

CANADIAN Healthcare Technology

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DOCUMENT MANAGEMENT

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Hands-free images in OR

Toronto-based GestSure shook up the operating room a few years back with a system that enables surgeons to call up images without touching a keyboard. The company has recently enhanced its technology.

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The study of homecare

Telus Health, a leader in tele-homecare, has produced a survey of studies that examine the effectiveness of monitoring systems in the dwellings of persons with chronic diseases. The studies include tele-homecare sites in Canada, the United States and Great Britain.

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Community care portal

Providers of care to children with complex needs have launched on-line portals that allow parents to communicate with care-givers and other family members. The portals are expected to keep parents and care-providers better informed.

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Better budgeting

Budgeting at Quinte Health Care, in eastern Ontario, used to require manually populating 250 departmental budgets. Now, the process has been automated, giving managers more time for analysis.



mental budgets. Now, the process has been automated, giving managers more time for analysis.

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PHOTO: DOUG NICHOLSON/MEDIASOURCE

Sunnybrook Hospital and the Ontario Institute for Cancer Research (OICR) have combined forces to achieve a breakthrough in the war on cancer through the use of genomic research and Big Data. The organizations believe progress in personalized medicine requires a collaborative effort. Pictured above are Sunnybrook's research chief, Dr. Michael Julius and CIO Sam Marafioti. **SEE STORY BELOW.**

Sunnybrook and OICR partner on personalized medicine

BY JERRY ZEIDENBERG

TORONTO — Sunnybrook Hospital is about to ink an agreement with the Ontario Institute for Cancer Research to share genomic research, IT processing power and Big Data resources. The two organizations are banding together to improve the care of oncology patients and to lead the way in the 'personalized medicine' revolution.

Many hospitals in Canada are now applying newfound knowledge of the human genome to individual diagnoses and therapies — a movement in healthcare known as personalized medicine. In most cases,

they're going it alone, with each of them building massive research facilities for decoding genetic maps and creating giant data warehouses to process the information.

However, Sunnybrook and OICR decided

Success in personalized medicine will require researchers and hospitals to band together.

to buck the trend and join forces — a strategy designed to build synergies and speed up the process of achieving breakthroughs.

"So many Canadian hospitals are doing

the exact same thing," commented Dr. Michael Julius, vice president of research at Sunnybrook. "Why not work together and become more efficient?"

Dr. Julius noted that hospitals around the world are now sharing resources when it comes to applying genomic information to the treatment of diseases. That's because making sense of genetic information is a massive job, and requires the collaboration of as many skilled scientists and researchers as possible.

"No one hospital will be able to do it on its own," said Dr. Julius. "We'll need thousands of hospitals to be involved and work-

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PHILIPS

Sunnybrook Hospital and OICR partner on personalized medicine

CONTINUED FROM PAGE 1

ing together.” To that end, he is inviting other Canadian hospitals and research organizations to collaborate with Sunnybrook and the OICR.

To get things off the ground, Sunnybrook and OICR are focusing on one form of breast cancer, ductal carcinoma in situ. They’ve launched a beta project with 2,000 to 4,000 patients, and after sequencing their tumours and analyzing the genes that are firing and misfiring, the Sunnybrook/OICR team believes it will be able to determine which therapies are useful to the patients, and just as importantly, which are not.

“Can you imagine the impact this will have on a breast cancer patient,” asked Dr. Julius. “We can determine how a tumour will metastasize, whether certain medications will work or not, and whether surgery will help or is even necessary.” It means that in the future, some women will be able to avoid the punishing rigors of chemotherapy or the disfigurement of a mastectomy.

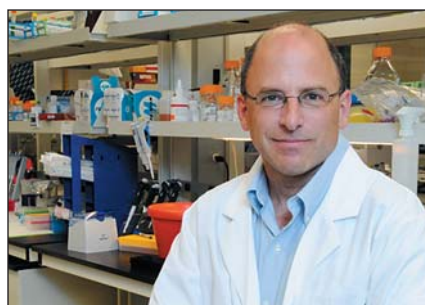
For its part, the Ontario Institute for Cancer Research has built up internationally recognized expertise in cancer genome se-

quencing and analysis. It has 100 computer scientists in Toronto alone that are dedicated to cancer informatics and Big Data.

In addition to supporting the clinical trials and research of 27 cancer centres across Ontario, it’s also a member of the International Cancer Genomics Consortium, which is currently decoding 25,000 tumour samples to create a catalog of mutations for 50 types of cancer. The global consortium’s informatics hub – the computer infrastructure, databases and analytics – is led and operated by the OICR team in Toronto.

While the OICR is involved in cutting-edge research in Ontario and around the world, the project with Sunnybrook is breaking new ground. “The level of integration is much deeper than with any of our other projects,” said Dr. Tom Hudson, president and scientific director of the OICR. “We’re combining longitudinal patient data from Sunnybrook, including pathology, imaging, and clinical information about the women before and after their treatments, with genomic sequences. That’s never been done here before.”

It’s all in a bid to determine the best way of treating the breast cancer that’s being



Dr. Tom Hudson, president of the OICR.

studied. Once a database is developed, populated and analyzed, and results are obtained, the team plans to move on to other cancers and diseases, Dr. Hudson said.

When will the project see results? “That’s the \$64,000 question,” asserted Dr. Julius. Sunnybrook’s research chief is bullish and predicts they will see results generated over the next 18 months to two years. Some of the initial work will focus on the creation of unified database, marrying various forms of clinical information from Sunnybrook and genomic data from OICR.

Once that job is hashed out, the team will be able to apply the knowledge of ex-

perts from both organizations. “It’s a four-year project,” said the more conservative Dr. Hudson, “but we could have discoveries before then.”

Within Sunnybrook itself, the personalized medicine project has been made possible through teamwork, as Dr. Julius has also joined forces with the organization’s CIO and vice president of corporate strategy, and capital re-development, Sam Marafioti.

“My team has the clinical records and analytics engine, and Michael’s team has the research capacity,” said Marafioti. Indeed, Sunnybrook’s researchers have been working for years to make sense of the human genome and to apply the knowledge to diseases such as cancer. A good portion of their work has been funded by the Canada Foundation for Innovation.

Meanwhile, Marafioti and his group have been delving deeply into analytics and Big Data as part of the third pillar in Sunnybrook’s information technology strategy. The first pillar of that strategy was to lead the way in the creation of the personal health record (PHR), a method of helping patients take charge of their own health.

