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Auditor General
of British Columbia

Electronic Health Record Implementation in British Columbia

February 2010

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The Honourable Bill Barisoff
Speaker of the Legislative Assembly
Province of British Columbia
Parliament Buildings
Victoria, British Columbia
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Dear Sir:

I have the honour to transmit herewith to the Legislative Assembly of British Columbia my 2009/2010 Report 9: Electronic Health Record Implementation in British Columbia.

John Doyle, MBA, CA
Auditor General of British Columbia

Victoria, British Columbia
February 2010

copy: Mr. E. George MacMinn, Q.C.
Clerk of the Legislative Assembly

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Auditor General's Comments

John Doyle
Auditor General

One of the challenges my staff encounter as they conduct audits is that the world is rarely static. The systems and processes we audit are often evolving—our audit reports represent a point-in-time view of what is sometimes a moving target. Added to this, organizations frequently begin addressing issues identified during the course of our work before the work is completed.

Both of these scenarios were true for implementation of Electronic Health Records (EHR). The audit team's initial field work was completed in May 2009. However, after reviewing our findings and recommendations with the Ministry of Health Services, and the ministry's short-term action plan to address the issues identified, I agreed to extend the evidence gathering period until November 2009. As a result, many of the significant issues my staff initially found have now been addressed. Appendix A provides these recommendations, and the Ministry of Health Services' response to them. I am very pleased so much progress has been made.

Nonetheless, development of the EHR system is only the beginning; significant implementation challenges remain.

Determining how the province-wide EHR will be integrated with regional health records, and implemented in private offices of physicians, has not been determined. Our recent report on the PARIS system highlights some of the security and privacy challenges associated with the design and operation of electronic health systems—the ministry should remain mindful of these issues as the EHR is made operational.

Because of these challenges, and the remaining work that is highlighted in this report, I will be following-up with the Ministry of Health Services every six months until the EHR is implemented.

I would like to thank the staff at the Ministry of Health Services for their cooperation and positive contribution to this audit.

John Doyle, MBA, CA
Auditor General of British Columbia

Victoria, British Columbia
February 2010

Auditor General's Comments

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Executive Summary

Executive Summary

An electronic health record (EHR) is a secure and private record of an individual's health history and care, intended to be collected over a person's lifetime. Being digitally stored, the information can be made available electronically to authorized health care providers anywhere, anytime. Since 2001, the federal government has supported the development and implementation of an EHR by each province.

Health records in electronic form are not only more legible and more easily retrieved than paper-based health records are, but they provide patients and their health care providers with complete and up-to-date details about the individual's health profile. This offers many potential benefits, such as decreased risk of a patient being sent for duplicate tests, being prescribed an inappropriate medication, and being delayed in receiving service. Overall, by enabling better health care planning, monitoring of health outcomes, and health research support, an EHR offers citizens longer-term benefits such as safer and more effective health services.

British Columbia committed to accelerate EHR development in 2004

In British Columbia, the EHR initiative has involved designing and building EHR systems that contain laboratory, drug and diagnostic imaging information about every patient in the province. British Columbia committed to building its EHR system to meet national standards for inter-provincial compatibility with other EHR systems across Canada.

The Ministry of Health Services in British Columbia is responsible for planning and managing the development of this undertaking and for reporting on outcomes.

The EHR initiative is a complex, high-risk endeavour

Creating EHR systems has involved using both provincial and federal resources, and has compelled health sectors across the province to collaborate closely. It has also involved coordinating the participation and support from multiple organizations and stakeholders, each with their own priorities. For example, British Columbia's health authorities are key players in the province-wide EHR system, yet they have other priorities, including developing and implementing their own regional EHR systems. All of these factors have combined to make the EHR initiative a complex undertaking.

At the same time, the endeavour poses numerous high risks. The move to sharing electronic information raises concerns about the privacy and security of personal health information. As well, the technology for managing electronic records of this scope is new (and often untried) and the shift to EHR represents a significant change for a sector that has traditionally used hard copy records. Furthermore, benefits will not be fully achieved just by making the technology available. Actual changes to work flows and sharing and updating information practices by health professionals must be effected, which will mean providing support as they adopt new technology.

The ministry estimates the capital cost of the EHR initiative will reach $222 million by March 31, 2013

The Ministry of Health Services expects to have spent $162 million[1] in capital costs on the EHR initiative by March 31, 2010 and estimates capital costs will reach $222 million by March 31, 2013, by which time the ministry expects that implementation will be complete. Canada Health Infoway (CHI), the national organization helping provinces implement a country-wide compatible EHR system, has agreed to reimburse a portion of these costs, up to a maximum of $110 million. The amount reimbursed depends on the ministry achieving agreed-to milestones. About 50% of reimbursement is tied to the adoption of (or demonstrated use of) systems by health care providers. As of the end of September 2009, $46 million had been received from Canada Health Infoway. As the CHI reimbursement is capped, the province is responsible for all other costs of the EHR.

Besides ministry capital costs, there are a number of other costs associated with building and operating electronic health records. For example, the potentially significant health authority costs are not included in the $222 million, nor are the ongoing operating costs which the ministry estimates will be $27.4 million a year by 2011/12.

[1] Estimated numbers have not been audited by the Office of the Auditor General.

Executive Summary

Audit purpose and scope

We examined whether the Ministry of Health Services has appropriate and effective mechanisms in place to guide, monitor and report on the implementation of its EHR system while meeting the goals of a Canada-wide compatible EHR system. Specifically, we expected the ministry to be:

- planning for, directing and guiding the implementation of an EHR system for British Columbia that would be compatible with that for the country as a whole;
- managing projects based on recognized project management methodology to achieve expected results, including that of establishing a compatible EHR; and
- reporting on progress in achieving the goals identified in its EHR strategic plan.

We did not examine the already completed procurement process because audit work was already being undertaken by the Office of the Comptroller General of British Columbia.

Concurrent with our audit, five other provincial audit offices are auditing how electronic health records are being implemented in their respective jurisdictions. In addition, the Office of the Auditor General of Canada is auditing Canada Health Infoway. Each office is reporting separately, and the Office of the Auditor General of Canada will issue a joint overview report on all of the audits in April 2010.

To assess ministry mechanisms for guiding and monitoring EHR implementation, we used the international standard of good practices known as Control Objectives for Information and related Technology (COBIT). COBIT recommends that mechanisms be structured at three levels: strategic (setting the direction); tactical (laying out how to best achieve the strategic goals); and operational/individual project (executing the tactical plan effectively).

We initially gathered evidence from November 2008 to May 2009 and completed our analysis in June 2009. When we shared our initial findings and recommendations with the ministry, they committed to taking immediate action. Our four recommendations to the ministry were to finalize its strategic plan, complete a comprehensive tactical plan, enhance its measuring of progress, and report publicly on

the outcomes of the EHR initiative. (See Appendix 1 for our initial recommendations and the ministry's response.) We extended our evidence-gathering to November 30, 2009, to allow the ministry the opportunity to implement the recommendations. The ministry completed the first two recommendations and work is underway on the last two. The final stages of our work included discussing our report's content with the ministry and developing appropriate plans for moving forward. In addition to discussing our initial findings, the report assesses the ministry's progress up to November 30, 2009.

Audit conclusion

The Ministry of Health Services now has most of the mechanisms in place or in development to enable it to fulfill its role of providing effective guidance, management, and reporting on performance of the EHR initiative. However, there is still a long way to go before British Columbians fully realize the benefits of having an electronic health record. Once the components are built, it will still take some time before they are integrated across the health sector and regularly used by health professionals in treating their patients.

Key findings and recommendation

Planning for the EHR initiative by the ministry was initially poor, but has improved

A critical role for the Ministry of Health Services is setting the strategic direction for its various health service initiatives. This includes providing guidance and direction for the EHR initiative through an open planning process with a current, comprehensive and well-communicated strategic plan.

The first strategic direction for the EHR initiative was set out in 2005 in the eHealth Strategic Framework. However, that plan lacked effective strategies to address the risk of duplicating similar, regional EHRs and the risk that health professionals might choose not to use the EHR when it is completed.

In 2008, the ministry adopted a new strategic planning approach to address compounding challenges that had arisen over the previous three years—challenges such as major turnover in ministry senior management and, specific to the EHR initiative,

transfer of health authority accountability for establishing the provincial EHR to the Ministry of Health Services. A new simpler governance structure, involving broader participation from health professionals and decision-makers, should minimize duplication in the EHR initiative. At the same time, the ministry developed the Health Sector Information Management/Information Technology Strategy, published December 2009, to provide direction over the next three years.

