FEATURE REPORT: DEVELOPMENTS IN SURGICAL SYSTEMS – PAGE 16

Publications Mail Agreement #40018238

CANADIAN Healthcare Technology

CANADA'S MAGAZINE FOR MANAGERS AND USERS OF INFORMATION SYSTEMS IN HEALTHCARE | VOL. 20, NO. 2 | MARCH 2015

INSIDE:

PHOTO: COURTESY BAYCREST

Baycrest and Michener train students to help seniors

The Michener Institute, and Baycrest, both in Toronto, have developed a program that trains students in providing care to senior citizens – a fast-growing part of the population and one with special needs. A week-long summer course, held at the Michener, offers students experiences such as interacting with seniors, participating in scenarios, and wearing a frail aging simulation s suit. SEE STORY ON PAGE 4.

'Tricorder' enables patients to diagnose 15 illnesses

BY JERRY ZEIDENBERG

The Qualcomm Tricorder XPrize competition, an international quest to develop a portable device that can diagnose 15 ailments in a package weighing less than 5 lbs., will announce a winner in January 2016 – and a Canadian company is one of the 10 companies in the running.

The competition, named after Star Trek's famed Tricorder that could diagnose medical problems, was launched three years ago and testing of final products begins this May. The winner will take home $7 million, while those in second and third place will wind up with $2 million and $1 million. (http://tricorder.xprize.org/about/overview)

> **Cloud DX is the lone Canadian company in the $10 million Qualcomm XPrize competition.**

"We've got a very good shot at winning," said Robert Kaul, CEO of Cloud DX, which does the majority of its research and development in Canada. "But we're using this competition as a springboard to create usable products."

The company has a core staff of seven in product development, sales and marketing, and has offices in Kitchener, Ont., and Brooklyn, N.Y. It has also contracted another 40 technologists to help further develop the Tricorder XPrize product.

CONTINUED ON PAGE 2

Canadian company in the running for Qualcomm Tricorder XPrize

CONTINUED FROM PAGE 1

Cloud DX already produces and sells a $199 health monitor, named Pulsewave, that uploads results into the cloud for easy sharing among caregivers and family members.

The Pulsewave cuff is FDA cleared and licensed by Health Canada to measure blood pressure, heart rate and heart variability. In Canada, over 45 clinicians are using it to screen their patients, and five pilot projects across the country are validating and helping to further refine the technology. The pilots are located in Ontario and New Brunswick.

As part of the XPrize mission, the company is engineering a new, wearable vital sign monitor, called Vitaliti, which goes much further, measuring ECG, heart rate, heart rate variability, oxygen saturation, respiration, core body temperature, blood pressure, movement, steps and calories. It is expected to be commercially available in 2016 at a price of $349.

The company calls it the "most comfortable wearable ever designed. So light you can forget you are wearing it. Designed to be worn continuously for up to three days … and to not make you look like a robot!"

It, too, uploads results to the cloud for processing, storage and easy sharing of the data.

And a third technology combines the Vitaliti necklace with a device capable of analyzing blood and urine specimens in less than 10 minutes. Using a wireless camera and specialized software, it will also be able to detect skin lesions, and by attaching a small instrument, it will be able to assess lung function.

This expanded version of the Vitaliti is now being tested by Cloud DX before sending it off to the Tricorder XPrize competition. "We've created software capable of diagnosing all 15 medical problems," said Kaul. "We're now refining the prototype and doing the fine-tuning."

Those 15 medical problems include anemia, atrial fibrillation (AFib), chronic obstructive pulmonary disease (COPD), diabetes, hepatitis A, leukocytosis, pneumonia, otitis media, sleep apnea, stroke, tuberculosis and urinary tract infection.

As well, the device must be able to diagnose three of the following: Allergens (airborne), cholesterol screen, food-borne illness, HIV Screen, hypertension, hypothyroidism/hyperthyroidism, melanoma, mononucleosis, osteoporosis, pertussis (whooping cough), shingles and strep throat.

Finally, to qualify for the Qualcomm Tricorder XPrize, the device must also be able to determine vital signs: Blood pressure, heart rate, oxygen saturation, respiratory rate and temperature for 72 hours without discomfort to the user.

What sparked the competition?

With skyrocketing medical costs and a shortage of medical professionals in many regions, it's believed that a point-of-care device capable of accurately measuring vital signs and diagnosing serious ailments would help control costs and improve care.

Dr. Keith Brunt

As well, a portable device would do wonders in war-torn regions and remote countries beset by natural disasters, such as earthquakes and hurricanes. Indeed, Cloud DX was co-founded by Dr. Sonny Kohli, an intensive care physician at the Oakville Trafalgar Memorial Hospital, near Toronto, who volunteered his services in Haiti after the earthquake devastated the country in 2010.

Dr. Kohli found that point-of-care diagnostic devices would have been a godsend in such circumstances. The experience led him to launch Biosign Technologies, a company producing portable medical devices able to deliver quick and accurate vital signs and diagnoses, and the forerunner of Cloud DX.

The organizers of the XPrize competitions came up with the idea of awarding a large sum to a company that could produce an easy-to-use, effective and accurate device that enables consumers to diagnose their own medical problems. The Qualcomm Life Foundation, which is heavily involved in developing e-health solutions and investing in the innovations of others, was enlisted to sponsor the $10 million contest.

While there are myriad point-of-care medical devices on the market today, most are single purpose. For example, a patient must wear a cuff for blood pressure, another device for pulse and blood oxygen, and must turn to other point-of-care devices for analyzing urine and blood. (In truth, portable lab test devices of this sort are just entering the marketplace.)

"Medical devices, whether they're for the consumer or in hospital, usually do just one thing," said Kaul. "And they don't talk to each other."

Moreover, the results are often not readily available to all healthcare providers, so nurses and doctors tend to take readings over and over again.

By contrast, Kaul believes the cloud-computing approach of his company will solve the communication problem. And by putting 15 or more tests in a single box, it will produce a powerful diagnostic device.

"We're pushing the boundaries of what can be done in a self-contained system, in a short period of time," said Kaul.

A key factor is usability, as the Tricorder XPrize organizers insist the device must be easy to use.

And as a consumer device, cost is another big factor. Kaul believes his firm has an edge here, too, as the cloud strategy is a huge advantage. Not only does the cloud enable medical professionals to obtain quick and easy access to results, but the processing of medical data can be done centrally by powerful computers instead of inside each and every point-of-care device.

"If you upload to the cloud, you cut the cost by 90 percent," said Kaul.

Finally, the results have to be extremely accurate. A good portion of the Tricorder XPrize evaluations will deal with the clinical accuracy of the 10 devices in the competition.

Cloud DX is benefitting from the input of medical advisors and clinical trials. One of the trials is being conducted in Saint John, N.B., where a test is taking place under the direction of Dr. Keith Brunt, an assistant professor at the Dalhousie University School of Medicine and Director of Community Engagement and Innovation Development.

Dr. Brunt explains that most consumer medical devices are not clinically accurate, and instead are for "entertainment purposes only." With that in mind, the Saint John trial is determining how accurate the Pulsewave cuff is when measuring blood pressure, and how useful it can be in promoting and monitoring the health of patient populations, such as patients with diabetes and hypertension.

"We need to establish whether the accuracy of the cuff can support clinical decision-making," said Dr. Brunt.

He's all for the idea of remote monitoring of patients, as it would go a long way towards assisting patients in New Brunswick and across Canada. But it's crucial to ensure that monitoring devices are of high quality.

He explains that hypertension is often missed at sporadic doctor's appointments, but can be caught through regular monitoring over a period of several days or weeks.

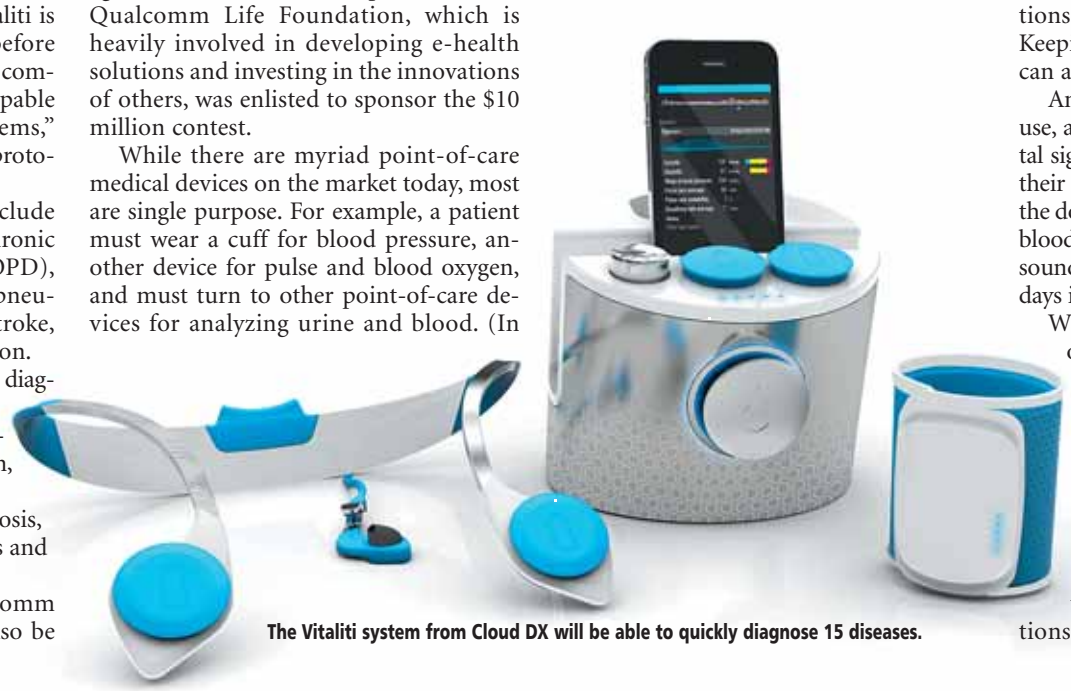
> **While there are myriad point-of-care devices for healthcare on the market today, most are single purpose.**

Moreover, there are tremendous cost savings and health benefits when vital signs can be monitored from a distance.

Many rural patients have trouble getting to their medical appointments, especially those who are elderly or frail, said Dr. Brunt. Moreover, these patients are also more prone to catching nosocomial infections when visiting hospitals and clinics. Keeping them out of medical institutions can actually promote their health.

And of course, if the technology is easy to use, and patients can easily upload their vital signs, it's possible to keep closer tabs on their health than through a monthly visit to the doctor's office. For example, if a patient's blood pressure suddenly soars and an alert is sounded, it can be treated within a matter of days instead of weeks or months.

While Dr. Brunt cannot yet comment on the findings of the trial, which is about half finished, Cloud DX's Kaul is confident the results will be positive. He not only believes that Pulsewave will rival catheter-based readings in accuracy, but that the technology will in many cases supplant the need for catheters. "By reducing the number of catheterizations, you can also reduce complications and infections."



The Vitaliti system from Cloud DX will be able to quickly diagnose 15 diseases.

CANADIAN Healthcare Technology

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

Volume 20, Number 2 March 2015

Address all correspondence to Canadian Healthcare Technology, 1118 Centre Street, Suite 207, Thornhill ON L4J 7R9 Canada. Telephone: (905) 709-2330. Fax: (905) 709-2258. Internet: www.canhealth.com. E-mail: info2@canhealth.com. Canadian Healthcare Technology will publish eight issues in 2015. Feature schedule and advertising kits available upon request. Canadian Healthcare Technology is sent free of charge to physicians and managers in hospitals, clinics and nursing homes. All others: $67.80 per year ($60 + $7.80 HST). Registration number 899059430 RT. Send all requests for permission to Jerry Zeidenberg, Publisher. **Publications Mail Agreement No. 40018238.** Return undeliverable Canadian addresses to Canadian Healthcare Technology, 1118 Centre Street, Suite 207, Thornhill ON L4J 7R9. E-mail: jerryz@canhealth.com. **ISSN 1486-7133**.

