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CANADIAN
# Healthcare Technology

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An innovative Halifax company has produced an online solution that links physicians in a secure network. They can quickly and safely

ask each other clinical questions. The system has caught on with doctors across the country.
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PHOTO: COURTESY MACKENZIE HEALTH

Mackenzie Health, in Richmond Hill, Ont., has launched Canada's first living laboratory for process improvements in hospitals. Pictured are: Dr. Anne Snowdon, International Centre for Health Innovation; Adam McMullin, VP with Hill-Rom Clinical Workflow Solutions; Dina Palozzi, Chair of the Board of Directors; CEO Altaf Stationwala; Chief Nursing Executive Tiziana Rivera; CMIO Dr. Aviv Gladman. **SEE STORY ON PAGE 8.**

# Novel tracking system improves patient flow and quality

**BY JERRY ZEIDENBERG**

A visual patient tracking system at the Southlake Regional Health Centre, in Newmarket, Ont., has had an astonishing impact on process improvement and quality at the 380-bed hospital. The system also gives managers a quick understanding of what's happening at the busy centre – letting them know whether things are running smoothly, or if actions should be taken to move patients from one unit to another to eliminate bottlenecks and waits.

"In an instant, it gives you the pulse of the whole hospital," commented Helena Hutton, chief operating officer at Southlake. "In minutes, we're able to clear logjams. You can see which beds are empty, and you're able to phone just those units instead of calling all over the hospital."

> **The solution at Southlake reduces interruptions and phone calls among nurses.**

Hutton and Susan Grills, project manager, gave an overview of how the system works during the eHealth 2014 conference, held in Vancouver in June.

The solution, called McKesson Performance Visibility (MPV), was supplied by McKesson Canada and installed in 2012. Southlake was the second site in Canada to use the system (the first was implemented in Montreal), and its success has led several others to acquire it. At Southlake, it has already:

- Reduced phone calls among nurses and other staff members by 960 minutes per day.
- Eliminated about 400 interruptions of the work of nurses and other staff members each day, the equivalent of about 12.2 hours daily.
- Reduced medication errors. (The reduction in interruptions is believed to be asso-

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# Novel tracking system improves patient flow and quality at Southlake

CONTINUED FROM PAGE 1

ciated with a sizeable lowering of drug errors.)

• Reduced the number of falls by 50 percent.

• Reduced the number of patients waiting in the ED by 17 percent.

The MPV system enables everyone in the hospital to see whether a bed is occupied, what type of patient is in the bed, when he or she is expected to be discharged, and the special needs of that patient.

It's all colour-coded, so staff can see at glance whether a patient who should have been discharged is still in a bed (red), if a bed is open but still needs housekeeping to get it ready (brown), or if it's unoccupied and ready for a patient (white).

"It's a geo-spatial map that works in real-time," said Hutton. "Once you know the colour scheme, it's quite easy to understand."

This simple but pervasive system is displayed on large monitors throughout the hospital (where patient names are hidden, for privacy reasons), and on desktops, where patient identities are available to staff members.

It has resulted in a dramatic drop in phone calls between nurses, many of whom used to spend much of their days tracking down available beds. Before the arrival of MPV, they'd call around to various units to see whether they could move patients into them. Now, they can see in a moment when beds are available, and need only call a particular unit to give a report on the incoming patient.

Interestingly, many staff members were initially skeptical about the new system, and doubted whether it would be useful. "One charge nurse told me she didn't have time for it," said Grills. "But it turned out that she would spend most of her time calling other units to see when beds were ready.

"After the system went in, and she started using it, she could see the state of readiness of a bed in seconds, without calling to badger anyone else. The charge nurse found she loved the new system," said Grills.

In addition, the reduced need to call other units resulted in better relations among units, as nurses felt less harassed.

Significantly, the visual system notes whether precautions should be taken with patients. It clearly indicates whether a patient requires infection control, has skin integrity issues, is at risk of falls, or may be violent.

"Staff members, including transporters, can immediately see if a patient has any special needs," commented Grills.

That's led to a tremendous reduction in falls – in a one year period, falls were reduced by 50 percent – and awareness of potentially violent patients was greatly enhanced.

**The simple but pervasive system is displayed on large monitors throughout the hospital, as well as on desktop computers.**

Patient flow has also improved, as staff can quickly see which units have beds available. That has led to reduced waits in the emergency department.

And because the MPV system includes an estimated discharge date, staff are alerted to patients who are still in hospital after their expected discharge date – the lettering on the screen turns bright red. Staff are then prompted to find out why the patient hasn't been discharged or to revise the discharge date.

Since the visual system lets staff know of impending discharges – 48 hours or less, with the lettering changing from green to yellow – they can take special efforts to ensure that tests and paperwork are completed beforehand.

Medication waste has been reduced, too, as pharmacy staff can see whether patients are still in hospital, and when they're expected to leave. Before the MPV system was implemented, pharmacy staff sometimes prepared expensive medications, only to find that the patients had already left the hospital.

The location of patients in the hospital can also be tracked, as nurses can note when patients have gone to different units for tests. A timer lets staff know how long patients have been at a certain location, such as the radiology department or a cath lab, and enables them to estimate when patients should return to their rooms.

Ron Dunn, vice president of information solutions for McKesson Canada, noted: "Hospitals are facing capacity and resource constraints that are impacting operational and clinical performance. The results for Southlake clearly demonstrate that MPV has had a positive impact on their operational efficiency, particularly at a time when Ontario hospitals must improve their performance to support the quality-based procedure funding model. MPV is the ideal platform to do this."

Grills pointed out that all staff members involved in patient flow have taken ownership of the system throughout the hospital. "They challenge each other to update the system, and to ask why certain tasks haven't been completed," she said.

In short order, the MPV has become an important management tool. In addition to the clinical staff members who make heavy use of the system, the hospital's chief executive officer – Dr. Dave Williams – likes to take an occasional peek, to keep tabs on the organization. Hutton mentioned that Dr. Williams was miffed, not long ago, when he couldn't use the system during a short period of product maintenance. "We've all come to rely on it," said Hutton. "I use it three times a day, and I'll often look [remotely] before I go to bed."

Southlake accommodates more than 90,000 visits to its Emergency Department, 22,000 in-patient admissions, and 600,000 out-patient visits each year. It provides care to the more than 1 million people who reside in York Region, Simcoe County, and as far north as Muskoka.



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**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


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# Application connects doctors in private networks, eases communication

BY JERRY ZEIDENBERG

HALIFAX – Many Canadian doctors have installed electronic health records to improve the way they care for patients. Some physicians have even created connections to local labs and hospitals to speed up the flow of information. However, something that was largely overlooked was improving the simple task of communicating between the doctors themselves – most of them still rely on phone and fax, a slow and laborious method at best.

Now, however, things are quickly changing. Already this year, more than 6,000 physicians across Canada have adopted a doctors' communication solution called The Rounds, and it appears that about 20,000 will be aboard by fall. It's a Facebook-like system that enables physicians to create groups and instantly communicate with those groups, just like they would on social media. Moreover, they can also conduct private, one-to-one discussions.

"It's growing quickly, largely by word of mouth," said Blair Ryan, CEO, who launched The Rounds in mid-2013 with two colleagues, Will Harris and Michael Clory, MD. "Specialty associations are promoting us," he said, noting that it's more effective to get the endorsement of a physician than to try advertising or cold calling.

The Rounds is now working with the Canadian Association of Emergency Physicians, which has set up a private network connecting ER doctors from coast-to-coast. If an emergency physician has a question, for example, about the best medication to prescribe, he or she can send out a general alert, or query one or two colleagues in particular.

Just like Facebook, as soon as someone answers, the physician who asked the question is notified.

Some physicians are using The Rounds several times a day, said Ryan. "It's helped their workflow," he said. "It's much faster than using fax or the phone."

In some instances, physicians have been using the platform to send referrals to colleagues, and to report back on tests, treatments and outcomes.

In the past, other organizations have tried to produce a solution that connected physicians to one another, including the Canadian Medical Association, which a few years back launched a system called Asclepius. However, the systems were not easy to use, and didn't offer group comments, instant messaging and alerting – features that are built into The Rounds.

"We interviewed 588 doctors to see what they wanted in a system of this kind," said Ryan "They said they used Facebook, Twitter and Foursquare every day, and wanted tools that worked in the same way."

That's just what The Rounds did. "We've built a tool that could be used by a 14-year-old or a 55-year-old," said Blair.

However, there are extra layers of security embedded in the system. First, The Rounds checks to see that each physician on the system is who he or she claims to be. A hospital-association is required, and the company manually calls the hospital to see if the person is who he or she claims to be.

The Rounds co-founders Will Harris and Blair Ryan.

The company web-site notes that The Rounds is HIPAA and PIPEDA compliant and incorporates Verisign security. Moreover, it has a medical advisory committee that users are encouraged to join.

As well, physicians must use their real names, rather than aliases, when communicating.

That's because they're expected to stand behind what they're saying.

At the same time, the private nature of the network and its groups means that physicians are not monitored by outsiders, such as the CMA or government health ministries.

Ryan said The Rounds is free to physicians, and nearly free for associations. It earns revenues by allowing some space for advertisers to promote their products. For example, pharmaceutical companies can publicize new products.

According to the company, this too has its benefits, as physicians can quiz the pharma companies about the medications when convenient, instead of making time for reps during a busy workday. "You could catch up on the discussion about a new medication on a Sunday afternoon, with a beer or glass of wine at hand," quipped Ryan.

There are 'social networks' in the United States for physicians, but The Rounds differs from them. "We focus on clinical discussions," said Ryan. "There is one large social network for doctors in the U.S., but they don't use their real names. There's also another one, but it's mainly for referrals."

In future, The Rounds plans to expand to connect other types of healthcare professionals, including nurses and naturopaths. "The need to collaborate is not unique to medical doctors," said Ryan.

# Michael J. Fox Foundation and Intel Corp. join forces

NEW YORK AND SANTA CLARA, CALIF. – The Michael J. Fox Foundation for Parkinson's Research (MJFF) and Intel Corp. have announced a collaboration aimed at improving research and treatment for Parkinson's disease – a neurodegenerative brain disease second only to Alzheimer's in worldwide prevalence.

The collaboration includes a multi-phase research study using a new big data analytics platform that detects patterns in participant data collected from wearable technologies used to monitor symptoms.

This effort is an important step in enabling researchers and physicians to measure progression of the disease and to speed progress toward breakthroughs in drug development.

"Nearly 200 years after Parkinson's disease was first described by Dr. James Parkinson in 1817, we are still subjectively measuring Parkinson's disease largely the same way doctors did then," said Todd Sherer, PhD, CEO of The Michael J. Fox Foundation. "Data science and wearable computing hold the potential to transform our ability to capture and objectively measure patients' actual experience of disease, with unprecedented implications for Parkinson's drug development, diagnosis and treatment."

"The variability in Parkinson's symptoms creates unique challenges in monitoring progression of the disease," said Diane Bryant, senior vice president and general manager of Intel's Data Center Group. "Emerging technologies can not only create a new paradigm for measurement of Parkinson's, but as more data is made available to the medical community, it may also point to currently unidentified features of the disease that could lead to new areas of research."

