa Hospital;

Dr. Clare Liddy, Co-Executive Director, eConsult Centre of Excellence, Bruyère Research Institute;

Dr. Rob Williams, Chief Medical Officer Ontario Telemedicine Network;

Elizabeth Keller, Vice President Product Strategy and Delivery, OntarioMD;

Gilad Epstein, Chief Operating Officer, Ontario Telemedicine Network;

Amir Afkham, Digital Health Lead, Champlain LHIN

eConsult is a secure web-based tool that allows physician or nurse practitioner timely access to specialist advice for all patients and often eliminates the need for an in-person specialist visit. The Ontario eConsult Program was built on the success of two pilot services - Champlain BASE Managed Specialty service and the Ontario



Attendees to e-Health 2018 were active participants at panels, offering questions and feedback each day.

Telemedicine Network's (OTN) Direct to Specialist service.

The initial pilot work, a collaborative effort of OntarioMD, OTN and Champlain BASE, resulted in over 75,000 eConsults (as of May 2018) being directed to over 100 different specialities – including dermatology, hematology, endocrinology and mental health. The many demonstrated benefits include timely access to non-urgent questions (average response time 2 days), lower cost, high patient satisfaction with care able to remain within the primary care setting, where patients are most comfortable and trust often the highest, and improved provider satisfaction with opportunities to enhance learning and build collaborative relationships.

With the goal of equitable access, eConsult is now available in all health jurisdictions in Ontario. A comprehensive, multi-faceted program, eConsult is built on clinical modeling, business process design, technology implementation and a governance framework. The new Ontario eConsult Program is accessed primarily through the secure OTNhub (otnhub.ca). The program is led by the Ontario eConsult Centre of Excellence (eConsult COE), housed at The Ottawa Hospital, in partnership with the Bruyère Research Institute.

Regional partners include Champlain BASE (Building Access to Specialists through eConsultation) and the South East Academic Medical Organization (SEAMO). Delivery partners are the Ontario Telemedicine Network (OTN), OntarioMD, and eHealth Ontario, with the support of the Ontario Ministry of Health and Long-Term Care. Services are now available across the province to physicians and nurse practitioners. The goal of the Ontario eConsult Program is to deliver 40,000 eConsults in 2018 and 140,000 by 2021.

Telehealth Integration for Residents of Long Term Care

Karen Tulk, Regional Telehealth Coordinator, Western Health, Corner Brook, NL; Shannon Perry, Project Manager Telehealth, Eastern Health, St. John's, NL

Despite the growth of Telehealth in Newfoundland and Labrador (host to the first telemedicine centre in Canada), long-term care (LTC) homes have had limited use of

this modality of service, resulting in high costs related to ambulance transfers and high risks to residents. Both the Eastern and Western regions are working to use telehealth to improve access to services for LTC residents.

As the Western region developed significant resources to assist in the transition to telehealth for LTC residents, they found that: overcoming education and training challenges lies in improving the confidence and competence of providers through standardization of telehealth education for staff at all levels; ongoing communication improved readiness at site and program level; and workflow concerns must be addressed as part of the change management process. Challenges included: addressing 'change fatigue' (from cumulative changes in the workplace related to technology); overcoming the as-

MoM offers real-time telehealth obstetrical consults for elective and emergent conditions through secure mobile devices.

sumption that clients should be seen in the same room as the provider; and dealing with caseload pressure.

Based on the successes of telehealth for wound care, surgery and psychiatry programs, new LTC programs to be added this year include programs offered by a Regional Behaviour Management Specialist as well as allied health professionals such as Occupational Therapists, Physiotherapists, and Social Workers in order to reduce transfers of residents or travel by these specialists.

The need for telehealth implementation in LTC at Eastern Health was identified when a report found 246 off-site appointments over a 28-day period, with 171 of those requiring an Eastern Health staff escort.

The project was identified as a two-year proposal, with year one focused on the implementation of telehealth services in 12 LTC facilities, and year two focused on uptake and utilization, as well as recruitment of healthcare providers.

A new Telehealth Nurse Specialist position was created for the project, focusing

on clinical education and implementation. The scope focused on pre-planned, scheduled outpatient resident appointments that could be captured by telehealth, with clinical goals of preventing unnecessary transfers as well as providing increased access to care.