Progress has been made and a tactical plan has been developed

The ministry has substantially built four[2] of the six core EHR components. The major work to integrate and support the adoption by the health authorities and health providers is still to be completed.

Progress in building and deploying the EHR system has been slower than initially planned. While there are likely several reasons for this, insufficient attention to tactical planning has been one of them. Early on, the EHR initiative suffered from lack of coordination among the component EHR projects and lack of a tactical plan to guide the development and implementation of the EHR. Good management practices at the individual project level and improved tactical planning have ensured progress. So has the adoption by the ministry of a recognized project management methodology and the close monitoring of expenses.

Since 2008, the ministry has made several development and implementation improvements—notably, clarifying responsibilities, establishing priorities among the EHR projects, and developing elements of a tactical plan to guide EHR implementation through to completion. The ministry, which had been developing elements of a tactical plan as the initiative progressed, brought these together in November 2009 into the eHealth Tactical Plan. This plan provides a sound basis for ongoing management of EHR implementation.

[2] The ministry chose an alternate approach for one of the six components, the provincial Diagnostic Imaging system. It upgraded the current system rather than build a new one, and is therefore not one of the four mentioned above.

Executive Summary

Progress measures need to be enhanced and outcome measures completed to improve reporting about the EHR initiative

The ministry is responsible for reporting to its funders—the provincial Treasury Board and Canada Health Infoway—on its progress in delivering the quality of EHR expected within the agreed-upon time and for the agreed-upon funding. Just as important is reporting to the public what the outcome is of spending more than $220 million of public funds (less a $110 million reimbursement from CHI) on the EHR initiative.

The ministry has been providing Treasury Board and Canada Health Infoway with the progress information they have requested. However, we found this information to be missing an estimate of full costs to completion, common definitions for milestones such as the meaning of initial adoption or complete, and common measures such as the percentage of work complete compared with the percentage of the full budget used. Although this information has not been specifically requested by the funders, we expected the ministry to have this information to enable it to manage the EHR initiative efficiently and effectively.

Early efforts by the ministry to develop a plan to measure the health impacts and outcomes of the investment in the EHR were not successful. As a result, baseline information for later comparisons has not been established. In 2008, the ministry renewed its efforts by adopting the national Canada Health Infoway evaluation model, and in March 2009 it finalized an agreement with Canada Health Infoway to partially fund the estimated $3.34 million evaluation effort. Reporting on the results of that evaluation is expected to start in late 2010.

Looking Forward

Given the challenges and risks in developing and implementing the EHR initiative for British Columbians, plus the significant investment involved, the undertaking is clearly one that needs to be done well. While notable progress has been made in the first five years of the initiative, there remains much to be done. It remains unclear how electronic health records will be deployed to users and what benefits will ultimately be realized. For this reason, our Office will ask the ministry to update us regularly on their progress in implementing the EHR initiative.

Therefore, we recommend that every six months the Ministry of Health Services provide our Office with a progress update on its results against planned measures of time, cost, quality and outcomes, as well as explanations of these results, and we will review and report this information to the Legislative Assembly.

Response from Ministry of Health Services

It has been more than six months since the Office of the Auditor General completed their original analysis and shared their initial findings and recommendations with the Ministry of Health Services. The Ministry has taken advantage of the opportunity to continue working with the Office of the Auditor General's team over that period and is pleased to receive and respond to their final audit report.

As acknowledged in the report, the establishment of electronic health records (EHRs) is expected to enhance patient care by providing authorized health professionals with access to secure and comprehensive patient health information. EHRs have been recognized as a vital tool in improving patient care not just in British Columbia but across Canada, and indeed internationally. It is a primary focus of the Province's eHealth Program and the Ministry is committed to ensuring that the project is successful. To that end, we have addressed all of the preliminary recommendations from the initial review and the Ministry is very pleased to see that work recognized in the final report. As the report concludes, the Ministry has most of the mechanisms to effectively manage the EHR initiative either in place currently or in development.

The Office of the Auditor General's review process has been a positive experience for eHealth staff and the EHR initiative has benefited from the exercise. A new Health Sector Information Management/Information Technology (IM/IT) Strategy has been endorsed and is available via the Ministry's website, a new Tactical Plan guiding eHealth deployment has been produced and is being updated regularly, and improved eHealth reporting processes are being implemented. The actions taken in response to the review have strengthened the program and will contribute to the successful completion of the EHR initiative through its remaining years.

The Ministry recognizes that the development and implementation of a provincial EHR system is a complex endeavour and is committed to making ongoing improvements in the management of the initiative to ensure successful completion. In addition, there are other eHealth priorities which must continue to move forward in parallel, such as the adoption of Electronic Medical Records (EMRs) in physician offices and the development of tools enabling British Columbians access to their personal health information. The effective management of these related projects, along with the EHR initiative, is accounted for within the Ministry's

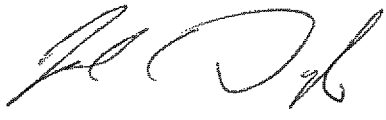
Response from Ministry of Health Services

eHealth tactical plans. These projects are expected to complement the electronic health record systems and contribute to the full realization of its potential benefits. Monitoring the extent to which those benefits are realized over time is itself another important and planned-for component within eHealth.

The eHealth program and the EHR initiative are now making significant progress and the Ministry is confident that we have the management and mechanisms in place to ensure success as we move forward. We are confident that we have the controls in place to ensure that informed decisions are made when called for to address whatever new challenges may arise.

We concur with the Auditor General that the overall success of meeting the vision of secure private health record and realizing the associated benefits is contingent on addressing a number of broader challenges. In the addition to the EHR systems, significant work and progress has been made in delivering EMRs, implementing privacy and security standards, upgrading existing systems and planning for consumer health solutions. We are committed to working with the Office of the Auditor General and to reporting our progress on the EHR and related initiatives on a regular and ongoing basis as we move forward.

Yours truly,



John Dyble
Deputy Minister

Detailed Report

Background

Health care is one of the most information-intensive industries in the world, but it remains behind other industries in using information systems to improve quality and efficiency. While many of us in British Columbia have the impression that our patient health records already exist in fully electronic and widely compatible form, this is not the case. Several aspects of health care record-keeping are electronic (for example, Pharmacare and regional electronic health records within health authorities), but no comprehensive electronic file—or electronic health record (EHR)—of an individual's complete health history yet exists.

Similar terms, often used interchangeably, contribute to confusion about what already exists. Explanations for the three common terms given in the sidebar clarify the distinctions.

The term "electronic health record" can be easily confused with the terms "electronic medical record" and "regional electronic health record." What is the difference?

- An *electronic medical record (EMR)* is an individual's electronic record maintained by a physician in his or her office and may or may not be shared with other health care providers.
- A *regional electronic health record* is an individual's local online health record in a regional health authority. The regional EHR systems being developed in the health authorities are not compatible with each other and are thus not accessible across the province.
- An *electronic health record (EHR)* — the subject of this audit — is an individual's province-wide health record. The overarching EHR system in British Columbia will allow authorized health care providers to view a patient's health history no matter where the individual seeks medical attention in the province and, in the future, country-wide.

Background

Not having a single, comprehensive health history creates challenges for physicians and the public in the province every day (see sidebar).

Why should lack of a comprehensive EHR be a concern for British Columbians? Three fictional scenarios illustrate the answer:

Scenario 1: Eric is a senior citizen who has lived in six different parts of British Columbia in the last 10 years. He has had X-rays and blood tests and received various prescriptions in several different towns. While on vacation in the Interior, he experiences a shortness of breath and is taken to a walk-in medical clinic. Currently, Eric's health records exist all over the province, on paper and film. This makes the job of the treating physician in Kelowna especially challenging because she will have difficulty accessing all the details about Eric's medical history quickly and efficiently.

Scenario 2: Susan is a young woman with diabetes who has been in hospital several times over recent years. She has had blood tests at various community laboratories and hospitals. To monitor her diabetes and reduce the risk of complications, she should have her lab test results tracked and trends analyzed. This is difficult for her doctor to do because of the time and effort it would take to access all of Susan's test results from so many different facilities.

Scenario 3: Lee is a health care professional doing research on heart disease. His goal is to understand the care provided in British Columbia and explore potential improvements. Lee's study requires non-identifiable clinical data covering the whole province and many years so he can come to understand regional differences and changes over time. Lack of access to a large amount of up-to-date, high-quality data hinders his ability to accomplish this work.