Marafioti says the goal has been achieved with the hospital’s creation of the MyChart system. “We’ve now got 42,000 users from Sunnybrook, Baycrest Hospital, Central CCAC, and MedicAlert, Soon we will be expanding to other organizations such as Mount Sinai Hospital and CML Labs.”

The second pillar of the strategy was to optimize workflow for clinicians, something that Marafioti’s team accomplished through the development of ‘Sunnycare’—which was developed with funding support from Canada Health Infoway and was recently named a Canada Health Infoway LEADING practice.

Now, Marafioti is focusing his efforts on the third pillar of the information management strategy and analytics, with the goal of extracting more meaning from the data that’s regularly collected at the hospital.

To be sure, the project with OICR will require additional investments in technology, human resources and other infrastructure – in dollar terms, the stakes will be very high. Dr. Julius warned that to see real progress in the future, governments will have to jump aboard and provide “serious dollars”.

He observed that one of the international leaders in personalized medicine, Vanderbilt University in Tennessee, has itself invested about \$1 billion in this area. Dr. Hudson noted that the International Cancer Genome Consortium has put another \$1 billion into its projects.

The work at Sunnybrook and OICR, Dr. Julius estimated, will require some \$200 million in investments over the next five to 10 years.

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Address all correspondence to Canadian Healthcare Technology, 1118 Centre Street, Suite 207, Thornhill ON L4J 7R9 Canada. Telephone: (905) 709-2330. Fax: (905) 709-2258. Internet: www.canhealth.com. E-mail: info2@canhealth.com. Canadian Healthcare Technology will publish eight issues in 2014. Feature schedule and advertising kits available upon request. Canadian Healthcare Technology is sent free of charge to physicians and managers in hospitals, clinics and nursing homes. All others: \$67.80 per year (\$60 + \$7.80 HST). Registration number 899059430 RT. ©2014 by Canadian Healthcare Technology. The content of Canadian Healthcare Technology is subject to copyright. Reproduction in whole or in part without prior written permission is strictly prohibited. Send all requests for permission to Jerry Zeidenberg, Publisher. Publications Mail Agreement No. 40018238. Return undeliverable Canadian addresses to Canadian Healthcare Technology, 1118 Centre Street, Suite 207, Thornhill ON L4J 7R9. E-mail: jerryz@canhealth.com. ISSN 1486-7133.

Publisher & Editor

Jerry Zeidenberg
jerryz@canhealth.com

Office Manager

Neil Zeidenberg
neilz@canhealth.com



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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Quinte improves multi-hospital budgeting process with automation

With provincial ministries of health moving towards patient-centric, procedure-based funding, Quinte Health Care, with sites in Belleville, Trenton, Picton, and North Hastings, Ont., wanted to achieve finer control of an increasingly complex budgeting process.

QHC's finance division has the complicated task of managing budgets for 250 diverse departments across four hospitals. The finance team knew it would need to tackle more complex budgeting demands than ever before, and did not know if its existing approach was up to the challenge.

"Previously, we relied on spreadsheets for budgeting – 250 of these to be exact," said Angela Abram, director of financial systems at QHC. "Each of these spreadsheets needed to be manually pre-populated, submitted and consolidated, a time-consuming and error-prone process. We found that our financial analysts were spending more time making the budgeting process work than on analysis."

Abram added that, "We ran the risk of overlooking departments that were under- or over-resourced, potentially missing opportunities to enhance patient care."

The team set out to define the goals for a new budgeting solution, working closely with a large stakeholder group within the organization to understand how to ensure rapid uptake and maximum benefit to all.

Brad Harrington, vice president and chief financial officer at QHC, said, "We released an RFP that outlined our goals: a high adoption rate, complex staff budgeting logic, the ability to drill down to all levels of very detailed budgets and a customized work flow that would help us track budgets and formalize the approval process."

Canrock Solutions won the public procurement process with their Canrock Performance Management Solution for Hospitals and Healthcare Providers, which incorporates IBM Cognos Express software.

Administering the cure: QHC tasked Canrock Solutions with deploying the solution in time for the organization's next budgeting cycle – a very tight deadline. Barry Hillier, director of information systems and knowledge management at QHC said, "We did not make it easy for Canrock. We asked them to get the solution up and running within just two and a half months – a month less than they would have preferred. To their credit, Canrock delivered not only the required solution within the allotted time, but added some nice-to-have features we were not expecting."

At a high level, the solution is based on two parts: A central engine (OLAP database) where all the calculations and logic are defined, and a web-based user friendly interface where users input data and view reports. Data are stored centrally and calculations are applied to generate instant results for users.

The solution also comes with a workflow engine that requires managers and reviewers to sign off, thereby promoting full accountability throughout the budgeting process.

Budget participants and reviewers can now get instant financial and non-financial reports at the cost-center or roll-up level while they work on the budget. For example, when users change the staff schedule, they can see the impact on the financial budget as well as FTEs. Such in-

stant feedback was not possible before, especially at rolled up levels.

Moreover, management was not able to drill down on variances and understand their source by department, as reporting was very inflexible. Managers can now drill down on costs by department and account and make appropriate recommendations.



The team at QHC. Left to right: Barry Hillier, Director of Information Systems and Knowledge management; Angela Abram, Director of Finance; Brad Harrington, Vice President and Chief Financial Officer; Christine Wilkinson, Interim Program Director for Medicine and Critical Care.

Canrock Solutions supported QHC with in-depth training and support for users, ensuring rapid uptake of the new approach to budgeting at the organization. In place of spreadsheets, QHC now relies on a web-based solution that offers managers unprecedented control over the budgets that they work on.

Abram says, "By investing time in bringing managers along with us on this journey, we have succeeded in showing them the true benefits of the Canrock and Cognos solution. The buy-in has been tremendous, and the feedback extremely positive."

Healthier outlook: Automating key parts

of the budgeting process, the solution helps QHC's finance team work more efficiently and contributes to a lower level of risk.

"Previously, implementing an organization-wide change to our underlying budgeting assumptions meant making changes to spreadsheets one-by-one, which could take a few analysts more than a day," said Abram. "Now, a single person can affect the change in just a few minutes. Removing the human element from this kind of work also hugely reduces the risk of error, allowing us to be confident in the accuracy of our budgets."

The solution enables greater visibility and granularity of budgets across the organization, driving better allocation of resources. A new formalized approvals process introduces unprecedented accountability around budgeting decisions. "IBM Cognos software enables us to drill down deep within budgets, eliminating any ambiguity around expected expenditure," said Harrington. "Armed with this sort of insight, we can make complex decisions like staffing changes supported by accurate data and calculations. And because we know exactly who has signed off what, we can spot opportunities to challenge leaders to work more efficiently."