For nearly two decades, researchers have been refining advanced genomics and proteomics techniques to create increasingly sophisticated cellular profiles of Parkinson's disease pathology. Advances in data collection and analysis now provide the opportunity to expand the value of this wealth of molecular data by correlating it

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# Canada lags G7 in cost-saving, interventional radiology procedures

TORONTO – Canada lags behind most G7 countries when it comes to the use of Interventional Radiology procedures, and is dead last in several important IR procedures – despite evidence that IR results in lower costs to the healthcare system, faster recoveries for patients and lower complication rates.

The April 2014 study, titled *Interventional Radiology: Global Landscape and Cost Effectiveness*, was conducted by Millennium Research Group. For its part, MRG conducted an analysis of eleven key therapy areas in interventional radiology (IR) to determine the value that IR treatment brings to both patients and the healthcare system.

For example, Canada came in last place in the use of Interventional Radiology for the treatment of lower extremity peripheral arterial disease (PAD). According to the MRG study, Interventional Radiology results in an average length of stay of 1.9 days, compared with 7.1 days for a surgical bypass, conducted in an operating room. The cost of the IR procedure is $10,600 compared with $17,400 for the surgical repair. Moreover, the complication rate for IR is less than half of that for surgical treatment of lower extremity PAD.

This pattern of lower costs, LOS and complications repeats itself for other procedures, such as abdominal aortic aneurysm (AAA) repair and interventional oncology for hepatocellular carcinoma (HCC).

So why does IR usage in Canada lag behind that of other G7 countries?

In general, healthcare funding in Canada is allocated as an annual budget to each hospital. This is in contrast to the United States and Europe, where a diagnosis-related group (DRG) system is used that allows IR procedures to gain greater traction.

**IR procedures lead to many cost-savings; however, the Canadian hospital funding system discourages IR usage.**

In a DRG system, hospitals are reimbursed on a diagnostic code or disease-specific basis, regardless of the intervention that is chosen. This provides an incentive to select the most cost-effective treatment for each patient, which in turn leads to increased patient access to care and less strain on the overall healthcare system.

MRG's analysis has shown that IR procedures lead to many patient-centered cost savings; however the Canadian healthcare system does not allow hospital administrators to recognize and take advantage of the value and cost effectiveness of IR.

Cost-effective decision making in Canada is further hindered by the division of the annual budget among different departments. This is a challenge to IR, because IR procedures typically reduce burdens on the OR budget while adding expense to the interventional and diagnostic radiology operating budget. Although the IR expense is typically smaller than the corresponding OR expense, this phenomenon reflects poorly on the annual IR budget.

What does the Millennium report recommend?

Based on the cost-effectiveness conclusions reached in this document, MRG recommends that Canadian governments and hospital administrators revise the system of budget allocation towards IR procedures. Based on the examples of lower extremity PAD and EVAR, government and administration should recognize that increased short-term funding of IR may reduce the long-term burden on the healthcare system by improving patient access to care.

Separate funding should be made available for IR procedures that have demonstrated cost-effectiveness relative to their surgical counterparts. This includes minimally invasive lower extremity PAD procedures, EVAR, and radiofrequency (RF) ablation.

It is important that interventional radiologists become more clinical in practice;

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# George Brown College trains its nurses to heal the sick and to innovate

BY JERRY ZEIDENBERG

TORONTO – At the new George Brown College campus, which specializes in health sciences, a new generation of nurses and personal support workers are being educated with the help of myriad high-tech tools. They include computerized manikins that can have heart attacks, bleed and even have babies.

"The point is to give high-fidelity simulation to nursing students before entering the hospital environment," said Robert Luke, PhD, Vice President of Research and Innovation at George Brown College. The beautifully designed, two-year-old building – constructed to maximize the amount of natural light – is situated at the foot of the city, just beside Lake Ontario.

The high-tech manikins are operated in control booths next door to four simulation suites, by technicians who control their vital signs. Faculty are involved in building the sophisticated scenarios for the manikins and technology. Students can then be faced with a multitude of problems they might encounter in a hospital – such as patients whose blood pressure suddenly drops, who stop breathing, or go into shock.

When the students react, the manikins will also respond – for better or worse, depending on whether the measures taken are appropriate.

Teachers and colleagues can watch the action through one-way glass panels; students can then come back into the meeting rooms for a debriefing. Cameras and microphones in the mock-clinical suites have captured what happened, and can be replayed for the benefit of the nurses-in-training.

The school also runs a mock-operating room, where nurses are trained to react to the scenarios they will encounter in the OR. There, too, cameras record the play-by-play, for the benefit of analysis and discussion afterwards.

In addition to the computerized simulation suites with high-fidelity manikins, George Brown College has a 60-bed simulated hospital – with a lower-tech form of manikins filling the beds. "It's a practice lab for nursing students," said Dr. Luke. "But in the event of an emergency, like SARS, under certain conditions it could function as a hospital. The area does not have oxygen, but could use tanks, so the condition of the patient would need to be considered."

He noted that during the 2003 SARS crisis in Toronto, several of the city's hospitals were locked-down. If this situation were to happen again, the beds at George Brown could be used to treat patients.

Not only do nursing students learn the practice and procedures of traditional nursing at the school, but they use and experiment with a variety of advanced technologies. The school does charting on its own electronic health record, and has deployed many new systems.

Indeed, it actively encourages innovative companies to test their new technologies in the simulated hospital wards, where nursing students can evaluate them and help with their improvement.

"We integrate research projects right into the curriculum," said Dr. Luke. "The projects aren't just given to one or two students. Instead, all students are involved."

Currently, George Brown is fostering dozens of research projects. One of the most exciting collaborations is with Toronto-based Infonaut, a specialist in infection control systems.

By using a variety of sensors in the hospital rooms, researchers are able to determine how close nurses are getting to patients and how often this occurs; knowing who visited patients can help when trying to sort out the possible transmission of diseases.

A new, wireless technology from Infonaut is also monitoring the soap and hand-wash pumps, tracking whether nurses are cleaning their hands as often as they should.

In addition to fine-tuning the setup of the technology in the George Brown College hospital rooms, the school recently helped run a trial in the transplant unit at the University Health Network. "We retro-fitted many hand-wash units," commented Dr. Luke.

Research and innovation is something that Dr. Luke is passionate about – for the sake of better education, improving healthcare and spurring the economy.

"Canada is really good at producing innovations, but we're near the bottom of the OECD nations in turning innovations into products," said Dr. Luke. He asserted that's got to change.

He and the team at George Brown are doing their utmost to instill a new mentality. "Every hospital employee should be aware of innovation, and the need to make things better," said Dawn Davidson, Director of Research. "They should be actively trying to improve productivity while on the job."

That's why a big part of the mission is to educate nurses in the art and science of innovation while they're in school. "They're going to be ambassadors for change in the hospitals," said Davidson.

Of course, the idea isn't to duplicate the basic research that's being done across town at the University of Toronto – one of the world's leaders in fundamental health research. "We focus on the practical side, on applied research," said Dr. Luke.

Dawn Davidson, Director of Research, at George Brown College.

The George Brown College site near Casa Loma, further north in the city, houses a facility that can prototype both hardware and software products. "The faculty in the Advanced Prototyping Lab like to say they can make anything there," quipped Dr. Luke.

Meanwhile, the lakefront site contains many workspaces for startups and growing companies to come in, meet with students, and hash-out new products and plans for expansion. "We can help them go from idea to delivering an invoice to customers," said Dr. Luke, noting the school has expertise in all stages of commercialization.

The school also trains personal support workers, an increasingly important cadre of healthcare specialists who help take care of the elderly and infirm, often in their own homes. To this end, George Brown operates a Health eHome lab.

It simulates the typical household, with living room, bedroom and kitchen. Here, George Brown College is also involved in innovation. It is working with a private-sector company called Good Robot to develop 'smart home' technologies that can improve the health of patients and their families.

"They're using passive surveillance to monitor people," said Davidson. "For example, if the fridge doesn't open in the morning, or the medicine cabinet isn't opened when it should, a family member can be alerted," she said. The alerts can go to a smartphone or a computer. "You can then call your mom or loved one to see if everything is OK," she added.

If it isn't, you can call for help – which could make the difference between health and a hospital visit.

Davidson mentioned that George Brown recently did a trial with 20 patients, and is in the process of partnering with retirement homes so that administrators can keep closer tabs on their frailer residents.

The spirit of innovation is built into so many aspects of the George Brown structure on the lakeshore. There are open spaces in the school that double as meeting places and spur-of-the-moment teaching spots, with white boards on the walls and tiers of benches that are reminiscent of Greek amphitheatres.

The classrooms themselves have no fixed seats. Desks are on wheels, and can be moved into a variety of configurations for learning in groups. Most of the classrooms have video cameras mounted on the ceilings – many of the classes can be live-streamed and stored for replay later.

That's because remote learning is very popular. "Nurses working in hospitals can't get here during the day, but many want to upgrade their skills," said Dr. Luke. "They can do it remotely, or they can watch a lecture at night when they're at home.

"We're all for disrupting the traditional classroom and creating new forms of learning."

# Michael J. Fox

CONTINUED FROM PAGE 4

with objective clinical characterization of the disease for use in drug development.

The potential to collect and analyze data from thousands of individuals on measurable features of Parkinson's, such as slowness of movement, tremor and sleep quality, could enable researchers to assemble a better picture of the clinical progression of Parkinson's and track its relationship to molecular changes.

Wearables can unobtrusively gather and transmit objective, experiential data in real time, 24 hours a day, seven days a week. With this approach, researchers could go from looking at a very small number of data points and burdensome pencil-and-paper patient diaries collected sporadically to analyzing hundreds of readings per second from thousands of patients and attaining a critical mass of data to detect patterns and make new discoveries.

MJFF and Intel initiated a study earlier this year to evaluate the usability and accuracy of wearable devices for tracking agreed physiological features from participants and using a big data analytics platform to collect and analyze the data. The participants (16 Parkinson's patients and nine control volunteers) wore the devices during two clinic visits and at home continuously over four days.

Bret Parker, 46, of New York, is living with Parkinson's and participated in the study. "I know that many doctors tell their patients to keep a log to track their Parkinson's," said Parker. "I am not a compliant patient on that front. I pay attention to my Parkinson's, but it's not everything I am all the time. The wearables did that monitoring for me in a way I didn't even notice, and the study allowed me to take an active role in the process for developing a cure."

> **Wearables can unobtrusively gather and transmit objective data in real-time, 24 hours a day, seven days a week.**

Intel data scientists are now correlating the data collected to clinical observations and patient diaries to gauge the devices' accuracy, and are developing algorithms to measure symptoms and disease progression.

Later this year, Intel and MJFF plan to launch a new mobile application that enables patients to report their medication intake, as well as how they are feeling. The effort is part of the next phase of the study to enable medical researchers to study the effects of medication on motor symptoms via changes detected in sensor data from wearable devices.

To analyze the volume of data, more than 300 observations per second from each patient, Intel developed a big data analytics platform that integrates a number of software components.

# Aussies and Canucks compare notes at digital home care conference

BY ANDY SHAW

At a recent conference in Toronto that brought together Canadian and Australian experts in home care to exchange knowledge about technological developments, one of the most exciting examples had to do with a project in Finland.