Publisher & Editor
Jerry Zeidenberg
jerryz@canhealth.com

Office Manager
Neil Zeidenberg
neilz@canhealth.com

BPA WORLDWIDE BUSINESS

Contributing Editors
Dr. Alan Brookstone
alanbrookstone@shaw.ca
Dianne Daniel
dianne.daniel@cogeco.ca
Richard Irving, PhD
rirving@schulich.yorku.ca
Rosie Lombardi
rosielombardi@hotmail.com
Andy Shaw
andy56@telus.net

Art Director
Walter Caniparoli
art@canhealth.com

Art Assistant
Joanne Jubas
joanne@canhealth.com

Circulation
Marla Singer
marla@canhealth.com

GE Healthcare

Rediscover space and movement

Discovery IGS 730

The Discovery* IGS 730 angiography system brings both extremely high-quality imaging and complete workspace freedom to the hybrid operating room. Its unique mobile platform brings all the power of a fixed imaging system to the table, yet it can be moved aside, so multi-disciplinary teams can complete procedures comfortably, with unobstructed access to patients. High-end fluoroscopy image guidance, advanced applications, 3D image fusion – it all comes on a sophisticated gantry that travels on predefined paths with laser-guided precision. Now one room accommodates a wide range of endovascular, cardiac, hybrid and open surgical procedures, free of interference from fixed floor or ceiling system structures.

imagination at work

gehealthcare.com/igs730

Osler contest challenges bright young minds to develop mobile apps

BY NEIL ZEIDENBERG

BRAMPTON, ONT. – William Osler Health System in January announced that a team of four grad students from the University of Toronto has won its second annual National Student App Contest. Victor Chen, Haley Liu, Jerry Tang and Cory Blumenfeld won for their app, called Outpatient, which focuses on lowering the number of patient re-admissions to hospital.

Outpatient features include: a list of discharge instructions for patients; an opportunity for patients to set alerts and reminders for medication, appointments, or important milestones in their recovery; an ability to tailor a care plan based on the set of discharge instructions they select; and a section of FAQs to help guide patients in deciding whether they should seek medical care after discharge.

The competition was held last November at a hackathon-style event, which attracted teams of high school, undergrad and graduate students. The purpose was to develop an innovative Android mobile app to help improve the patient experience at Brampton Civic and Etobicoke General Hospitals. The toughest part – they were given only 48-hours!

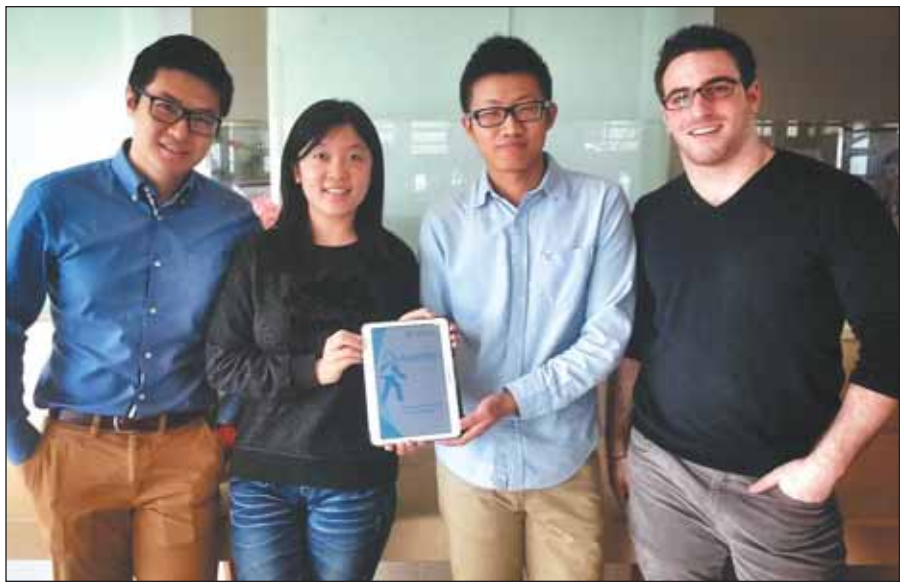
"Students were asked to build an app based on self-management, and not everyone competed live," said Susan deRyk, joint vice-president, patient experience, communication and strategy, Central West CCAC, Headwaters Health Care and William Osler Health System. "Being that it's a national competition, not everyone could be in Brampton, so we allowed teams to participate remotely via Twitter, Facebook or e-mail."

Early on, Osler tech-experts were on-hand so participants could ask specific questions about the app, and to ensure teams were on the right path. As an indication of how difficult it is to finish, let alone win the competition, only nine of the 14 teams that participated managed to submit a viable app.

The winning team was presented with $10,000, compliments of Fieldpoint Service Applications Inc. – a software management company based in Oakville, Ont. "Fieldpoint got to be part of the panel, to help support healthcare and play a role in helping the next generation of IT experts," said deRyk.

The judging panel was comprised of key members of Osler's IT staff; an industry leader from Fieldpoint and a member of Osler's patient experience team. When asked what the panel looks for in choosing the winning app, deRyk said, "The apps were judged on criteria such as originality; positive impact on patients; design and function; and providing a great user-experience."

Examples of these criteria can be found in last year's winning app – developed by Atinder Singh Multani. Called HosNav, it's a way-finding app that helps patients navigate through the labyrinth of hallways in a hospital without getting lost. "Imagine Brampton Civic Hospital, one of our two hospitals, over 2-million square feet, and one of the largest hospitals in the province. HosNav can help you find your way to wherever you're going, and provides you with information to prepare you for diagnostic testing, and what to do in advance – what to eat or not eat, what to wear and what to expect. It greatly improves the user experience," said deRyk.



A team from the University of Toronto won the contest for developing an app that lowers re-admissions.

To date, HosNav has been downloaded over 500 times and it's used in the organization every day. "If you're coming to an appointment, it tells you which parking lot to use, and provides maps so you know how to get to your appointment, said deRyk. "At a minimum, I use it many times a day. It's also rewarding to see others plugging it into their phones and using it too."

Multani, was asked about the challenges he faced in creating a useful app in such a short time. "The biggest challenge in developing was thinking about hospital management and patients as end users at the same time. I had to build something user-friendly by working around hospital infrastructure and management needs."

Despite the youth of contest participants, deRyk believes the contest can be successful because participants look at things from a different perspective.

Moreover, many had a significant connection to healthcare and were motivated to helping support the patient experience. "I think these are exactly the right kinds of folks to get involved in building apps like this. They're visionaries, non-conventional and they're seeking new solutions to problems. These students look at things differently than those who have been in the field for a long time. That's what makes it fresh, and they reach a little farther."

Program trains next generation of geriatric healthcare professionals

TORONTO – A new geriatric training course developed by The Michener Institute for Applied Health Sciences, in partnership with Baycrest, aims to prepare the next generation of healthcare professionals for the unique needs and care challenges of older patients.

Working With Seniors: A Primer for Healthcare Providers is available to students enrolled in Michener's applied health sciences programs who go on to careers in fields such as Diagnostic Imaging (DI), Nuclear Imaging (NI), Medical Radiation and Respiratory Therapy.

The program brings together Michener's expertise in responsive curriculum design and development with Baycrest's expertise in geriatric care and aging brain research, creating a one-of-a-kind education experience for young professionals embarking on careers in healthcare.

Currently, about every second patient admitted to hospital in Ontario is a senior. Education and skills development are needed to help this population, which is growing in size.

The intensive week-long training – now incorporated into Michener's summer semester – combines flexible learning formats, such as e-learning modules, with simulation experiences such as interacting directly with seniors, observing and participating in scenarios, and wearing an innovative frail aging simulation suit. The curriculum is designed to provide students with first-hand perspective and experiences of the challenges seniors often encounter during medical appointments.

Members of a seniors' advisory council from a local community health centre provided input for the content, along with a seniors' acting troupe known as ACT II. The actors participated in role-playing, real-world patient and professional caregiver scenarios for students to observe and engage in directly.

"The competency framework for this new program starts with the seniors' voices," said Gillian Nichol, director of continuing education and project lead with the Working With Seniors program at Michener. "This really is a 'patient's first' approach, and respects the opinions and perspectives of seniors as experts in their own care, reinforcing the whole concept of 'nothing about me without me'."

Results from the first cohort of 270 full-time students who took the program last summer were encouraging. Nearly all of the participants reported that their knowledge and understanding of seniors had improved considerably. This included greater awareness for respecting seniors' autonomy, creating senior-friendly environments, and being adaptive and responsive to the individual needs and wishes of seniors.

About every second patient admitted to hospital in Ontario is a senior, and caregivers need new skills.

"It was an eye-opening experience," said Elizabeth Pickles, a medical laboratory sciences program graduate, now in her clinical placement in Ottawa. "It reinforced the importance of customizing your approach around the needs of each patient."

Michener has now integrated the program permanently into its curriculum so that all students will enter their chosen career fields with basic competencies in working with seniors in a healthcare setting. Michener and Baycrest hope to extend the curriculum to Michener graduates, and general entry-to-practice healthcare professionals in the future.

"Our mandate is to be a responsive provider of educational solutions that meet current and emerging needs within the health system," said Maureen Adamson, president and CEO, The Michener Institute. "We are proud to be working with Baycrest to educate future healthcare professionals on the importance of understanding the unique healthcare needs of people as they age, an important part of providing patient-centred care and contributing to a sustainable healthcare system in Ontario."

"This has been a truly gratifying partnership utilizing our mutual strengths," added Dr. David Conn, vice-president of education at Baycrest, and co-chair of the Canadian Coalition for Seniors' Mental Health. "Together we've created a leading educational product that will help cultivate the clinical knowledge and skills required of health professionals caring for seniors."

New system for surgical patients helps them prepare, recover faster

BY JERRY ZEIDENBERG

TORONTO – A new computerized system, designed to help patients prepare for their operations before surgery and to help monitor their recovery afterwards, is proving to be highly effective.

The Toronto East General Hospital is testing the platform, called SeamlessMD, in a trial involving 70 thoracic surgery patients that began last December. The test has already resulted in fewer missed appointments.

It is also reducing patient anxiety – not a minor task, when patients are often worried sick about appointments, preparing for the OR and conducting wound-care in the weeks following surgery.

"We surveyed 30 of the patients, and we got a 100 percent satisfaction rate," said Mari Iromoto, director of improvement and innovation at Toronto East General.

Iromoto noted that in a three-month timeframe prior to the trial, there were six appointment cancellations for the three participating surgeons. By contrast, during the trial of patients using the app, there were zero no-shows.

Based on telephone consultations, Toronto East General also anticipates there will be a reduction in emergency room visits, as patients will be able to care for themselves better than before by using the computerized system.

SeamlessMD is the brainchild of physician-turned-entrepreneur Joshua Liu, MD, and his colleagues Philip Chen and Willie Kwok, respectively an engineer and computer scientist. The trio has been developing the app to improve the surgical experience and to reduce re-admissions – which are traumatic for patients and costly for hospitals and healthcare systems.

Dr. Liu said the average re-admission of a surgical patient costs $10,000. Re-admissions in Canada cost in the neighborhood of $1.8 billion annually, while in the U.S. they cost an astonishing $25 billion.

Mari Iromoto is director, Improvement and Innovation, at the Toronto East General Hospital.

Toronto East General is conducting the first pilot test of Toronto-based SeamlessMD in a Canadian hospital. The app is also being used at medical centres in the United States.

For its part, Toronto East General created the content for thoracic surgery patients, and adapted it to run on the SeamlessMD app. It instructs patients about what to do before their operations, when and how to contact their care-givers, and how to look after themselves once they've been through the operating room.

Most hospitals give patients a thick envelope full of text-heavy papers to prepare for surgery. For many patients, the tome is daunting and difficult to understand.

But SeamlessMD takes a different approach. It stores all of the needed content on the patient's smartphone, tablet or desktop computer, and the information is presented in a highly graphic and interactive way.

In many cases, the patient is directed to a video, where a surgeon explains what will happen and what is required of the patient.

In this way, patients can easily educate themselves about what they need to do before and after their operations.

"Our patients feel they're continuing their relationship with their surgeons," said Iromoto. "And they're absorbing the information better in this way."