Stakeholder Engagement focused on engagement sessions and site visits with each LTC facility, at a management level. Session priorities included information sharing; review of project scope, goals and objectives; and 'site champion' selection. Site visits uncovered a challenge: clinical space for the telehealth room was in short supply, as most sites were at capacity. Ultimately dedicated spaces were found at all but one site, where the telehealth room became a shared space with palliative care.

Supporting documents were created to improve the process and to assist nursing staff with resident and family education prior to a telehealth session. These documents included a Telehealth Long Term Care Resident Information Sheet, Telehealth Share Form Transfer of Information, as well as surveys and a teaching script. Implementation also included two-hour education sessions for Registered Nurses, Licensed Practical Nurses, and Personal Care Attendants at all sites.

Statistical results to date have indicated continually increasing uptake by participating sites. Feedback from providers, supporting staff, residents and families, has been extremely positive demonstrating that this modality of care is beneficial and welcomed by staff and residents of LTC.

Mobile Maternity (MoM) a New Kind of Telehealth

Mona Mattei, Centre for Rural Health Research, UBC

Mobile Maternity (MoM) is a new type of telehealth program and research project with the objective of documenting impacts of care provided closer to home for expectant mothers. Research documents social morbidities for women with high-risk pregnancies and their families, resulting from challenges faced by rural and remote residents who must travel to receive specialist care.

MoM offers real-time telehealth obstetrical consults for elective and emergent conditions through secure mobile devices, and support for precipitous deliveries in remote sites to mitigate these challenges. The consults differ from traditional linear communication between patient and specialist, to tripartite (PCP, patient and specialist) patient care planning.

MoM provides mobile devices for OB/GYN specialists to connect remotely with family physicians, nurse practitioners, midwives and patients. Using mobile tablets is a key to providing the service for emergent consults at any time from any site. Midwives use the devices to connect with specialists from the patient's home, making the access to specialty support instantaneous. MoM is offered in two regions with very different patient populations: Kootenay Boundary in the BC interior, and North Vancouver Island.

The service began in the Kootenay Boundary with Interior Health IT as part

CONTINUED ON PAGE 22

Big White Wall shows quantifiable benefits for mental health in Ontario

John lives in eastern Ontario, in an area with limited access to mental health resources, particularly after business hours. Having access to help when he needed it wasn't a sure thing. He was relieved when Big White Wall (BWW), a new online mental health service free to Ontarians, became widely available.

"With BWW there was immediacy of contact, either with someone going through a similar situation, or had been, or a moderator who could step in and give me nice guidance to get me through that moment safely," says John.

Big White Wall (bigwhitewall.ca) is an online support community designed to help individuals ages 16 and up cope with depression and anxiety, as well as social isolation.

The service doesn't require a referral, however, a healthcare provider can refer to the service. It is available free to users thanks to funding through the Ontario government and the support of the health regions in the province.

Users can connect with others around specific topics or challenges. The site offers guided support courses on topics, such as depression, anxiety, weight management, and smoking cessation. It also provides an opportunity to display feelings using images, drawings, and words to make bricks that are posted to the Wall.

"Big White Wall can be a tremendously useful option for people struggling with anxiety and depression while waiting for in-person support or as a stand-alone tool for those seeking a supportive community," says Harriet Ekperigin, Senior Business Lead for the service at the Ontario Telemedicine Network (OTN). "This is an exciting first for Ontarians to have direct access to this type of impactful tool at no cost."

Big White Wall, which originates in the UK, has been adapted for the Canadian population, and any information shared is safeguarded securely in Canada.

The service was introduced into Ontario by OTN and the Ontario Shores Centre for Mental Health Sciences, and was piloted at Ontario Shores, Lakeridge Health, and Women's College Hospital, with evaluation by the Women's College Hospital Institute for Health System Solutions and Virtual Care, before being offered province-wide.

A member survey conducted by Big White Wall found that:

- 70% of users saw improvement in at least one aspect of their well-being
- 46% of users reported sharing an issue for the first time
- 51% of users reported less mental health-related time off work using Big White Wall

Ekperigin is gratified to see the steady uptake of BWW and is working with the Local Health Integration Networks and colleges and universities to promote its availability. She sees great potential for Big White Wall to make a difference particularly among the youth population, with its well documented challenges with mental health stigma and judgement.