Steve Saunders hails from the small Ottawa Valley town of Eganville, but he works globally, as chief architect for global health at CGI, the information technology and business process consulting giant with operations in 40 countries. Saunders spoke to the conference about what he termed an "international success story" about connecting home care to all other forms of care and doing it on a scale never seen before.

"There are about 6,000 in our group around the world who just focus on health IT and we can see that everything is moving toward bringing healthcare closer to the home," Saunders began. "Also, we are no longer in the pilot stage. Some of our CGI solutions are now in full scale production running with a 35,000 person city workforce delivering care, cleaning and other support services to citizens in their homes."

Saunders says the first upshot of deploying the CGI mega-system, dubbed CommunityCare 360, was that its home care providers have gone completely paperless and that patients in their homes are fully active digital participants. They can share in the planning of their care, stay connected with their families, book appointments, see their test results – and do all of that online from home. Connected, too, are primary care physicians, case coordinators, benefits managers, device technicians, meals-on-wheels, first responders, cleaners, extended care teams, and even neighbours – all being coordinated in their care giving by the all-seeing CommunityCare 360 digital platform.

"We've spent literally hundreds of millions of dollars at CGI building this kind of 360 degrees of integration system for a variety of industries, but healthcare was one of the first," said Saunders.

And the savings from CommunityCare 360 are proving significant according to Saunders. "When home and community care workers make the shift to 360 and away from the traditional paper-based approach to managing care, they generate between $36,000 and $55,000 dollars per employee of net benefit to the system."

In the city of Järvenpää, one of eight cities in Finland, including Helsinki, that have deployed CommunityCare360 technology, Saunders summarized the benefits to 13,000 mobile-equipped clinical and allied care workers:

- The time dedicated to patients is up 30 percent
- Home visits have increased 16 percent without increasing staff
- Home care revenue has grown 20 percent due to accurate visit data
- Caregivers visits to the office have declined by 70 percent
- Caregiver sick leaves have decreased significantly.

"The real beauty of the 360 system is that it's easily scalable up and down," said Saunders in conversation after his presentation. "We can take a system that can coordinate home care for a whole city, scale it down, to a neighbourhood or a building, and have it operational, not in a matter of months as something similar would have taken in the past but in about four hours."

A baker's dozen of Australian "aged care" providers, healthcare organization execs, and industry consultants travelled to Toronto to learn how we up here in the True North are faring in caring for our elderly. They were joined by some 40 Canadians for an intense one-day "Digital Care Delivery for Aging in Place" conference, staged by the Canadian Home Care Association at the King Edward Hotel in Toronto.

Immediately, two differences in the countries' healthcare systems were evident: Australia allows and indeed encourages

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# Mackenzie Health creates first-in-Canada living lab for process improvement

BY JERRY ZEIDENBERG

RICHMOND HILL, ONT. – Mackenzie Health, a 500-bed community hospital, has transformed a 34-bed ward into an 'Innovation Unit', a living laboratory that will test evidence-based practices and technologies to produce the most effective ways of treating patients.

The busy hospital, located in Richmond Hill just north of Toronto, has partnered with Hill-Rom Canada, which helped design the unit and supplied much of the initial technology. As well, Mackenzie Health will be working with the International Centre for Health Innovation, at Western University's Ivey Business School to assess the impact of the technology on quality, safety and patient care.

The team at Mackenzie Health believes it has created a first-of-its-kind facility in Canada, a real-life laboratory that will test technologies and methodologies to improve the quality of care – with an emphasis on patient safety and outcomes.

"The innovation unit will allow us to accelerate the adoption of innovation," said Tiziana Rivera, chief nursing executive at the hospital. "It will also put us at the forefront of evidence-based medicine."

She said the results, which will be analyzed by a team from the Centre for Health Innovation, will be shared so that new methods are adopted by the rest of the hospital and at the new Mackenzie Health Vaughan hospital the organization is building. The Vaughan site, located several kilometers away, is to open in 2019. Ultimately, said Rivera, the Innovation Unit findings will have an impact on patient care across the country. "We want to produce system level change," she said.

The Innovation Unit went live in April with an investment of $500,000, and the initial technologies being evaluated include:

• Smart beds that can alert staff to patients who are trying to get out and are in danger of falls – a major hazard for many frail or elderly patients. The beds can also weigh patients, eliminating the need to get out of bed and onto a scale, another potential occasion for falling.

• Smart communication panels on the walls of every room, which enable nurses and other caregivers to communicate with each other.

• Badges that interact with the smart panels and workstations, showing the location on the unit of each staff member and allowing them to respond to patient calls more effectively.

• Hand hygiene solution – the hand-wash and soap pumps in the rooms all have sensors, and track whether staff are washing upon entering and leaving a room. Nurses can be alerted, too, when they've forgotten to wash their hands, and performance is all tracked.

At a June reception marking the official launch of the Innovation Unit, hospital CEO Altaf Stationwala said the leadership team wanted to blaze new trails in research and development, but felt there wasn't any point in duplicating the efforts of the academic centres located on University Avenue in downtown Toronto.

"Their strengths are in pure research," said Stationwala. "We're strong in lean methodologies, workflow and technology. With our new hospital coming on-stream in Vaughan, we focused on applied innovation – real technologies that will have an impact on patient care today."

Dr. Aviv Gladman, chief medical information officer, noted that in addition to the current technologies being tested, "new IT projects are forthcoming that will transform how we deliver care." He said all projects will free up staff and physicians, enabling them to spend more time at the bedside.

Dr. Gladman, an engineer as well as a physician, said the unit will be exploring real-time decision support tools in the future. "As an engineer, I just think this is very cool."

On a more serious note, he emphasized that every dollar spent on technology is a dollar withheld from other areas – such as staffing. Ultimately, investments in electronic wizardry have to prove their worth in better patient care or staff efficiency. "Using the Innovation Unit," Dr. Gladman said, "we'll learn a lot about how to move forward."

On a tour of the Innovation Unit, professional practice lead Sabina Sabo demonstrated how the system can track the location of each caregiver by using the wireless badges and wall panels. Patients can quickly call nurses by using a handy control with one button for pain medication and another for washroom help.

Sabina Sabo demonstrated how the system works during a tour.

"How fast are we responding? It will all be measured," said Sabo.

Using the Hill-Rom system, patient calls can follow a nurse, no matter which room he or she happens to be in. That's because the room sensors can identify the badge worn by the nurse and route the call through the nearest wall module. "We can reply through the module, too," said Sabo, to reassure the patient that help is on the way.

If a nurse is about to leave a room without properly adjusting the bed rails of a patient with a falls precaution, an alarm will sound – reminding the nurse to fix the bed. And when a fragile patient is climbing out of a bed, alerts will be transmitted to nurses. "The nurse can come into the room before anything happens," said board chair Dina Palozzi. "It's a first in Canada."

While other hospitals have bed exit alarms, the system used at the Innovation Unit will transmit the alert to the nurse, wherever he or she may be on the floor, via the wireless badges and modules on the walls of rooms and in the halls.

"The alert follows the nurse," said Sabo.

When a patient is in distress or needs help, an alert will go to a secondary nurse if the primary caregiver doesn't respond in 60 seconds. If that nurse doesn't respond, the signal flips back again to the first care-giver. "It's a loop that ensures someone will respond," said Sabo.

Sabo noted that in the second phase of the project, slated to start in 2015, each nurse will carry a personal device. That means he or she can be alerted not just on the Innovation Unit, but anywhere in the hospital.

In a bid to improve the patient experience, the system collects performance data showing the speed with which nurses respond to alerts, such as patient calls and bed exits, and whether they're consistently washing their hands.

Managers know, however, that the statistics collected by the system must be interpreted in the right context. For example, a nurse helping a patient into a room, and supporting him with both hands, won't be able to use a hand-wash pump.

Dr. Anne Snowdon, chair of the International Centre for Health Innovation, commented that change is not easy. "Technology is sometimes terrifying," she said. "But thanks to the frontline staff here that have embraced it, we expect to see benefits for patients and their families."

Dr. Snowdon added that, "Our job is to create the evidence to show the rest of the world how it's done, what's possible and what's achievable.

"We'll probably start with Ontario, though," she quipped.

# Brain-CODE: the Ontario Brain Institute's platform for discovery

BY MOJIB JAVADI, PhD
AND JANICE PONG, MSc

'Big Data' is a term used promisingly in healthcare. While massive amounts of data hold the potential to provide us with major insights, questions remain about how to collect, analyze, and link the data in ways that will make it useful.

To capitalize on the immense potential of neuroscience data, OBI has created an unprecedented model of data sharing and analysis with its neuroinformatics platform called Brain-CODE (Centre for Ontario Data Exploration).

**OBI's data sharing model:** Ontario has one of the highest concentrations of brain scientists in the world. The goal of the OBI is to nurture and harness this strength in neuroscience in order to improve the brain health of Ontarians, as well as patients across Canada and beyond. OBI is achieving this by driving collaboration and innovation among researchers, clinicians, industry partners, and patient advocacy groups.

As a part of this effort, OBI provides funding to Ontario's top brain research experts. These experts are organized into 'Integrated Discovery' (ID) programs – patient-centered programs that consolidate clinical and basic research efforts around a brain disorder or group of brain disorders.

Five ID programs are currently funded by OBI: cerebral palsy, epilepsy, neurodegenerative disorders, neurodevelopmental disorders, and depression. The integrated approach led by OBI has provided Ontario with an important opportunity to use brain data in new ways.

Over 35 Ontario-based research and healthcare institutes have signed a data sharing agreement with OBI, demonstrating widespread commitment to sharing and integrating data. This is an exemplary effort in scope and size, and will set the standard for future inter-institutional collaborative research programs.

> **Providing researchers with a platform like Brain-CODE is expected to catalyze research and development.**

**Brain-CODE – A platform for discovery:** To make the most of the large amount of brain data being generated by the ID programs, OBI has been developing Brain-CODE, a web-based platform for data storage, management, sharing, and discovery. Brain-CODE will not only serve as a central data repository for the ID programs, but it will also offer a set of powerful analytics tools to facilitate data analysis.

Housed at the High Performance Computing Virtual Laboratory (HPCVL) in Kingston, Ont., Brain-CODE's current capacity includes a combined computing power of 416 cores, and 600 TB of dedicated and expandable storage. Brain-CODE utilizes the Orion Network, which connects to various universities and hospitals within Ontario with a 10 GigE bandwidth, making it one of the fastest networks in the world.

Providing researchers with an integrated collaboration platform such as Brain-CODE will catalyze novel and increasingly in-depth scientific exploration across various brain disorders.

"A tool like this will help us make connections we didn't even know

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# Conference

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private healthcare insurance to complement its government-backed public healthcare; also, Australia's federal government pays directly for aged care, as Australians term it. Otherwise, healthcare down under is the responsibility of Australia's five states, just as it is with Canada's 13 provinces and territories.

Like Australia's kangaroos and koala bears, however, healthcare providers in the community and in the homes outside of hospitals have evolved into organizations unique to the country. Huge non-profit "mutual societies" and "associations" that provide community care have generated demand for healthcare technology from vendors that can be readily scaled up to handle large numbers. Procura Australia, for example, the Victoria, BC-headquartered company, and co-sponsor of the Australians' tour to North America, provides an end-to-end single client record that spans the continuum of care for over 30,000 aging and disabled Australians under community care or in retirement villages.