She noted the hospital has many patients whose first language is not English, and written materials are harder for them to understand than videos and graphics. For this reason, SeamlessMD is a more effective way of learning.

The system also has text messaging about appointments, and will alert patients when they have an upcoming meeting with the surgeon or another caregiver. That's a big help to patients and prevents them from missing appointments.

SeamlessMD enables the patient's family, close friends and caregivers to access the system, so they can be aware of the protocols the patient needs to follow, as well as the appointments that are booked and the progress the patient is making after surgery.

In this way, it creates a well-informed support system for the patient.

"This was a nice surprise for us," said Iromoto. "We discovered that the system not only reduced the anxiety of the patient, but it also kept the whole care-circle informed about what was going on."

Importantly, the app guides patients on self-care during the post-op period by using a daily checklist. Each day, the patient logs in and goes through a series of questions about his or her health. Included are questions about temperature, breathing, and the state of the surgical wound.

"Depending on your responses, it tells you to continue what you're doing, or it links you to the videos we've created, or it may tell you to go right to the ED," said Iromoto.

That's already improved self-care in the cohort of patients, and has reduced their anxiety about what they should be doing.

"We've gotten feedback from patients saying they wouldn't even have looked at their wounds as often," said Iromoto. "Now, they're invested in the care of their wounds."

In the future, the app could be used to take photos of wounds, which could be transmitted to the surgeon for a look. That would reduce visits to the hospital, and would also help reassure many patients that their incisions are healing normally. TEGH is holding off on the photo sharing function for now, as it is still investigating the patient privacy implications.

As well, future versions of the app's checklist could be connected to caregivers, with real-time alerts. For example, if a patient notes an emergency, nursing staff could be informed right away through the app, and they could respond immediately by contacting the patient. "It has two-way capabilities, but we're not there yet," said Iromoto.

The SeamlessMD trial has had the full backing of TEGH's chief of surgery, Dr. Carmine Simone. As Iromoto said, "Dr. Simone is very enthusiastic about using technology to enhance the patient experience."

Women's College and Trillium announce 'innovation' partnership

TORONTO – Trillium Health Partners and Women's College Hospital have announced an innovation partnership to share and scale-up innovations that have demonstrated improved outcomes for patients and the health system as a whole.

These organizations are producing innovations to improve patient care through the Women's College Research Institute, WCH Institute for Health System Solutions and Virtual Care (WIHV) and the Trillium Health Partners Institute for Better Health.

The partnership will focus on:

- Bold patient impact: Strengthening capacity to shape the future of healthcare for patients and communities.
- Scalable Innovation: Translating new discoveries and adapting effective models of care to provide scalable and sustainable system solutions.
- Broad system impact: Delivering on meaningful health system quality outcomes.
- Synergizing our strengths: Pooling clinical, education and research strengths to drive tangible solutions and to advocate for health system reform.

The first project this partnership will undertake is called the X-OR. This WCH initiative has been focused on redesigning perioperative pathways and testing new surgical models to enable transformation of traditional inpatient procedures to outpatient or ambulatory procedures while improving outcomes and the patient experience.

Together, Women's College Hospital and Trillium will work to scale up select surgical innovations and transform care pathways in Ontario.

These projects may include testing new outpatient models of care that don't require patients to have overnight stays in hospital, improving access to specialists for primary-care providers through improved coordination, and reducing utilization of unnecessary tests or treatments.

"Women's College Hospital is committed to advancing the health of all women and delivering on health system solutions here at the hospital and beyond our walls," said Marilyn Emery, president and CEO, Women's College Hospital.

The first project is called the X-OR, which will redesign the perioperative pathways and test new surgical models.

"Our partnerships are central to our success as we extend our reach to ensure that our patients and communities have access to the highest quality patient care. Working with Trillium Health Partners, we will improve integration and care at transition points in the system where patients are most vulnerable to falling through the cracks and we will scale our ambulatory innovations to transform healthcare for patients across Ontario."

"At Trillium Health Partners, we are building a new kind of healthcare that can only be achieved through innovative, patient-centred partnerships," said Michelle DiEmanuele, president and CEO, Trillium Health Partners. "Through our partnership with Women's College Hospital, we have an opportunity to scale leading-edge innovations that will not only benefit our patients, but transform care for patients across Ontario."

Minimize downtime, maximize care time.

CareLink™ offers faster communication capabilities that include built-in messaging, a precise battery monitoring system and an intuitive touchscreen interface – allowing nurses to be more efficient at the bedside. It's not just about minimizing downtime. It's about maximizing the time nurses have to do what they do best: care.

ACCURATE BATTERY DISPLAY

FASTER COMMUNICATION

Rubbermaid® Healthcare

Developing the next-generation Canadian medical device entrepreneur

BY DAVE WEBB

When David Mravyan was looking to move into the $6.4-billion medical devices market in Canada, he was determined to start with a need, not a product.

Mravyan, an electrical engineer, and Will Mann, a biochemist he met when both were earning their MBAs at Western University's Richard Ivey School of Business, approached the Toronto Rehabilitation Institute to identify health problems that some technological innovation could help improve. "We wanted to do something real and useful," Mravyan says.

Toronto Rehab, part of the University Health Network, identified pressure sores as a serious problem. Common to bedridden and wheelchair-bound patients, these painful ulcers develop with prolonged, unrelieved contact with a surface. Aside from the pain, pressure sores open up avenues for serious and potentially fatal infections. With Canada's population aging, it is becoming a more common health issue.

Mravyan and Mann (who has since moved to another company) created SENSIMAT Systems Inc. With Toronto Rehab, they began work on SENSIMAT, a system that combines a thin, pressure sensitive mat wirelessly connected to monitoring software to help ensure patients were following their pressure-relief regimen. "Think of it as a FitBit for wheel chairs," Mravyan says.

SENSIMAT can be retrofitted to wheelchair seat pads. Software alarms tell the patient when he or she is due for a pressure relief, and monitors whether the correct action – say, a right lean – is performed. If patients perform their reliefs themselves on schedule, there's no alarm, so there's also an element of conditioning, Mravyan says.

With the concept product this far along, the company turned to George Brown College to help complete the bigger picture: how the product would perform in a clinical environment, like a hospital or continuing care facility.

Nursing students from George Brown's Centre for Health Sciences learn in a technologically sophisticated environment. At the college's three-year-old waterfront campus in Toronto, simulation suites, with mannequins wired to exhibit systems and react to intervention, put students in situations they may encounter in the real world. Alongside, a 60-bed, five-ward simulated hospital serves as a practice lab for learning practices and procedures, as well as exposing students to cutting-edge technology.

It's the simulated hospital where healthcare device entrepreneurs like Mravyan have the opportunity to further develop their products as they attempt to bring them to market.

After George Brown's Advanced Prototyping Lab had helped redesign the hardware and printed circuit board, students and faculty from the Centre for Health Sciences designed scenarios that simulated real-life conditions, while SENSIMAT collected wireless data over a three-month period.

"The interesting part about this is that it's being conducted as part of the third year Bachelor of Science program," says Robert Luke, PhD, Vice-President of Research and Innovation at George Brown. "It's a kind of experiential learning. We think this has real benefits, not just for the company, but for the students, who gain practical experience and needed innovation skills."

"The study at George Brown went really well," Mravyan says. "We collected a lot of data." So much so, in fact, that SENSIMAT now has the world's largest mobile seating database. Mravyan is still sifting through the data for each scenario, examining in aggregate how effectively and efficiently the hospital performed. This kind of analysis has implications for medical institutions in terms of monitoring practices, wringing out efficiencies and identifying at risk patients. For example, if Mr. Smith in Room 425 hasn't moved in eight hours, a nurse can be sent to intervene.

The development of SENSIMAT isn't the first healthtech development project

CONTINUED ON PAGE 22

eHealth

Metro Toronto Convention Centre

May 31 - June 3, 2015

Making Connections

Canada's ONLY National e-Health Conference and Tradeshow

KEYNOTE SPEAKERS

Kerry Munro
Digital Leader, Social Marketing Expert & Former COO, Syncapse
@kerrymunrois

Dr. Samantha Nutt
Global Humanitarian, Founder of War Child & Bestselling Author
@SamanthaNutt

CONFERENCE HIGHLIGHTS

- Compelling education focused on digital health, connectivity & the future of Canadian healthcare
- Ground-breaking, innovative health IT on Trade Show floor
- Insider insight on key topics like accelerating interoperability & patient-centred solution collaboration
- Great networking opportunities across all sectors of care
- Canadian Health Informatics Awards Gala

EARLY BIRD RATE

Save by registering before

APRIL 7, 2015

Register NOW

SPONSORSHIP & EXHIBIT OPPORTUNITIES

GET ON BOARD TODAY AND TAKE ADVANTAGE OF THE MANY BENEFITS

- Breakfast session popularity grows as more new initiatives and the latest R&D efforts are showcased
- Vendor sessions draw significant conference traffic
- Exhibitors report growing their social media followers: **"We booked more than 100 client meetings and grew our Healthcare Twitter followers by 8% over three days."**
- Great opportunity to gain leads and arrange client meetings

Connect with us!

@eHealth_2015 & #ehealth15

www.e-healthconference.com

CONFERENCE HOSTS

Association canadienne d'informatique de la santé
COACH™
Canada's Health Informatics Association

Canadian Institute for Health Information
Institut canadien d'information sur la santé
CIHI ICIS

Canada Health Infoway
Inforoute Santé du Canada

Accurate, consistent BMD testing is the first step towards bone health

BY DIANNE DANIEL

It's called the silent thief. You go about business, leading a normal life, and then one day you trip. Instead of bouncing right back up, you fracture a bone in your wrist. You instantly blame the fall, when the real culprit is osteoporosis – a condition that is stealing your bone density and you don't even know it.

Unfortunately it happens all too often in Canada, says Dr. Angela Cheung, director of the Osteoporosis Program at University Health Network (UHN) in Toronto and chair of Osteoporosis Canada's Scientific Advisory Council. Osteoporosis Canada estimates one in three women and one in five men will suffer a fracture caused by osteoporosis in their lifetime. In fact, osteoporosis accounts for more than 80 per cent of fractures occurring in people 50 and over, with most breaks occurring in the wrist, hip, and spine.

Which is why Dr. Cheung and others are working to raise awareness about bone health, in general. That includes the need for accurate, consistent bone mineral density (BMD) scans, a very precise test that measures the density of minerals in your bones in order to determine their strength.

"Bone and muscle is the new frontier," says Dr. Cheung. "Nowadays we're looking at it from an organ perspective. Bone is an organ and when you have a failure of an organ, there's a problem."

Just as we use terminology like heart attack and heart failure, she believes fractures should be considered as either bone attack or bone failure. And with that shift in viewpoint comes a strong focus on prevention, starting with bone assessment.

In October 2014, UHN became one of the first sites in Canada to install the Horizon dual energy X-ray absorptiometry (DXA) imaging system from Hologic Inc. The system is distributed in Canada by Christie InnoMed. Osteoporosis is one of three critical health problems assessed by the platform, which is also used for cardiovascular disease and obesity.

A significant advancement is the system's ability to perform a single energy femur exam, enabling clinicians to more accurately detect the dreaded black line or stress fracture, a common indicator used to determine whether a patient is at increased risk of future bone fracture.

"Bone density scans usually get only a certain part of the hip; this scan looks at the whole femur," explains Dr. Cheung, noting that another improvement is the ability to treat heavier patients, up to a maximum of 500 pounds.

The Horizon DXA provides a 10-year fracture risk report that takes additional risk factors into account to determine if a patient is low, moderate or high risk. A high risk score means the likelihood of a fracture over the next 10 years is 20 percent or greater.

The new system also offers a high definition capability to significantly improve detection of vertebral fractures, roughly two-thirds of which typically go undetected, says Dr. Cheung. "Maybe you notice you're losing height and have to shorten your pants or shirt, or you may notice your tummy is sticking out," she explains. "What you may not know is that you've had a spinal fracture. This system will detect that."