Moving faster: QHC is already seeing the impact of the Canrock and IBM solution on the time needed to create annual budgets. "We succeeded in finalizing this year's budget two weeks ahead of time, even though we were implementing and training users on a brand-new system," said Abram. "In the future, we expect even bigger time savings, as users get more familiar with the solution."

GestSure improves its hand-free system for controlling OR computers

BY JERRY ZEIDENBERG

Toronto-based GestSure, which only a few years ago launched a world-leading innovation that enables surgeons to use computers in the OR without touching a keyboard or mouse, has now released a major improvement. Instead of needing two hands to make the gestures that operate computers by remote control, surgeons will be able to perform these tasks using just one hand.

"This will be a big help for surgeons and interventional radiologists," said Jamie Tremaine, an engineer specializing in machine vision and co-founder and CEO of GestSure.

The solution works by deploying Microsoft's Kinect platform and sophisticated software and hardware devised by GestSure. Kinect was originally aimed at the consumer marketplace, and has done very well there. But increasingly, innovators are finding uses for it in healthcare.

Kinect allows users to control a device from a distance by gesturing with their bodies. GestSure's innovation employs Kinect and its infrared light coding to

capture the hand motions of physicians, enabling them to quickly change the diagnostic pictures on a screen or to zoom in and out.

The three creators of GestSure – who include a University of Toronto surgical resident, a computer engineer and engineering specialist Tremaine – adapted the Kinect system so that surgeons wouldn't have to touch a keyboard in the OR when calling up diagnostic images.

The advantage? Keyboards and mice are not sterile, and surgeons cannot use them directly, due to the risk of transferring pathogens to patients on the operating table.

"Maintaining sterility is paramount," noted Tremaine. Failing to do so could lead to the deaths of patients or result in re-admissions.

Some surgeons direct an assistant to call up images in the OR, but that is often a frustrating experience, as the assistant doesn't know quite what the surgeon wants to see.

Often enough, surgeons try to commit diagnostic images to memory before conducting their operations. Needless to say, that doesn't always work so well.

That's where GestSure comes in. Using the technology, surgeons can access the images they need without touching a keyboard or laboriously instructing an assistant. "It's important to see the images, especially for complicated surgeries like the brain, spine and ENT," commented Tremaine. "You just can't go blindly digging around in there."

Thoracic surgeries also benefit from having images up on the screen. And

Using GestSure, surgeons can access the images they need without touching a keyboard or instructing an assistant.

increasingly, physicians are using the GestSure technology to retrieve notes and information as well as images while in the OR.

GestSure's system has been tested with favourable results in the ORs at Sunnybrook Hospital. The company has also sold solutions to users in the United States, including Swedish Hospital in Seattle. (Interestingly, GestSure was fea-

tured in Microsoft's advertising in the most recent Super Bowl telecast.)

The company also works with Techna Institute in Toronto, a think-tank and development lab that was launched by the University Health Network. And it's a key partner of Microsoft in the healthcare sector.

The ability to control the flow of diagnostic images appearing on a monitor, by using motions from one hand, is a major innovation. "No one else has this," asserted Tremaine, who said that competitors are still trying to get the basic technology right. The one-handed control means that surgeons can keep one hand on their instruments. "That's especially important for interventional radiologists," said Tremaine, as IRs manipulate flexible instruments that have been inserted into their patients.

Commented Peter Jones, Microsoft's healthcare industry lead for Canada: "As innovation and collaboration become the primary catalysts for change, Microsoft plays a vital role through its network of 625,000 global software, hardware and service partners to build these affordable solutions."

Patient engagement through technology is leading to better outcomes

BY SCOTT HERRMANN

I generally don't like to use sports analogies, but for the sake of this discussion, let's use one. Imagine the overall management of your own healthcare as if it was managing a professional sports team. Who would be your number one draft pick?

In this scenario, you, the patient, are your own number one choice. You are the franchise player and the key driver for your own life. You are a driving force to a speedy recovery, because when you have an ailment, the person that it affects the most is you. It is your body and you should have the strongest voice in the management of your own care.

This level of engagement in our own healthcare has really only become possible in our modern age. For example, the internet has become a powerful tool for healthcare independence. We have been liberated in our knowledge levels, armed with new

and powerful research tools. We are now capable of asking more in-depth questions in relation to our healthcare; in fact, today many healthcare professionals encourage it. By working closely with your healthcare team, you are working towards a similar goal, ensuring you are recovering and healing as quickly as possible.

Many care teams still believe that all the decisions in your care lay with the specialists. It is your right to have an impact on your care. Are you passively waiting for a team of specialists to make decisions about your health or are you actively taking a step forward and impacting change?

As an active member in your team of healthcare professionals, it is your right and responsibility to give an accurate account of your health history and conditions. By doing this you will establish a personal "bank" of healthcare data, which can be called upon in times of reference for various ailments. This all leads to having information if and when you need it. This is powerful for you as well as for the greater good of the healthcare industry.

In regards to acute and post-acute care, many hospitals and medical clinics recognize the value of empowering the patient by involving them in their own care. By working closely with the patient to document healthcare history, medical professionals can establish an electronic health record (EHR), a complete medical record of information on the patient. Using the EHR, healthcare professionals have the ability to inform the patient from the initial discovery of a disease through the potential outcomes that may occur.

Therefore it is important, as an active participant in the management of your healthcare, to have access to your own personal EHR. You are able to see the contents of your complete medical record, and keep track of your records and treatments. As the patient, you can provide key data points about your health.

Many of our peers are using their smartphones and corresponding apps to stay on track with health and wellness goals. For example, there are apps that can manage prescribed medications, help follow a healthy diet, and ultimately motivate to leading a healthier lifestyle.

By being proactive in your own health and working closely with your healthcare team and living a healthy lifestyle, you will ensure that if an ailment arises, your healthcare team has a wealth of knowledge of your healthcare history which will aid in helping you to a quicker recovery. By combining the

building of personal data and tracking the metrics, all through personal devices, we are able to improve our own lives both before and after opening the hospital doors.

Scott Herrmann is Director of Mobile Solutions for Procura.

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Logibec, a healthcare solutions powerhouse in Quebec, rolls into Ontario and Western Canada

With the recent acquisition of QHR Technologies' EMS division, Logibec has become the country's largest provider of software solutions for healthcare organizations.

