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Learning from the achievements of the *Canadian* public sector.

BREAKING DOWN BARRIERS IN PEDIATRIC CARE

A novel project keeps kids connected while in the hospital

HOSPITAL OF THE FUTURE

Where the doctors come to you

ARE YOU TAKING ANY MEDICATION?

Ontario program prevents drug interactions

HEALTHY FUTURE 2.0

Envisioning a new kind of healthcare

ELECTRONIC HEALTH RECORDS

Accessible health information, wherever you are

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CONTENTS



3
Technology Keeps
Kids Connected



4
Hospital of
the Future



6
Preventing Drug
Interactions



7
Healthcare in
the Digital Age



8
The Stethoscope
of Tomorrow

A BRAVE NEW WORLD BY BARB BERG

Technology is fundamentally changing the delivery of healthcare and breaking down barriers to care. The advancement of medical science goes hand-in-hand with the development of new technologies, from surgical tools to pharmacological treatments. In research settings, physicians work closely with computer scientists and engineers in the creation of devices designed to improve and extend life. But in practice and community settings, healthcare professionals do not always have the opportunity to incorporate new technologies as quickly as they might like. For example, while nearly every healthcare provider would like to adopt electronic patient management and recording systems, their adoption involves important considerations like access, privacy and security.

These issues are central to the Electronic Health Record (EHR) project headed by Richard Alvarez of Health Infoway. This program will develop a national blueprint for EHRs – the first step in a transformative process for healthcare across the country that will see each Canadian’s healthcare information become accessible through an online management system.

The Ontario Drug Profile Viewer is a micro version of the EHR project. In an effort to reduce the number of adverse drug-to-drug events amongst senior citizens in Ontario hospitals, the Ministry of Health and Long Term Care has developed an online database to house their prescription data. Now when a senior citizen goes into the hospital, staff can access and print out information on all their medications, reducing the risk of drug complications and speeding up diagnosis.

The Asklepios Hospital of the Future in Germany takes this concept to a macro scale by using technology to fundamentally reorganize the way in which medical care is delivered to create a truly unique patient-centred approach. In this hospital, the patient’s convenience and comfort are paramount, and technology is employed creatively to make this goal a reality.

Patient-centred care is the goal of Dr. Alejandro Jadad, director of the Global Centre for eHealth Innovation at the University Health Network. As a palliative care specialist, Dr. Jadad has a great deal of experience in managing quality of life care, and his vision for the future of the healthcare system is that it become an active, ongoing partner to keep people healthy, rather than simply serving as a sickness-management service. Technology plays an important role in his vision, by allowing people to engage directly in their own health management through a range of information technology systems. Enabling patients to become active participants in their own healthcare is also at the heart of the Child Life Computers for Kids (CLICK) program, currently active in the Children’s Hospital of Eastern Ontario. Child patients can use tablet PCs and wireless Internet access to stay in touch with family and friends, keep up with their schooling and even learn about their condition. Child Life Specialist Maureen Jones describes the ways that this program both enhances and enables the quality of life for her patients.

As Richard Alvarez notes, Canada is well placed to become a world leader in using bold technological solutions to address the challenges of providing universal healthcare that is convenient and accessible for patients regardless of their health need. Governments at all levels across the country have shown commitment towards making the vision of a technologically-advanced healthcare system a reality.

This issue of *possibilities* demonstrates that technology can do more than just improve the administration of healthcare services. All of the stories that follow describe how technological solutions are changing the way that medicine is practiced, and the way that patients experience their interaction with their healthcare providers. This technological revolution in healthcare has the possibility to be as important a change to our national healthcare experience as the introduction of universal care more than 60 years ago.

Sincerely,



Barb Berg, Director,
Healthcare and Western Government,
Microsoft Canada Co.

JUST A CLICK AWAY – HOW TECHNOLOGY IS CHANGING THE HOSPITAL EXPERIENCE FOR CHILDREN

Child Life Experts use technology to keep kids in the loop with school and friends

Illness in childhood can be a frightening and isolating experience. The feeling of isolation can be reduced, however, particularly given that today's young people are extremely technologically advanced and rarely more than a click away from communicating with their friends and family.

Internet access in hospitals is often thought of in the same way we think of television – as an extra entertainment service that interested patients should pay for. However, Internet access is not a passive technology like television. Instead, it is an interactive tool that is at the core of many children's social networks.