The EHR is being established across Canada

The problems posed by a lack of widely compatible online health records have been recognized for well over a decade at all levels in Canada. In 2001, the federal government set up Canada Health Infoway (CHI) to support and accelerate the development of an EHR system that will be compatible across the country.

Members of CHI are the 14 federal, provincial and territorial Deputy Ministers of Health. Their target for the EHR initiative is to see a record established for at least half of all Canadians by 2010 and all Canadians by 2016.

In 2001, the British Columbia government made EHR a cornerstone of the province's eHealth Strategy. The government has articulated this commitment in several documents, including the New Era document (June 2001), the Select Standing Committee on Health (December 2002), the recommendations from the Premier's Technology Council (September 2002 and June 2004) and the 2008 Throne Speech.

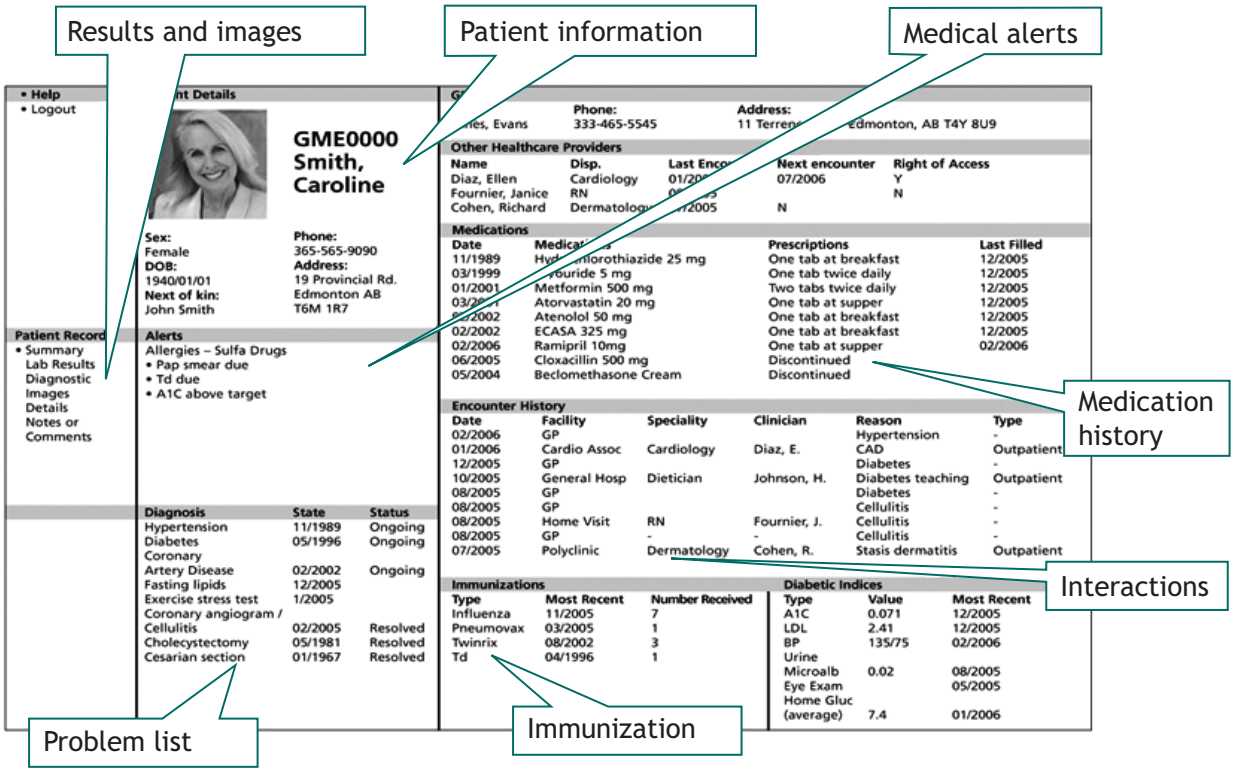
EHRs are expected to solve a number of persistent challenges in the health system

The aim in establishing EHRs is to improve the effectiveness, efficiency and safety of health care delivery in British Columbia and across the country. Each fully functional EHR—to include demographic, diagnostic imaging, drug, laboratory, hospital, clinical reports, infectious disease, immunization and other health information—will allow authorized health professionals to view and update a patient's health record anywhere, at anytime, while protecting patient privacy and confidentiality. Exhibit 1 shows how a completed EHR might look.

Exhibit 1:

Prototype of a patient's EHR

Note: A British Columbia EHR design is not yet available. The actual record might therefore look different from that shown here.



Source: Canada Health Infoway

Health records in electronic form are also likely to be more legible than many paper-based records are now, available when required, and more readily and rapidly retrieved and communicated. Other potential benefits include:

- **For patients** — improved health care and decreased risks (e.g., adverse drug reactions); avoidance of duplicate, invasive and/or expensive tests; reduced delays and improved access to provincial specialty services.
- **For health professionals** — easily accessible and up-to-date patient information to aid decisions; trustworthy and accurate information; more effective sharing of information; improved research and evidence to support quality practice and a population health approach.
- **For health administrators** — more effective use of health care dollars as a result of economies of scale; improved health care quality; and robust privacy and security standards.
- **For governments** — creation of the foundation for improved long-term planning; improved ability to maintain patient confidentiality and ensure that personal health information is private and secure.

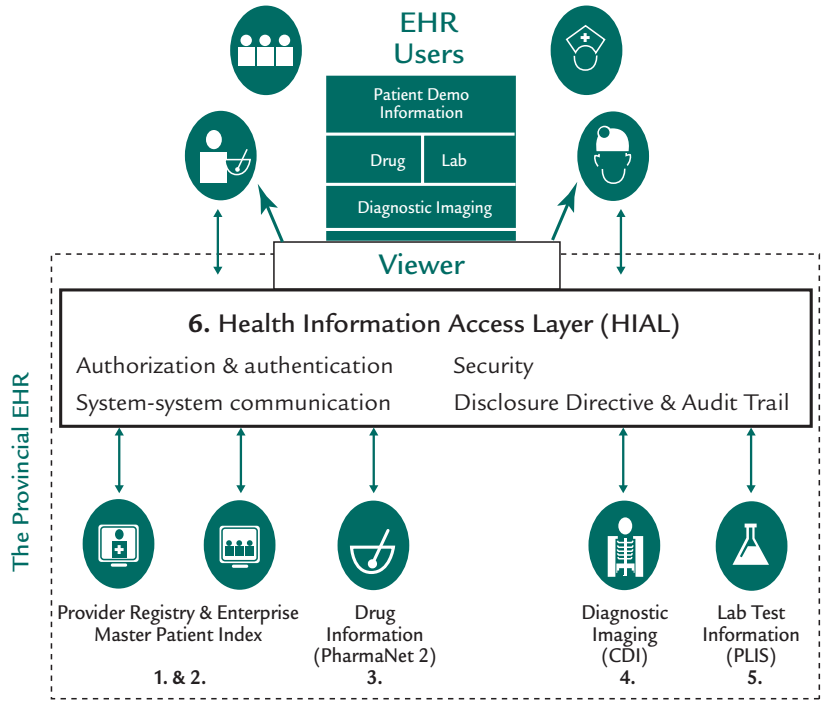
Implementing the EHR initiative is complex, costly and dependent on shared federal and provincial responsibilities

To achieve EHR information such as that shown in Exhibit 1, the Ministry of Health Services has determined that several core components must first be in place, as shown in Exhibit 2.

Exhibit 2:

Core components of a patient's EHR

1. **Provider Registry** – lists all of the participating authorized health care providers.
2. **Enterprise Master Patient Index** – lists all of the patient's relevant demographic information (names).
3. **Drug Information** – lists all of the patient's medication history in both hospital and community and enables writing of electronic prescriptions.
4. **Diagnostic Imaging** – shows the patient's radiology images (x-rays).
5. **Lab Test Information** – shows the patient's laboratory test results
6. **Viewer and HI Access Layer** – systems that enable authorized providers to view the patient's health information and that allow the other systems to connect to share data with privacy and security.



Source: Office of the Auditor General based on the Ministry of Health Services information

The development and implementation of an EHR system is no simple matter. The initiative is a complex and high-risk endeavour. It is complex because it requires leveraging both provincial and federal resources; it compels health sector collaboration; and it depends on the involvement of a large number of health sector organizations, health care professionals, stakeholders and advocacy groups. It is high risk not only because of the large investment of public funds being made, but because collecting, storing and disclosing information electronically raises concerns about the privacy and security of personal health information. An EHR system also requires a greater reliance on new and complex technology and is a significant change for a sector that has traditionally managed the flow of information through paper.