By Rosie Lombardi

Healthcare institutions now have a powerful new player to consider when they're evaluating business and clinical systems. Although it's relatively unknown outside Quebec, Montreal-based Logibec Inc. is hardly new in its home province – the company offers a wide array of healthcare systems that have been used by the majority of Quebec-based hospitals, ambulatory clinics and long-term care facilities for over 30 years.

Logibec has achieved its market leading position in Quebec because it has focused primarily on developing solutions for the healthcare sector since it was founded in 1982. The company's partnerships with major university hospital networks, has allowed it to gain deep knowledge of the needs and wants of the healthcare industry.

Logibec is now looking to expand its presence across Canada. To this end, Logibec recently acquired BC-based QHR Technologies' Enterprise Management Solutions (EMS) division, which will now operate under the name of Quadrant. About 300 healthcare institutions across Western Canada and Ontario that use Quadrant to manage their financial and

administrative information are now Logibec clients.

"The acquisition of the EMS division strengthens Logibec's position as the largest software solutions provider for healthcare organizations in Canada," says Marc P. Brunet, Logibec's President and CEO, adding that

"The combination of Quadrant and Logibec brings together two highly complementary companies, each a recognized leader and innovator in IT solutions, creating an organization uniquely qualified to meet the evolving workforce and financial solution challenges of the healthcare sector in Canada."

—Marc P. Brunet
Logibec's President and CEO

the deal has brought EMS' existing staff and talent into the Logibec fold.

"The combined expertise of over 360 IT professionals dedicated to Canadian healthcare and the expanded product suite will allow Logibec to continue to drive even greater operational efficiencies for care providers throughout the country."

Logibec already has its own administrative software suite, called Espresso, which manages HR, payroll, financial and materials management. The Quadrant acquisition complements Espresso, as both solutions have value to different healthcare segments, and the company plans to position them according to the specific needs of healthcare establishments.

The company plans to use the Quadrant acquisition as a springboard to expand both its administrative and clinical product lines across Canada. Logibec has already made a major push out of Quebec with its patient management systems, which has allowed it to establish a strong presence in Alberta.

Ultimately, Logibec's vision is to design solutions that maximize efficiency in all sectors of the healthcare industry. "The combination of Quadrant and Logibec brings together two highly complementary companies, each a recognized leader and innovator in IT solutions, creating an organization uniquely qualified to meet the evolving workforce and financial solution challenges of the healthcare sector in Canada," says Brunet.

This new relationship is strengthened by solid Canadian ownership from OMERS, one of Canada's largest pension funds.

For more information, visit: www.logibec.com



Scott R. Herrmann

Applying digital imaging's lessons learned to document management

BY JODY MILLER, RT (R,M), BS, MBA

Our current migration to electronic health information has given me a surreal sense of déjà vu. Originally a practicing registered Radiology Technologist, and subsequently working for Kodak

Health Imaging, I witnessed firsthand the technology migration from radiology film and laser film printers to diagnostic DICOM digital devices and Picture Archiving and Communications Systems (PACS).

Although the technology transition had a revolutionary impact on patient

care, efficiencies and diagnoses, it was not without its growing pains.

Challenges were numerous, including a steep learning curve, the need to build network and IT infrastructure along with external communication capabilities, ensuring interoperability, and facilitating the ef-

ficient exchange of images for viewing and interpretation. As with the migration to electronic health information exchange, initial adoption negatively impacted clinical productivity – causing resistance, frustration, and financial challenges. Doctors wanted to focus on patient care rather than evolving imaging technology and dealing with hybrid environments of medical films and digital images.

Leveraging the lessons: Today, most radiologists could not fathom interacting with anything but digital systems – and having results and information at their fingertips. With Electronic Health Record (EHR) adoption and the continued transition from paper to electronic health information, other healthcare providers will be able to provide optimal patient care because information is available immediately for reference and exchange.

EHR adoption, in fact, is only one part of the digital health information voyage. Integrating other system capabilities and processes will enhance patient care and functionality (e.g., e-prescribing, test result access, patient health records communication), and will eventually evolve to extended online electronic access.

As Canada's healthcare system continues its migration toward electronic health communication and interoperability, the opportunity is to encourage accelerated physician-wide adoption of electronic healthcare processes. This will help facilitate immediate access to information and reduce the instances of lost information. Examples of technology-enabled process improvements include:

- Unilateral electronic health records use, physician entries, and information exchange between doctors, practices, facilities and patients.
- Closed loop e-prescriptions, to improve patient medication adherence.
- Proactive patient engagement for wellness management and better patient outcomes.

Digital medical imaging was ahead of its time. Radiologists and clinicians understood the need and importance, but pushed back for various reasons, which made for a slow, painful adoption. Today's healthcare environment does not face as many issues, but still struggles with cost, adoption, and shifting technology challenges. We can take advantage of lessons learned from the film-to-digital evolution and relate these lessons to the transition from paper-to-electronic health information exchange. Some are already common practice today:

Proactive change management – plan and prepare

- Utilize upfront planning to help you choose systems that meet your needs and ensure a successful transition.
- Manage user introduction through new system and process implementations, since initial and ongoing perception can make or break a project.
- Identify and accept the gaps and realities upfront, so you will be prepared.

Manual to electronic processes

- The familiarity and comfort with current medical manual practices creates anxiety with the thought of change to new elec-



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tronic processes. Even with today's culture, where nearly everyone uses digital communications in their everyday lives, there is still the dread of change, cost, and implementation challenges. But with most medical providers knowing that electronic information is a must, taking on the challenge should be embraced and implemented as quickly as possible.

Paper-to-electronic data transition

- A valuable lesson learned from moving away from film is to identify a methodical migration plan up front. A conversion plan for back file paper documents and charts is critical. Options include outsourcing the complete conversion project, converting paper files and charts prior to the next patient visit, or to adopt a hybrid approach of scanning prior to visit along with converting back file charts when on-site availability permits.
- Determine a day forward process of converting paper documents that may present themselves from patient orders to test results received. Planning out whether the information would be stored as part of the EHR or in another system is critical to know where and how to access pertinent information.
- Determine whether to store and manage documents as part of an EHR system, taking into account whether a dedicated, integrated and accessible document management solution is more appropriate for handling all document types – not just patient health information. Always check ease of use and compatibility.