While Big White Wall is directly accessible without a referral, OTN is also supporting access to, and the scaling of, additional mental health resources for healthcare

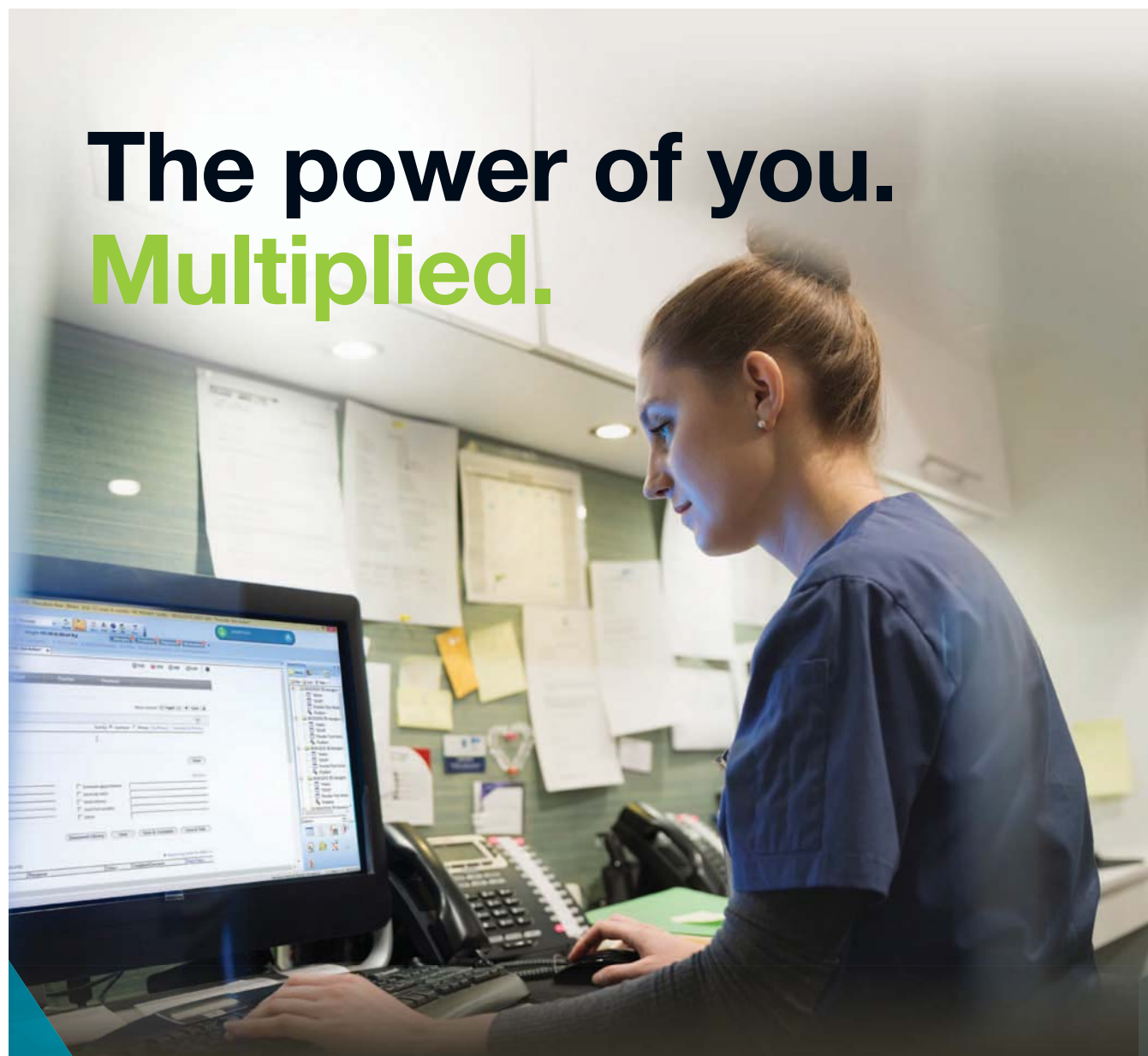
providers and organizations seeking solutions for their patients. These tools address the Mental Health Strategy for Canada recommendation to 'use technology to foster collaboration, increase access to services, and engage people in managing their mental health problems and illnesses.'

A mood and anxiety vendor of record arrangement is available through OTN's online Innovation Centre. It features four vendors: Big White Wall Ltd., MindBeacon Health Inc., Morneau Shepell Ltd., and TruReach Health Incorporated.

Each offers mature and market tested

mood and anxiety tools that support timely access to care, enhance self-management skills, and improve quality of life. Big White Wall was the first vendor selected from this VOR arrangement to support the provincial peer support platform.