Background

Canada Health Infoway (CHI) and the Ministry of Health Services share responsibility for implementing EHR systems. CHI is responsible for accelerating development and use of compatible systems across Canada. The province is responsible for implementing a British Columbia EHR system that is compatible with the national standards.

CHI has three main roles:

- *Articulate national direction* — CHI developed "the Blueprint," a framework for the design of health information systems. Alignment by the provinces and territories with the Blueprint and their compliance with national standards are essential if a nationally compatible EHR system is to be achieved, one in which data can be exchanged in a uniform and understandable way.
- *Develop national standards* — CHI guided the development of national standards for each component of the EHR in consultation with representatives from the provinces and territories, as well as with health care professionals and vendors. CHI develops, maintains and supports the implementation of national standards.
- *Make focused investments to spur the development of EHR systems across the country* — CHI reimburses a percentage of provincial costs, participates in project planning, and monitors progress of projects and the quality of products through a "gated funding" approach (that is, provides reimbursement only when specific milestones have been achieved). Provinces usually receive 20% of project funding when a project agreement is signed and 30% after CHI approves project products such as project charters and system design documents. The remaining 50% of funding is tied to the adoption, or demonstrated use, of systems by health care providers. Linking 50% of funding to adoption provides some assurance to CHI that EHR systems are being used and is an incentive to provinces to enable adoption.

In British Columbia, the Ministry of Health Services is responsible for managing the province's EHR initiative and for ensuring that its products align with the government's goals and legislation, as well as with the Blueprint and national standards. The ministry is funding implementation of the individual projects of the EHR

initiative, but CHI will reimburse 75% of eligible costs for the component projects where the two agencies agree to share costs.

In the early years of the initiative, the ministry developed a notional estimate of cost of $150 million, of which $30 million was to come from the provincial government and $120 million from CHI.[3]

Now, five years on, the ministry expects to spend $162 million to March 31, 2010, and estimates it will spend a total of $222 million by March 31, 2013, by which time the ministry anticipates the EHR will be completed.[4] If the ministry meets all the milestones, CHI is expected to reimburse the province a maximum of $110 million. As the CHI reimbursement is capped, the province is responsible for all other costs of the EHR. As of September 30, 2009, CHI had paid British Columbia $46 million, or 41% of the maximum amount the province will receive once the adoption milestones are reached (Exhibit 3).

Besides ministry capital costs, there are a number of other relevant costs associated with building and operating electronic health records. For example, the ministry estimates that operating costs will be about $27.4 million a year by 2011/12. As well, the potentially significant costs incurred by the health authorities in developing their regional health records and in supporting the adoption of the provincial EHR once it is built are not included.

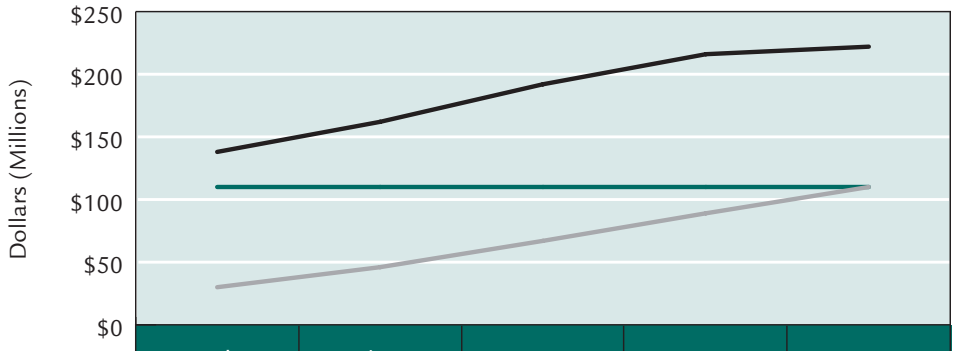
[3] The notional estimate encompassed the broader eHealth initiative. "eHealth" is the umbrella term used for the broader grouping of ministry initiatives using electronic systems to enable health care. The EHR is the largest of these initiatives, accounting for about 90% of costs to date. Other initiatives include Telehealth and Physicians Information Technology Office.

[4] In this audit we define completion of the EHR as being when the system is available and in use (adopted) by authorized health professionals anywhere and anytime in the province.

Exhibit 3:

Estimate of cumulative Ministry of Health Services EHR capital costs and reimbursement

Note: Assumes adoption milestones met by March 31, 2013 (estimates as at September 2009). The Office of the Auditor General estimated CHI reimbursement by dividing the remaining amount evenly among the years 2010/11–2012/13.



	Actual pre 2009/2010 (CHI to Dec. 31, 2008, MOHS to Mar. 31, 2009)	Estimate 2009/2010 (CHI to Sep. 30, MOHS to Mar. 31, 2010)	Estimate 2010/2011	Estimate 2011/2012	Estimate 2012/2013
MOHS Cumulative EHR Capital Costs	$138	$162	$192	$216	$222
CHI Cumulative Reimbursement	$30	$46	$67	$89	$110
Maximum CHI Reimbursement	$110	$110	$110	$110	$110

Note: MOHS – Ministry of Health Services; CHI – Canada Health Infoway
Source: Ministry of Health Services. Numbers have not been audited.

Background

Audit Purpose and Scope

We examined whether the Ministry of Health Services has appropriate and effective mechanisms in place to guide, monitor and report on the implementation of its EHR initiative while meeting the goals of a Canada-wide compatible EHR system. Specifically we expected the ministry to be:

- planning for, directing and guiding the implementation of an EHR system for British Columbia that would be compatible with that for the country as a whole;
- managing projects based on recognized project management methodology to achieve expected results, including that of establishing a compatible EHR; and
- reporting on progress in achieving the goals identified in its EHR strategic plan.

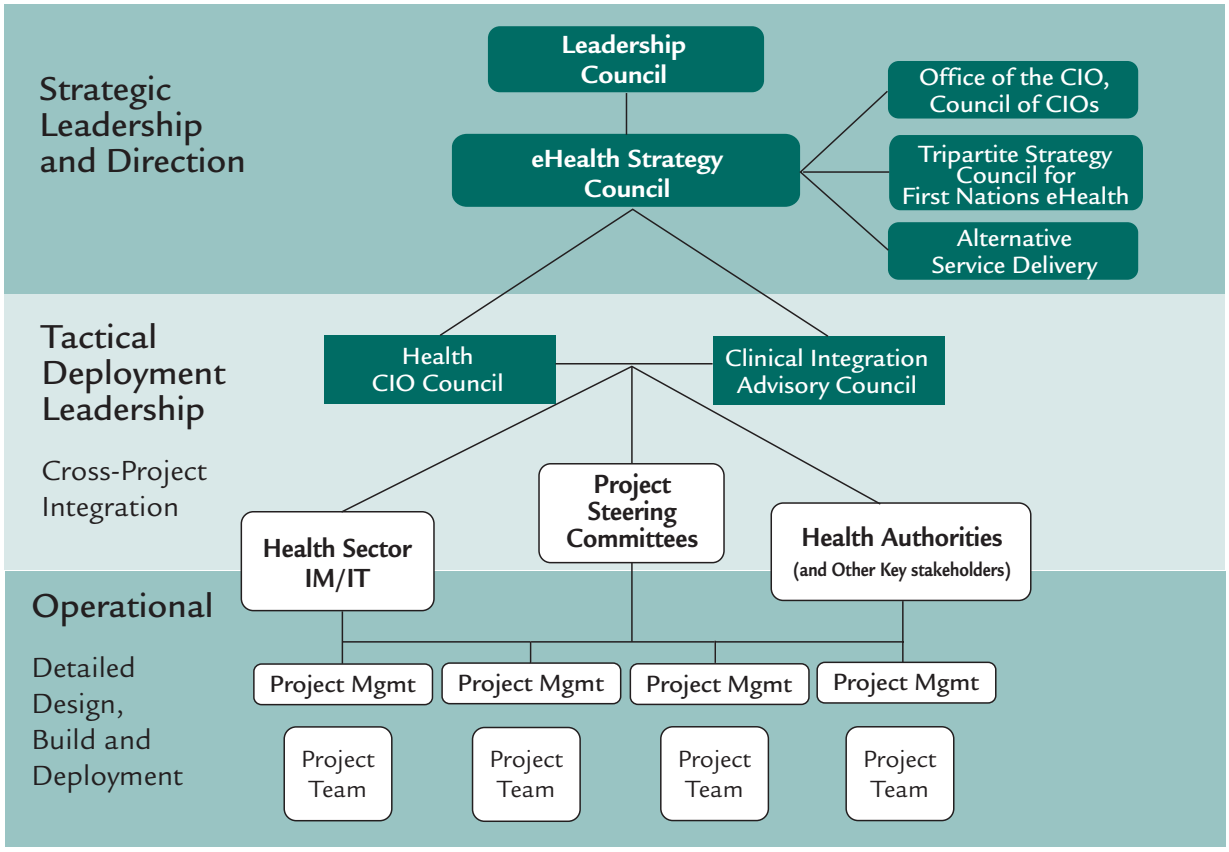
To assess ministry mechanisms for guiding and monitoring EHR implementation, we used the international standard of good practices known as Control Objectives for Information and related Technology (COBIT). COBIT recommends that mechanisms be structured at three levels: strategic (setting the direction); tactical (laying out how to best achieve the strategic goals); and operational/individual project (executing the tactical plan effectively). Exhibit 4 shows this structure as it is currently applied in the Ministry of Health Services.