"We are both huge countries with concentrated urban areas and then widely strung out populations elsewhere," said tour leader Judy Martin. "In the outback, where nurses visit the aging, homes might be a hundred miles apart. So they can lose their whole travel budget with one blown tire," said Martin. "And higher up the system, like Canada, we are all struggling with change. We've had 12 different (federal) Ministers of Aging Care in the last decade or so. We can't get an aging policy to last long enough to understand it. "

Avoiding the cost impact of blown tires and other added expenses of caring for remote patients is one point of comparative pride with Canada Health Infoway, which spurs the use of electronic healthcare solutions in Canada.

"In the telehealth networks we've invested in since our inception in 2001, our studies have shown that we in Canada are now logging 47 million fewer kilometres driving remote patients each year to larger centres for examination," said Shelagh Maloney, Infoway's vice president of communications.

Australian bragging rights, on the other hand, include having sorted out the public versus private healthcare debate, which drags on endlessly in Canada.

"From a policy point of view, what makes us different from Canada is that we have a mixed private/public healthcare system, meaning that if you have private insurance you can choose your care provider and can jump up the public healthcare queue for elective surgery, for example," said Derek McMillan, a director of Australia's independent National Aging Research Institute. "Another difference is that while our states, like your provinces, control the hospitals, our federal government runs the age-care system directly."

Mr. McMillan's full-time job is as the CEO of Retirement Living at Australian Living, one of Australia's unique not-for-profit mutual societies that finance, develop, sell, and manage homes for the aging. He oversees 24 retirement villages and age-care homes in two south-eastern Australian states, Victoria and New South Wales. The society's profits are all turned back into the care of the residents and the maintenance of their facilities.

What also distinguishes these age care societies, according to McMillan, is their approach to technology: "In most other countries we see that bettering in-home care through technology is very much about hospital avoidance, about delaying entry to hospital, or averting returns to hospital.

But in Australia, that's not the case. There, home care is very much about substituting it for institutional or long-term care in nursing homes, or about reducing visiting nurse care in patient's homes."

And nowhere is that focus more in evidence than at the remarkable Silver Chain in-home health care non-profit in the state of Western Australia.

And the Silver Chain organization is big like its state – more than twice the size of Ontario, Canada's largest province – with 3,000 staff members, 400 volunteers in 27 centres throughout Western Australia helping over 74,000 people to live in their own homes and stay in their own community. Silver Chain services run the gamut of specialist nursing, in-home acute and sub-acute care, palliative care, physiotherapy, podiatry, and even speech therapy.

# Software wizards at Toronto hospitals produce innovative PACS and RIS

BY JERRY ZEIDENBERG

TORONTO – There's a major difference between producing clinical IT solutions in-house and buying the software from outside vendors. For one thing, when a hospital devises its own software, there's a tight relationship between developers and users.

A case in point is the Joint Department of Medical Imaging, which has created both a PACS and a RIS for three of the big downtown Toronto hospitals – the University Health Network, Mount Sinai Hospital and Women's College Hospital.

When end-users want something fixed or enhanced, "They will come right to your office and knock on your door," said Leon Goonaratne, Director of Informatics of the Joint Department of Medical Imaging. "I've even been swarmed while walking down the hall."

By contrast, there's more of a separation between hospitals or clinics and outside companies. The vendors are typically located miles away from the users, and some may take their sweet time in responding to phone calls and emails. What's more, their developers and programmers may never see the actual users.

For his part, Goonaratne takes the requests for changes very seriously. When his team rolled out a clinical viewer last December to 17,000 users across six different sites – a huge project – the customers were generally satisfied with the product. But suggestions immediately started rolling through on how the system could be improved.

Instead of making the clinicians wait for months, Goonaratne immediately took his team into the viewing rooms and clinics. The developers interacted with end-users – finding out first-hand what changes should be made. The team worked day, night and a weekend on the fixes, and had an update ready within a week.

"And it was a highly featured viewer to start with," commented Catherine Wang, Executive Director of the Joint Department of Medical Imaging. "With vendors, we might have to wait months for changes to be made. But when you're developing solutions at the hospital, where the users are, it's a different setting."

Indeed, in-house developers and users may see each other each day – there's a constant reminder that people are waiting for your enhancements and you don't want to let them down.

As a result, there have already been four additional updates made to the clinical viewer.

The Joint Department of Medical Imaging decided in 2010 to develop its own PACS and RIS. Prior to this decision, the Joint Department had issued an RFP, but wasn't satisfied with the responses. While some solutions offered particular features of interest, the respondents weren't able to promise integration of the system across six different sites. What's more, many of them weren't open to the idea of the partner hospitals adding their own innovations to the software.

So the Joint Department went ahead with its own PACS and RIS solution, called Coral. (It's named after the coral reef, which maintains a symbiotic relationship with other organisms in its environment.) The team also produced its own diagnostic workstation (called Coral Workstation), which is used across the six hospitals to view and report.

Catherine Wang emphasizes that in addition to ensuring connectivity and innovation, the Joint Department wanted to help lead the way in quality. It has already made impressive inroads, becoming one of the first organizations in Canada to use peer review as part of their everyday workflow.

Using Coral Review (the name of their peer review software) that was also developed by Goonaratne's team, "We've now been doing peer review for over two years," she said. She explained that the various imaging departments and subspecialties can set their own schedules for the frequency of checks. As well, the reviews are anonymous and the radiologists don't know the identities of their reviewers.

Leon Goonaratne is Director of Informatics at the JDMI.

The Canadian Association of Radiologists has named peer review as one of its priorities for hospitals across Canada. It's an important way of discovering when a radiologist needs to update his or her skills, and results in continuous quality control and improvement.

On another front, the Joint Department has also implemented dose monitoring into its CT and X-ray equipment, using technology from Radimetrics (now owned by Bayer.) However, the Joint Department went a step further, and developed a real-time image quality module into their own Quality and Safety software. The feature allows the department to correlate changes in dose to image quality, allowing them to find the best balance between dose and image quality.

Radiologists are often asked whether the images with reduced radiation are of sufficient quality. As a result of using the quality tool, the hospitals have reduced the radiation dose given to patients by 40 percent, while maintaining high image quality.

While it is actively developing diagnostic imaging software, Goonaratne notes the Joint Department certainly isn't against using products supplied by vendors. The Radimetrics solution is just one instance of a technology that has been adopted from outside suppliers. Another is analytics software, which is provided by ABS Technologies (now owned by Christie InnoMed.)

As noted earlier, the Joint Department of Medical Imaging opted to develop a new RIS in-house – the Coral RIS was rolled out in April, and is used by 90 radiologists across six hospitals. It's also used by 100 residents and fellows, and approximately 400 technologists and 200 clerical staff.

One of the key features of the new RIS is its Master Patient Index, which enables users to obtain direct access to the records of patients at the various organizations. Previously, there was no such index, and users had to access separate systems to get the full patient history.

That capability will eventually allow radiologists and administrators to perform load balancing across the system. So if the UHN, for example, has a long wait list for MRI exams, and Women's College doesn't, a clinician can easily order the test to be performed at Women's College. "It can be very cumbersome to move a patient from one site to another," said Wang. "The Master Patient Index feature looks to simplify this tedious process."

Another advanced feature of Coral RIS is its integration across the three member hospitals and with the GTA West repository of diagnostic images. That means it can find patient exams that have been taken throughout the Greater Toronto Area. "It will connect to the GTA West and pull up all of the priors," said Goonaratne.

In future, Goonaratne's team – which consists of 10 developers working on the PACS and RIS – plan to increase Coral's connectivity with the patient record systems used by the three organizations, along with the various imaging 'silos' that exist. "Ideally, we would like to link to all of the different 'ologies' in the hospitals, to provide a single source for all imaging" he said.

Moreover, the team wants to incorporate various innovations produced by Techna, the research arm of the University Health Network.

Wang said it's a priority to integrate the 'best practices' that have been recognized by teams at the Joint Department of Medical Imaging. In some cases, they've combed the province looking for the best ways of doing things.

And Wang is adamant that technology should be an enabler, and not an end in itself. "We want IT and performance management to drive improvement led by our staff and physicians," she said.

# Canada lags G7 in savings, interventional radiology

CONTINUED FROM PAGE 5

however there are challenges to the evolution of Canadian IR in this direction. Unfavourable IR remuneration schedules make it challenging for interventional radiologists to participate in clinical evaluation.

Furthermore, IR departments tend to be understaffed, leaving little time for clinical pursuits. Currently, administrators in Canada are reluctant to finance hiring clinical assistants such as nurse practitioners, clinical nurse educators, and assistants to support clinical activities in IR.

Additionally, there is a lack of clinic space and infrastructure in IR for patient consults and follow-up visits. These factors are large contributors to Canada's lag in IR adoption relative to other G7 countries. An increase in IR resources and staffing is required in order to drive growth in IR while maintaining the caseload of valuable and cost-saving IR procedures such as drainage, vascular access, and GI bleed embolization.

Canadian hospitals should increase IR support staffing, including nurses, technologists, and administrative assistants. Increased support would allow interventional radiologists to better manage the time constraints of adopting an increased clinical role, while allowing IR procedures to expand beyond the current caseload.

More Interventional Radiologists should be trained and hired to keep up with the current and future demands on the IR departments of Canadian hospitals. This involves increased enrollment in IR fellowships, which can be driven through promotion and raising awareness of the subspecialty to medical schools by the Canadian Interventional Radiology Association, supported by a government-led initiative to increase IR positions in Canada.

**Interventional Radiologists need more support, including equipment, clinic space and clinical assistants.**

The Canadian Interventional Radiology Association should continue to play an active role in the development of IR in Canada. IR-based education, marketing and training should be targeted at general practitioners (GP) and hospital administrators to increase awareness of IR and the value that it brings to Canadian healthcare.

Educational marketing should also be targeted to patients to increase their awareness of IR treatments and the patient benefits associated with these procedures. MRG also recommends that CIRA work with industry to drive awareness, because industry has a stake in many IR procedures, and a greater marketing budget. Canadian patients would benefit from an improved understanding of the minimally-invasive options available to them; this is particularly true for procedures with historically poor referral such as UFE.

Finally, the Canadian Interventional Radiology Association should work with multidisciplinary physician groups to develop best practices that result in the creation of effective referral patterns.

# Summit highlights use of business intelligence in healthcare sector

BY NEIL ZEIDENBERG

ORLANDO, FLA. – Information Builders (www.informationbuilders.com), a leading supplier of business intelligence (BI), analytics and integration solutions, held its 39th annual summit in June. About 1,500 developers and analysts, along with customers of its WebFOCUS Web-enabled business intelligence (BI) and analytics tools, converged to network and learn from one another.

The Summit opened with a presentation of Awards of Distinction recognizing innovative use of BI and analytics tools. Winners included: RainTree Oncology Services of San Diego, Calif., a community oncology organization that created an analytic platform enabling researchers to follow the entire patient journey from diagnosis to current day, enhancing cancer research and promoting best practices for more effective cancer treatment; and

Butler Health System, a community health system in western Pennsylvania, which created a WebFOCUS reporting portal and InfoAssist empowering clinicians and administrators to identify diagnostic trends within its patient population.