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ner and focused on piloting the use of iPads with the health authority (HA) preferred software for video conferencing (Polycom Real Presence). Using the HA software allows specialists to connect with any site that has the common platform, including emergency room carts and sites without iPads. On Vancouver Island, the telehealth team uses Microsoft Surface Pro tablets with Cisco Jabber. Physicians are able to link into any existing telehealth sites as well as those developed specifically for the MoM Project.

MoM demonstrates that a collaborative model of care impacts patient outcomes by providing home-based access to specialist care while developing primary care provider skills. While patient volumes fluctuate across the seasons, feedback is clear: the service is reducing cost and risk, and women can stay in their hometown secure in the knowledge that they have support.

Breaking New Ground for Telehealth Programming

Mona Mattei, Kootenay Boundary Division of Family Practice

Interior Health and the Kootenay Boundary Division of Family Practice have collaborated in piloting telehealth in non-traditional settings linking primary care teams with specialists: between physicians for clinical decision support from rural emergency departments to regional ICU teams and other specialists for emergent care; providing pre-surgical screening access to anesthetists with the support of nursing or primary care teams at rural sites; between primary care teams and specialists using in-clinic systems and mobile devices.

Telehealth for rural areas is still a new practice for many physicians and there have been some challenges. While some patients embrace telehealth with enthusiasm, others are reluctant to change how they traditionally meet with their physician. The core of the work completed has been to create op-

tions and ensure systems are in place for when they are needed. Key successes are clearly linked to physician and nurse champions who enable patients to access care through the telehealth systems. Other key factors include ease of use of the technology, patient education, and relationship building between physicians themselves.

Breathing Easier from Home: Telehomecare Results

Lisa Saffarek, Michelle Wright, and Jessica Sullivan, Island Health; Linsey Bachiu, TELUS Health

Chronic Obstructive Pulmonary Disease (COPD) has the highest rate of admissions and re-admissions among major chronic illnesses in Canada, and is the only chronic disease with an increasing mortality rate. Home Health Monitoring (HHM) is gaining recognition as a clinically transformative health service that supports and accelerates transitions to

community-based, integrated primary care. HHM is now offered free to Island Health residents. It supports patients living with COPD or heart failure (HF), and allows clients to manage their condition from home and improve their knowledge of their chronic condition and ability to manage their own health.

History of HHM at Island Health:

- 2009: Initiated a home tele-monitoring pilot for HF population.
- 2013: Partnered with the BC Ministry of Health HHM provincial initiative and implemented a standardized HHM service for clients living with HF.
- 2016: The HHM Expansion project introduced HHM for COPD as well as expanded both COPD and HF HHM services across all of Island Health.

An evaluation was conducted to assess program objectives and outcomes. This evaluation fulfilled Canada Health Infoway requirements to plan and conduct an eval-

uation of the HHM Expansion project and to assess the impact of Infoway's investment based on healthcare quality, productivity and access. The evaluation found that HHM resulted in:

- 81% fewer emergency department visits

On Vancouver Island, the telehealth team is using Microsoft Surface Pro tablets and Cisco Jabber.

- 92% fewer inpatient admissions
- 94% fewer inpatient days

Positive interview responses included reports of reduced exacerbations, mortality, and morbidity; praise for the program's effectiveness; and client satisfaction in having the ability to control their condition at home and to be proactive about their health.

Virtual care is now being used by hospitals and clinicians

CONTINUED FROM PAGE 18

contacted the physician who ended up changing the patient's blood pressure medication remotely.

In a recent blog post, Laura said the app is also useful for sending and receiving photos. "I have a patient that frequently gets cellulitis and they live far away. To have the ability for them to send a photo of the wound and potentially infected area, and be able to get in touch with their physician quickly, can mean an avoided hospitalization because we had a quick intervention," she said.

In its report, EY points out that the next generation of mobile technologies, incorporating artificial intelligence, sensors and real-world analytics, will be a game-changer in delivering virtual care.

One Toronto start-up banking on that evolution is Insig Health.

Company co-founders Matthew Mazzuca and David Del Balso focused initially on developing a virtual assistant to help family doctors automate their workflow and more efficiently complete the patient care cycle in an office or clinic environment.

Mobile technologies, using AI, sensors and real-world analytics, will be game changers in delivering virtual care.