We did not examine:

- other systems in the ministry such as Public Health Information Project (which the ministry includes as an EHR component), Telehealth, Public Health Surveillance, and Physician Information Technology Office because, although important, they are not part of the six core components of an EHR listed in Exhibit 2;
- the already completed procurement processes employed in the EHR projects, because audit work was being undertaken by the Office of the Comptroller General of British Columbia; or
- how well the new initiative meets privacy and security requirements, because it was too early in the EHR implementation.

Exhibit 4:

The new governance structure established in British Columbia in 2008 through the Health Sector IM/IT Strategy



Source: Ministry of Health Services, Health Sector IM/IT Strategy, October 2009.

Background

We initially gathered evidence from November 2008 to May 2009 and completed our analysis in June 2009. When we shared our initial findings and recommendations with the ministry, they committed to taking immediate action. Our four recommendations to the ministry were to finalize its strategic plan, complete a comprehensive tactical plan, enhance its measuring of progress, and report publicly on the outcomes of the EHR initiative. (See Appendix A for our initial recommendations and the ministry's response.) We extended our evidence-gathering to November 30, 2009, to allow the ministry the opportunity to implement the recommendations. The ministry completed the first two recommendations and work is underway on the last two. The final stages of our work included discussing our report's content with the ministry and developing appropriate plans for moving forward. In addition to discussing our initial findings, the report assesses the ministry's progress up to November 30, 2009.

The final stages of our work included discussing our report's content with the ministry and developing appropriate plans for moving forward. In addition to discussing our initial findings, the report assesses the ministry's progress up to November 30, 2009.

The audit was carried out in accordance with the standards for assurance engagements established by the Canadian Institute of Chartered Accountants.

Planning for the EHR initiative by the ministry was initially poor, but has improved

The Ministry of Health Services' responsibilities in the EHR initiative include providing guidance and direction for implementing the system. We expected to find an inclusive planning process and a current, comprehensive and well-communicated strategic plan.

Conclusion

The Ministry of Health Services did not start the EHR initiative with a well-formulated strategic plan or effective planning processes. Key stakeholders such as health professionals were not effectively engaged to ensure the proposed EHR system would meet the needs of its users. Also, duplication of efforts with health authorities likely delayed progress and contributed to missed opportunities to achieve economies of scale.

The ministry adopted a new approach in 2008 that includes a simpler governance structure with clear roles and a broader group of stakeholders. This planning process produced the new Health Sector Information Management/Information Technology Strategy published in December 2009—the first provincial health sector information management/information technology plan in British Columbia. The new strategy has not been widely communicated and it is too early to assess the effectiveness.

The ministry initiated the EHR without having a well-formulated strategic plan, process or structures in place

Vision for EHR

"An integrated, interoperable eHealth system in which health care information is accessible, when and where it is needed, to support personal health, health care decision making and health system sustainability."

Source: Ministry of Health Services, eHealth Strategic Framework 2005

In 2004, the British Columbia government declared that accelerating the development and implementation of the EHR system was a priority. The ministry appointed an eHealth Steering Committee whose mandate was to provide central strategic planning and to resolve issues related to strategy, priorities, funding, governance and implementation approaches. The committee's job was also to coordinate the accountability and reporting processes of the various working groups involved in eHealth initiatives. This committee created a plan in 2005—British Columbia's eHealth Strategic Framework.

The eHealth Strategic Framework is a directional document that presents a high-level plan to develop and implement eHealth in British Columbia. The framework includes a strategy for accelerating the implementation of the EHR system through the purchase or building of new systems in phases over three years, with a steering committee responsible for the implementation

and one health authority or the ministry responsible for leading individual projects. In hindsight, the framework's commitment to substantially complete the initiative in three years was overly optimistic.

The 2005 eHealth Strategic Framework was missing key elements needed to provide appropriate and effective guidance: measurable objectives; an estimate of the full cost to complete the EHR system; a communication strategy for internal and external stakeholders; a human resources strategy; risk strategies; and a measurement and reporting strategy for progress and outcomes.

As well, the ministry did not adequately engage health professionals or manage the duplication of effort that resulted from both the ministry and the health authorities developing similar electronic record systems simultaneously:

- *Health professionals were not engaged by original planning processes* — Achieving the expected value from the EHR initiative requires engaging doctors, nurses, pharmacists and other health professionals from the start, to ensure the tools developed meet their requirements. The professionals must see the benefits of the EHR system for their clinical work before they will adopt it.

  While some processes to involve doctors in EHR planning (for example, on advisory committees during design and build phases) have been initiated, these have not succeeded. Among the reasons for the failure of this effort: unclear goals for doctor involvement, possibly too little compensation offered, and the competing priority of health authorities planning regional EHRs.

- *The original planning processes did not avoid duplication of effort among competing priorities* — Health sector governance structures in British Columbia have not ensured that the EHR initiative stood out from competing priorities. Health authorities are governed by boards, with chief executive officers making decisions about what new systems their organizations will adopt. Provincial funding to the health authorities is mostly for their use as they see fit; they apply funds they receive to priorities they see as most pressing. As well, physicians' offices are self-managed, allowing them to select the systems they will use.

Thus, in implementing a provincial EHR system, the ministry essentially had three options: to mandate the implementation of a provincial system; to provide incentives for the health sector to support and adopt the EHR; or to persuade the health sector to participate by proving the value of the benefits. As the ministry did not mandate the provincial EHR initiative, we therefore expected other processes to have been established within the undertaking to enable the ministry and entire health sector to work together. Instead we found that the eHealth Steering Committee (the strategic planning group responsible for resolving EHR initiative issues from 2004-2007) was not successful in addressing the duplication between ministry-led development of a provincial EHR and health authority-led development of similar regional EHRs.

The provincial and regional EHRs have proceeded along relatively separate paths. For example, each health authority and the ministry itself has developed or purchased its own viewer (the part of the electronic record that connects to, and displays, the health information on a health professional's computer). Duplicated effort such as this likely contributed to delays in EHR progress and missed opportunities for efficiencies.

The ministry established a new planning process and structure in 2008

Several changes led the ministry to reassess the original planning process and structure:

- Turnover in ministry senior management, including a sudden change in the Assistant Deputy Minister and executive team responsible for the EHR initiative, resulted in new leadership.
- Transfer of responsibility and management of the individual EHR projects from the health authorities to a single division in the ministry resulted in consolidation.
- Direction from Treasury Board to replace the separate plans for building and managing information systems with a single integrated health sector plan resulted in a new process for engaging the large number of stakeholders in the common plan.

The ministry reassessed the EHR initiative's commitments to Canada Health Infoway and to the provincial government, re-evaluated the progress made, and examined the concerns identified about delayed progress and waning stakeholder support. Concluding that a different approach was needed, the ministry then instituted a new strategic planning process that reflected recognized good practice. The new process, established in 2008, sets out how priorities are to be determined and decisions made, and places greater emphasis on meeting health service priorities rather than technological ones.

As well, a new, more streamlined governance structure established in 2008 brings key stakeholders together in one group called the eHealth Strategy Council and defines clear lines of authority (Exhibit 4 page 27). The council provides strategic advice to the ministry and developed the Health Sector IM/IT Strategy for the province.

The eHealth Strategy Council membership includes health professional organizations (representing doctors, nurses and pharmacists), First Nations, and key decision-makers. The 20 members are responsible for providing health system leadership and not just organizational representation. Expanding both the membership and the role to the broader health sector should reduce the risk of duplication and of time and resources wasted because of competing priorities. In our view, however, the group lacks some important perspectives, such as those of a citizen-advocate and an academic.

