



Electronic Health Records . . . A Prescription for Relief

- Barry Burk – General Manager, Healthcare and Life Sciences, IBM Canada

Knowing a patient's medical history can mean the difference between life and death when a doctor is delivering treatment in a hospital emergency room. But today, most hospitals, in emergency rooms and throughout their facilities, rely on a fragmented paper trail of information that may be far less than complete, and lead to less than effective treatment.

Just as Information Technology (IT) is increasingly being recognized as a huge enabler of new models of health care delivery, momentum is now building to extend the advantages of IT into direct patient care. In fact, virtually every care delivery organization in Canada is working to end the paper chase, and beginning to digitize patient records.

The impetus behind this groundswell for electronic records is coming from a number of sources. In November 2002, the Commission on the Future of Health Care in Canada delivered its final report to Canadians. Among its findings was a strong endorsement for the creation of a national electronic health records (EHRs) system: "Electronic health records are one of the keys to modernizing the health system and improving access and outcomes for Canadians," the report states.

Further, focus on EHRs is the foundation of Canada Health Infoway and their mission to foster and accelerate the development and adoption of electronic health information systems with compatible standards and communications technologies across the country.

But perhaps most compelling is evidence that EHRs provide a tangible solution to specific challenges Canada's healthcare faces: the need to reduce errors, the desire to save money and the ultimate goal of improving the quality of care.

EHRs hold perhaps the most promise when viewed in the context of patient safety. A recent study found that almost half of all serious medication errors result from clinicians not having enough information on either their patient or the drugs that they are prescribing.

A major initiative in the U.S. to identify the most promising strategies for reducing errors found that the single most effective measure to improve safety is to introduce an electronic health record and develop the capacity for computerized ordering of medications and tests. What's more, a survey of senior hospital managers in five countries including Canada found that 80 to 90 per cent of them said an EHR was critical to improving patient safety.

A recent IBM report on the future of Canada's health care system, "Heading True North: Giving Canada's Health Care System New Direction," also supports the argument for EHRs, finding reliable, relevant and accessible health data are key to decision making at all

levels of the health system and essential to practitioners engaged in diagnosis and treatment.

Looking forward, the IBM report outlines a progressive vision for Canadian healthcare, with a "new generation of health care consumers who will be armed with health information from the Internet, motivated by knowledge of their personal genetic makeup, and assisted by easy access to their electronic health records."

St. Michael's Hospital, a large teaching and research hospital in the heart of Toronto renowned for providing exceptional patient care, is a leader in helping achieve that vision, having recently completed Phase One of Project Gemini, an initiative to build an Electronic Health Record -based patient care system.

Phase One saw the implementation of a patient care management system enabling clinicians to view patient results and diagnostic images online. It included a Picture Archive and Communications System (PACS), a Radiology Information System (RIS) and a new clinical data repository. St Michael's' new systems also computerize and catalogue consolidate patient demographics, results and images, and automated the Medical Imaging Department's reporting, billing and transcription processes.

"The completion of Phase One moves St. Michael's closer to our goals of enhancing patient safety, clinical outcomes and the coordination of care within our hospital and across the health system. St Michael's is fully committed to an electronic health record strategy," said Jeff Lozon, president and CEO, St. Michael's Hospital.

Like many hospitals, the goal of St. Michael's' EHR is to automate the system in ways that will enhance clinical workflow practices and enable safer patient outcomes, greater staff and physician efficiency and patient satisfaction.

Creating integrated, electronic patient records requires a major investment of time and money over a period of several years. Most important is realizing that digitizing records is a clinical project, not just an IT project. Technology simply helps a hospital implement its policies and procedures.

At the outset, St. Michael's recognized this. "Rather than simply automating our current patient care processes, we needed to look carefully at ways to use the new technology to truly transform clinical practice," said Mr. Lozon. To that end, St. Michael's developed Strategic Alliance Council for Project Gemini, comprised of executives from its three selected technology providers - IBM, Getronics and Siemens Medical Solutions (Siemens). These partners work collaboratively with multidisciplinary care teams from across the hospital.



Jeff Lozon, President and CEO, St. Michael's Hospital

This unique public-private sector collaboration is premised on medium- and long-term agreements between St. Michael's and these industry partners, and the commitment of all to the transformation of clinical practice, research and education through an EHR.