At the core of the platform, now called Tia Health to represent The Insig Advantage (Tia), is an intelligent questionnaire that serves as a triage service, gathering patient-specific information for each visit and automatically adjusting physician workflow according to the information received.

Early on in the product development

process, Mazzuca and Del Balso realized that doctors don't need help with diagnosis.

In fact, the partners routinely tap into the expertise of doctors for help in creating their online questionnaires and ensuring clinical protocols are accurate. The real pain point facing doctors, they discovered, is dealing with the 'business' that happens around them, from interfacing with administrative staff to documenting notes to accessing electronic medical records and maintaining efficient patient flow.

"Right now we're automating a lot of their workflow," said Mazzuca. "We're interfacing with the patient and getting all of the triage information...but also presenting the doctor with things they can quickly do to complete the care cycle." For example, if sick notes, prescriptions, referrals or requisitions for lab work are required, the documents are presented to the physicians with relevant information already embedded.

Rather than creating a virtual clinic from the ground up and hiring doctors to staff it, Tia Health focuses on supporting doctors so they can easily add virtual care features to an existing practice. The Appletree Medical Group has 44 clinic locations and more than 30 telemedicine sites in Ontario, with subsidiary clinics in Alberta and B.C.

Earlier this year, the group introduced Tia Health in Ontario. Appletree medical director Dr. Abhishek Raut said he believes virtual care platforms are the future of primary care. "While it may seem daunting to some, we have found the experience to be an incredibly natural extension into the humanization of medicine," said Dr. Raut, noting that his team is excited about the platform's ability to provide patients with a more compassionate experience in healthcare.

Appletree doctors are using the technology to remotely treat urinary tract infections and prescribe birth control, as well as for chronic disease management and weight loss. One of the benefits is that "a patient who should be resting and recovering can call in to see their doctor and receive the right medical care without exposing themselves or others to greater pathogen risk," he said. "Tia Health allows our patients to experience the best of both worlds. They are able to call in without disrupting their careers or their family time."

Denis Chamberland

CONTINUED FROM PAGE 16

extended period of time, which is not always possible.

Article 512.2 also allows for consecutive negotiations, with one supplier at a time, as long as there is "a deadline for the participating supplier to submit any new or revised tender prior to proceeding to negotiate with the next ranked supplier."

Consecutive negotiations tend to be much more manageable because the hospital focuses on one supplier at a time. The major downside of this type of approach, however, is that the competitive tension that drives value for the hospital has now dissipated.

In this scenario the table has been turned away from the hospital's position of strength (Caveat Venditor) to one of relative weakness (Caveat Emptor).

At this stage of the process, the hospital may believe it holds all the cards – after all, the bids are in and the pricing is fixed – but the value which the hospital leaves on the table, in the form of better pricing, lower risk of failure, and a more tailored solution, is unnecessary,

and frankly objectionable in terms of taxpayer value.

The optimal approach is to negotiate not with a single bidder, not with multiple bidders, but with two. Alternatively, start with several bidders but quickly bring it down to a manageable two. This is the essence of the Competitive Dialogue, which the Ontario Centres of Excellence offers as one example of innovation pro-

In the end, the fear to negotiate may turn out to be a much lesser concern than fear of change.

urement, and which is now being piloted across several hospitals in Ontario.

Finally, article 512 1(b) appears to throw all caution to the wind by allowing negotiations if it seems that "no tender is obviously the most advantageous in terms of the specific evaluation criteria set out in the tender documentation." What this language means exactly is unclear, but it is a fair assumption that a compelling value-for-money analysis supported by a well-articulated legal rationale would be required to set the

course of the negotiations while mitigating the risks of being challenged legally.

Article 19.11 of the Canada-European Union Comprehensive Economic and Trade Agreement (CETA), which came into force on September 21, 2017, sets out almost identical (and apparently the original) language to the CFTA on the forms that negotiations can take.

In sum, both trade agreements recognize the value that negotiations make available to public sector buyers. Of course, starting to negotiate when negotiations have never or rarely have been conducted is difficult. But change, and this change in particular, is coming. Hospitals must be willing to change and they must be willing to invest the resources needed to achieve the greater rewards that negotiations make possible. In the end, fear to negotiate may turn out to be a much lesser concern than fear of change.

Denis Chamberland is a commercial lawyer with extensive procurement, technology and trade law experience in the healthcare sector in Canada and Europe. He works with many hospitals on a variety of projects. He can be reached at dac@chamberlandlawcorp.com.



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