"In hospital, kids don't have computers, the Internet, e-mail or Instant Messenger. These are not only entertainment devices for children, they are the tools they use to communicate with family and friends and do their homework," says Maureen Jones, Child Life Specialist at Children's Hospital of Eastern Ontario (CHEO). *"Without access, children in the hospital are afraid of being left out or forgotten. They become even more isolated."*

In 2003, CHEO developed a partnership with Microsoft Canada and the Children's Miracle Network to provide Xbox game consoles for in-patients in their pediatric wing. As the partnership developed, it quickly became clear that there was potential to do more than just provide gaming tools for the kids. Perhaps technology could enable them to stay connected to the outside world, keep up with schoolwork and chat online to their friends?

The result of this collaboration was the Child Life Computers for Kids (CLICK) program, which debuted at CHEO in May, 2005.

The program provides children with wireless bedside Internet connections, Tablet PCs, software and Xbox consoles and games. The hospital features two dedicated technology rooms where kids can hang out, play games and do projects together. The partnership also provides funding for a Child Life Specialist, who teaches the children how to use the technology tools so that they can do everything from keeping up with their schooling to research information about their disease or condition.

"We are bringing a sense of normalcy to the bedside for these kids – this is a way for them to have day-to-day contact with friends and family outside the hospital and it reduces their sense of isolation," says Jones. *"It used to be that our only option was the telephone, but that can be expensive, particularly for children who have to call long distance. This is a way to break down barriers."*



Fast-forward two years and the program is a great success and has attracted attention from other hospitals around the country. The Centre Hospitalier Universitaire du Québec will launch the program in May, and several hospitals in Alberta are considering the project.

The inclusion of the Child Life Specialist is a key to the success of the program, as they are able to use the technology to help these young patients to manage the ordeal of their illness. Used this way, technology has a real effect on patient quality of life; it's not only entertainment or a distraction.

While there is no clinical evidence yet to confirm the degree to which CLICK improves patient quality of life or therapeutic response, Jones says that her anecdotal evidence shows that CLICK is a powerful tool.

"There has been a rise in the past several years of the number of spinal cord accident patients that we see at CHEO, and I have seen a real difference in the lives of these patients in particular," Jones explains. *"These kids are totally dependent and have no autonomy. We can now give them laptops with special adaptive devices that give them back a way of communicating with the world, even if they have only a tiny bit of mobility. They can 'talk' to friends, get back into their school work and learn about how to manage their condition. Using the technology they are able to do things without needing help, and for them it's like winning an Olympic gold medal."*

"Being sick makes children grow up so quickly. But it's important to realize they are still kids," says Jones. *"My goal is to make their hospital stay as fun and vibrant as I can, to provide them with some quality of life during their hard times."*

'HOSPITAL OF THE FUTURE' PILOT SITE OPENED IN GERMANY

Asklepios Hospital has transformed the patient experience through technological innovation



It would seem to anyone who regularly watches *ER* or *Grey's Anatomy* that hospitals constantly run in hyper-speed, delivering test results and diagnoses to patients in the blink of an eye. While hospital staff make every effort to ensure that patients are managed as quickly and as efficiently as possible, the sheer magnitude of the logistics required to run a large acute care hospital mean that results are rarely immediate.

A pilot project launched in February 2006 in Hamburg, Germany hopes to change that by increasing efficiencies through better use of technology. And more significantly, by completely re-thinking how hospital services should be organized and delivered.

The Asklepios Hospital in Hamburg Barmbek is the international pilot site for a joint program between the Asklepios Group, Intel and Microsoft – called the Asklepios Future Hospital Program. The program was developed with the aim of pioneering technological solutions and developing a new model of patient-centred care.

The quality of the patient experience is what truly sets Asklepios apart, as every aspect of the hospital's system has been designed with the patients' convenience and quality of care in mind.

"The primary goal of the new Asklepios Hospital is to break down barriers," says Hans-Friedrich Gunther, Commercial Director of the hospital. "This includes the borders between various disciplines and between the hospital and general practitioners in the community. Our focus is on creating interdisciplinary teams to facilitate simple and speedy communication."

Asklepios Hospital has done away with the traditional organizational structure used by most hospitals, based on separate departments or wards for different clinical areas. Instead patients are treated by a multi-disciplinary team of doctors, nurses and therapists.