Gaps in information exchange and communication

- Build strategies to address gaps in communication with various care providers, thereby assuring that cross communication is accomplished in mandated protocols with secure and encrypted send capabilities engaged.
- Move away from traditional fax exchange of information to avoid Health Insurance Portability and Accountability Act (HIPAA – U.S.) and Personal Information Protection & Electronic Document Act (PIPEDA-Canada) breaches of information. Alternatives to faxing are expected to become more pervasive over time.

Realize hybrid environments

- Research and compare current and new technology compatibility gaps; and identify best practices that include effective ways to work in hybrid environments. Healthcare hopes for the single “fix” to process issues, similar to the way patients pursue a cure for an illness. EHRs were perceived to be that single “fix.” Healthcare has recognized the reality that between providers, facilities, patients, and associated businesses, there will always be:
 - some information in paper form
 - data in various formats (structured and unstructured)
 - technology integration and compatibility issues
 - information security concerns
 - communication and exchange challenges
 - care providers that will not implement electronic systems or electronic communication methods
 - user adoption struggles

Looking forward: Once electronic information is interoperable and accessible,

applied clinical and business intelligence and analytics will become important tools, enabling another level of transformation in healthcare. This added dimension of “intelligent” information will provide the ability to receive immediate clinical feedback and trigger treatment suggestions, resulting in better outcomes. This will aid in readmission reduction while optimizing patient care and satisfaction, with expecta-

tions of assisting in population health management (PHM).

We will also see greater operational efficiencies related to staffing and resource allocation, coding and billing guidance, and information process enhancements, all leading to increased productivity and reduced cost. Ultimately, if we learned well from previous technology migrations, there will be enormous opportunities for

IT leaders and providers to make an impact on the healthcare industry. After all, we've been down this road before.

Jody Miller, RT (R,M), BS, MBA is Director, Healthcare Solutions, Kodak Alaris. For more information about Kodak Alaris' ongoing efforts to deliver solutions for the healthcare industry, please visit www.KodakAlaris.com/go/connectcare.

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Studies show the benefits of home health monitoring

HHM technology leads to improved outcomes for patients and reduced costs for hospitals.

BY MICHAEL GUERRIERE, MD

The Canadian Institute for Health Information (CIHI) recently estimated that roughly 8.5% of patients are readmitted to hospital within 30 days. Furthermore, an estimated 9% to 59% of those readmissions could be avoided by better identifying those most likely to return to hospital within short periods and improving the care they receive before and after discharge.

Home Health Monitoring (HHM) technology presents an important opportunity to reduce readmissions, particularly for patients with chronic conditions, such as Chronic Obstructive Pulmonary Disease (COPD), diabetes or congestive heart failure.

HHM empowers these patients, who are frequent users of the healthcare system, to monitor their own health from the comfort of their own homes, and to provide their healthcare teams with detailed information about their health in real-time. Healthcare providers can closely monitor patients and take action before situations become acute, averting the use of costly emergency visits or hospital readmissions.

The current research in HHM clearly demonstrates that HHM reduces readmissions to hospitals, decreases average length of stay and emergency room visits and, ultimately, results in fewer deaths. In addition, patients who use HHM services are consistent in reporting high satisfaction with the technology.

Key findings from published Home Health Monitoring studies: Several studies provide sound insights about the value and benefits of Home Health Monitoring (HHM) as a new model for patient care delivery. What follows is a synopsis of recent peer-reviewed and published studies that demonstrate the impacts telehealth and HHM can have for patients and the healthcare system.

Home Telemonitoring for Chronic Disease Management: An Economic Assessment. JR Health Centre, Montréal, 2012: The analysis assessed the economic impact of home telemonitoring on the consumption of health services at the JR Health Centre in Montréal. It followed 95 patients with chronic diseases over a 21-month period.

Patients were equipped with a touch-screen computer and integrated modem, which were pre-programmed to monitor various health parameters. Patients transmitted their clinical data using the internet, and completed a daily data entry table to report vital signs, symptoms and medication taken.

The device analyzed the data and generated an alert to a nurse if certain conditions were detected. (TELUS Health technology was involved in this study.)

The results showed:

- significant savings over traditional home care due to reduced hospitalizations, emergency room visits and shorter hospital stays (41% savings of \$1,557 per patient per year)
- 34% decrease in the number of patients visiting an emergency room
- 66% decrease in the number of hospital stays
- 75 fewer emergency room visits
- patient satisfaction was high, with 80% of respondents wishing to keep the telemonitoring system.

Economic Assessment of a Home Telemonitoring Program for COPD Patients – Maisonneuve Rosemont Hospital, Montréal, 2012: This assessment provides a detailed economic assessment of a home telemonitoring program aimed at treating people with severe COPD. Patients were recruited through the Service Régional de Soins à Domicile (SRSAD) at the Maisonneuve Rosemont Hospital. Data for the analysis was obtained from patient HHM devices, and then electronically transferred to the hospital where it was reviewed by nurses and respiratory therapists.

The study compared the effects and costs of care for a group of 60 patients under a telehomecare program, with a comparable group receiving tradi-

Home Health Monitoring technology provides an opportunity to reduce readmissions, particularly for patients with chronic conditions.

tional home care. Summary findings showed there were significant economic savings even after considering the technology acquisition cost, as well as nursing and respiratory therapist time at monitoring centres. (TELUS Health technology was involved in this study.)

The analysis demonstrated:

- telehomecare saved 14% (\$1,613 per patient per year) over traditional care, by reducing hospitalizations by 45%, emergency department visits by 35% and achieving 50% shorter hospital stays
- faster recovery associated with early detection of COPD exacerbations followed by rapid and appropriate interventions
- telehomecare patients indicated a very high satisfaction rating with the device with 86% of patients willing to continue to use the system in their homes.

Effect of Telehealth on Use of Secondary Care and Mortality (BMJ), UK, 2012: This study assessed whether telehealth interventions to diagnose and manage patients could reduce both mortality and the number of patients admitted to hospital over a 12-month period. The study analyzed results from 3,230 people recruited from practices between May 2008 and November 2009 across the UK with diabetes, chronic obstructive pulmonary disease or heart failure.

The results of the study showed the telehealth group had:

- 20% fewer emergency admissions
- a 45% decrease in mortality rates
- shorter hospital stays

Because a relatively high number of low-risk participants were recruited for this study, cost savings per patient totalled only £188 (\$295 CDN). This cost savings is insignificant when compared to the up-front costs of the technology that was used. The authors point out that if services are targeted at patients with advanced stages of illness, the probability of cost savings and overall success of the program would increase.