A new Clinical Integration Advisory Committee started in 2009. The group represents clinical users of the EHR—active health professionals with eHealth linkages. The aim is to obtain health professionals' advice and support on the deployment and adoption of the EHR and associated policies (related to privacy, for example). It was too early for us to assess how effectively this committee operates.

The Health Sector IM/IT Strategy published in 2009 is a significant achievement

The eHealth Strategy Council's provincial Health Sector IM/IT Strategy[5] published in December 2009 is the first integrated, whole health sector IM/IT plan for British Columbia. Through the process of developing the strategy, the council members and the organizations they represent committed to:

- developing a provincial health sector IM/IT strategy aligned with provincial health sector priorities, identifying key areas of focus;
- aligning IM/IT plans in each organization with the strategy;
- containing IM/IT costs by expanding shared services (reducing duplication in organizations); and
- ensuring that privacy and confidentiality of health information are protected.

The new strategy covers the period 2009/10-2013/14, and is to be revised on an ongoing basis with publication of annual updates. This plan has been shared with stakeholders and published on the ministry website.

Progress has been made and a tactical plan has been developed

To manage the EHR initiative effectively, the ministry should have a current and comprehensive tactical plan that is based on relevant and timely information, proven strategies and sufficient resources. We expected such a plan to set out how the ministry will achieve the objectives of the EHR strategic plan, and to include a deployment strategy outlining how and when the newly built EHR system will be put into use across the province by authorized health professionals. Building on the tactical plan would also be, we expected, project plans to guide execution of the individual projects using recognized project management processes.

[5] The Health Sector IM/IT Strategy is available at the Ministry of Health Services website

What We Found

Conclusion

Early on, the EHR initiative suffered from lack of coordination among the component EHR projects and lack of a tactical plan to guide the development and implementation of the EHR. Good management practices at the individual project level and improved tactical planning have ensured progress. The ministry, which had been developing elements of a tactical plan as the initiative progressed, brought these together in November 2009 into the eHealth Tactical Plan. This plan provides a sound basis for ongoing management as the EHR is implemented. Nevertheless, more work is needed. For example, both the consultation with stakeholders about their communication needs and the EHR communication strategy need to be completed; an identity strategy to ensure client identity matches across the health sector needs to be finalized; and progress measures need to be developed. The work still to be done to complete the EHR is extensive.

Progress has been made

The ministry has substantially built four[6] of six core components of a provincial EHR system (see sidebar). We were told that the ministry is the first in Canada to develop an EHR access system that applies the national standards for ensuring privacy, security and compatibility of the EHR. The new access system enables authorized providers to view their patients' health information and allows the other systems to connect to share data. The major work to gradually load health data into the EHR for the whole province and support the adoption by the health authorities and health providers is in progress. The ministry expects that work and the remaining two systems to be completed by March 31, 2013.

[6] The ministry chose an alternate approach for one of the six components, the provincial Diagnostic Imaging system. It upgraded the current system rather than build a new one, and is therefore not one of the four mentioned above.

What components have been substantially built?

A small number of authorized health professionals at the Provincial Health Services Authority have been testing the **EHR access system (iEHR)**—a provincial viewer and the Health Information Access Layer—since June 2009. The Ministry of Health Services plans to expand viewer testing in December 2009 to about 3,000 authorized health professionals in the Vancouver Coastal Health Authority. The provincial access systems will not only give authorized health professionals the ability to view patient's health information, but will also allow other systems to connect to share data.

The new **Provincial Laboratory Information System (PLIS)** is also being tested by the same health professionals and the same expansion is planned for December 2009. This part of the EHR provides patient's laboratory test results.

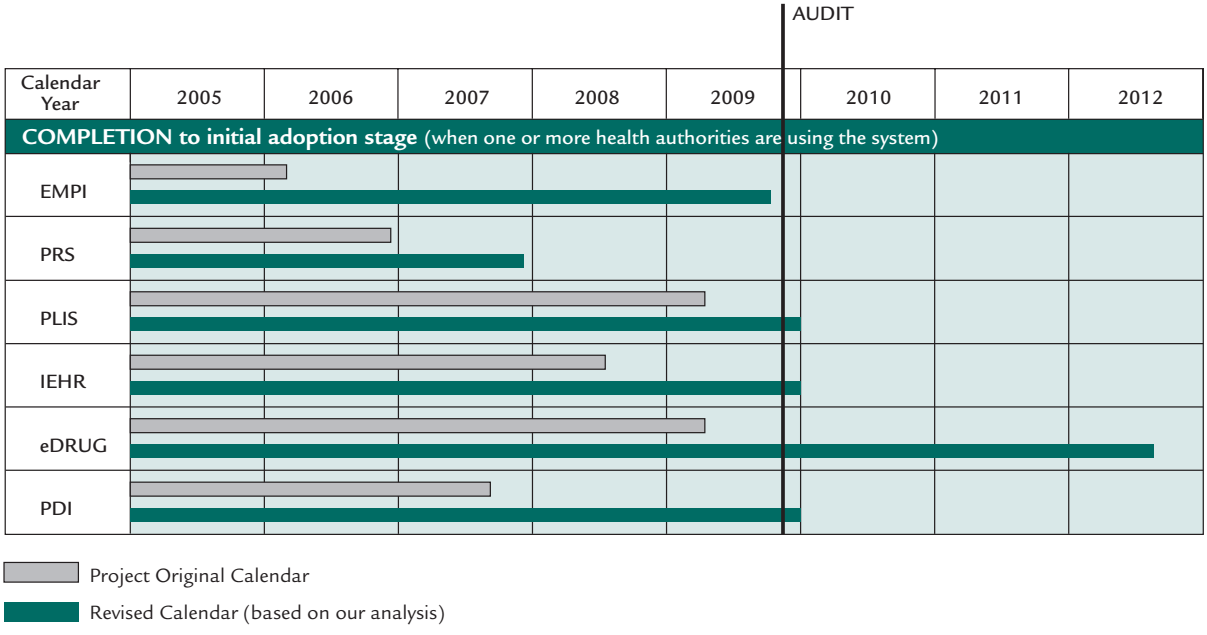
The two registries that provide demographic information are in place: the **Enterprise Master Patient Index (EMPI)** that provides patient demographic information and the **Provider Registry (PRS)** that provides information about authorized health professionals. Both have been enhanced to integrate with the EHR access system and provide the performance needed for the provincial EHR.

Individual projects follow recognized project management methodology. The ministry hired experienced project managers and teams to execute the individual projects and adopted project and risk management processes based on recognized good practices. It uses recommended cost control practices (such as fixed-price contracts with vendors) and closely monitors expenses. At the individual project level, the ministry has also established annual budgets and timelines and closely monitors progress.

However, individual EHR projects are taking longer than initially planned (Exhibit 5). Reasons for this include overly ambitious timelines, insufficient tactical planning and changes in key ministry management personnel during the early years.

Exhibit 5:

Comparison of the original estimated EHR project initial adoption dates with those at November 2009



EMPI is Enterprise Master Patient Index, PRS is Providers Registry System, PLIS is Provincial Laboratory Information System. iEHR is Interoperable Electronic Health Record, eDRUG is the electronic Drug system, PDI is Provincial Diagnostic Imaging system.

Note: For the Provincial Diagnostic Imaging system, the ministry chose to upgrade the current system rather than build a new one, and is deploying the system upgrades to initial adopters.

Source: Office of the Auditor General based on Ministry of Health Services information.

A tactical plan, developed as work progressed, is now in place

Elements of Good Tactical Plans

A good tactical plan is updated regularly and identifies:

1. Full lifecycle (start to finish, including deployment)
2. Priorities and dependencies among EHR components
3. Risks and mitigation strategies
4. Resource requirements, costs and how they will be monitored
5. Timelines and major milestones and their monitoring
6. Communication needs, plans and their monitoring
7. Measurable objectives and targets (including financial)
8. Outcomes and how they will be monitored

Source: COBIT (Control Objectives for Information and related technology)

We expected the ministry to develop and follow a good tactical plan from the start; one that laid out how it intended to achieve the strategic goals of an integrated, compatible provincial EHR. For any information technology project, a good tactical plan should include elements such as the best practices shown in the sidebar.

The ministry initiated the EHR in 2005 without having a comprehensive tactical plan for completing this complex and high-risk endeavour. The early priority was establishing agreements with CHI to reimburse costs and procuring a reliable vendor. Planning the overall initiative was a lesser priority and therefore initially postponed.