The patient no longer has to move through various specialist departments. Instead, the specialists come to the patient and consult at the bedside. This is facilitated through the use of tablet computers that enable all the members of the team to view the patient's medical chart, latest test results or diagnoses in real time. This information can also be exchanged with community-based family doctors as well as with external services such as rehabilitation clinics.

One of the primary focuses of the Asklepios Hospital is acute, emergency-service care and the hospital has revamped the way this care is delivered through a combination of technological solutions and organizational changes. Traditional patient management in the ER requires staff to constantly update a central chart to see what the status of each patient is and which examination and treatment spaces are available. The Asklepios approach uses technology to improve this process and make it much more efficient. Availability in the ER is managed through an electronic "dashboard" display panel that allows staff to easily determine a patient's status and quickly see which beds are available and which will shortly be available, as the information is updated by physicians using their tablet PCs at the bedside. Staff can immediately see whether a patient has been examined, requires examination or is ready for discharge. This allows the ER to admit patients without delay when they arrive, or to quickly divert emergency cases when capacity has been reached.

possibilities

Asklepios was built with the necessary infrastructure in place to ensure that future innovations can be quickly assimilated. The hospital's current plan for extending the use of technology includes the introduction of radio-frequency identification bracelets, which will monitor patient status and whereabouts, and offering online services to facilitate after-care and outpatient booking systems.

The goal for both patients and healthcare professionals is to help people get better, and get them out of the hospital and back to their normal lives as quickly as possible. At Asklepios, this goal is

reflected in a system that is built around convenience and comfort for the patient.

"We've opened our doors to the future," says Gunther. "And we're making it happen today."



A PRESCRIPTION FOR PREVENTING DRUG INTERACTIONS –THE ONTARIO DRUG PROFILE VIEWER

New system tracks prescriptions for elderly patients

One of the first questions asked of all patients admitted into hospital emergency rooms is “are you taking any medication?” It’s a question that not only aids physicians with their diagnosis, but also helps to prevent potentially dangerous drug interactions. But what happens when patients aren’t able to answer the question, either because they are brought to the hospital unconscious, suffer from memory failure or confusion, or have difficulty communicating in English or French?

This is a problem commonly faced by nurses and doctors treating elderly patients; one that is compounded by the fact that elderly patients are more likely to be taking multiple medications.

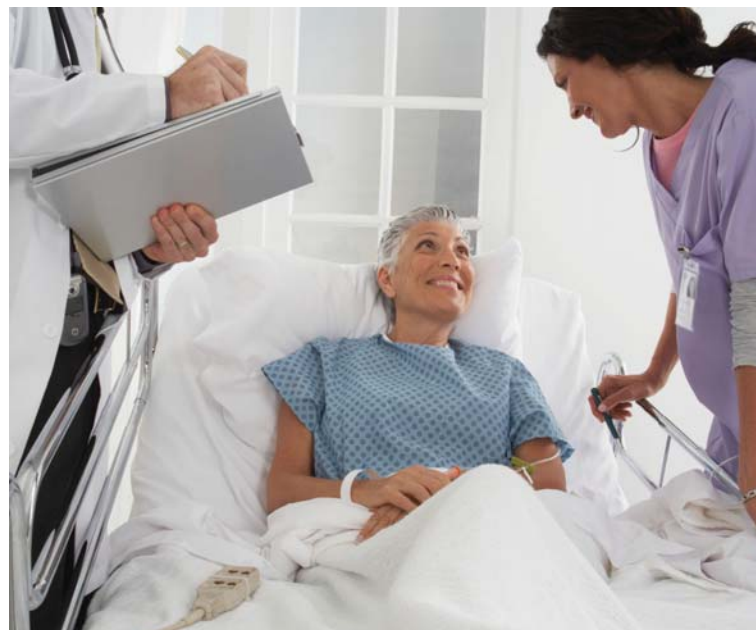
The Ontario Ministry of Health and Long Term Care (MOHLTC) decided to tackle this problem with a project aimed at enabling all authorized healthcare providers in hospital emergency rooms to have access to information about the medications currently prescribed for senior citizens, via an online system called the Drug Profile Viewer (DPV).

