



# Canadian EHR: Early Benefits and Journey Ahead

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**A**s electronic health record (EHR) technologies and other health information systems (HIS) spread across Canada, there is growing evidence of the economic impact and improved quality of care resulting from these investments. However, there is also growing recognition that their full potential is still far off. EHR initiatives in the United Kingdom, the United States, Europe and Asia share similar findings: a focused approach -- be it called benefits realization or benefits management -- is required for solutions to deliver significant value.

A focus on benefits is critical for Canada Health Infoway (Infoway), a not-for-profit organization mandated to accelerate the use of EHR solutions across the country. To achieve that goal Infoway works with Canada's provinces and territories, health care providers and technology vendors.

Part of that work includes Infoway's clinical adoption effort, which refers to the adoption and benefits realization of solutions supported through such investment programs as registries, drugs, laboratory, public health surveillance, diagnostic imaging, telehealth and the interoperable electronic health record.

As national EHR progress continues to take focus in regional solution development and implementation, promoting solution adoption and benefits realization becomes central to this mission.

## Evidence of progress

Leading components of the EHR, such as diagnostic imaging and drug information systems are now available across much of Canada and innovative solutions for clinicians are spreading. And now we're seeing tangible results of these investments.

For example, investments in **diagnostic imaging** (DI) are generating substantial benefits; with the potential of up to \$1 billion in annual radiology cost savings and efficiencies to be realized across Canada once implementation is complete. This includes: increased efficiency to a level equivalent to adding more than 500 radiologists to our health care system; a 25 to

30 per cent increase in technologists' efficiency; and elimination of up to 17,000 patient transfers annually through remote access to images.

Patients in remote locations benefit the most from the technology. Dr. Benvon Cramer, radiologist in Newfoundland and Labrador illustrates that claim with a typical case, where she was contacted at her office in St. John's by a primary care physician in St. Anthony, located hundreds of miles on the north eastern tip of the province. "I was sitting in my office at about 4 p.m. on a Friday and this physician rings me up a little worried about a six-month-old baby," she said.

Using Picture Archiving and Communications System (PACS), Cramer was able to review the infant's chest X-ray, see that the baby had a major congenital heart defect and was in need of immediate transport to an intensive care unit in St. John's. "In days gone by, that doctor might not have been able to get that information to me, and that child might have gone home for the weekend. We would have no way of knowing what might have happened then," she said.

Similarly, **drug information systems** (DIS) across the country are delivering clear value, especially in improving patient safety and reducing adverse drug events.

British Columbia's PharmaNet, which has been up and running for almost 15 years, is now an essential tool in pharmacies, emergency rooms and various community settings across the province. In 2008 more than 55 million prescriptions were processed on PharmaNet, and some 30,000 prescriptions were changed to avoid issues like harmful adverse drug interactions.

The Ontario Drug Profile Viewer (DPV) is another compelling example of the benefits of drug information systems. The DPV makes seniors' medication histories available in the province's emergency departments. Project evaluation work has indicated that 75 per cent of health care providers agree that the DPV helps streamline therapy, prevent duplication, ensure patients' medication continues upon admission and promotes patient safety. As well, more than 80 per cent said the DPV was a helpful, timely tool and a starting point

for patient drug reconciliation when patients cannot communicate or remember their medications.

**Beyond the large provincial initiatives**, more and more solutions at the point of care are demonstrating value across the country.

**WebSMR**, initially implemented by the Alberta Cancer Board, is a structured, electronic-reporting process for operative records for cancer patients, "Surgeons want reliable information. They want to know the impact of their surgery on a given cancer patient," says Evangeline Tamano, program leader of Cancer Surgery Alberta. "The only way to have standardized reports on outcomes generated in real time is to enter the information themselves through an automated electronic system."

David Stringer, the program's implementation coordinator, says during the pilot program the synoptic system missed only one per cent of the data generated during surgical procedures, compared to about 50 per cent omitted from traditional narrative reports. The project's success has led to a partnership between Alberta and the Canadian Partnership Against Cancer to develop WebSMR on a national scale. By 2010, the system will support various types of cancer surgeries in Manitoba, and at least 20-30 surgeons in Quebec City and Montreal will begin using it for colorectal and breast cancer surgeries. The project will spread to selected centres in Nova Scotia and Ontario in the near future.

In another example, the **Patient Safety Learning System** -- implemented in British Columbia -- leveraged technology proven in other countries. The system is used by health care providers in acute care settings to support identification, investigation, and analysis of all safety and risk-related incidents. It can capture and facilitate response to client feedback and enable claims management. Findings from a neonatal intensive care unit pilot, showed dramatic increase in the number of reports submitted (158 per cent increase), greater diversity in those reporting (eg: non-registered nurses reports increased from 8 to 26 per cent), much faster reporting and response time and higher quality follow-up, all towards the end result of greater patient safety. Following these initial successes, the system is now being rolled out in Newfoundland and Labrador, and is

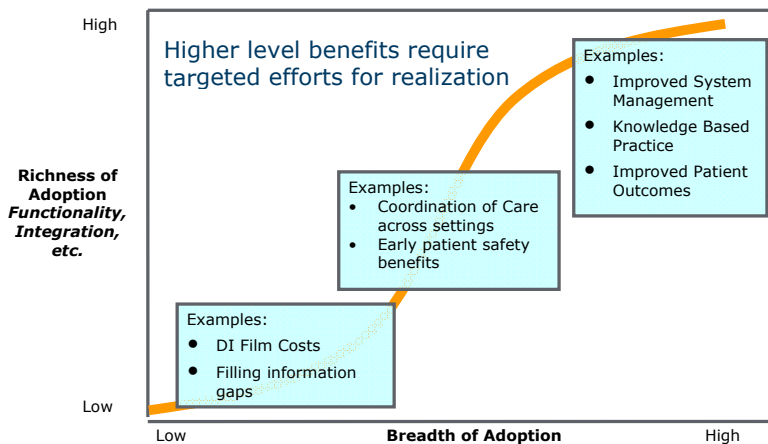
being considered in other provinces.