"The Horizon system is both a bone densitometer and a low dose X-ray imaging system," said Kevin Wilson, PhD, Scientific Director, Hologic, Inc. "This allows the physician to assess the two most important risk factors for osteoporosis, bone density and the presence of vertebral fractures – at the same visit with one device. Additionally, the imaging capabilities of Horizon allow for the early detection of features consistent with developing atypical femoral fractures, a rare, but worrisome side effect associated with some osteoporosis treatments."

Osteoporosis Canada recommends BMD testing for all women and men over the age of 65. Testing at a younger age is suggested if you fall into a higher risk category, which may include premature menopause, smoking, and other factors.

2015 JOINT CONGRESS ON MEDICAL IMAGING AND RADIATION SCIENCES

MAY 28 – 30, 2015 | PALAIS DES CONGRÈS DE MONTRÉAL, QUÉBEC

COLLABORATIVE CARE
IMAGING AND TREATMENT

KEYNOTE SPEAKERS

André Néron
Président du Comité de patients experts
Université de Montréal, Montréal

Gerard Farrell, MD
Associate Professor and Director eHealth Research Unit
Memorial University, St. John's

George Wells, MD
Professor, Department of Epidemiology and Community Medicine Director
University of Ottawa Heart Institute, Ottawa

This bilingual congress is co-hosted by the Canadian Association of Medical Radiation Technologists (CAMRT), the Canadian Association of Radiologists (CAR), the Société canadienne-française de radiologie (SCFR), and the Ordre des technologues en imagerie médicale, en radio-oncologie et en électrophysiologie médicale du Québec (OTIMROEPMQ). The congress features a rigorous scientific program and offers unparalleled opportunities for collaborative learning and professional networking among radiologists, medical radiation technologists and other members of the medical imaging team.

The compelling and topical theme – *Collaborative Care – Imaging and Treatment* – will be infused throughout with provocative lectures, informative workshops and exhibit sessions and will carry on into the Exhibit Hall, a large showcase for today's – and tomorrow's – innovative products and practices. For further event details, including the congress learning objectives and program topics, see overleaf.

SOCIAL EVENTS

Social events at the Joint Congress will provide attendees the perfect occasion to mingle with colleagues in a more relaxed setting. Reconnect with old friends and make new ones at the Welcome Reception to be held on Thursday, May 28 at the Exhibit Hall and be sure to reserve your tickets for an enchanting evening with world renowned Cirque Éloize on Friday, May 29.

REGISTRATION
www.jointcongress.ca

LA SOCIÉTÉ CANADIENNE-FRANÇAISE DE RADIOLOGIE
Développement Professionnel Continu
ASSOCIATION DES RADIOLOGISTES DU QUÉBEC

CAMRT ACTRM
Association canadienne des technologues en radiation médicale
Canadian Association of Medical Radiation Technologists

Canadian Association of Radiologists
L'Association canadienne des radiologistes

Ordre des technologues en imagerie médicale, en radio-oncologie et en électrophysiologie médicale du Québec

An interview with Mike Barron of COACH: A president's perspective

BY MIKE MARTINEAU

The Canadian Organization for the Advancement of Computers in Health is celebrating its 40th anniversary this year. More commonly referred to as COACH, this stalwart of the Canadian health IT sector has consistently championed the cause of digital healthcare solutions and has advocated on behalf of the health informatics professionals who make it possible. What does the future hold for COACH, and why should someone join? I put these and other questions to Mike Barron, the current COACH president, in an interview prior to the Christmas holidays.

Ordinarily I would refer to the subject of an article by his or her last name: e.g. Mr. Barron. However, in this case, doing so simply doesn't suit the personality of the man. He is one of the most affable and down to earth executives I know. He pulls no punches yet manages not to offend, no matter how blunt his comments might be. 'Mr. Barron' just seems too formal and stuffy for such an approachable and friendly man. Instead, I will use his first name.

I asked Mike how he ended up working in healthcare. He explained that his first important job was with the Royal Commission on Hospital and Nursing Home Costs in the mid 1980s.

Two years later, he moved to the General Hospital Corporation in St. John's in the role of Director of Information Systems. This task, he explained, introduced to him to the "complexities of healthcare." It was a "rewarding yet challenging" assignment.

At the turn of the new century Mike joined the Newfoundland and Labrador Centre for Health Information (NLCHI) during what he referred to as their "early days." In 2006, Mike was appointed NLCHI's CEO.

Given his demanding job, I asked Mike why he devotes time to COACH. He explained that when he first joined NLCHI, Canada Health Infoway was in its formative years and he was involved in various federal/provincial/territorial (FPT) committees. These committees gave him a "taste of national vision and leadership."

Getting involved at the board level at COACH was a natural extension of his other national roles. According to Mike, it gave him "an opportunity to participate in an organization outside government" that involved both public and private sector organizations.

Mike has devoted his working career to the health sector. Healthcare, he observed, is "something that glues us together as Canadians – besides hockey – and is a subject about which he is unabashedly passionate. His involvement in COACH provides him another outlet besides NLCHI to feed this passion.

COACH's Role: When asked how COACH fits into the complex Canadian digital health ecosystem, Mike replied that it is the "glue for the health informatics environment." While COACH is not, in Mike's words "a one stop shop", he does feel it is, "a place where people from different communities can gather."

Some people with whom I have spoken wonder how COACH is different from HIMSS, an organization with Canadian chapters that is also focused on digital health. Mike pointed out that COACH "offers more accessibility and more meaningful engagement." While HIMSS supports a largely private sector constituency, COACH "brings together public sector necessity and private sector reality."

Some people have suggested there might be economies of scale to be gained by combining COACH and ITAC Health to create the Canadian equivalent of HIMSS. I asked Mike what he thought of this suggestion.

Mike Barron is the current President of COACH.

While he didn't rule out the possibility in the long term, he felt it was important to recognize that "in the current environment, we need to ensure we don't lose sight of the constituencies that these groups represent" as well as "the contributions these associations offer today."

Mike pointed out that many of the same benefits attributed to the merging of two organizations could also be achieved by partnering. He pointed to collaborative efforts with ITAC Health and CHIMA as examples. "As Canadians, we are not predatory in nature," Mike noted. "Partnerships are often a preferred model."

Membership: According to Mike, membership has remained stable between 1,400 and 1,800 members. Chicago-based HIMSS, by comparison boasts 52,000+ members. It never ceases to amaze me how many people in the Canadian digital health community have opted not to join COACH.

I asked Mike about COACH's plans to grow membership, a stated objective in their 2014-2017 strategic plans. He replied, "You don't need numbers to denote success." Instead, COACH is striving to "balance quality and quantity."

He also said that COACH is looking for "engaged members" who can "carry the message into various areas of the health system."

Why should someone join COACH? Without hesitation, Mike rattled off a number of reasons, all sharing two common themes. First, COACH is one of the most effective ways for anyone with an interest in digital health to broaden their horizons. COACH, Mike observed, offers "exposure at very low cost to an extensive knowledge base" and "provides information about and exposure to different areas of health informatics."

Second, COACH offers an opportunity to become a more active participant in the healthcare system and to join "a complete national network of very bright and experienced healthcare professionals."

Annual eHealth Conference: For many people, the COACH brand is most closely associated with the annual eHealth conference it co-hosts. Over the past few years both revenue and attendance have declined leading some people to question the conference's relevancy. Mike acknowledged that there is a "need to make it more applicable and attractive" but also asserted "as a conference it will remain relevant by sheer nature that it's the only national conference."

While there are factors such as travel restrictions over which COACH has little control, Mike was emphatic that the annual eHealth conference is an event to which COACH is committed. He spoke about a number of ideas for refreshing the annual eHealth conference, starting with a "need to embrace youth." According to Mike, COACH and its partners are "concentrating on bringing value and entertainment" and striving to "make the conference a more diverse experience."

On a Personal Note: I closed up my interview with Mike by asking about his personal goals for his two-year tenure as COACH president. He told me he had two goals. First, he is "very much into strengthening COACH as a sustainable entity" which, he said, was a natural extension of his involvement in the business side of COACH for many years.

His second goal is "to reach out to the youth element." He wants to create a critical mass of members under 40 years old to "carry the torch" after he and other long-time members retire.

Are you a COACH member? If so, why? If not, why not? Drop me a line at michael.martineau@avenant.ca or comment on my blog posts on this topic at eHealthMusings.ca.

Why I will be using telehealth in my addictions practice 2015

BY DR. ALAN BROOKSTONE

A number of years ago I began to work in addictions, an area of practice that I now find extremely satisfying despite all of its inherent challenges. In comparison to family practice, with a practice roster of over 1,500 patients, I now look after less than 100 patients. Many of these have a high level of acuity as well as concurrent mental health issues and comorbid diseases such as HIV and Hepatitis C.

While many patients struggle with their substance use issues on a daily basis, a significant number are stable and some have been in recovery for years. They are also very grateful for their recovery and continue to depend on their physicians, sponsors, support groups and counsellors to maintain their sobriety.

Patients with addiction issues have some unique challenges that make them very good candidates for remote care or telehealth. They may have to travel long distances to attend clinic appointments, which is complicated by a need to depend on public transit.

Dr. Alan Brookstone

They frequently have financial issues as a result of their addictions, resulting in great difficulty if they need to purchase transit tickets. In addition, if working, they may be in remote locations, creating added difficulty in attending appointments consistently.

While telehealth is not appropriate for the majority of patients with addiction disorders, there is a specific patient population in which it is not only appropriate, but preferable to use telehealth services to provide care for these individuals.

Telehealth is not a replacement for face-to-face care. It is an adjunctive tool that can be used very effectively to maintain continuity of care in situations in which it is difficult to see patients face-to-face.

In addiction treatment, developing a therapeutic alliance with a patient is a critical part of their recovery. Many of these individuals are victims of physical, mental or sexual abuse.

They have been abandoned by friends and families and lack any structured support systems. It takes time to develop a therapeutic alliance upon which patients can depend, particularly when making difficult changes to behavior that are uncomfortable mentally as well as physically. Addiction patients are not good candidates for walk-in type care. They need this continuity in order to maintain their progress as well as their long-term sobriety.

Our addiction medicine practice is fully EMR enabled. We also have a platform to provide teleconsultation services. I personally looked into a number of services, each of which has pros and cons.

Polycom is an advanced teleconferencing system that is widely used in healthcare and within the provincial regional healthcare facilities, so using a Polycom system may make sense if you plan to provide teleconsultation services to patients in regional settings.

After an extensive review I selected Medeo as my primary teleconhealth platform. Medeo provides a waiting room for patients, scheduling service, secure messaging and the ability to use desktops as well as mobile devices such as telephones or iPads.

It is my opinion that Medeo is one of the leading telehealth platforms in Canada and one that could very effectively meet the needs of physicians who provide remote care to their patients.

Based upon my use of the platform, CanadianEMR will be promoting Medeo as a telehealth platform in 2015 for Canadian physicians.

Dr. Alan Brookstone is a Vancouver-area physician and creator of the CanadianEMR website.

VIEWPOINT

Faster, cheaper, and more portable tests will detect diseases earlier

Instead of visiting clinical labs, consumers may soon drop into their local drug stores for lab tests.

BY MICHAEL SMIT

As West Africa struggles with an Ebola outbreak that has stretched the capacity of healthcare systems and left thousands dead, researchers around the world are rushing to find solutions. Dr. Lee Gerhke, leading a joint MIT-Harvard research lab, believes his new test will help contain the epidemic.

With challenging circumstances in the field, Gerhke is taking a low-tech approach. Paper printed with specific nanoparticles reacts to the presence of Ebola virus in a single drop of blood, giving visual results within thirty minutes from a kit that is small, portable, and easily used. As Gerhke tells MIT News, "Waiting an hour for lab results could mean infecting the rest of the waiting room." Rapid results allow patients to be isolated and treated faster, hopefully turning the tide against the disease.

Gerhke's group is just one of many recent examples for how new technology improves disease detection. Rapid HIV tests that don't require a needle have been approved in Canada for almost a decade, but new changes to the availability of the tests have been credited with recent successes in detecting the virus earlier.