“In an urgent situation, doctors and nurses need to be able to quickly determine what medications an elderly person is taking, even if that person is not able to communicate the information themselves,” says Susan Paetkau, director of the Drug Programs Branch of the MOHLTC. “The Drug Profile Viewer is designed to speed up diagnosis and treatment in the emergency room.”

Information can be accessed in several ways, such as swiping a patient’s health card or by entering key patient information. The record is maintained by the Ministry’s Health Network System, and provides details of all prescriptions paid for by the Ontario Drug Benefit or Trillium Drug programs. Information about new prescriptions is added to the system whenever a patient fills a new prescription at their pharmacy.

From the start of the program in November 2005, there have been dramatic examples of how the DPV can aid in both diagnosis and treatment.

“The first day the DPV was online, an elderly Lebanese man who spoke little English or French arrived in the middle of the night with vague, non-specific symptoms,” says Dr. Nicolas Chagnon, an emergency



department physician at Ottawa’s Montfort Hospital. “We discovered that he had fallen about three weeks earlier and hit his head. Reviewing his medications on the DPV, I noticed Coumadin, a blood thinner, listed. Although he denied taking the drug, my suspicions were raised and on the assumption that he was taking Coumadin, I ordered a CT scan of his head. The scan revealed bilateral subdural hematomas, or a collection of blood on the surface of his brain. Without this clue from the DPV, this serious condition could easily have been missed.”

The DPV system is one that the MOHLTC hopes to extend for all Ontarians.

“From the outset, we believed that the DPV system for senior citizens would serve as a precursor to a wider initiative,” says Paetkau. “Emergency departments clearly have the most urgent need for this type of system, however all Ontarians would benefit from this service.”

The DPV project has also led to a great deal of learning about sharing health information online, from issues about privacy considerations, including consent, to the development of strong partnerships amongst hospital staff and between MOHLTC and hospitals. It has truly become a prescription for better health management.

A HEALTHY FUTURE 2.0

– A VISION FOR THE HEALTH SYSTEM IN THE DIGITAL AGE

Dr. Alejandro Jadad envisions a system of interactive healthcare



*Dr. Alejandro Jadad,
Chief Innovator and Founder of the
Centre for Global eHealth Innovation*

“Most people in our society are healthy, but at least one third are dealing with chronic disease, and neither group is well served by our healthcare system” says Dr. Alejandro Jadad, Chief Innovator and Founder of the Centre for Global eHealth Innovation at the University Health Network and University of Toronto.

“The healthcare system must evolve from being an inefficient franchise of repair shops that is available to people mostly when things go acutely wrong, to become a ‘companion for life’ that allows people to proactively

manage their own health on an ongoing basis by providing timely access to information, advice and support,” he explains.

“We need to focus more on health – helping people to remain as healthy as possible, rather than fixing them once they break down.”

As a supportive care specialist, Dr. Jadad’s overarching goal is to explore innovative ways to improve quality of life, something he believes has been eroded by a system that doesn’t place the person at the centre of its decisions.

At present, patients must be directed through the healthcare system by health professionals. The system will be improved, he argues, if patients have the opportunity to be managers of their own care, something that he believes technology can help achieve. The broad cultural shift towards “interactive” technology, such as social networking tools like MSN Spaces, Wikipedia or YouTube, has created a generation of Internet users that is very comfortable taking an active role in creating content and communicating personal information online.

While some are fearful of patients self-diagnosing by surfing the web, Dr. Jadad sees much more of an upside in the democratizing effects of technology.

“We have to start by recognizing that physicians cannot continue to be the only purveyors of medical knowledge and information,” says Jadad. “Online services like Wikipedia don’t require doctors to monitor or peer-review their content, and have been shown to provide very accurate information. Instead of resisting this revolution, we must join in and support it wholeheartedly.”

Beyond this, the Internet provides plenty of opportunity to create or search for communities of individuals who have the same illness. Together, they can share information or even invite experts to address their specialized questions and concerns. You can even sign up for news alerts about topics of interest or your own illness from medical journals or high quality online resources, and alerts can also be sent by other patients or loved ones.

But Rome wasn’t built in a day, and Dr. Jadad recognizes that many patients are not yet this tech-savvy. Many health professionals, managers and policy makers are also struggling with a rapidly changing world that leaves them with little guidance as to how to select and introduce options that could lead to better health. However, he also believes that we can make small changes now to improve convenience and communication between patient and physician without a major overhaul of the system.