Veteran Health Administration, US, 2008: In 2003, the Veterans Health Administration (VHA) introduced the national Care Coordination/Home Telehealth (CCHT) program to coordinate the care of patients with chronic conditions and avoid unnecessary admission to long-term care.

Between 2003 and 2007, the number of patients involved in the program grew from 2,000 to 31,570. CCHT is now a routine program provided by VHA to support veterans with chronic conditions as they age, improving both quality of life and reducing overall healthcare costs.

Analysis of 17,025 patients demonstrated:

- substantially lower cost over other programs and home care (\$1,600 per patient annually)
- 25% reduction in number of bed care days
- 19% reduction in number of hospital admissions

PEER-REVIEWED STUDY HIGHLIGHTS

Categories	SRSAD-Maisonneuve Rosemont Hospital Canada 2012	JR Health Centre Canada 2012	A.Steventon England (BMJ) 2012	Veteran Health Admin (VHA) USA 2008
STUDY CONTEXT				
Patient types	COPD	COPD, CHF, Diabetes and HT	COPD, Heart Failure, Diabetes	Veterans with chronic conditions
Number of patients	120	95	3,230	17,025
Period of service delivery (months)	21.5	21	12	53
KEY OUTCOMES				
% Reduction of ER visits	36%	34%	20.60%	N/A
Reduction of hospitalizations	45%	66%	10.80%	19%
Number of home visits	Increased overall, but reduced during the intervention (per) phase	Volume increased but shorter stays	N/A	N/A
Annual cost savings (%) per patient over usual care	\$1613 (14%)	\$1557 (41%)	£188	Substantial savings
Other outcomes	50% reduced hospitalization days	Reduced LOS	45% reduced mortality	25% reduced bed days
Satisfaction level	Very high	Very high	N/A	86%

Critical Success Factors: As the studies reviewed in this paper highlight, HHM programs have significant impact on patient outcomes and on more efficient provision of healthcare. Achieving important results relies on several critical success factors:

- user-friendly technology
- well-trained and supported staff
- patient engagement and education to help them understand their care plan and how to use the technology
- well-designed clinical workflow and delivery of services from the start.

The use of best practices and implementation standards is equally critical. Core Standards for Telemedicine Operations, developed by the American Telemedicine Association in 2007, is a recommended resource for healthcare leaders who are planning to implement electronic communications with patients.

Patient selection is a critical part of any successful HHM program. Select a group of patients who are too ill, then the number who fail to use the technology successfully will be prohibitively high. Cast the net too broadly, and the costs of the monitoring program will outweigh the value of the acute care encounters that are avoided.

Patient cohorts that are likely to require acute care services more frequently would justify a higher cost,

HHM facilitates better patient engagement, improved experiences, and better health.

high intensity monitoring service, as those costs would be more than offset by avoided acute care costs. Larger cohorts of people dealing with less complex conditions would have to be managed with lower cost monitoring solutions.

Strategies to reduce cost might include self-managed protocols that require minimal oversight from a clinician, use of the patient's smart phone device rather than a device provided by the health service, and alert measures that involve members of the patient's family.

Identification of appropriate patients for monitoring and their enrolment into an HHM program are significant challenges which require planning and appropriate resources. Family physicians, emergency departments, home care agencies and selected specialist practices all have something to contribute to finding candidates for a HHM program. Making these busy care providers aware of the HHM services that exist and the criteria for enrolment is not a trivial task.

Based on the research and analysis presented in this paper, there is a strong business case to be made for home health monitoring care – particularly for sub-acute patient populations at risk of exacerbating their condition and being readmitted to

hospital or having to visit an emergency department. The benefits gained by reducing the use of acute care services alone provide a compelling argument for investing in technologies that support home health monitoring.

What is perhaps even more compelling is the potential to improve the quality of life

for individuals suffering from COPD, CHF or diabetes. HHM facilitates better patient engagement, improved patient experiences and better health. The high level of patient satisfaction with HHM services – 80% or higher, depending on the study – also gives healthcare organizations the opportunity to improve their relationship with patients

and families. HHM services empower patients to manage their own health and also provide the security of additional oversight and biometric monitoring when they are at their most vulnerable.

Dr. Michael Guerriere is Chief Medical Officer at TELUS Health.



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Ethics in IT procurement: Do we need a crash to improve behaviour?

BY DOMINIC COVVEY

Wreckage, bodies, cockpit voices and getting crash data have stimulated the airline industry to put safety features in planes. We have instrumentation that says “pull up, pull up”

because a plane flew into a ridge killing everybody aboard. An air traffic control system followed after planes crashed together over the Grand Canyon. It seems we need actual evidence of possible or even probable events before we are willing to invest money and effort in prevention.

There is a connection between air traffic safety and business ethics that I'd like to address. Virtually all professional organizations have a code of ethical behavior. However, we do not seem to take them seriously. Could it be that we need to show specific examples of actual ethi-

cal misbehavior and how people are injured by it?

Pretty well everyone knows that it's immoral, unethical and even illegal to steal. Every time an institution releases an RFP, but does not follow through to buy something ... that's stealing. It steals time and money from every responder. Proposal responses cost in the tens of thousands of dollars. With no potential reward, responding is pointless! Yet we swindle companies into investing the effort and cost of responding.

Even worse is the matter of 'wired procurements', where the outcome is already determined, but organizations kite RFPs to gather competitive pricing or to paper over a violation of accepted procedures. What is the total annual cost associated with both of these cases? Millions! Ultimately, the victims are the clients and taxpayers who face higher prices or higher taxes.

Early in my career, I learned that certain medical devices were shipped to physicians in a very nice leather briefcase. In other cases, companies have provided consulting money, special stipends, research funds to attend meetings and the like. Many years ago a salesman offered me a \$5,000 kickback to buy a certain disk drive. I passed. This stuff is unethical! Unfortunately, we don't hear about it unless the police get involved.

I work mainly in the academic arena. There are practices related to funding that are close to being unethical, if not actually so. I know of substantial amounts of taxpayers' money being wasted to assess academic submissions that could have been eliminated by a simple reading of the proposals. But, they were subjected to site visits – expensive undertakings. I would assert that any waste of the taxpayers' money is unethical, but we're flooded with examples of politicians apparently misusing funds on expensive travel, meals and accommodation.

Of course, it is unethical to lie. I was once engaged to look into a hospital's claim that a vendor had misrepresented its product. The hospital had engaged a consultant, recommended by the vendor, to evaluate products and inform the hospital about the best choice. Unfortunately, the consultant happened to owe his allegiance to the vendor. This was eventually resolved after a threat of suing the vendor for commercial fraud.