Bob Rai, pharmacist and co-owner of six Medicine Shoppe franchisee pharmacies and PharmacyBC.com, recently partnered with local health authorities and regulators to offer the first pharmacy-based 'point-of-care' HIV tests in the country. With pharmacies at the front line of our medical care system, Rai hopes to improve accessibility and remove the stigma associated with HIV testing.

Seventy-six percent of patients who took an HIV test at his pharmacy did so for the first time. His pharmacies are also now offering other tests that look for twenty-one different biomarkers, returning results within minutes to a tablet computer, and available anytime online so patients can track their health.

Miniaturized testing is becoming big business. Theranos, a secretive testing company from Palo Alto, Calif., was recently valued at $9 billion, and has partnered with forty-one Walgreens pharmacies across the United States. Founder Elizabeth Holmes – named by Forbes as the youngest self-made female billionaire – argues that between fear of needles, cost, and inconvenience, people avoid tests they should get – even those ordered by their doctor.

By testing multiple indicators with one, inexpensive kit (three dollars, at Walgreens), she hopes Theranos will make it easier for patients to take a more proactive approach to their health. From a painless finger prick, Holmes says her labs can return results on cholesterol and dozens of other indicators, relying on automation and computer algorithms to provide the same quality of testing that normally requires multiple large blood samples.

> **Using a sample collected from a painless finger prick, Theranos says it can return results on cholesterol and dozens of other indicators.**

Possibly taking this new paradigm one step further is Google X, the company's more far-fetched innovations lab, which hopes to make disease detection nearly immediate. Their contact lens tracks glucose levels for pre-diabetics or diabetics, with feedback given by tiny indicator lights viewable to the wearer. Google X is even developing blood tests that work internally: pills with magnetic nanoparticles that react to specific molecules in the bloodstream, with results displayed on a special watch-like device. With nanotechnology, wearable devices, and implant technology all making incredible leaps forward recently, these tools may not be as far off as one might think.

Michael Smit is VP of marketing at QHR Technologies, in Vancouver.

Some tests aren't just moving into the bloodstream; they're moving up the family tree. Genomic results may one day be our modern fortune-tellers, giving us probabilities related to any number of diseases. 23andMe recently expanded to Canada, where its $199 mail-away saliva kits offer interpretation of 108 characteristics and conditions.

The company's Canadian website promises that understanding your risk factors lets you "change what you can, manage what you can't" and that your genetics can tell you about "your response to certain medications." However, The US Food and Drug Administration have not approved the test for these sorts of health results, so American consumers can only see their ancestry information and raw data results.

Anyone can get a test done by Theranos, but will everyone know how to interpret the results without a doctor? Are people ready to discover the likelihood of passing a rare disorder to their children from a mail-away genetic test?

The innovation occurring in testing needs to be met by similar innovation in how we engage with trained health professionals for correct interpretation of this ever-expanding personal health information. 'Patient-centred care' requires not only empowerment of the patient, but also greater empowerment of physicians and practitioners, achieved through either increasing access to care for patients or expanding the scope of practice for individual health professionals.

REBOOTING eHEALTH

Ten questions seeking answers: Our way or the Infoway?

BY DOMINIC COVVEY

I am often asked about my opinion or thoughts about Canada Health Infoway. I try my best to express a balanced view, looking at the pluses as well as the minuses and perhaps even things that don't fit well in a binary space, but are interesting.

Infoway has been involved now in a self-evaluation, so it might be productive to ask some probing questions and to challenge you to share your answers with Infoway.

Question 1: What are the crucial immediate, medium-term and long-term health priorities – and how important are they – on which Infoway should concentrate its efforts and resources?

Surely we should not be engaged in investment in technology for its own sake. The development of technological solutions must have specific, clearly stated, defensible and measurable health and health economic outcomes as its purpose. Anything less is not a real strategy!

Question 2: What are the effects Infoway should enable, facilitate or directly achieve related to these priorities and how significant are they?

We need to know exactly what Infoway is trying to measurably change to the advantage of patients and the health system, and how important these changes are. Important means things like how much illness avoided, how many lives saved, how many more patients adequately cared for, etc. Stating this would set up a framework for monitoring Infoway's achievements. Without this, it's impossible to judge results.

Dominic Covvey

Question 3: For each of these priorities and to achieve these effects, which are the crucial immediate activities that Infoway should undertake (including activities which are foundational to others)?

Answering this question would allow the transparent setting of priorities for further development and show how actions and investments are linked to these activities.

Question 4: In what sequence should Infoway sequentially proceed in terms of undertaking these activities?

If we knew the answer to this question, it would clarify the order in which things are being done and allow all of us to see any dependencies and pressure redirection if the process drifts off-course.

Question 5: In the priority order of the answer to question 1, what are the specific projects that Infoway and partners should undertake and how do these projects map to the achievement of desired effects?

CONTINUED ON PAGE 22

How hospitals can reduce the risk of employee privacy breaches

BY BRADLEY LIMPERT

The media have been full of reports recently of privacy breaches at hospitals. These breaches come with many risks for the hospitals and their patients. A number of best practices are emerging for pro-actively addressing these threats.

From a legal point of view, implementing these best practices is important to ensure that the hospital minimizes its potential liability in the event of a privacy breach.

A number of these breaches have been caused by rogue employees and contractors. A further reason to implement these practices is to help ensure that such personnel can be identified, and appropriate measures can be taken to manage the situation.

Control over external threats: Hospitals need to minimize the risk that outside people and entities will be able to access personal health information without authorization. There are two key approaches that can be used here: encryption, and controlling the use and storage of personal health information on mobile and outside devices. Taking these steps will also reduce the risk that a rogue employee could cooperate with someone outside of the hospital to use personal health information without authorization.

Encryption: The Privacy Commissioner of Ontario, as well as those in other provinces, has made it clear that personal health information needs to be encrypted in one or more ways. Encryption can occur at the level of the file, the hard-drive, the server, etc. In light of the strong and clear statements and recommendations made by the Privacy Commissioner, it would be difficult to justify not implementing systematic and comprehensive use of encryption.

Control over mobile and external devices: It is easy for personnel to remove personal health information from hospital systems and to use, store or access this on mobile devices, such as tablets and smartphones, on laptops and on home computers.

There have been a number of reported cases where this type of personal information has been lost, for example, when a laptop containing personal health information has been stolen from its owner's automobile.

Hospitals will want to ensure that they have written policies describing what personal health information can be used on mobile and external devices. Hospitals may also wish to clarify the extent to which hospital IT systems can be accessed from public Wi-Fi networks, for example, the network at your local coffee shop.

Programs can be installed on personal devices so that if they are stolen, after a brief period of time their memory will be wiped clean.

Control over internal threats: There are a number of steps that can be taken to help identify rogue personnel, and how they might have accessed and used personal health information without authorization.

Activity logging: Keeping electronic logs or records of who accesses specific health records and information is a critical aspect of identifying unauthorized access to personal information. Such logs can record who accessed data, when the data was accessed, and any associated actions (e.g. whether the personal health information was printed, stored, emailed, etc.).

This activity logging is critical to determine whether people who have some authorized purposes to access the data have also been engaged in unauthorized activities.

"Need to Know" data access: In particularly sensitive situations, it may be desirable to grant access to patient health records only to those people who have a "need to know." This is inefficient and awkward to implement, but where celebrities or people who are otherwise notorious are patients, this may be the only way to avoid unauthorized disclosure to the curious or star-struck.

Staff education: There is a role for ongoing education to remind staff of the consequences of unauthorized access to personal health information. As more scenar-

CONTINUED ON PAGE 22

Canadians push the bounds of imaging to improve surgical outcomes

Phantoms, software and virtual reality systems enable surgeons to work with greater precision.

BY DIANNE DANIEL

Medical students who grow up playing video games may have an advantage when it comes to the latest advances in image-guided procedures. Being able to control images on a screen without watching your hands is a useful skill to have.

"For them it comes naturally," said Dr. Elvis Chen, research associate at Robarts Research Institute, University of Western Ontario in London, Ont. "Older surgeons tend to look at their hands instead of the monitor."

Dr. Chen is a member of the Institute's imaging group, led by Dr. Terry Peters, PhD. The team is currently investigating how augmented virtual reality – the notion of inserting pieces of the real world into a virtual world – can help to further develop and refine minimally invasive procedures.

Part of their work involves creating three-dimensional (3D) silicon and plastic models called phantoms that mimic real-life organs and provide hands-on training platforms for clinicians. Another area focuses on developing software that takes simulated computer environments and streams real-time ultrasound images over top.

Just as gamers have their Xbox, Dr. Chen's team has developed the spine box. The spine box is an exact replica of the spinal cord, including the surrounding membranes, tissues and skin, generated from a CT scan of an actual spine and printed using a 3D printer. It is intended to assist in training for common spinal interventions such as epidural injections and lumbar punctures.

Traditionally, spinal interventions are performed blindly with surgeons relying on tactile sensations such as 'give' or loss or resistance to properly insert a needle with precision. The practice requires continual training, usually on animals and sometimes on humans. "We hope that medical students can be trained using this model first," said Dr. Chen.

Ultrasound images are commonly used to assist spinal needle insertion. However, most surgeons aren't trained to properly interpret those images and often have difficulty "understanding exactly where the ultrasound image is intersecting with the spine anatomy," he explains.

In conjunction with the spine box, Robarts researchers have developed "augmented virtual reality software" that accurately visualizes the geometry of a spine and then renders real-time ultrasound images on top.

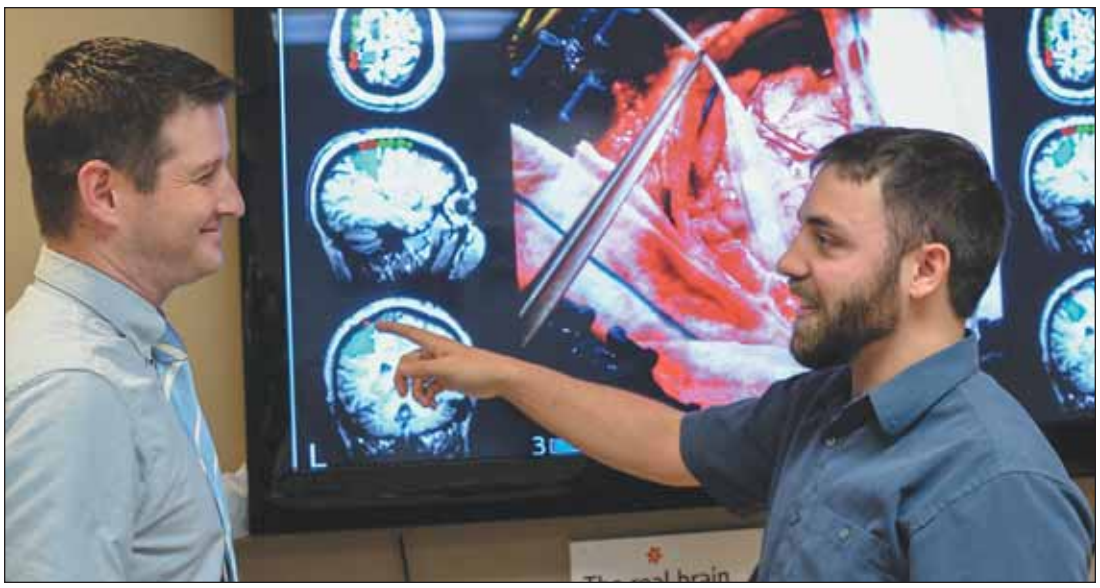
"If you think of it like you're playing a computer game, you look at the monitor which depicts everything in three-dimensional space, and you use your game controller to navigate through that space," explains Dr. Chen. "That's what we're doing here. By seeing everything in 3D we're hoping we can teach them how to interpret ultrasound images, and hopefully navigate the needle at the same time."

A similar Robarts Institute project is using a beating heart phantom to simulate minimally invasive valve replacement and repair procedures. "You have this blood-filled cavity, it's beating, and it's very difficult for surgeons to see where they're going," said Robarts research associate Dr. John Moore. "That's where we bring our augmented reality assistance to the table."