In Ontario, The **Scarborough Hospital** introduced electronic triage software (eTriage) to improve efficiency and effectiveness in the emergency department. The solution allows ER nurses to evaluate and triage patients more effectively. The project found the eTriage tool has increased triage efficiency and reduced by half the time needed to perform an assessment. Specifically, the time decreased from approximately five minutes down to an average of two and a half minutes, effectively reducing nurses' workloads. As a decision support system, triage accuracy scoring improved, showing a 14.6 per cent increase. That translates into greater patient safety, with patients being categorized correctly and receiving timely access to care. Prior to the implementation of eTriage, utilization rates for overworked ER nurses were 140 per cent and 100 per cent at the General and Grace Campuses respectively at peak hours. The implementation of eTriage helped decrease these rates to 85 per cent and 70 per cent respectively, and thereby increased both access and quality of care as well as better working conditions for nurses.

### The glass is half full

Substantial value has been achieved and demonstrated in many of EHR programs. But there are untold benefits yet to be realized. This is evident too beyond our borders. Benefits realization is currently of such interest that a virtual network was established through Britain's NHS Connecting for Health sponsorship. Known as the Benefits Realization & Achievement International Network (BRAIN), the initiative has brought together leading organizations implementing health information technology to share experiences and knowledge and advance current practices.

The high-level maturity model (below) demonstrates the patterns observed in projects around the world: Early benefits can demonstrate quick wins in many projects, requiring a solid user population applying the basic function of the system. Many benefits however, require a greater richness of adoption, and ultimately buy-in across the system. Currently, EHR investments across Canada fall primarily on the lower part of the curve.



An *Infoway* review identified three core benefits realization activities:

1. Articulation of the benefits;
2. Identification of key assumptions or conditions, and development of action plans to address them;
3. Measurement against objectives.

Clear articulation of the benefits and value proposition needs to occur at the individual, organizational, provincial and national level. *Infoway's* Benefit Evaluation Framework provides a high-level, coherent, evidence-based model to guide discussion of benefits and evaluation approaches. The Framework is expanding to become a more comprehensive adoption-success framework. Key factors such as strategy, culture and business process will be included.

### What does it take to move up the curve?

Moving up the curve calls for a range of activity from foundational change-management practices to more complex activities such as deploying effective decision support or incentive and policy changes. A focus on the end-user is central; delivering solutions that enable them to do their jobs more effectively.

### Let's review this concept against some current project examples.

Many benefits of DI systems materialize almost immediately, including reduction in film costs, improving providing remote care, and more. These systems also generate significant efficiencies in the activities of radiologists and technologists. In turn, these efficiencies generate some value in the short-term. For instance, back-logs can decrease, workflows can be more flexible, and time-wasting activities avoided. However, like many HIS investments, increasing efficiencies does not necessarily improve the productivity of the system as a whole, because other aspects of the system remain unchanged.

The challenges in uncovering the full value of DIS is increasingly clear. Making a drug profile available in a setting like an ER, where patients may not be able to communicate their drug or health history, has undeniable value in the short-term. Ensuring pharmacists have a more comprehensive profile to review before dispensing medication has improved patient safety. However, the goal for these investments is not only that they address some of the information gaps in the system, but ultimately that they are applied with great precision to eliminate patient safety risks.

Alerts are a key example for the middle of the curve: they should be well integrated into workflow, applied at a point when the clinician can act upon them (ideally as part of electronic prescribing), and should be kept to a minimum actionable set to avoid alert fatigue. Progress is being made in leading Canadian examples to optimize

the use of alerts, but there's still plenty of work yet to be completed.

Another critical example is using the data at a population level to determine efficacy and identify safety issues. Effectively leveraging the EHR in this way represents the top of the curve, and is a long way off for Canada. Both of these examples have the potential to dramatically improve patient safety beyond the value currently being realized. But the implications for practice, policy, business processes, and more are enormous and complex.

Smaller initiatives continue to evolve to optimize benefits. Effectively integrating technology into workflow and business practices is a challenging and ongoing activity. As the project teams strive to make solutions relevant in the care environment, that environment continues to evolve. The typical project cycle no longer applies and increasingly HIS must be managed and allowed to evolve.

### The way forward

Canada Health *Infoway* continues to encourage and support its partners in moving up the curve of benefits realization: ensuring anticipated benefits are clear in project planning; supporting development of effective metrics and monitoring processes for implementation and adoption targets, and emphasizing the importance and role of Benefits Evaluation.

The value of investments in EHRs and HIS is substantial. That's why policy makers, organizations and clinicians need to approach benefits realization proactively and with a long-term view. In other words, target and celebrate quick wins, but maintain a focus on a modernized health care system providing greater accessibility, quality and productivity, and – ultimately – better patient outcomes. ●