Misrepresenting a product is unethical. Acting as an independent consultant, while actually being biased towards a particular vendor, is unethical. When I asked a friend if she knew about the particular consultant, she said he would always recommend the same vendor.

These are real occurrences, and they still go on. Is it not timely and worthy of effort to stop this stuff from happening? Please share your examples so we can all see the wreckage!

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

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Nova Scotia at the forefront in developing a provincial, personal health record system

The province has conducted a cloud-based test with 3,000 patients before a bigger rollout.

BY DIANNE DANIEL

At a time when we can download travel tickets, do our banking, and renew our driver's licences over the Internet, it makes sense that we should be able to manage our health while online, too. Doesn't it?

Alexa Thompson thinks so. At age 65, the Nova Scotia-based freelance writer and editor is among the first patients to log into the province's personal health record (PHR) demonstration portal from home. For more than a year she's been able to book appointments at her convenience, see her test results, track her height, weight and blood pressure, and receive alerts when her body mass index is high or when her doctor wants to see her.

"It's really changed my attitude," says Thompson, who now believes she has a responsibility to manage her own health. And she's more than happy to do it.

After spending much of 2012 in hospital or being cared for at home by Victorian Order of Nurses (VON) following complications related to a knee replacement, Thompson was determined to turn her health around. When she saw a notice in her family physician's office advertising enrolment in the province's PHR portal last year, she signed up.

"To me it was instinctive, and I'm actually going to volunteer to help other people my age become more comfortable with the system as it rolls out," says Thompson. "I trust my bank. So if I'm going to trust my bank, I'm going to trust these people."

As PHR initiatives begin to roll out across Canada, "these people" will look different in various jurisdictions, but the basic premise of a PHR remains consistent. Canada Health Infoway defines a PHR as "a complete or partial electronic health record, under the custodianship of a person or persons that holds all or a portion of the relevant health information about that person over their lifetime."

When launching its consumer health program, one of Infoway's first activities was to survey Canadians about the type of on-line functionality they would value most in a PHR. According to that research, Canadians want to book appointments, correspond via email with healthcare providers, renew prescriptions, and access their personal health information, including lab results. They also want to be able to perform all of those functions for a dependent, whether a child, aging parent or person with a special need.

"There's a lot of consistency in terms of the functions that people want, but there's a lot of diversity in terms of how those functions may be delivered," says Infoway executive vice-president Jennifer Zelmer. "But the vast majority of Canadian adults say that they would be interested in having access to these types of tools, regardless of their age."

Although PHRs require a significant effort to launch – from privacy and security issues to integration with existing electronic health record systems to interfacing with external consumer health information databases – they also offer remarkable benefit by engaging patients in their own care.

Nova Scotia believes a PHR will improve access to health services, extend the reach of primary healthcare practices, and create efficiencies through improved patient-to-physician communication, shared accountability for health, e-referrals, reduced paper

use and the ability to easily send reminders for visits, flu clinics or immunizations.

Considered a game-changer, the province's two-year PHR Portal demonstration project wrapped up in March of 2014. Funded 75 percent by Infoway and 25 percent by the Department of Health and Wellness, the \$1.495-million effort was an opportunity to "plan, do, study, act," says Mary Russell, the department's project director, personal health records.

"(A demonstration project) really is the best way to learn what works and what doesn't," says Russell. "By putting a solution out in the field to be used by those who are going to use it, you'll hear very quickly what needs to be improved."

The PHR Portal was launched in the geographic area of Capital Health, Nova Scotia's largest provider of health services. Like Thompson, patients learned of the effort through their family physicians who

enables the province to use a non-capital asset funding model, meaning it doesn't have to invest in resources to maintain or support the system. It also provided greater speed to market for the demonstration project with the flexibility to scale as more users signed on.

"This is the first time we've gone to the cloud, so it's very exciting," says Russell. "There's a lot to look at when you implement cloud technology, but if you do it right it can be very efficient and effective."

One lesson learned, she adds, is to get good legal advice pertaining to privacy and security legislation. The province did its due diligence upfront, taking time to look at current and pending legislation, and using common sense to apply its intent. "We selected a vendor who would be interested in going on the journey with us because we really are treading in uncharted waters here," she says. "There's not a lot in Canada going on."

Infoway's Zelmer points to B.C.'s My eHealth as one of the largest consumer health initiatives under way in Canada, with more than 300,000 people signing up to receive laboratory test results. Powered by Excelleris Technologies, it is a very different approach that zeroes in on one specific functionality, lab results, rather than tackling a more comprehensive PHR.

"It's about connecting, working together in terms of healthcare," notes Zelmer. "So that means a change for us as individuals in terms of our interactions with the health system, but it also means a change in terms of how the health system interacts with us."

In Ontario, Sunnybrook Hospital has taken the lead in personal health records with its MyChart system, which enables patients to build a personal record, make appointments online and see parts of their hospital records, such as test results. Sunnybrook embarked on the development of the technology years ago, and has become a leader in the area. Other Toronto-area hospitals are adopting the system, including Mount Sinai Hospital and Baycrest.

In Alberta, the provincial government and Alberta Health Services are working with Telus Health Solutions and its consortium partners to develop a PHR solution using Microsoft HealthVault, a trusted online consumer platform. Later this year, MyHealth.Alberta.ca is expected to become the point of access to personal health information for all Albertans.

The first phase is education. Visitors to the MyHealth.Alberta.ca website are greeted with a wealth of information, including answers to frequently asked questions. The site defines a PHR as a personal record that Albertans can set up and manage themselves. It includes information they enter, information from devices (e.g. blood pressure monitors), and information downloaded from Alberta Netcare, the provincial electronic health record.

Benefits of the proposed PHR, as outlined at a September 2012 meeting of the Alberta Network for Health Information Exchange, include: the ability for Albertans to proactively manage their wellness and health; improved access to health services; improved interaction between patients and clinicians; increased participation by patients in managing their treatment; the ability to more effectively engage the support of others and assist others in treatment; and increased efficiencies in general. The province also expects the health system will be more informed about Albertans' healthcare experiences overall once a PHR is in place.

Infoway is supporting Alberta's deployment through one of five funding streams available in its



posted notices in their offices. Login requires an e-mail, user name and password. Surprisingly, patient adoption rate was 67 percent higher than anticipated and the project reached its target of enlisting 3,000 patients six months early.