Since 2008, the ministry has improved its tactical planning. It developed various tactical plan elements as the EHR progressed, and in November 2009 brought those together into a single document, the eHealth Tactical Plan.

We found the tactical plan to be a reasonable one. It links to the five main focus areas of the Health Sector IM/IT Strategy and provides the guidance and direction needed for ongoing management of the initiative. Recognizing the need to keep it current, the ministry has also committed to updating the tactical plan quarterly. However, its effectiveness will only be evident over time as implementation progresses.

Despite this progress, considerable work still needs to be done to achieve EHR goals. For example, to establish the eHealth communications strategy going forward, the ministry is now gathering information through consultation with stakeholder groups and through clinical advisory councils. This job needs to be completed. The ministry is also establishing a management committee that will coordinate efforts to ensure the accurate identification of all authorized health professionals and clients across the health sector. The safety and quality of the EHR require the accurate identification of users. This work needs to be finalized. As well, planning in the ministry is underway to develop overall eHealth targets against which program performance can be measured and reported on. These targets need to be firmly set.

We summarize the ministry's progress in implementing the EHR initiative below, by tactical plan element:

- *Full lifecycle (start to finish, including deployment and ongoing operations)*

The ministry's new tactical plan identifies the full lifecycle of the EHR, from the initial approval through building, deployment and adoption to ongoing operations. However, four of the six core components were already built before the plan was in place. The lack of an earlier plan to coordinate the development and deployment of these components contributed to challenges in making these systems available for use.

Since 2008 work has been underway to develop a deployment strategy to guide bringing health professionals and health authorities into the EHR. The new tactical plan provides the guidance needed to do this. The plan's deployment strategy identifies several key activities required to make the EHR system available for use and to support their adoption by authorized health professionals. It describes the ministry approach for providing ongoing supports that the EHR will need, such as a help desk. It confirms that a strategy is being developed for engaging users at the project level to help health professionals adopt the new EHR system. It describes the approach for developing adoption targets. And it outlines the approach for establishing a deployment schedule. All that is necessary is for the ministry to carry out these activities.

Just as importantly, the tactical plan describes how the EHR will be operated and sustained on an ongoing basis. In July 2009, the ministry and the Provincial Health Services Authority (PHSA) signed a five-year Memorandum of Understanding for PHSA to become the organization that provides ongoing eHealth support services within the province. Detailed descriptions of the responsibilities are still to be developed. The ministry will continue its role as steward of the health system and will retain ownership and control over the province's eHealth initiative and its Master Service Agreements with vendors and CHI. While the majority of related costs will be transferred to PHSA, a number of costs will remain with the ministry for a while subsequent to the transfer. The ministry estimates that EHR operations will cost it and PHSA combined about $27.4 million a year starting in 2011/12.

■ *Priorities and dependencies among EHR components*

The initial lack of a comprehensive tactical plan may have been a factor in creating gaps in inter-project coordination. Because of the dependency between multiple individual projects, setting priorities at the outset was critical to ensure that projects on which others relied could be completed to meet their milestones. Not prioritizing which projects would be necessary to complete first meant that as foundational projects fell behind—especially the interoperable electronic health record (iEHR) and registries—others fell behind as well.

In 2008, the ministry began addressing this issue by focusing on getting the foundation pieces for the EHR initiative in place first: namely, building both the iEHR, which provides authorized health professionals access to the information, and the registries that provide demographic information of patients and providers.

The tactical plan identifies the priority for 2009/10 as planning and executing system integration and deployment activities. The plan also outlines the governance structure that is being used to coordinate and guide the EHR initiative. As well, in keeping with best practices, the tactical plan sets out an integrated approach to managing the human side of change and describes a sound approach that builds on what is already in place in the health authorities, with the ministry providing oversight and a coordination role in eHealth change management.

Examples of EHR risks the ministry was managing during our audit:

The risk that:

- EHR deployment and completion might be delayed;
- clinical adoption of EHR might be insufficient for the changes needed to achieve improvements;
- long-term viability of EHR might not be financially sustainable; and
- outcomes might be insufficient or unacceptable.

■ *Risks and mitigation strategies*

The tactical plan clearly describes the risk management strategy. The ministry set high standards for risk management by adopting the eHealth Risk Management Framework in 2006. The framework is based on government-wide enterprise risk management requirements and was endorsed by CHI as representing good practice. However, until 2008, the framework was applied inconsistently and lacked executive support. In 2008, ministry and CHI executive established formal processes to ensure that the framework would be used consistently across the EHR initiative and that regular monitoring would occur, including joint quarterly reviews. The ministry also established plans to reduce a range of risks (see sidebar).

- *Resource requirements, costs and how they will be monitored*

EHR resources are required for individual projects and coordination of the overall eHealth program. The tactical plan identifies that human resources are to be obtained through a combination of employee and contractors at both the project and program level, and makes clear that all procurement is to follow government policies. In addition, it identifies how the ministry is to have ensured capacity to deal with the high volume of procurement and contract activity by establishing and staffing two positions dedicated to eHealth procurement and contract requirements.

As mentioned earlier, project level costs have been closely monitored by the ministry based on the project management best practices.

- *Timelines and major milestones and their monitoring*

Setting out and communicating one integrated schedule early in an initiative is good management practice. For the EHR initiative, it is particularly valuable because an overall schedule is needed to help plan the most efficient way to complete the work. The ministry was slow in developing integrated timelines. The first integrated schedule was not produced until March 2008 - four years into the EHR initiative. The lack of an overall schedule early on resulted in an inability to anticipate interdependencies among the multiple projects developing in parallel—an essential element of tactical planning. As a result, delays in individual projects contributed to delays for the entire EHR initiative. For instance, when the EHR access system project, iEHR, fell behind schedule, like dominoes, other project schedules fell behind. As noted previously, tactical planning improved in 2008, including attention to integrated scheduling and contingency planning.

The tactical plan identifies that an integrated deployment schedule will be created each year for the following year. Twelve months of milestones are established for 2009/10, and the next increment for 2010/11 is expected to be approved by April 2010. The tactical plan also lays out "streams of activity for deployment of the EHR" through to completion.

- *Communication needs, plans and monitoring*

The EHR initiative had not had a communication strategy that identified who the key stakeholders were, what information they needed, and how the ministry would provide that information. The individual project teams established communication activities, but the EHR initiative lacked overall guidance. The tactical plan now identifies the internal and external key stakeholders, describes the consultation approach the ministry will follow to confirm the information they need, and sets out the structure the ministry will use to provide it. This approach should help ensure health professionals, stakeholders and the public are informed of what is being put in place and when it will be available. Given the ministry's dependence on health professionals and the public to support the EHR system, this is a critical part of tactical planning.

- *Measurable objectives and targets (including financial)*

We expected the ministry to use measurable objectives and defined targets to monitor its progress in developing and implementing the EHR. The ministry had some measures and targets, such as annual budgets. However, there is no comprehensive plan for measuring EHR implementation progress. The tactical plan identifies that a more comprehensive level of performance reporting is needed and that planning is underway to develop overall eHealth targets against which program performance may be measured and reported on.

The tactical plan estimates that the EHR will be complete in 2012/13 and emphasizes that this date is contingent on approved funding being received over the next three years. As well, it provides estimated expenditures and reimbursements to 2012/13.

The tactical plan also notes that the ministry and CHI will be finalizing the EHR adoption targets and measures of what represents sufficient adoption over the coming months. To ensure the EHR system is used, CHI holds back a portion of the reimbursement funds it offers until there is proof of adoption—that is, a sufficient amount of data flowing into the EHR system (data in) and a sufficient number of users accessing the system on a regular basis (data out).

We discuss outcomes and how they will be measured in the next section.

What We Found

Progress measures need to be enhanced and outcome measures completed to improve reporting about the EHR initiative

We expected the Ministry of Health Services to report to key stakeholders and funders on its progress in developing the EHR system and ultimately to the public on the outcomes attained.

Conclusion

The ministry has reported its progress to its funders, but needs more complete information for its own long-term planning and financial management. The ministry is also only beginning to determine how it is going to measure future outcomes of its investment in the EHR initiative.

The ministry has reported its progress to its funders, but needs information for long-term planning and financial management

The ministry has now identified key stakeholders and in November 2009 established a process to provide regular quarterly reports targeting the eHealth Strategy Council, Health Chief Information Officers, and Health Authority Chief Financial Officers. However, the reporting does not at this time include established progress measures, such as the percentage of work complete relative to the percentage of the total budget used, and measures of quality. As previously stated, the ministry says that planning is underway to develop these.