Moving forward, researchers intend to demonstrate the simulated environment's ability to successfully guide cardiac surgeons and interventional radiologists who perform beating heart procedures. The goal is to replace CT and MRI scanners which are more costly than ultrasound, and subject patients to radiation and the damaging effects of X-ray contrast.

By simplifying the image-guiding tools – which can be as simple as an ultrasound probe sliding into a USB port on a laptop – and adding their unique augmented virtual reality software, researchers expect to make beating heart procedures more widely available in the long run.

Simplifying complex tasks is a common theme in image-guided surgery. At the Biomedical Translational Imaging Centre (BIOTIC) in Halifax, researchers are working to streamline the complex task of mapping brain function using MRI data. Announced in July 2014, the project will see $7.6 million invested over five years to create a suite of new "push-button" applications that enhance the imaging and interpretive capabilities of MRI machines.



Dr. Steven Beyea (left), scientific lead of BIOTIC in Nova Scotia, examines brain images with a research-centre colleague.

Right now MRI technology is used to map the areas of the brain cortex responsible for motor activity, language generation and understanding, memory and other functions prior to surgery. Before the information can be used for image guidance during surgery, however, it must be analysed by PhD-level experts, and that's a stumbling block to wider clinical impact, said Dr. Steven Beyea, scientific lead of BIOTIC, a multi-site imaging facility shared by Nova Scotia's two leading research hospitals. "Here in 2015, computers should be able to make those decisions for us based on the data at hand," he said.

BIOTIC is developing sophisticated computer algorithms to perform the same analysis, removing the element of human subjectivity. The intent is to make it as easy as pushing a button and though commercialization is still a few years away, the "pushbutton" functionality is expected to be embedded in popular MRI machines.

The advancement is significant because it offers an alternative to the standard care of cortical stimulation mapping, which is physically invasive and relies on responses from patients who must remain alert while their brain is probed – the "I smell burnt toast" example that made neurosurgeon Wilder Penfield a household name across Canada when it was featured as a Heritage Minute.

With BIOTIC's development, neurology patients will undergo an MRI prior to their procedure, the analysis and brain mapping will be performed without human intervention, and the results will go directly to the picture archiving and communication system (PACS). The information can be used before the operation to help plan a surgical approach, and during the procedure as a decision-making tool.

To demonstrate its effectiveness, Dr. Beyea shares the example of a patient who puzzled neurosurgeons. Based on the known size and location of her brain tumour, her language should have been compromised, but wasn't. After performing a functional MRI mapping session at BIOTIC, the team discovered that her brain was wired in a way that was the complete inverse of the average person. The part of the brain that controlled language was nowhere near her tumour, allowing the neurosurgeon to be more aggressive in removing it and allaying her fears about losing her ability to speak to her kids.

"So many things have advanced light years beyond and yet, in many ways, the state-of-the-art for intra-surgical brain mapping and guidance of surgical decisions based on location of brain function really hasn't changed dramatically since 1936," said Dr. Beyea. "Where we'll have an impact is being one of the first groups to make this something that can become clinically routine."

Getting the latest technology into the mainstream isn't an easy road. Dr. Brian Toyota, head of neurosurgery at Vancouver General Hospital in B.C., is the first in Canada to use the NeuroBlate System developed by Monteris Medical, based in Winnipeg.

Approved by Health Canada in 2014, NeuroBlate is an MRI-guided neurosurgical ablation system that uses a map of the brain to guide surgeons as they apply lethal heat to kill tumour cells. As Dr. Toyota noted, the laser probe is inserted into the middle of the tumour through a very small hole in the skull, with the patient's head mobilized in a frame and placed in the MRI scanner. Once in the MRI suite, the images guide him so he can precisely place the ther-

motherapy probe before using a foot pedal to apply heat, up to 57 degrees Celsius.

"As the laser heats up, you see the temperature change," he explains. "Once the heat hits cytotoxic levels at the border of the tumour, you turn off the laser and it cools right down so you've only killed tumour cells and not normal brain cells."

The procedure requires use of a regular diagnostic MRI scanner. So far, Dr. Toyota has been able to book the machine during research time. His first patient was a young boy dealing with osteosarcoma who had already lost his left leg to amputation. When the cancer spread to his brain, his right leg was at risk of paralysis.

"We did the treatment on a Tuesday evening and he went home the next afternoon. He actually took a video of himself walking out," recalls Dr. Toyota. "Compared to the complexities we normally do with brain surgeries, this is nothing."

The NeuroBlate purchase was made possible through a sizable donation from a B.C. family and included future funds to cover operating costs for a short time. Dr. Toyota is receiving interest in the procedure from as far away as Hong Kong, but at this point patient selection is a careful process. "Eventually that money will run out so it's my obligation to prove the worthiness of the technology and that it does supplant the old way of removing tumours," he said.

At the Centre for Image Guided Innovation and Therapeutic Intervention (CIGITI) at SickKids Hospital, in Toronto, improving on and demonstrating the value of new approaches is always top of mind. The graduate students working at the centre not only have a passion for problem-solving but display an enthusiastic entrepreneurial spirit as well, and are currently working on several robotic systems they hope to commercialize.

One promising development is the EndoHand, a patent-pending tool being manufactured to meet Health Canada and FDA regulations as the centre prepares for human clinical trials. The idea was born when CIGITI researcher Rob Brooks was looking for minimally invasive ways to fix a congenital problem in newborns, where the esophagus doesn't form properly resulting in two segments that don't connect to each other. The end result has much broader application to treat many gastrointestinal tract issues as well.

The EndoHand attaches to endoscopes already on the market. Once passed through the mouth, it uses a series of suction ports to pull two sides together and attach them with a suture using unique Nitonol clips, made from smart material that can remember and return to its original shape. "You load it as a straight wire and then when you fire it, it curls up into a circle and as it's doing that it forms a suture which has very strong holding strength," explains Dr. James Drake, CIGITI lead. "It's a really clever idea, but it's also simple."

According to Dr. Drake, smaller, more specialized robotic systems are needed, not only to treat children but for specific cases in adults too. Though its mandate is pediatrics, many of the tools designed by CIGITI, like the EndoHand, can easily be adapted to work in other environments.

Another example is the minimally invasive endoscopic manipulator or MIEM, designed to improve neurosurgical procedures in children. A single incision robot measuring eight millimetres in diameter with a camera and three two-millimetre arms, it is constructed using smart materials to allow better navigation in confined spaces like the ventricles of the brain.

"You can actually create a robot that's quite dexterous and very resilient," said Dr. Drake, noting that the intent is to miniaturize the tools available for open micro neurosurgery, including micro scissors and graspers. "They can create significant forces, more than you would need to operate within the brain."

A third CIGITI project involves the Pediatric Surgery Robot (PSR), a system that will allow clinicians to simultaneously image and conduct biopsies of bone. The robot is mounted on the MRI bed with the patient and moves into the MRI bore. A clinician targets points on the patient and the robot autonomously begins the biopsy process, while the clinician uses the images to monitor in real-time.

While the projects mentioned above are works in progress, they all show great potential for success. To be sure, Canadians are proving to be leaders in the area of image guided surgery, and are pushing the envelope in this area.

New treatment for aneurysms used at University Health Network

This past summer, a young woman who had just given birth to her third child ended up at Toronto Western Hospital with a diagnosis of a giant aneurysm in one of the arteries in her brain. Her treatment options were limited and there was a risk of rupturing the aneurysm, which could cause bleeding in her brain or a stroke.

Fortunately, the timing for the patient meant that she was treated by Dr. Vitor Pereira, who arrived a few months prior from Switzerland where he was the head of the interventional neuroradiology division at the University of Geneva.

Dr. Pereira, a neuroradiologist with the Joint Department of Medical Imaging at Toronto Western Hospital, was able to perform the lifesaving procedure for his patient using a new technology called the Pipeline Flex – a first in Canada.

The Pipeline device redefines treatment for large or giant wide-necked aneurysms by reconstructing the parent artery and restoring its natural course. There have been two additional cases performed successfully, making the Toronto Western Hospital the most experienced hospital with this technology in North America.

Unlike embolizations using coils or embolic liquids, the Pipeline system was designed to divert the flow of blood away from the aneurysm without filling the bloated spaced with another substance. As time passes, post-implantation of the stent-like wire mesh, the diseased vessel heals and the aneurysm slowly shrinks.

As an expert on the management of intracranial aneurysms, Dr. Pereira is a world leader in the use of this technology and recently published study in the Journal of NeuroInterventional Surgery, which shows the effectiveness and efficacy of the procedure.

The new Pipeline device, unlike previous techniques, reconstructs the parent artery and restores its course.

"This treatment is a breakthrough for patients who have very large and complex brain aneurysms," said Dr. Pereira. "It is very exciting to bring this treatment to Canada and North America and work for a centre that will help patients, some of whom might have otherwise been told there was no treatment for them."

An aneurysm is an abnormal, weak spot on a blood vessel that causes an outward bulging or ballooning of the arterial wall. It is often treated surgically, by opening the skull to reach the aneurysm or with an endovascular procedure using coils and stents.

With both options the goal is to stop the blood flow to the aneurysms so that it stops growing and reduces over time. But when aneurysms are very large or complex, traditional treatments can be too risky, leaving the patients with no other option.

The technology of the Pipeline Flex builds on the treatment of using coils and stents by giving neuroradiologists the ability for navigation inside the aneurysm and the precise stent placement over the aneurysm neck.

The Pipeline Flex device features a braided cylindrical mesh tube that is implanted across the base or neck of the aneurysm. This new device is repositionable and designed for even more accuracy and controlled placement.

"Many things must be considered when treating a brain aneurysm – it could be a region of the brain that is technically difficult to access or involve arterial trunks and branches or the wall structure," said Dr. Pereira. "We are constantly looking for ways to improve the diagnosis and care of this condition, and this new treatment will save lives."

A treatment for an aneurysm depends on a variety of factors, including your age, overall health, if the aneurysm is producing symptoms, and the size, location and shape.

Some aneurysms require a single treatment, while others are complicated because of their location, shape or size. They may require more than one treatment type. The healthcare practitioner can provide options to patients during a clinic visit.

An aneurysm that's less than 5 mm in size or one without symptoms is considered too small to treat, and its potential to rupture is extremely unlikely. A periodic test, such as a CT angiography, may be recommended to check whether it has grown in size.

Endovascular treatment: This treatment uses a platinum coil sent through an artery in the groin to the aneurysm to pack it off. Sometimes a wire mesh is placed into the aneurysm to change its shape.

Surgical Treatment: This kind of treatment includes "clipping" the aneurysm with a small titanium clip that looks like a small set of tweezers. It's placed on the "neck" of the aneurysm or the area where it bubbles out from the artery. If the situation is complicated, the surgeon can create a detour for the blood and a small artery or vein is sewn around the aneurysm.

CIMTEC helps start-ups develop tech for cancer biopsy, treatments

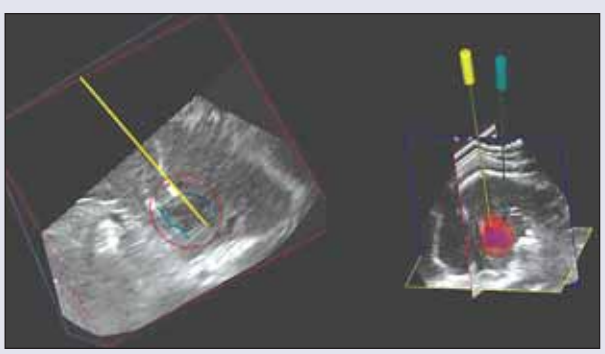
False negative diagnoses for prostate cancer are an abiding issue and a significant area of unmet need, therefore improving biopsy and treatment for early stage prostate disease is an area of focus being explored by several companies here in Canada.

The Centre for Imaging Technology Commercialization (CIMTEC) has world-class expertise and intellectual property (IP) in minimally invasive 3D image-guided interventions, and is helping several customers develop new imaging technologies that focus on combining MR or CT images with variations of ultrasound imaging, to improve targeted biopsy and treatment options for prostate and liver cancers. The result of these innovative technologies is fewer appointments, more effective treatment with shorter recovery times, and overall better quality of life as a result of minimally invasive procedures as opposed to traditional open surgery.