Case studies presented at the summit highlighted successful IT projects featuring IB's BI and analytics reporting tools – solutions that give users a greater understanding of their data. Two healthcare presentations of note, Grand River Hospital (GRH) of Kitchener-Waterloo, Ont.,and Halifax Health of Daytona Beach, Fla., both of which created a data warehouse to consolidate their clinical information.

For its part, Grand River Hospital went from a fragmented, silo-based structure to a centralized data warehouse. "Our hospital uses 68 best-of-breed systems (best in their category). It's fine for building reports within a department, but the systems don't talk to each other," said Kathleen Lavoie, director of Health Information Management and Chief Privacy Officer. "We wanted to extract more data, more quickly and manage more requests."

Having a common platform in place would simplify report gathering and help achieve greater efficiency with more accurate, timely and meaningful data.

"Information Builders (IB) was the right choice because they paid attention to our needs, and their solution provided us the most flexibility," said Lavoie.

In late 2012, the project began by getting the first four systems online. About every four months another four systems goes online, and this will continue until all 68 systems are up. "With a data warehouse in place we can answer more questions faster than ever before," said Lavoie. "It will improve patient care by being able to mine for information that previously didn't exist. WebFOCUS provides access to data that was previously inaccessible."

Lavoie ended by offering lessons learned. "Before implementing a project it's important to have a strong governance structure in place. For accountability, the senior leadership team needs to know who makes the decisions and when. It's also suggested that goals and priorities are set, and to review them often." She also recommended celebrating each success and to learn from each go-live. "Bringing data together and breaking silos brings people and teams together."

Tara Olsen, a BI developer at Halifax Health, highlighted the success of its BRAIN (Business Related Actionable Information Network) project, migrating from non-complex to more complex reporting systems. Halifax Health is a Florida-based group of hospitals.

Initially, Halifax ran solely on Meditech, which spits out reporting data very slowly and is limited to what data can be extracted. Information Builders' WebFOCUS BI solution was used to create a data warehouse, putting all of the organization's data in one place. The data became more easily extracted, analyzed and reports could be run on demand.

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[2] Source: 3rd Annual Desktop Virtualization and Cloud Adoption Survey, Imprivata, 2013

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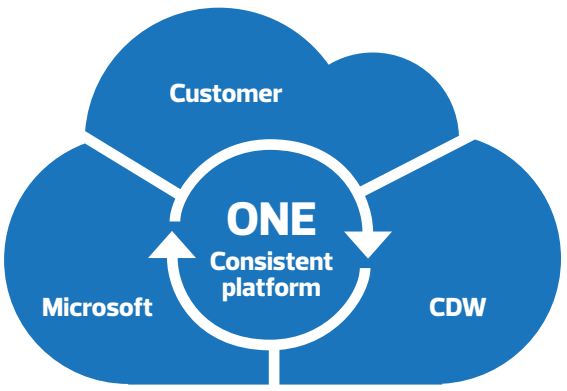


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VIEWPOINT

# What actually happened with the Obamacare website

**Faulty communication, poor leadership, and a lack of resources all contributed to a near-disaster.**

BY DOMINIC COVVEY

A couple of months ago I wrote about the Obamacare website debacle. I asked a number of questions and now, finally, we seem to have a few answers. A recent article in Time magazine (March, 2014) focuses on how the problems were corrected, and, together with other sources, one gets insights into how the problems were created.

The initial scuttlebutt was that the website was not subjected to end-to-end testing. That turns out to be true. Most of the modules were tested, but the developers did not fully assemble them into an integrated system that was given a test drive. Despite the national importance and political implications of the project, the system was actually fielded without that. The result was an instantaneous disaster that nearly provided sufficient basis for the revocation of the Affordable Care Act … a Republican dream come true!

It appears that much of the effort prior to the launch of the website concentrated on issues like marketing Obamacare and enabling enrollment. It seems that the root cause of this was engaging marketing hot shots from Obama's campaign, rather than the technical talent that could have delivered a viable system.

After the Congress got involved, contractors belatedly claimed they did not have enough time to test the website's technology. But, nobody yelled before it was too late.

There were many weaknesses that set the stage for a disaster. These included a multi-independent team approach to development combined with poor inter-team and intra-team communication. This was made worse by a failure to provide overarching leadership and the underestimation of the sheer volume of users. Another issue was an inadequate initial design and a failure to appreciate the time and effort required. Finally, I believe, there looks like there was a lack of appreciation of the political and social importance of a successful outcome. One gets the feeling that there was a kind of arrogance that just assumed things would go well.

> **This project is worth almost $1 billion, but the best talent was engaged only at the point the patient nearly died. It should have been there at the start.**

It is important to realize that this is an almost billion-dollar project – and we should recall how many of these gargantuan undertakings meet the undertaker – that should have had the attention of the best of the best in the field. Well, the truth is that the best talent was engaged only at the point the patient nearly died. Then and only then were the types of leaders and doers brought in who could rescue the septic patient and return her to a healthy state.

As I read this material, it all seemed familiar. Back many years ago, Fred Brooks wrote a book called "The Mythical Man Month: Essays on Software Engineering". I still have a copy of the book and have never forgotten Brooks's key messages. One example is that it is very difficult to improve a project late in the project cycle, because introducing additional people and the necessary communication slows the project down, rather than speeding it up.

Brooks faced the challenge of developing the operating system for the IBM 360 computer at the same time the command set of the computer and its architecture were being developed – a mega challenge. He studied what worked and what did not work. The Obamacare website project shows an even clearer message: if you don't have the proper team in place with the proper leadership and clear communications, you're in even deeper do-do.

I wonder when we will learn that the "machine" for software development is competent people linked together by clear goals, efficient communication, a focus on excellence, a willingness to take the risk of blowing the whistle, a common purpose and professional independence. On looking into this disaster, it seems that every one of these aspects was missed!

You can argue that the toolset is important; the lack of tools to assess website performance was definitely a problem. Maybe we do not have the proper toolset to address challenges like this and, if that's the case, we are really impaired! It would be like having an airplane that can't fly or isn't

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

# Energy accountability is growing in Canadian healthcare facilities

BY ANNA DOWBIGGIN

Proponents of healthcare reform are well-advised to look more closely at energy conservation and renewable energy adoption by Canadian healthcare centres. There are considerable gains to be made by reducing energy consumption and creating more sustainable healthcare facilities.

Here in Canada, hospitals have been identified as among the greatest consumers of energy: "Hospitals are one of the most energy intensive of all publicly funded facilities, spending over $300 million each year in energy. On average, Ontario's hospitals used 2.51 gigajoules of energy per square metre of conditioned floor space in the 2009-2010 operating year," according to the Ontario Hospital Association's 2013 report.

The Ontario Ministry of Energy's 'Broader Public Sector Energy Conservation and Demand Management Plan' requires annual energy usage and Greenhouse Gas Emissions (GHG) reporting, and starting this year, Ontario hospitals will also be required to produce their first five-year energy conservation and demand management plan.

Elsewhere in Canada, reporting on GHG emissions and energy usage on a public sector basis is picking up steam. British Columbia actively tracks GHG inventories in three reports filed with parliament and already participates, along with Quebec, in the International Carbon Action Partnership.

At the national level, The First Biennial Report on Climate Change for 2014, recently released by the federal government, offered a sector-by-sector approach to GHG and energy reporting, including carbon dioxide emissions projections.

What does it all mean – now? Years ago, nomenclature like 'triple bottom line' 'sustainability' and 'environmentalism' might have provoked eye rolling and gratuitous public relations campaigns in some sectors. Other groups may have mulled over the implications of a change in organizational culture from one of energy consumption to that of conservation and demand management.

Anna Dowbiggin

In healthcare, a few recent notable hospital facilities such as Sunnybrook Hospital, Kingston General, Haliburton Highland Health Services and Lady Minto Hospital on Salt Spring Island, B.C., have installed energy efficiency projects involving solar panels or geothermal heating and cooling systems. Others have adopted principles of energy efficiency and conservation on a smaller scale, with projects such as better medical waste management or improved water savings and materials selection.

At the present moment, however, the 'elephant in the room' is a growing top down requirement for energy accountability across all sectors and none are spared, not even healthcare. How Canadian healthcare leaders interpret this challenge, learn from other countries and build the capacity in energy conservation and demand management will be of ongoing importance.

*Anna Dowbiggin is a doctoral candidate in Business Studies and Energy, Edinburgh School of Business, Heriot Watt University, Scotland. She lives and works mostly in Canada and can be reached at amdowbiggin@gmail.com.*

# Privacy breach at Ontario hospital leads to $400 million class action

BY BRADLEY LIMPERT

Last spring, the media were buzzing with reports about a huge breach of privacy at Rouge Valley Centenary Hospital, in Scarborough, Ont. When a new baby was born at the hospital, contact information for the family was often provided to companies selling Registered Education Savings Plans. Over 8,000 patients had their personal information accessed for this unauthorized purpose. A hospital spokesman confirmed that two hospital employees were being paid by RESP marketers to provide the information.

The privacy breach occurred in two separate incidents. The first was discovered in October 2013, when an employee involved in the scheme confessed to the hospital about what had been happening. About 4 months later the hospital discovered that another employee was doing the same thing. The activities occurred from 2009 to 2014.

On June 4, 2014, the Privacy Commissioner of Ontario announced that it had launched a major investigation into the affair. The Commissioner will be reviewing the hospital's policies and procedures.

On June 25, 2014, Rouge Valley Health System was named as a defendant in a class action lawsuit claiming more than $412 million dollars, close to $50,000 per patient affected.

The situation raises a number of questions. First, why did it take so long to figure out what was happening? Were there any hints or clues earlier that a massive privacy breach was underway? With such a large-scale and ongoing breach of privacy, it would seem strange that at no point had any of the affected patients mentioned anything to the hospital. Equally strange is that it occurred a second time, after the first employee had told the hospital about what was going on.

It will be interesting to see whether the Board of Directors of the Hospital carries out an independent investigation. The Directors individually have fiduciary duties towards the patients. In these circumstances it would not be unreasonable for the directors to hire their own counsel and conduct an investigation to ensure that they have all the relevant facts.

Before the privacy breach was announced, what type of culture did Rouge Valley Centenary Hospital have concerning privacy? A hospital spokesman indicated that because of these incidents the hospital is now tracking who accesses certain types of patient information. Will the Privacy Commissioner of Ontario conclude that the hospital should have been doing this all along?

A hospital spokesman said that the hospital had not contacted police regarding this breach of privacy. The Privacy Commissioner may use this situation to clarify when police ought to be brought in.

The Privacy Commissioner of Ontario has been quite prescriptive about what steps hospitals should take to safeguard personal health information. For example, the Privacy Commission has recommended that in relation to any records or data containing personal health information, a hospital or other custodian of healthcare information should:

- record continuously and in real-time patterns of access and activity by its staff;
- monitor continuously and in real-time staff behavior for activities that may indicate misuse;
- continuously and in real-time generate alerts or reports to identify, manage and contain any unauthorized activity or any loss or theft of personal health information;
- continuously and in real-time track and report uses for all purposes; and,
- continuously and in real-time log every transaction by its staff involving personal health information.