Nova Scotia's strategy is to roll the PHR portal out as a web-based, subscriber-based service using McKesson Canada's RelayHealth solution. A trusted electronic health record and information sharing tool, RelayHealth is designed to provide clinicians with a complete picture of a patient's medical record. At the same time, it allows patients to securely collaborate and interact with clinicians and provides tools that make it easier to manage their own health and wellness.

Relying on a Software-as-a-Service (SaaS) model

consumer health area that targets jurisdictional deployments. Additional funding streams include start-up support to those who are just beginning to investigate the issues surrounding consumer health efforts, remote patient monitoring support, demonstration project support – as in the case of Nova Scotia – and support for e-booking implementations.

“We’re certainly seeing an upswing in interest,” says Zelmer. “When we first started working the consumer health space, it was still pretty early. There were some early adopters who were testing and trialling different approaches, but now we’re into the space where people are really looking at wide-scale sustainable solutions.”

In Nova Scotia, initial feedback is indicating that people are using the portal with good results. One physician practice, for example, used the PHR to broadcast a message about an upcoming flu clinic, saving hours of phone calling. A significant percentage of patients also reported that being able to view lab results on-line saved them a visit or call to their family doctor for follow up.

Now the province is in the process of surveying all participants, including patients, physicians, laboratory specialists and department employees, to learn more about what worked and what can be improved.

“As part of the evaluation we will be looking at the funding model over the next few months and based on our results, we’ll be making decisions about how we move forward,” noted Russell.

One functionality Nova Scotia intends to add to its PHR is e-referral. The goal is to help reduce wait times by introducing a more collaborative approach to ensure specialists receive the information they require and that both patients and physicians are notified simultaneously when an appointment is booked.

Another area that needs to be investigated is how to compensate physicians for electronic work. A physician working under a capitation scheme who gets paid a salary based on serving a defined group of patients will have a very different viewpoint than one who’s working on a fee-for-service basis, for example.

“There are a whole bunch of different compensation models,” says Zelmer. “That’s part of the complexity of ‘How do we work this through?’”

One of Infoway’s primary roles is to share research pertaining to questions about privacy, security and workload issues when it comes to developing PHRs. It also offers incentive, like its recently launched ImagineNation e-Connect Impact Challenge, which invites clinicians who use digital health to share their experiences for a chance to receive monetary awards.

The current challenge focuses on secure messaging and prescription renewals. In addition to addressing privacy concerns and ensuring that the right clinician is communicating with the right patient over a secure channel, other considerations focus on clinician workflow.

“From what I’ve seen, nobody is ahead in everything and nobody is behind in everything, so there’s always an opportunity for that exchange of learning,” says Zelmer.

In its recent report entitled “It’s All About Me: The Personalization of Health Systems,” the International Centre for

Health Innovation at Western University’s Richard Ivey School of Business suggests that “not only are individuals ready to manage their own health and wellness, they are actively seeking out strategies and tools to take charge of their health and change the way they access health services.”

The executive summary outlines 10 steps health systems can take to personalize their structures, services and care de-

livery models. Number six says it’s time to get connected.

It states: “Digital tools put into the hands of all members of the health care team – including the patients – present an enormous opportunity to create personalized programs of health and wellness.

“New digital technologies, with all of the security and privacy features used successfully in other sectors, need to be lever-

aged to better connect people to their health care team and allow consumers to be active partners in managing their care.”

That message is not lost on Thompson. Recently, she learned that she may have to undergo yet another knee surgery – her ninth.

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Children's Treatment Network and KidsAbility launch family portals

Guided by the belief that families are essential partners in their children's care, the Children's Treatment Network (CTN) of Simcoe York, located in southern Ontario, and KidsAbility in Waterloo Region and Guelph-Wellington, are launching exciting family portals with the

assistance of Waterloo-based GoldCare.

GoldCare's family portal is an important way of facilitating the journey of parents of children with special needs. The new system will be instrumental in building trust and collaboration between families and providers. It will also increase

transparency, accountability, support and access to information and services.

According to Brad Bell, GoldCare's chief technology officer, the portal equips health-care providers with an effective way of understanding the special needs of a child. At the same time, it allows parents, who know

their children best, to actively interact with caregivers through the healthcare record.

Phase 1 of the pilot project will provide a subset of the chart, giving parents access to some of the clinicians' assessment reports and progress updates. Upon completion of an evaluation, and staff and caregiver surveys, Phase 2 will provide access to additional documents in the record, which will be determined by each individual site. The first parent login is slated for May 2014.

The online area of communication notes will present a new learning experience for everyone involved in the pilot, says Bell. Parents will be able to write a note resembling something between a chat message and an email, to which team members can reply.

Michelle Biehler, director, access and health records, CTN, says the pilot is an important part of CTN's commitment to family-centred care. It will enable family members to seek and provide information, reach out and talk to other participating families, and connect with providers.

"Research indicates that family involvement results in better outcomes for children," Biehler observes. "This portal is an important piece of our overall approach to family engagement. It will give families another way of being involved in their children's care."

CTN is addressing privacy compliance to ensure the appropriate sharing of relevant health information by establishing passwords and providing orientation for piloting families. An evaluation following the pilot will address costs and resources required to sustain implementation.

KidsAbility is one of 20 Children's Treatment Centres in Ontario that provides rehabilitation services for children up to 18 years of age in Waterloo Region and Guelph-Wellington, and a member of the Ontario Association of Children's Rehabilitation Services. Barbara Hill, KidsAbility's director, information technology and lead, Centre of Excellence, says the portal enables parents to access information at any time and supports the journey of the younger demographic served by the organization.

"The family portal presents an option for a secure exchange of information and is a meaningful strategy for engaging parents in service delivery," explains Hill. "Some of these families don't get to sit down and think about the following day until 10 or 11 at night, so it's an easy way to support the lifestyle of the younger generation that is extremely busy and accustomed to leveraging technology."

Actively involved with CTN's Family Engagement council, Theresa Sanders of Lefroy, Ontario, is enthused about her role as parent lead in the pilot project, which involves assisting other parents to use the portal.

"I'm very excited that we're so close," she says. "We live in a world where it's easy to communicate all the time, but I'm still dealing with service providers that don't have access to our electronic record or aren't using it on a regular basis. The family portal means immediate access to our team and a secure and confidential environment that allows me to update them on any information they need in order to help my daughter reach her goals. At the end of the day, every family wants to be seen as an equal partner."



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