Focal Healthcare, Enhanced Medical and Hybridyne Imaging Technologies are three Canadian companies CIMTEC is helping to develop novel devices for prostate biopsy and treatment. The current standard for prostate cancer care has not changed significantly in the last 25 years. Digital rectal examinations only detect more advanced cancers on the anterior side of the prostate, since the physician cannot access the posterior side. There is significant controversy over the efficacy of the PSA test; although a simple blood test may indicate the presence of cancer, it does not distinguish between slow growing and advanced cancers and may lead to unnecessary tests and treatment.

About one-third of men receive false negative diagnoses, meaning that after a positive PSA test the subsequent biopsy did not find cancer – this does not mean that the individual is cancer-free. Due to limitations of standard 2D ultrasound image quality in visualizing tumours, prostate biopsy procedures are currently performed using a systematic pattern-based approach that often results in poor discernment of the location and extent of disease. False negatives necessitate additional anxiety-inducing biopsies.

Poor detection and diagnosis can lead to either over-treatment of indolent cancers or under-treatment of aggressive cancers. Because of the uncertainty of diagnosis, patients often opt to over-treat using a whole gland approach in which the entire prostate is irradiated or surgically removed. The side effects of whole gland removal or irradiation are incontinence and impotence, which significantly impacts quality of life.



Perfint is developing 3D ultrasound-guided liver tumour ablation.

Focal Healthcare, a CIMTEC spin-off company, is developing technology using CIMTEC IP that fuses MR and ultrasound images in conjunction with a novel mechanical arm under active guidance by the urologist to more accurately place biopsy needles in the tumour. Fusing live ultrasound with previously captured MR images provides the benefits of pre-procedural high-resolution diagnostic images with real-time imaging in the surgical environment.

Dr. Michael McGuire, Chief of Urology at NorthShore University Health System in Chicago is one of three highly-respected experts in the prostate world who sits on Focal Healthcares Clinical Advisory Board. Dr. McGuire says, "I am pleased to be able to play a role in the success of Focals game-changing prostate therapy products by testing the equipment and providing valuable feedback. The superior capabilities of their products will enable urologists to accurately record biopsy locations for active surveillance of prostate cancer, as well as allow us to appropriately administer therapy, which will significantly reduce the incidence of over-treatment and improve quality of life for our patients."

Enhanced Medical is a Canadian

CONTINUED ON PAGE 19

CIMTEC

CONTINUED FROM PAGE 18

start-up that is developing IP from Oxford University in the UK. Its technology uses electromagnetic and acoustic waves to create advanced medical images at a cost comparable to ultrasound. Called OxEMA, the technology will provide clinicians with MRI-like information using an ultrasound instrument. This will allow quick, accessible and cost-effective biopsy and therapy for prostate and liver cancers, particularly for patients in remote areas without easy access to MRI services.

The OxEMA system can radically improve identification of tumours and other anomalous tissue, not currently possible with standard ultrasound technology. It has the potential to enable earlier diagnosis and more accurate treatment of conditions such as prostate and liver cancer. Dr. Masoom Haider, chief of the department of medical imaging at Sunnybrook Health Sciences Centre said, This technology is uniquely positioned to improve prostate management for both imaging and therapy.

Hybridyne Imaging Technologies is combining gamma camera and ultrasound imaging to improve accuracy of ultrasound-guided prostate biopsy and focal therapy. Hybridyne's compact gamma cameras provide a fully digital probe to localize the uptake of radionuclides in the body. The gamma cameras use nuclear medical diagnostic techniques to better visualize abnormal tissues in anatomical regions of interest. They rely on the imaging of radio-pharmaceutical agents, which are designed to have higher affinity for attachment to abnormal tissue, such as cancer cells, compared to normal tissue. These radio-pharmaceuticals contain one or more gamma-emitting isotopes. By imaging the emitted gamma rays, clinicians can obtain the location of abnormal tissue within the region of interest in an accurate, rapid, and less invasive manner.

Poor detection and diagnosis can lead to over-treatment of indolent cancers or under-treatment of aggressive tumors.

CIMTEC is developing software that will incorporate Hybridyne's gamma imaging technology with 3D ultrasound images reconstructed from conventional 2D US images for planning targeted prostate biopsy. The software will first acquire the 3D US and import the gamma image(s), and then perform a rigid registration between the two. Both images can be visualized in detail before and after registration for evaluation purposes. A graphical user interface will also be developed for the user to execute the steps sequentially.

Liver cancer is the other significant area of clinical need being addressed by CIMTEC and its customers. Hepatocellular carcinoma, the most common type of liver cancer, is the fifth most commonly diagnosed malignancy and the third most frequent cause of cancer related deaths worldwide. Furthermore, the liver is the second most common site of metastatic cancer arising in other organs.

India-based Perfint Healthcare was drawn to CIMTEC's work on 3D ultrasound-guided focal liver tumour ablation that was born out of a project funded through the Ontario Institute for Cancer Research. OICR's Imaging Translation Program team has been addressing the limitations of conventional 2D ultrasound imaging, the most commonly used modality for guiding and monitoring radio-frequency ablation and microwave ablation of liver tumours. The system under development for Perfint will increase the accuracy of identifying and localizing a tumour and reduce, perhaps even eliminate the need for intra-operative CT imaging.

CIMTEC is designing and manufacturing the innovative robotic system and developing four plug-in modules that perform specific tasks, which are assessed and manipulated by the clinician in real-time. The advantage of the system is that highly accurate ablations can be performed in an ultrasound suite, as opposed to a CT scanner, making them more accessible faster and much cheaper.

With this new technology, patients in developing and developed countries suffering from liver cancers will receive treatment with an accurate and cost-effective technique.

Canada Health Infoway announces e-Connect Impact Challenge winners

TORONTO – Celebrating the more than 50 million times clinical teams or individual Canadians used digital health solutions over the past 12 months, Canada Health Infoway has announced the recipients of the ImagineNation e-Connect Impact Challenge Adoption Awards.

The Adoption Awards are presented to the teams whose solutions were accessed and used the most to communicate health information digitally to Canadians and authorized healthcare professionals, in the following four categories: e-Visits, e-Request for Prescriptions Renewals or Refills, e-Reports of Services and e-Request of Services.

These awards are one component of Infoway's e-Connect Impact Challenge, which encourages healthcare providers to improve the quality of care through digital health tools.

"The Adoption Awards recognize and celebrate the accomplishments of teams who are using digital health solutions to help deliver better healthcare to Canadians," said Fraser Ratchford, Group Program Director, Consumer Health and Innovation at Canada Health Infoway. "Each team's effort contributes to a more efficient and effective healthcare system."

Congratulations to the recipients of the Adoption Awards:

e-Visits: Provides Canadians access to a private, secure and digital two-way interaction with their healthcare provider.
- First place – Medeo
- Second place – miDASH
- Third place – Wellx

e-Requests for Prescription Renewals or Refills: Allows patients to digitally request prescription renewals or refills from their healthcare provider.
- First place – Community MD
- Second place – miDASH

e-Reports of Services: Enables regulated clinicians to electronically provide reports about the services a patient received to other authorized care providers.
- First place – ClinicalConnect
- Second place – Interior Health Authority
- Third place – The Oshawa Clinic

e-Requests for Services: Allows authorized healthcare providers to securely send electronic requests from one healthcare provider to another to request healthcare services for their patient.
- First place – The Ottawa Hospital
- Second place –The Oshawa Clinic
- Third place – Otn.teledermSF

Coming up next in the Challenge: The e-Connect Impact Challenge closes on March 31, 2015, so there's still time to participate and qualify for other awards and incentives:
- The Max Impact Award – Until March 2015, $1,000 will be awarded to the top three teams in any category who increased the number of uses of their solution the most in the previous month.
- The Overall Impact Awards – Up to $400,000 is available for the top three teams in each category of the Challenge who increased the use of their solution the most throughout the Challenge period.

Shafique Shamji, Michelle Leafloor, Dr. Glen Geiger of the Ottawa Hospital accept the first place award in the e-Requests for Services category from Infoway's Terry Moore and David McGuinty, MP, Ottawa South.

ClinicalConnect accepts a first place award in the e-Reports for Services category. Pictured are Mark Farrow, Hamilton Health Sciences, Infoway's Jennifer Zelmer, and Dale Anderson, eHealth senior manager.

About the ImagineNation Challenge Series: The Infoway ImagineNation Challenges were unveiled in 2011 with a vision to inspire, provoke, and promote innovation in health and healthcare in Canada. Although each challenge is different, they all share the same ultimate goal: to improve quality of care and the patient experience using digital health.

The e-Connect Impact Challenge is currently open and runs until March 31, 2015. This Challenge is encouraging health providers to digitally connect with their patients and each other.

Infoway works with leading Canadian health organizations to help shape the Challenges by providing expert advice, encouraging participation, and promoting the Challenges and the results. These organizations are:
- Accreditation Canada
- Canadian Dental Association (CDA)
- Canadian Foundation for Healthcare Improvement (CFHI)
- Canadian Home Care Association
- Canadian Institutes of Health Research – Institute of Population and Public Health (CIHR-IPPH)
- Canadian Partnership Against Cancer (CPAC)
- Canadian Patient Safety Institute (CPSI)
- Canadian Public Health Association (CPHA)
- COACH
- Health Action Lobby (HEAL)
- HealthCareCAN
- Institute for Safe Medication Practices (ISMP Canada)
- Patients Canada
- Patients for Patient Safety Canada
- Royal College of Physicians and Surgeons of Canada

About Canada Health Infoway: Infoway helps to improve the health of Canadians by working with partners to accelerate the development, adoption and effective use of digital health across Canada. Through our investments, we help deliver better quality and access to care and more efficient delivery of health services for patients and clinicians. Infoway is an independent, not-for-profit organization funded by the federal government.

Community MD won in the e-Request for Prescription Renewals or Refills category. Pictured are Terry Moore of Infoway, Dr. Amit Arya, Community MD, and Kyle Seeback, MP, Brampton West.

QHR Technologies won first place in the e-Visits category. Pictured are Jim Mickelson from Canada Health Infoway, Michael Smit and Greg Bell of QHR Technologies, and Dr. Hedy Fry, MP for Vancouver Centre.

SUBSCRIBE ELECTRONICALLY
VISIT OUR WEBSITE
www.canhealth.com

Read all about it.

Canadian Healthcare Technology, published eight times per year, is sent free of charge to managers of hospitals and clinics, and executives in nursing homes and home-care organizations. Qualified subscribers need only periodically renew their subscription information to ensure continued delivery of the magazine. Please take a minute to complete your renewal and make sure Canadian Healthcare Technology keeps coming to you – absolutely free.

THERE ARE TWO WAYS YOU CAN SUBSCRIBE:

- **FILL OUT AND SUBMIT THE FORM ONLINE AT www.canhealth.com/subscribe.html**
- **or FILL OUT THE FORM BELOW AND FAX IT TO 905-709-2258**

COMPLIMENTARY SUBSCRIPTION REQUEST

☐ **YES, I want to receive/continue to receive Canadian Healthcare Technology magazine.**

(PLEASE PRINT)

Name _____

Title _____

Company _____

Address _____

City _____

Province _____ Postal Code _____

Telephone _____

Fax _____

E-mail _____

Signature _____ **Date** _____

Signature required for authenticity purposes only. All data must be supplied for subscription to be processed. Publisher reserves the right to determine qualification. Valid only in Canada.

Your organization's business or industry?

- ☐ Hospital
- ☐ Health region
- ☐ Long-term care institution
- ☐ Home care
- ☐ Clinic
- ☐ Government
- ☐ University
- ☐ Computer or software vendor
- ☐ Telecommunications vendor
- ☐ Medical device vendor
- ☐ VAR or systems integrator
- ☐ Education
- ☐ Finance/insurance
- ☐ Consulting/legal
- ☐ Public relations

Other _____

If you are employed by a hospital, which of the following categories would best apply to you?