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

Q & A

# Southlake Regional CEO, Dr. Dave Williams, walks the space talk

*Canadian Healthcare Technology's* contributing editor, Andy Shaw, recently interviewed Dr. David Williams, who is President and CEO of Southlake Regional Health Centre, in Newmarket, Ont. Dr. Williams is also an assistant professor of surgery at the University of Toronto and former head of the McMaster Centre for Medical Robotics in Hamilton. But he's better known for his exploits during 687 hours in space. During his two flights on the Space Shuttle, the last in 2007, Dr. Williams set a record of 17 hours and 47 minutes spacewalking to work outside the shuttle including installation tasks on the International Space Station. Later as a NASA administrator he was responsible for astronaut crew safety and health. He spoke with CHT contributor Andy Shaw recently about what healthcare can learn from his strolling in space.

**CHT:** It's a very long way, in more ways than one, from orbiting high above earth in the International Space Station to manning the President and CEO's desk at Southlake Regional Health Centre. So what's the connection? How and why did you end up grounded, if you will, in healthcare?

**Dr. Williams:** Well, first of all, as a former astronaut, many people have asked me why we should be exploring space at all. And my answer was and still is: space exploration is not just about space. It also solves the problem of keeping humans alive in an extremely hostile environment by creating innovative technologies – which, in turn, become commercial spin-offs that stimulate the economic engines of the countries that venture into space.

So, to answer your question, I believe we can do the same with technology in healthcare. We are doing this with our new technology accelerator, CreateIT at Southlake, and there is room to do more.

**CHT:** How so?

**Dr. Williams:** I think partnering in healthcare is certainly part of the answer, just as it is for the major spacefaring nations. I am very proud to say that the International Space Station could not have been built if it were not for Canadian robotic technology and, specifically, the Canadarm you see on the back of our new $5 bill. Indeed, I came across a great example of how partnering and applying space technology can work to enormous benefit in healthcare when I was working as Director of the Space and Life Sciences Directorate at the Johnson Space Center in Houston (NASA's home of astronaut training and Mission Control).

**CHT:** Tell us about it.

**Dr. Williams:** The story began a decade or so ago when Dr. Garnette Sutherland, a neurosurgeon at the University of Calgary, envisioned a surgical robot that could assist neurosurgeons in performing complex, image-guided neurosurgery. The robot had to be capable of being used simultaneously with an intraoperative MRI; something that appeared impossible at first glance. So Dr. Sutherland approached

Dr. Dave Williams, President and CEO of Southlake

MDA, the same company that built the Canadarm, and together they developed the NeuroArm, a neurosurgical robot based on the principles of Canadian space robotics. This technology enhances the surgical capability of the most skilled neurosurgeons and has recently been commercialized. I think you could safely say it's a significant spinoff of the Canadian investment in space robotics.

**CHT:** Wonderful story! But can that space-style partnership approach be applied to healthcare's larger ills such as its inexorably rising costs?

**Dr. Williams:** Here's how: Instead of thinking of healthcare as an economic drain, we really should see it as an opportunity for economic gain. Partnering to meet the needs of patients in the healthcare system with innovative technologies that, in turn, have economic benefits is something I'm convinced we can do, just as we did in space. It's a paradigm shift that's needed to make it happen. We need to leverage the unique requirements of healthcare to develop technological solutions that both create economic growth and new ways of caring for patients. Impossible, you might say. But that's what I loved about the space program. We used to say that we did the difficult right away and the impossible would take only a little longer. Similarly in healthcare, I'm convinced we can make what seems impossible become a reality.

**CHT:** So how do you begin to do that?

**Dr. Williams:** We can do that by looking at our processes for meeting the unique needs we have for new technologies. We're doing that now at Southlake.

When I first worked at NASA, I was responsible for the life sciences research and development of technologies needed to support long-duration exploration of space. For the better part of a decade, the life sciences team had done a great job in creating new knowledge about long-duration spaceflight through a robust peer-reviewed research program. The development of new life science technologies had not progressed to the same degree.

**CHT:** Then what happened?

**Dr. Williams:** The NASA team concluded we needed to do things differently; we needed to change our processes. And so we did. Starting in the late 1990s, NASA developed the Technology Readiness Level (TRL) process that provided a rigorous approach to creating new technology. The process has been used by a number of government agencies with modifications of the approach used by many companies. It lays out nine steps of development from the TR Level 1 new idea to TR Level 9 where the technology is ready to be used in space. Many of the TR Level 9 devices have become commercialized as spin-offs from the space program highlighting the success of the TRY process.

The analogy in clinical healthcare would be a surgeon saying, 'You know I could use such-and-such to improve my operations.' That would be considered a TR Level 1 idea. Then, if and when that surgical innovation eventually becomes a marketable product, it would become TR Level 9.

Like space, healthcare is all about processes. So we need to think and examine them all the time. What parts of the process are working and what parts

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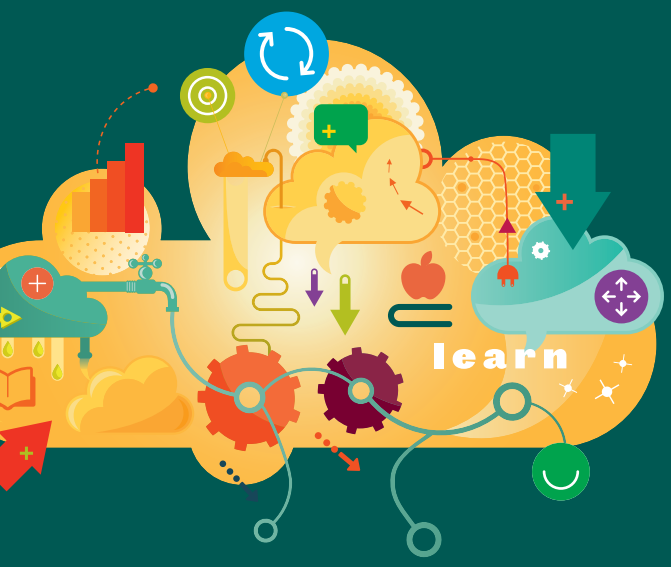


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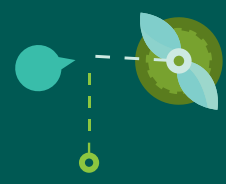

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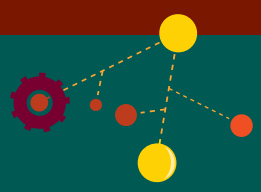

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# BC's Island Health moves ahead with an integrated, cross-sector patient record

## The patient voice is an important part of the 'Know Me' strategy.

BY DIANNE DANIEL

Joe, a 78-year-old survivor of prostate cancer, suffers with side effects from radiation treatment, including a bladder burn that causes daily discomfort. After seeing the same specialist for more than a decade, he recently transitioned to a new physician.

You might expect his greatest concern to be the prospect of facing a bladder removal. Surprisingly, he's more preoccupied about whether his new doctor will understand his history. "I just wish there was a way he could know me," he says.

Joe's story illustrates the rationale for a fundamental shift under way at Island Health, a health authority providing services to more than 765,000 people on Vancouver Island in B.C., including the islands of Georgia Strait and mainland communities.

Island Health is actively moving towards having a single, integrated electronic health record across the continuum of services that it provides – including primary care, home and community care, residential care, mental health and substance use, ambulatory care and acute care.

As part of this transformational One Patient, One Record, One Plan for Health and Care strategy, Island Health is currently working to develop a new view of patient information called Know Me.

"What's really missing from a traditional electronic health record is the patient's voice," says Dr. Mary-Lyn Fyfe, Chief Medical Information Officer and a practicing physician at Island Health. "What's their story about their experience? How can they tell us about what they would like for health and for care prior to us seeing them?"

The intent is to ensure that social factors impacting health and wellness, as well as information about personal goals, are incorporated into the health record. The concept is considered a first and is part of Island Health's alliance with Cerner Corp., formed in February 2013, to advance the health authority's integrated electronic health record (EHR) strategy.

"If I walk into a patient's room, I know she has diabetes, hypertension, heart failure," explains Dr. Fyfe, acknowledging the tendency for doctors to sometimes think of patients in terms of their medical conditions. "But what if I also know that she would really like us to have conversations when her son is present, or that she worries about being out of work too long because she can't afford her rent? How would our conversation change if I knew that the only thing she really wants answered is, 'Am I going to have to stay in hospital?' Until we address that she just cannot listen to a thing I have said."

The Know Me concept is less about patients accessing their personal health information and more about changing the conversation that takes places between providers and patients, adds Catherine Claiter-Larsen, Vice-President Quality and Chief Information Officer at Island Health. "It's about triggering a conversation that doesn't always happen today … so that we will know what matters to the people we serve and not just what's the matter with them," she says.

Island Health's Know Me view is currently under development. Other Cerner Canadian firsts arising from the One Record, One Patient, One Plan for Health and Care strategy supported by Cerner include:

- PharmaNet integration, the ability to view drug-related information contained in a provincial data repository from within the patient record;
- integration with biomedical devices in a new patient care centre so that information from blood pressure machines, thermometers and other devices is now wirelessly transmitted to the health record;
- and, a new design methodology focused on workflow validation, a process that engages clinicians and patients in furthering the design of the integrated electronic health record itself.

"I think this could be internationally leading," said Claiter-Larsen, referring to workflow validation. "Instead of engaging clinicians in the bottom up design of a clinical information system, repeating the creating of that wheel over and over, we have interdisciplinary teams of experts who are validating an existing, well configured Cerner clinical information system."