“We are working with outmoded structures, workflows and roles in most cases,” explains Jadad. “For example, in most settings, doctors cannot be reimbursed even when using widely available and well-known old tools such as the telephone or e-mail, they must have an in-person consultation. This is inconvenient for the patient, and a drain on the doctors’ resources. They are forced to spend time with a patient who does not need a face-to-face consultation, when they could instead see someone who is actually ill. In Canada, many patients don’t hear from their doctors at all if their test results are normal. Patients are left wondering and worrying. This unnecessary suffering could be solved easily with the use of technology.”

For Dr. Jadad, our healthcare service will be transformed by building on the possible and introducing change gradually. The change will be led by the democratizing effects of technology.

“It’s a complex process, but these changes are coming. It is impossible to stop them,” explains Jadad. “All I want to do is to help accelerate the inevitable.”

ELECTRONIC HEALTHCARE RECORDS

– TRANSFORMING HEALTHCARE THROUGH TECHNOLOGY

Richard Alvarez discusses a revolution in the practice of medicine

“Eventually, I believe that electronic health records will become as integral to the daily practice of medicine as the stethoscope is today,” says Richard Alvarez, the man who is leading the development of Canada’s Electronic Health Record system.

As the President and CEO of Health Infoway, Alvarez is leading the \$1.6 billion project to create a national blueprint for managing access to the health information of all Canadians.

In Alvarez’s view, EHRs promise a revolution in healthcare service delivery that will enable Canadians and their healthcare providers to access from anywhere personal health information online, including details such as currently prescribed medications, test results and diagnostic imaging. This in turn will cause dramatic improvements in patient care across the entire healthcare system.

“The ultimate goal is to enable access to health information from wherever you are,” explains Alvarez. “If you are from Montreal and break your leg skiing at Whistler, a doctor in Vancouver could access your record to make sure that he or she has information about the medications you are currently prescribed or any underlying medical conditions they need to be aware of. Even if you are a snowbird in Florida for the winter, you will one day be able access your online EHR and share it with a physician in the U.S.”

Alvarez believes the EHR model will fundamentally change both the practice of medicine, and the patient’s experience of the healthcare system. This new tool promises to create a system that is more accessible, safer and more convenient. And that means benefits for physicians, including efficiencies in workflow by reducing time spent taking patient histories, preventing the loss of diagnostic or lab tests and introducing functions such as e-mail appointment reminders to patients.

“The technology will be transformative,” he says. “Patients won’t always have to be in the same room as their doctor. Physicians will be able to more easily collaborate with their colleagues across the country, with doctors in different locations all ‘treating’ the same patient.”

Given Canada’s considerable geographic constraints, EHRs will also improve convenience and accessibility for patients in rural areas. For example, many rural hospitals do not have full-time radiologists, and patients must either wait or travel to larger hospitals to have their x-rays assessed. With the EHR system, digitized x-rays can be sent to other parts of the country to be read, and then a diagnosis and recommendation for treatment can be sent back to the emergency room in more remote areas.



Richard Alvarez, President and CEO of Health Infoway

Electronic drug prescribing through the EHR system will also be a benefit. Physicians will one day e-prescribe your medication and send it directly to your pharmacy of choice. By the time you get to the pharmacy, your prescription should be underway, if not ready and waiting for you.

Beyond simple information management, Alvarez believes there are several areas where this technology will have a direct impact on the practice of medicine.

“Eventually, we will bring together telecommunications and wireless service with medical devices. This will allow us to do things like monitor congestive heart failure patients while they sleep to identify possible dangers and determine if preventative action is urgently required,” he explains.

“Clinical trials and research will also benefit incredibly from this new system,” says Alvarez. “We can easily pull together anonymous patient databases for large, epidemiological studies or long-term safety studies on prescription medications. If this system had been in place several years ago, it would have been possible to identify all of the Canadians taking Vioxx and to warn them in advance of the potential problems emerging with that drug.”

Alvarez strongly believes that Canada is well prepared to meet the challenge of integrating technology into the healthcare system.

“I think Canada’s potential for success in this area is the best kept secret around,” he says. “In my 25 years of experience, I have never seen such incredible support and buy-in from all stakeholders, from government to physicians to healthcare administrators. This is a number-one priority for many people. Once the public has a good idea of how this will transform their healthcare, they will be banging down the doors to get to it.”

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