The ministry provides Treasury Board and Canada Health Infoway (CHI) with the progress information they request. Until November 2009, this has not included an estimated cost on the EHR initiative to completion. Although funders may not have been requesting this information, we believe the ministry should know it anyway to efficiently and effectively manage the initiative. In November 2009, as part of the ministry annual capital budget process, the ministry did report to Treasury Board that the estimated cost of the initiative was $222 million to 2012/13, when the ministry expects it to be completed. It also reported that it estimates operating costs will be about $27.4 million a year starting in 2011/12.

The plan to evaluate and report outcomes of the EHR is in the early stages

As steward of the health care system in the province, the ministry is responsible for reporting on how the needs of the residents of British Columbia are being met and what the outcome is of spending more than $220 million of public funds (less a $110 million reimbursement from CHI) on the EHR initiative. The ministry is also responsible for assessing whether the EHR initiative is achieving the intended outcomes of faster, safer and more effective health services. In addition, the ministry committed to CHI to evaluate the outcomes of the investment.

During our audit, the ministry had just started planning how to evaluate the impact and outcomes of the EHR initiative. Good management practice would have been to establish how the initiative would be evaluated early in the planning stage and to collect baseline information to measure future results against. The ministry adopted the national CHI evaluation model in 2008 and finalized an agreement with CHI to partially fund the evaluation in British Columbia in March 2009. Total costs are estimated to be $3.34 million, $2.5 million of which CHI will reimburse when the milestones are achieved. The ministry expects to begin reporting evaluation results in late 2010.

Challenges Ahead

While progress has been made in developing and implementing an EHR for British Columbians, it is still early days. This is an important initiative and it needs to be done well. Our Office will monitor ministry progress through ongoing reviews, about every six months.

Continued progress is, in our view, contingent on the health sector addressing the following challenges:

- **Meeting the goal.** The goal is to complete the EHR system in 2012/13. Will the vision of a secure and private electronic record being available when and where it is needed be achieved? Will the EHR core components be deployed by 2012/13?

- **Realizing the benefits.** Studies done in other countries have found improved efficiencies in health care delivery and identified other benefits gained as a result of using EHRs. Will British Columbians realize such benefits? If so, what will those benefits be? Will EHRs live up to the expectations?

- **Upgrading systems.** Many of British Columbia's health care information systems were not part of the EHR implementation system and need upgrading. As well, because the information technology standards required for national compatibility will be regularly updated, the province's EHR system will need upgrading to remain compatible. Who will provide the funding needed to ensure that all systems will be compatible, and when will this funding be provided?

- **Implementing electronic medical records.** Until the percentage of doctors using electronic medical records (EMRs) increases significantly, the potential benefits offered by EHRs will not be fully realized. The ministry and doctors are currently collaborating to implement EMRs in 4,500 physician offices. By September 2009, about 2,100 physicians had enrolled in the EMR implementation program—roughly 20% of British Columbia's 10,613 active physicians. What are the constraints to a more rapid uptake? When will use of EMRs in the province increase significantly?

Challenges Ahead

- **Developing compatible consumer health solutions.** New health information systems that give patients direct access and control over their personal health information are becoming more common. Making these systems compatible with the provincial EHR system should become an important goal of vendors. Will these and personal health records be made compatible with the EHR systems already in place?

- **Sharing and protecting personal health information.** Data-sharing throughout the province, and eventually among the provinces and territories, is critical to creating EHR systems that are compatible across the country. The ministry has made progress in establishing the mechanisms for achieving this. How will the many issues be resolved to facilitate the sharing of information?

- **Funding the initiative.** The ministry expects to spend $222 million on the EHR capital costs by March 31, 2013. This does not include other relevant capital costs, such as the costs incurred by the health authorities in developing their regional health records. Nor does it include the operating costs of maintaining the EHR once it is built, or the costs associated with integrating the systems across the health sector and supporting health professionals to effectively use the EHR in treating their patients. What will the total costs be to complete the EHR? Will the funds be available? And, if so, from which sources?

Appendix

Appendix A: Ministry Response to Initial Audit Report and Recommendations

General Comments:

The Ministry of Health Services is pleased to receive and respond to the Office of the Auditor General's review entitled 'Electronic Health Record Implementation in British Columbia'.

The establishment of electronic health records (EHRs) is both a national and provincial health system priority. In 2002 the Kirby Senate Study on the state of the health care system in Canada recommended the establishment of a system of EHRs and the Romanow Commission on the future of health care in Canada indicated that EHRs are one of the keys to modernizing Canada's health system and improving access and outcomes for Canadians. That same year in British Columbia, the Premier's Technology Council hosted an eHealth Round Table bringing together some of British Columbia's leading health care providers, health educators, and selected representatives of the provincial and federal governments to discuss eHealth in the Province. They recommended that the provincial government implement a common electronic health record.

Seven years have passed since 2002 and great progress has been made towards the implementation of a provincial EHR. A number of the primary foundational systems are now in place with the remaining components scheduled for completion over the next few years. As acknowledged by the Auditor General however, the implementation of the EHR is a complex endeavour involving numerous public and private stakeholders as well as new and often untried technology. As a result, while we have celebrated many successes, the Ministry has also faced significant challenges from which we have learned a great deal. The Ministry has made efforts to continuously evolve and improve the mechanisms in place to manage the provincial EHR implementation based on the lessons learned and we will continue to do so in the future.

The review conducted by the Office of the Auditor General has provided the Ministry with confirmation that we have most of the mechanisms in place or under development to successfully fulfill our role and we are moving in the right direction. The recommendations provided are constructive and helpful. They have been welcomed by the Ministry and incorporated into our continuous improvement process. We are pleased to be able to report that the Ministry has already taken steps to implement the

Appendix A: Ministry Response to Initial Audit Report and Recommendations

recommendations and will ensure that our further progress in this regard is regularly monitored and reported on.

The Office of the Auditor General's review highlights three key findings and recommendations. The Ministry's specific actions to address those recommendations are detailed in the table below.

Specific Actions by Recommendation:

OAG Finding: Planning by the ministry was initially poor, but improvements are underway
Recommendation 1: *We recommend that the Ministry of Health Services finalize and communicate its strategic plan for integrated health sector information management/information systems and keep it up to date.*
Actions Taken To Date: ■ The first version of a Health Sector IM/IT Strategy was completed in July 2009 and endorsed by the British Columbia eHealth Strategy Council, whose membership includes all six health authorities, the College of Pharmacists, the College of Physicians & Surgeons, the BC Medical Association and other health sector stakeholder organizations. ■ The Strategy provides information management/information technology direction for all British Columbia health care delivery organizations.
Actions Planned (Timeframe) ■ The Health Sector IM/IT Strategy will be updated on an annual basis.
OAG Finding: Progress has been made, but a comprehensive tactical plan is needed
Recommendation 2: *We recommend that the Ministry of Health Services finalize and maintain a current and comprehensive tactical plan that includes strategies for communication, deployment, and a current integrated schedule that extends to project completion.*
Actions Taken To Date: ■ A review of existing component plans and previous versions of integrated workplans has been carried out to identify gaps and determine requirements for a current and comprehensive plan. ■ An new eHealth Director's Forum has been established, which includes all managers with eHealth project accountabilities, to develop and manage against an integrated deployment plan (tactical plan).

Appendix A: Ministry Response to Initial Audit Report and Recommendations

Actions Planned (Timeframe)

- The new version of the integrated eHealth deployment (tactical) plan will be completed by November, 2009.
- Progress against the deployment (tactical) plan will be tracked on a monthly basis and changes to the plan will be formally managed.

OAG Finding: Progress measures need to be enhanced and outcome measures completed

Recommendation 3: *We recommend the Ministry of Health Services:*

- *establish measures of quality, completion and full costs and monitor its progress; and*
- *evaluate and publicly report the outcomes of the EHR initiative.*

Actions Taken To Date:

- Work towards the establishment of an updated eHealth deployment (tactical) plan is underway. This comprehensive plan will include milestone targets and associated costs against which progress will be monitored and reported.
- A Benefits Evaluation Project Agreement has been established with Canada Health Infoway which includes a plan to develop pre and post-implementation eHealth benefits indicators and measures.
- A benefits evaluation working group has been established and the first draft of the eHealth benefits indicators and measures document has been completed.

Actions Planned (Timeframe)

- An updated version of the integrated eHealth deployment (tactical) plan will be completed by November, 2009. Reporting against the plan will begin following plan approval.
- Final approval of the benefits evaluation plan is anticipated by the end of the calendar year with the pre-implementation measures taken for selected projects early in 2010.