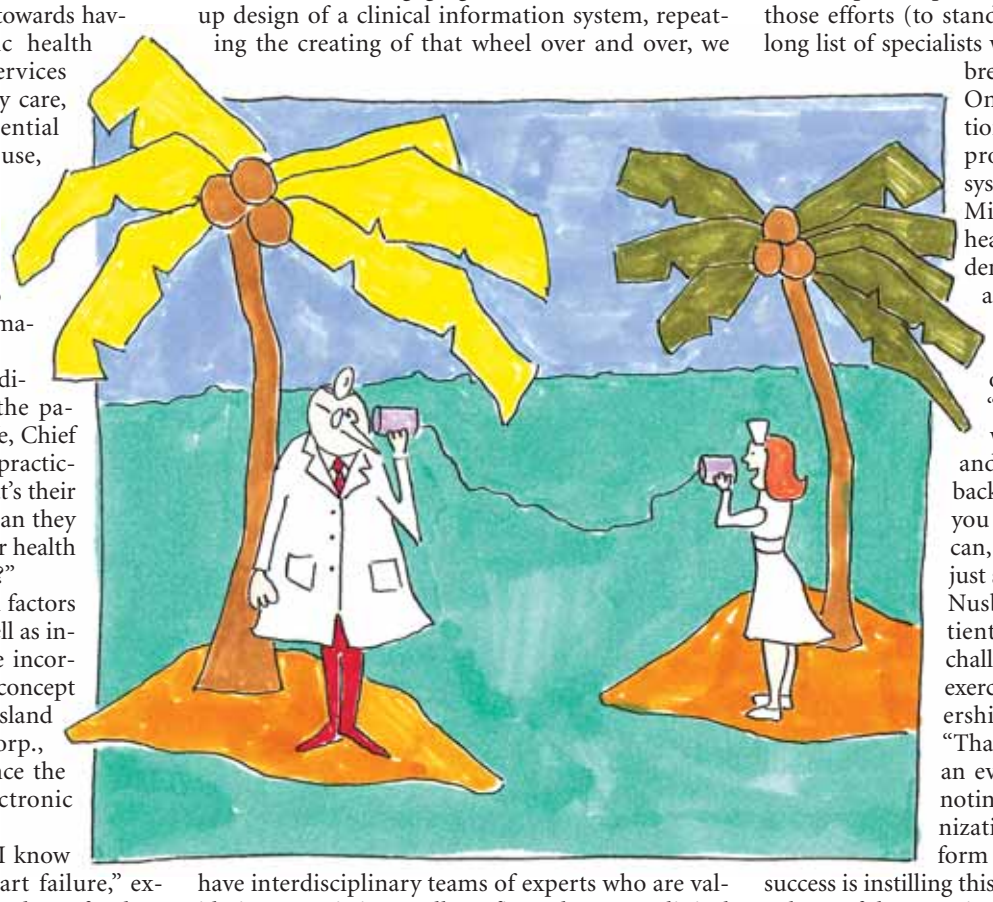

ILLUSTRATION: LINDA WEISS

As part of the process, patients are asked to sit down with the project teams to discuss how advancements to the integrated electronic health record might work. For example, they might go through the steps that will take place if a patient were to arrive at Emergency and needed to be admitted for help with mental health or addiction issues. In addition to providing comment on the process itself, what makes sense and what doesn't, patients also have the opportunity to provide feedback about how the proposed scenario makes them feel. "That's quite different, to expose patients to the early build of an application and get their input," she said.

Island Health's journey towards establishing an integrated electronic health record started in 2006 with a decision to standardize on Cerner software. At the time, Cerner was installed in one of three geographical locations that make up the health authority, but was under-used because a parallel paper system was also maintained.

Like many organizations, Island Health was "plagued with multiple, disparate, duplicative information systems all over the place," explains Claiter-Larsen. The recommendation at the time was to leverage the investment already made in Cerner in order to provide a thin but complete set of core clinical content across the entire region served by Island Health.

"We debunked the myth that clinical information systems had to be highly tailored to geographies, physical environments and scope of services provided," she says, noting that the same configuration was used for a 500-bed hospital as well as the smallest ten-bed site on a tiny island.

"The pivotal point was that prior to completing those efforts (to standardize on Cerner), we had a long list of specialists who wanted their own best of breed system … Once we got the One Person, One Record solution in place, those requests for profession- and sector-specific systems faded away."

Michael Nusbaum, a long time healthcare consultant and president of MH Nusbaum & Associates Ltd. in Victoria, B.C., says efforts to move towards an integrated patient record are often met with hesitation. "There are always naysayers when you do these projects and I always tell them I'll come back in a year and you tell me if you can live without this. If you can, beer is on me," he says. "Let's just say I've never ever lost a beer."

Nusbaum refers to the One Patient, One Record integration challenge as a change management exercise that requires strong leadership as much as technology. "That's the beauty of this thing. It's an ever-changing system," he says, noting that every healthcare organization is working towards some form of integration. "The secret to success is instilling this notion of one record into the culture of the organization, from the most senior executive all the way down to the person who is cleaning the bed pan."

One reason for Island Health's success to date, he adds, is the dynamic team of Fyfe and Claiter-Larsen, who communicate well with all key stakeholders, including medical staff and patients. "They have done a fantastic job. Most of the health informatics industry in Canada looks very admirably on the work done by Island Health," he says.

Another is that Island Health was prepared to start somewhere, knowing that technology is often out of date faster than it can be implemented.

"The important thing is you just have to draw your line as best you can with the information you have at the time and then make it work," says Nusbaum. "When you achieve your objective, there's always going to be someone else with a better mousetrap."

Though there are many ways to achieve an inte-

grated electronic health record, the current emphasis is on implementing a single vendor solution as much as possible. It's an approach that shifts the burden for interoperability – the task of automating communication between disparate system components – away from the healthcare organization to the vendor, says Nusbaum.

Currently, Island Health is focused on developing the Know Me view as a way to improve the "health and care experience of Island Health residents." To date, the integrated EHR at Island Health includes lab results, diagnostic image reports, transcribed documents, inpatient and outpatient medication profiles from the community pharmacy database, and limited electronic capture of vital signs and nursing documentation.

Next steps include the addition of standardized electronic documentation of clinical assessments; electronic ordering for tests, medications and specialist referrals; expanded capture of key vital sign information from the home, community and hospital settings; and, patient self-service capabilities.

At this point in the Island Health journey, 1,600 physicians and 13,000 clinical staff have active EHR accounts and wireless access is in place across all major hospital facilities. There are 9,600 devices on the health authority's secure network, including 510 mobile carts.

Of the 68,000 transactions performed in the EHR each day, 2,700 are medical imaging test orders, 4,000 are for medication orders and 24,000 are lab orders. The number of concurrent users averages 1,700 at peak times.

The goal is to achieve a single patient story across the continuum of care by maintaining functionality in a single patient chart – without asking clinicians to open a separate application with a new ID and password. According to Island Health, the EHR will "apply evidence to real-time patient information creating intelligence to guide and support improved care planning, decisions and communications across care settings."

"The focus in the next two years is to really accelerate our automation so that we achieve those quality objectives for improved care across the continuum," says Fyfe. "We will be pursuing the appropriate pieces of a HIMSS Level 7 and achieve a HIMSS Level 7 across the entire care continuum."

Looking ahead, Island Health recognizes its integrated EHR is only one part of a much broader healthcare picture that includes private physicians who may have invested in their own clinical information systems. "There are many other sources and systems that we need to connect with," explains Claiter-Larsen. "Integration is still a huge topic, even for folks like us who have a single system for the services we provide."

**Canada EMR Adoption Model**
(source: HIMSS Analytics)

**Stage 7**
Complete EMR; CCD transactions to share data; Data warehousing; Data continuity with ED, ambulatory, OP

**Stage 6**
Physician documentation (structured templates), full CDSS (variance & compliance), full R-PACS

**Stage 5**
Closed loop medication administration

**Stage 4**
Computerized Physician Order Entry, Clinical Decision Support

**Stage 3**
Nursing/clinical documentation (flow sheets), CDSS (error checking), PACS available outside Radiology

**Stage 2**
CDR, Controlled Medical Vocabulary, CDS, may have document imaging, HIE capable

**Stage 1**
Ancillaries – Lab, Rad, Pharmacy – All installed

**Stage 0**
All three ancillaries not installed

# Champlain LHIN 'champ'ions move forward with rollout of Meditech 6

OTTAWA – At the stroke of midnight on Saturday, February 1, 2014, a phone message and an email were sent out to hundreds of in-boxes within Hôpital Montfort: "Please note that as of now, the Electronic Health Record (EHR) Meditech 6 is operational." Then, on Monday, May 26 at midnight, Arnprior Regional Health went live, while Carleton Place District Hospital went live on Wednesday, June 2, followed by Queensway Carleton Hospital on Monday, June 16.

These events kicked-off Champlain LHIN's CHAMP (Champlain Association of Meditech Partners) project and marked the start of electronic clinical documentation for CHAMP. The project is in its fourth year and this phase was specific to documentation.

CHAMP is a group of six hospitals in Ontario's Champlain Local Health Integrated Network in Eastern Ontario that, in 2011, partnered to implement a shared electronic patient record. These hospitals agreed to collaborate on a project that would result in a single shared Electronic Patient Record deployed on the Meditech 6.0 platform.

The success of the Meditech 6.0 launch relied not only on great planning, work and commitment of the teams, but also on the fact that the hospitals chose a global approach (single vendor) and a single, shared platform.

"The decision to move towards an electronic clinical documentation system by our CHAMP Hospitals supports our commitment to enhancing patient safety and increasing efficiencies for our healthcare providers," said Cory Bell, Regional Project Director for the Champlain LHIN Meditech 6.0 Initiative.

"Together, our partners are moving towards a complete, state-of-the-art electronic health record system and our goal is to achieve Stage 6 of the HIMSS Analytics EMRAM certification. Upon completion of the project, all departments in each facility will have access to the single source patient record at any internal location with web connectivity."

**Hôpital Montfort:** The "go-live" for the 289-bed bilingual, acute-care teaching hospital, whose mission is to provide quality care in both French and English, had involved months of multi-sectorial planning and thousands of hours of training.

"Adopting a single vendor for Electronic Health Record (EHR) and working in collaboration with partners within our LHIN will ensure the best possible care for our patients and the best value for the tax payers," said Jean-Claude Lemonde. "Montfort is well-equipped and has enough support to pursue its EHR adoption."

The hospital's financial services department, as well as its laboratories, also made the switch to Meditech, resulting in an even greater integration of the systems. The new emergency department management (EDM) module will have a dramatic impact on the quality of care, patient safety, patient experience and the overall performance of the organization. For example, with the new Emergency Tracker, clinicians can check on the state of a patient, an order or a result anywhere in the hospital and at any time. This greatly helps streamline the emergency department processes and workflows while helping clinicians make faster critical decisions.

**Arnprior Regional Health:** This rollout focused on inpatient floors and targets nursing, physiotherapy, pharmacy, dietary, diabetes, and nursing education. For ARH this means the move from paper charting to charting on screens at the bedside, with a gradual move to hand held devices.

"The screens at the bedside will really provide a more efficient way of charting. If you have a patient with low blood sugar, a protocol will pop up and tell the nurse the process to follow," said Ralph Mawdsley, RN, clinical project lead at Arnprior.

**Carleton Place & District Memorial Hospital:** The vision of an integrated electronic patient record at Carleton Place & District Memorial Hospital (CPDMH) became a reality as the hospital went live with the launch of their electronic clinical documentation system.

Project leaders Cory Bell and Dom Ielo.

The new system allows nurses to complete all of their documentation electronically, right at the bedside. Care providers are able to access the patient's history, care plans and ongoing assessments, as well as lab and diagnostic test results – all in one place.

"We are currently testing various devices to see what will work best in Carleton Place," noted Valerie Sherrard, Manager, Patient Registration/Records and Project Manager. "We need to look at factors such as the size of the devices, storage options and power supplies."

She said the opportunity to collaborate with other local hospitals, as part of the (CHAMP) project, was a key part of CPDMH's success. "It's exciting," said Sherrard. "Everyone is working extremely hard, but our nurses are definitely up for the challenge."

**Queensway Carleton Hospital:** This phase of the implementation of the electronic health record at the 264-bed Queensway Carleton Hospital focused on inpatient clinical units. Electronic clinical documentation super-users and champions were seen on each unit supporting staff as they began this new journey on how they would be charting for their patients.

The hospital also created a new position of Chief Medical Information Officer to act as liaison between Physicians and the IS/IT Team. The role is important in enabling a successful implementation of each of the clinical modules of Meditech. Coordinating physician engagement, evaluation, involvement, and input into the components of each project will increase the value and acceptance of the tools developed.