Physicians like Dr. Dan Cass, Chief of the department of Emergency Medicine at St. Michael's Hospital, recognize the importance of the hospital's technology infrastructure in supporting the clinical applications and enhancing patient outcomes. "Our goals for an EHR are focused on patient care, such as more rapid initiation of orders with less risk of error, the ability to access clear, legible multidisciplinary notes and better access to vital signs and nursing notes from any location in the hospital. To achieve our goals, St. Michael's must have a reliable and available system that provides physicians, nurses and allied health staff with the tools necessary to do our jobs at any time of day and in any clinical situation."

IBM, Getronics and Siemens have been involved each step of the way towards St. Michael's EHR. Staff from all three organizations work on-site in the hospital during the planning, building, testing and implementation phases, and problem-solve alongside clinicians, project management and IT staff to align the technology with the clinical and technical needs of a large and complex hospital.

Over the years, complexity has been a major obstacle in hospitals going electronic with patient records. Most purchased "best of breed" systems for clinical departments — such as surgery, lab, and pharmacy — resulting in fragmented, incompatible systems that make integrating data difficult. St. Michael's was no exception.

When the project began, St. Michael's had a somewhat disconnected IT infrastructure made up of 150 individual servers, each attached to individual storage tape devices and tape libraries. This made it difficult to locate stored information and did not allow for a hospital-wide disaster recovery plan. Furthermore, IT staff spent more time fixing and maintaining the existing system than proactively developing new IT projects.

IBM provided an extensive data storage system, which will serve as the backbone of the EHR. For the new digital clinical system applications to run smoothly, the hospital needed a system that could quickly handle large volumes of data, and ensure that this data was available around the clock.

St. Michael's Hospital achieved this by connecting its servers to an 8-terabyte storage server. Three terabytes would be used for the

hospital administration system and 5 terabytes for the PACS repository. To give quick access to the PACS environment a dedicated IBM TotalStorage FAST900 device was also installed.

St. Michael's Hospital then centralized its tape backup processes and installed an IBM hardware and software system that automatically backs up all server and application data. The hospital also put in a storage area network (SAN) volume controller that virtualized the storage system so the IT staff could reallocate storage space as required.

With all the hospital's storage consolidated onto a single system, St. Michael's then built a second data centre. The second data centre serves as a disaster recovery system and is powered by a different electrical grid than the primary center. Should the original data centre fail, the second data centre contains sufficient resources to provide full application functionality for critical applications.

Working with Getronics, St. Michael's also significantly improved its network performance to enable a regular flow of data from software applications to computer desktops in clinical and non-clinical areas.

With Siemens, the hospital is implementing software applications that will integrate patient information and support patient safety initiatives. St. Michael's continues to serve as a Canadian 'beta site' for a platform of Siemens applications that once in production will enable clinicians to share multidisciplinary patient data and clinical knowledge in a standardized format through a series of integrated health information systems.

Lessons learned during Phase One have helped St. Michael's fine-tune a comprehensive plan for the next, 24-month phase of Gemini applications, after extensive consultation and input from the hospital's clinicians, physicians and senior management. Phase One applications didn't touch every aspect of the hospital's operation, but the implementation of Phase Two will have a much broader impact.

The new lineup of clinical applications to be rolled out address clinical documentation (with physician documentation scheduled for a later phase), clinician and physician order entry, pharmacy, cardiology and patient scheduling.

St. Michael's plans to provide more training for its clinical staff before introducing this next set of systems. The hospital is actively engaging nurses, physicians, residents and allied health professionals in the planning and implementation phases and will be pilot testing some of the new applications in one patient care area before they are introduced across the hospital.

"This is a very exciting time for St Michael's Hospital," says Mr. Lozon. "We are leading with innovation with Project Gemini, advancing clinical care processes in ways we never thought possible 20 years ago."



For a copy of IBM's report, "Heading True North: Giving Canada's Health Care System New Direction" contact Leslie Plant, Media Relations Manager, IBM Canada, 905.316.6275 or laplant@ca.ibm.com

For more information on St. Michael's Hospital or Project Gemini, contact Sheri Zernentsch, Marketing/Communications Consultant, Project Gemini, 416.864.5151 or zernentschs@smh.toronto.on.ca.