- ☐ CEO/President/VP/Executive Director
- ☐ Finance
- ☐ MIS
- ☐ Medical Director
- ☐ Physician
- ☐ Purchasing
- ☐ Nursing
- ☐ Pharmacy
- ☐ Radiology
- ☐ Pathology & Laboratory
- ☐ Human resources
- ☐ Health records
- ☐ Public relations
- ☐ Quality assurance

Other _____

IF YOU HAVE SUBMITTED A SUBSCRIPTION REQUEST IN THE PAST 12 MONTHS, EITHER ONLINE OR BY FAX, PLEASE DISREGARD THIS NOTICE.

CANADIAN Healthcare Technology

Privacy breaches

CONTINUED FROM PAGE 15

ios work through the courts, or are publicized in the media, it makes sense to highlight for staff what went wrong, and how the lessons learned are applicable in the particular circumstances of each hospital.

At a minimum, staff should be signing written confidentiality agreements, making it clear that unauthorized access to personal health information will be cause for dismissal. (Implementing this may be challenging for unionized employees.)

Measures addressing both internal and external risks: There are a number of activities that can help minimize both external and internal risks of unauthorized access to personal health information.

Password control: The Privacy Commissioner of Ontario has made it clear that "strong" passwords must be used to protect personal health information stored in electronic systems. Such passwords (and associated user ids) should not be shared amongst end-users, and the passwords should contain a mix of letters, numbers and characters, and should be changed frequently.

Effective control of passwords and user ids is necessary to, among other things, ensure that the people who access personal health information can be identified. Strong passwords and password procedures also help reduce the risk of unauthorized access (hacking) by outsiders.

Intrusion detection and prevention systems: Intrusion detection and prevention systems monitor data traffic and electronic messages in computer systems, and look for unauthorized and anomalous activity. They can be used to detect both internal and external threats.

The Privacy Commission of Ontario, in a recent review of Cancer Care Ontario (see: http://www.ipc.on.ca/english/Decisions-and-Resolutions/Decisions-and-Resolutions-Summary/?id=9667), makes it clear that such intrusion detection and prevention systems form part of the best practices for protection of personal health information.

Spot check and follow-up with patients: One approach to help understand possible risks and problems with the protection of personal health information is to occasionally survey patients and former patients about whether they are aware of any unauthorized or unexpected use of their personal health information. Many hospitals already carry out patient satisfaction surveys, and questions in relation to privacy could be added into these surveys at a small marginal cost.

Service provider contract clauses: An important part of reducing employee privacy breaches is to ensure that third party systems and software is designed and implemented with data security in mind. The precise clauses required in contracts between service providers and hospitals will vary according to whether the contract is a software license, development agreement, software maintenance agreement, hardware outsourcing agreement, etc.

The following provides some indication of the types of contract clauses that should be considered. In many cases, a privacy impact assessment or threat and risk assessment will need to be carried out.

"Reasonable" steps are not enough: In general, it will not be sufficient to state that "reasonable" steps should be taken to protect the security of data and personal health information. Even mentioning industry standards, such as ISO/IEC 2700X, will not usually be sufficient, as it will be quite difficult for a court or arbitrator to interpret the requirements of such standards. Perhaps for this reason, the Privacy Commissioner of Ontario has been quite prescriptive about the types of contract clauses required.

Substantive clauses: When a hospital contracts with an outside contractor to provide ongoing IT services (that could potentially involve access to personal health information), the hospital should ensure that the service provider is obliged to carry out those activities and practices set out above.

> **Patient satisfaction surveys can be used as spot checks to determine whether intrusions have taken place.**

There should be explicit contract clauses requiring the service provider to implement systems which utilize strong passwords, encrypt any personal health data they receive, make use of activity logging, implement an intrusion detection system, etc.

Notice of breach: In addition to this, the service provider should be obliged to notify the hospital in the event that it becomes aware of any unauthorized access to, copying, use, etc. of personal health information.

Audit and inspection rights: It is important that the hospital receive rights under the contract to audit or inspect the systems and records of the service provider to ensure that there is compliance with the contract terms and conditions.

Compliance with privacy law: The service provider should have an obligation to comply with any changes to privacy legislation (including guidelines provided by Privacy Commissioners), however many service providers will reserve the right to charge more where such compliance costs them more to deliver their services.

Application to sub-contractors: Where the service provider uses sub-contractors, these subcontractors will need to be bound to similar terms and conditions.

That is only the tip of the iceberg, and although many other clauses will be required, the provisions outlined above should provide an indication of some of the areas addressed and the approach which could be taken.

Bradley Limpert specializes in technology law, particularly in the areas of litigation and commercialization. He can be reached through http://limpertlaw.com

Developing the next-generation Canadian entrepreneur

CONTINUED FROM PAGE 8

George Brown has taken on, says Luke. George Brown has worked with (or is working with) companies developing hand hygiene compliance systems, real-time location systems, heart monitoring vests, passive surveillance systems for monitoring in-home care, and more. The Office of Research and Innovation also works with companies across disciplines, including engineering, food sciences, green technology and game design.

"Colleges and polytechnics like George Brown are funded to work with industry specifically because we can help them get their innovations to market," Luke says. "We have access to skills and talents in the form of our students and faculty, machinery and equipment in our prototyping facilities, and our simulation centre for healthcare where we can test products."

Entrepreneurs come to the college in a variety of ways, some directly, others through referrals from organizations like non-profit innovation hub MaRS Discovery District.

"We get a fair amount of clients through MaRS, as we're plugged into the ecosystem," Luke says. "We also do a fair amount of work with scientists from the universities around us helping them create products and prototypes. It's a very collaborative and complementary system."

This stewardship of innovation is critical in healthcare, which eats up an unsustainable 49 percent of the public purse in Canada. But it's also important to the economy as a whole.

"Canada is great at research. We have world-leading research institutions, we have a lot to be proud of, but we're not so good at business investment in R&D," Luke says. "We're top of the G8 in per capita spending on research, but bottom of the G8 for business spending. What we are trying to do is help businesses realize that innovation, spending on R&D, getting these products to market, is essential to a vibrant economy. The recent collapse of oil prices shows us we cannot rely on resource extraction … we need to innovate. And one thing we do really well is healthcare – from research to practice. Combining this expertise with industry receptivity and responsiveness to industry innovation creates a world class ecosystem for launching new products and services in support of healthcare innovation."

Dominic Covvey

CONTINUED FROM PAGE 14

There always seem to be many projects underway, but we should know the relevance of each project and how it contributes to the overall plan and its projected effects. Without this we can't make sense of the choices of projects.

Question 6: In the priority order of the answer to question 1, for each project, what are crucial partnerships in which Infoway should engage?

Infoway has always emphasized its partnerships. However, perhaps these should be revisited and a clear analysis be made of the importance of each partnership to carrying out individual projects and the overall plan. This would allow all of us to understand how Infoway is proceeding regarding partners and why. It would also allow us to suggest alternative partnerships.

The nature and complexity of the healthcare system also dictate multiple parallel approaches so that better ones can be allowed to rise to the top and the maximum can be learned from different approaches.

Question 7: Which crucial human resources (with their roles and qualifications) must Infoway access and retain in order that each project and the entire program proceed to success?

We are all aware that our human resources complement is very constrained. It would seem that we should undertake a careful analysis of the skills, knowledge and experience of human resources relative to the demands of projects and the overall plan.

Question 8: How should Infoway be optimally organized to carry out this program over the next decade?

Infoway started from almost nothing and gradually evolved into its current organizational format. A significant question is: does Infoway's organization correspond to today's needs? Should Infoway re-organize to deal with current challenges, budgetary restrictions, human resources constraints, needed partnerships, evolving technologies, and so forth?

> **What is the ideal governance structure to ensure that Infoway is properly managed and monitored?**

Question 9: How can taxpayers be assured that Infoway is proceeding appropriately at each moment, and overall in the achievement of its undertakings and the effects it expects from them?

With any effort, especially a national one involving substantial taxpayer funds, mechanisms should permit constant evaluation by a variety of experts as well as those who participate directly in the delivery of healthcare and are impacted by it. The operant words are accountability and transparency. Infoway must be sufficiently open so that what it is doing and how it is proceeding can be monitored, critiqued and redirected as required. And this input must be sought and acted on.

Question 10: What is the ideal governance structure that would ensure Infoway was properly mandated, managed and monitored, constrained and motivated to achieve the desired effects?

Currently Infoway is responsible to a board comprising provincial representatives. Is this optimal for now and the future? Is this even adequate? Are there better governance models for the organization that has now matured beyond its initial form?

Asking the right questions, getting and determining that we have gotten adequate answers is a challenge on which we must collaborate. Maybe there are better ways to formulate these questions. I do think, however, that we should all have in mind questions like these and we should demand answers that can be evaluated.

It would seem to be high time to ask these questions, get answers and see action that increases our confidence in how Infoway is proceeding.

TOSHIBA
Leading Innovation >>>

International CT Symposium 2015

June 12-13, 2015
Fairmont The Queen Elizabeth (Montreal)

COMPUTED TOMOGRAPHY AT THE HEART OF INTEGRATED DIAGNOSTIC IMAGING

Early Registration closes March 27th

Toshiba Canada is pleased to announce our 2015 International CT Symposium "Computed Tomography at the Heart of Integrated Diagnostic Imaging" which will explore a wide range of clinical topics, from the perspective of the radiologist, cardiologist, technologist and physicist. The early registration deadline is March 27th and Toshiba encourages all who plan to attend the 2015 CT Symposium – held June 12-13th at the Montreal Fairmont Queen Elizabeth and McGill University – to take advantage of hotel reservation discounts by registering by March 27, 2015. A comprehensive 2-day program will allow participants to share their experiences and update their knowledge. CE Accreditation: Conference attendees will be approved to earn category 'A' continuing education credits. A faculty of internationally renowned speakers has been assembled to provide an academic experience of the highest order, engaging participants in every element of modern CT imaging.

Speakers

- Professor Alain Blum - CHU Nancy, France
- Dr. Russell Bull – Royal Bournemouth Hospital, UK
- Dr. Marcus Chen – NIH, USA
- Ms. Annicka Cimbert – TCL, Montreal, Quebec
- Dr. Maria Del Pilar Cortes – Montreal Neurological Institute
- Ms. Shauna Hall – TCL, Sturgeon, Alberta
- Ms. Katia Kirpa - Montreal Neurological Institute
- Dr. Catherine Legault - Montreal Neurological Institute
- Dr. Narinder Paul – UHN, Toronto, Ontario
- Dr. Almudena Perez – Montreal Neurological Institute
- Dr. Daniel Podberesky – Nemours Children's Health System, USA
- Mr. Nagi Sharoubim – McGill University, Montreal
- Dr. Donatella Tampieri – Montreal Neurological Institute
- Mr. Arthur Voorpool – TCL, Toronto, Ontario

"Topics-at-a-Glance": Session A (June 12, 2015)

- Clinical approach to Stroke: Ischemic and Hemorrhagic Stroke
- Protocols and Techniques using 320 Multislice Scanner in Cerebrovascular Disease
- Multidetector CTA in the Management of Hemorrhagic Stroke
- Multidetector CT in the Management of Acute Ischemic Stroke
- Applications of Multidetector CT in other Cerebro-Vascular Diseases

Venue: McGill University
Montreal Neurological Institute and Hospital
Montreal, Quebec

"Topics-at-a-Glance": Sessions B & C (June 13, 2015)

- AIDR Enhanced Imaging
- 4D MSK Imaging - Movement Analysis
- Advanced Vascular Imaging
- The Next Step in Cardiovascular Evaluation
- Subtraction Versus Dual Energy - The New Debate
- Single Energy Metal Artifact Reduction using Helical CT and/or Volume CT
- Volume, Volumetric or Helical CT - from a Technical Perspective
- Contrast versus Spatial Resolution in Neuro Imaging
- Dose Reduction Technologies
- Volume CT Imaging in Cardiothoracic Diagnosis
- Fusion Imaging – Integrated Diagnostics

Venue: Fairmont The Queen Elizabeth
900 Rene Levesque Boulevard West
Montreal, Quebec

SAVE THE DATE! June 12-13, 2015

For additional information, please visit
www.Toshiba-Medical.ca

Made for Life