"We are very pleased with how the implementation has gone", said Melissa Dougherty, Director of Nursing Professional Practice and Clinical Informatics at QCH. "This is an exciting time as we move to an electronic chart that supports real-time interdisciplinary documentation at the point of care". Frontline staff have contributed to the design and build to ensure the system captures all components of their patient assessments.

# Sunnybrook uses new solution to enable a connected environment

**BY GARY FOLKER**

For most hospitals, seamless connectivity and the expectation to deliver a patient-centric care model presents a great challenge that is becoming more pressing in the current state of Canadian healthcare. Today's world operates on millions and millions of pieces of data and information is key. For hospitals, fast, easy, secure and accurate access to patient information is critical. Sunnybrook Health Sciences Centre was feeling the pressure to address these challenges, and needed a solution that would integrate their many internal and external systems, increase their network visibility and streamline processes to support the healthcare practitioners' goal in improving patient care.

Working with Orion Health, Sunnybrook selected the Orion Health Rhapsody Integration Engine to fulfill its needs and address said challenges based on the solutions' intuitive and user-centered interface, level of security and overall ease of use and implementation. Since its implementation, the Integration Engine (IE) has already led to higher adoption levels of the technology and improved the security of sensitive data.

"With the vast amount of data that crosses our network each day, we needed a robust integration engine that would give us a better-connected health system," said Oliver Tsai, Director, Information Technology, Sunnybrook Health Sciences Centre. "Rhapsody has added to our technical strengths and allows us to deliver the data on time to the clinicians who are able to provide coordinated, quality care for our patients."

Sunnybrook is an excellent example of an organization that's opted for an integration engine versus a "rip & replace" approach when updating their legacy systems. It further reinforces that investing in an IE goes beyond just the integration itself – it addresses other areas such as security, support, monitoring and mobile monitoring capabilities that are almost or just as important to keep up-to-date. The intuitive nature of the technology, allows healthcare facilities like Sunnybrook to have more control over their patient environments and manage critical patient information from within.

An integration engine truly is a key component of health reform that enables better access and sharing of information between healthcare providers, patients and healthcare institutions. Acting as the backbone inside a healthcare facility, it enables more efficient and effective access to clinical data. In addition to its interface, security and support systems, Orion Health's Rhapsody integration engine boasts a variety of features that benefit hospitals such as: simplified standards support, integrated lookup tables, guaranteed message delivery and a fully customizable system. It's reliable and scalable, making it easier for healthcare organizations to update legacy systems and transition more easily to new technology.

Gary Folker

The millions of messages that cross the Sunnybrook network each month are better managed with Rhapsody. Using the agnostic technology is the easiest way for the healthcare facility to achieve interoperability between disparate IT systems.

There is a change in the healthcare landscape as to how facilities are managing their data. Facilities like Sunnybrook are recognizing that an effective integration engine like Rhapsody will allow them to not only update systems today, but as new standards and protocols emerge; Rhapsody will help to prepare for what is next and continue to evolve alongside the healthcare system.

*Gary Folker is the SVP and Country Manager for Orion Health Canada and is responsible for the strategic planning, ongoing development and growth of Orion Health in Canada. For more information on Orion Health, visit www.orionhealth.com or email at canadiansolutions@orionhealth.com*


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CANADIAN Healthcare Technology

# Brain-CODE

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existed. It will allow us to begin looking across disorders and brain conditions to better understand common underlying causes," said Dr. Evdokia Anagnostou, a clinician-scientist leading OBI's Province of Ontario Neurodevelopmental Disorders Integrated Discovery (POND) program. Additionally, OBI is setting up partnerships to connect Ontario with international expertise and existing data sources to improve patient care by augmenting data sets and setting standards for data collection and harmonization.

**Privacy and security are top priorities:** While keen on the prospects of data sharing, OBI is also acutely aware of privacy concerns in the evolving digital age. OBI is committed to patient privacy, and Brain-CODE adheres to the highest standards of privacy and security. In recognition of its continued commitment to privacy and security, OBI has been designated a "Privacy by Design Ambassador" by the Information and Privacy Commissioner of Ontario.

The Brain-CODE Governance Policy outlines how data, including patient data, is stored, protected and responsibly accessed by approved researchers. Brain-CODE's data access and data sharing policies maximize research potential while minimizing patient risk. Additionally, regular audits including Threat Risk Assessments (TRAs) and Privacy Impact Assessments (PIAs) are undertaken to minimize the risk of patient identification or data theft.

**Maximizing data use through standardization:** The OBI has placed strong emphasis on establishing data collection standards. Through stakeholder engagement, OBI established a core set of demographic and clinical Common Data Elements (CDEs) that will be collected by all ID program researchers. Collection of these CDEs ensures a high degree of consistency and standardization of data collected across the province, which ultimately allows for effective data comparison.

Consistent data collection within and across disease states will help elucidate how brain diseases are alike and how they differ, which may identify underlying mechanisms of disease and new treatment options. To this end, OBI has hosted a brain data harmonization workshop and multiple neuroimaging standardization workshops involving institutes across Canada to explore best approaches. Promising data standardization initiatives were instigated at these OBI workshops and are being implemented throughout OBI's ID programs and other initiatives.

> **OBI hopes to engage with patients by allowing them to track the progress of the study in which they are participating.**

**Enriching datasets through linking and federation:** To further enrich data captured by Ontario researchers, Brain-CODE is developing the capacity to link securely with other national and international databases. Brain-CODE will be using proprietary security and privacy software developed by the Electronic Health Information Laboratory (EHIL) in 'federation' or 'linking' projects, ensuring the highest standards of data security and privacy are met.

Federation will provide Ontario neuroscientists with access to previously inaccessible puzzle pieces, such as patient health administration history, which may help to answer currently unresolved brain-related questions. Discussions around these kinds of collaborations are already underway, paving the way for health data integration in Ontario.

**Building Brain-CODE through effective partnerships:** The development of a comprehensive informatics platform like Brain-CODE not only requires significant investment of resources, but also a variety of expertise in informatics, computing, and health information privacy and security. The OBI has been able to effectively leverage tens of millions of dollars partly through its partnership with the InDOC consortium, which has been building Brain-CODE on behalf of OBI.

The InDOC consortium is led by the Ontario Cancer Biomarkers Network (OCBN), which provides extensive experience in clinical and molecular data management. The InDOC consortium also includes the HPCVL, EHIL and the Rotman Research Institute (RRI). As Brain-CODE expands, OBI will be working closely with other industry, academic, and not-for-profit partners to leverage the best expertise locally, nationally, and internationally.

**The future of Brain-CODE:** The core infrastructure of Brain-CODE is complete, and the development of linkage and federation capacities is ongoing. OBI is now working with current Brain-CODE users to further advance the design and user experience of the scalable platform, that will soon include a patient portal through which OBI hopes to engage with patients by allowing them to track the progress of the study in which they are participating. OBI is also working with experts all over the world to incorporate robust analytics capacities for Brain-CODE.

*Mojib Javadi, PhD, is a Management Fellow and Janice Pong, MSc, is an Intern, Informatics and Analytics, with the Ontario Brain Institute.*

# What happened with Obamacare's website

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safe. So, okay, maybe the toolset is an issue. However, it seems that virtually all the mistakes here related to the human machine that created risk instead of an adequate product.

For now, we can only take lessons from this crash and maybe improve the next project we undertake. We are all ethically responsible for ensuring that things like this do not recur. We are surely responsible as individuals for our competency. However, we are also responsible for the quality of the teams we lead or in which we participate and for our designs and tools. We are responsible, too, to stand up and say "stop", or "no", or "there's a problem". I mentioned before that we sacrificed seven astronauts by not taking these ethical mandates seriously. Our social systems, not just our space program, are dependent on taking these responsibilities seriously.

I am reminded of what David Parnas, then a computer scientist at McMaster University, said about the 'Star Wars' technology promoted by Ronald Reagan. He indicated that it would only be fully tested during the first few minutes of a thermonuclear war. He and most others believed that this testing would turn up errors and the result would be a cataclysm of epic proportions. So, if we undertake in a state of hopeful arrogance what we cannot do or do not fully test, even extinction could be the outcome. We are doing serious stuff!

In a later article, I will write about how the Obamacare website was rescued.

# Southlake Regional CEO Williams walks the space talk

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aren't? How can we combine our processes and develop fully integrated systems? How can we draw from the academic world to improve our processes? In other words, how can we create an environment in healthcare where innovation thrives, just as it does in space?

**CHT:** Speaking of making innovation thrive, I understand Southlake is currently involved in a commercialization project with ventureLAB. Can you tell us more about that?

**Dr. Williams:** Certainly. Together with our partners, including the Town of Newmarket, Regional Municipality of York, Newmarket Chamber of Commerce, ventureLAB, York University, and University of Ontario Institute of Technology. Southlake recently launched a centre of innovation called CreateIT to drive the future of healthcare innovation by cultivating great ideas that will translate to healthcare and commercial success.

CreateIT is a space to bring private sector organizations together with academic institutions and Southlake to drive new technologies and to select promising projects based on a culture of 'fail fast and succeed early.' It's housed in a stand-alone building, but extends into the hospital and the community. The CreateIT team will help fast-track ideas to market by mentoring new entrepreneurs, addressing regulatory issues, and generating a sustainable revenue stream.

CreateIT participants include companies from the local community and other areas across Canada, plus international organizations that are seeking an entry point into the Canadian market. This is a unique opportunity for businesses to gain expertise by utilizing the resources at Southlake to field-test innovation, or simply to establish their business in an environment populated by like-minded companies.

Nurturing innovation provides the opportunity to drive healthcare excellence to patients and the greater community. CreateIT will generate a sense of optimism, accomplishment, and pride within the walls of Southlake. Locally, nationally, and internationally, it will be known as an initiative of great ideas that culminates in healthcare excellence.

# Summit highlights customers' successful use of BI

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They began by creating a new Emergency Department (ED) dashboard that monitors live data and is auto-refreshed every minute, and arrival data tracked 24-hours a day. "Now we can see in-patient trends during the day, evening, the reason for visit, time in and time out. It's not just a commentary," said Olsen.

Halifax Health can also generate a "high-flyer" report for patients with chronic conditions who visit on a regular basis. Upon arrival a page is automatically sent to their case manager leading to more consistency of care. Olsen says about 90-percent of what they do is done using WebFOCUS InfoAssist, an interactive web and mobile BI app that's easy-to-use and manages heavy resource leads.

"We can drill down further to detailed reports and find the patient's experience, their X-rays, labs, radiology reports etc. The data is constantly updated."

> **Halifax Health has built a business intelligence system that easily tracks 'high flyers' and the cause of readmission.**

Halifax also created a SNF (skilled nursing facilities) dashboard where drilling down provides details about re-admissions, and patient admissions with ulcers, etc. Reports can be requested by duration or number of patients returning to hospital with C. difficile, MERS, etc. The hard data can then be discussed about what is happening and where. "This leads to more productive discussion," said Olsen.

Future plans include developing a budget tracking tool, physician billing system database, expanded infection control tracking, insurance claims analysis, and patient-physician mapping.

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