British Columbia’s Provincial

Health Sector Information Management/Information Technology Strategy

Developed by the BC eHealth Strategy Council
Version 1.0

October 2009
# Table of Contents

**Executive Summary** ................................................................. 3
  - Information Management/Information Technology Vision .................. 3
  - Benefitting British Columbians ..................................................... 5
  - eHealth Strategy Council Endorsement ........................................ 6

**Introduction** ............................................................................. 8
  - IM/IT Vision .............................................................................. 8
  - Strategy Purpose and Scope ........................................................ 9
  - Consultation Process ................................................................... 9
  - Key Strategic Principles ............................................................. 10

**Alignment with BC Health Sector Strategy** ................................ 11
  - Summary of BC Health Sector Strategy ........................................ 11
  - Health Sector IM/IT Strategy Alignment ......................................... 12

**Current State Assessment** ....................................................... 13

**Strategic IM/IT Focus** .............................................................. 14
  - Current IM/IT Assets .................................................................. 15
  - Chronic Disease Prevention and Management ................................. 16
  - Care Delivery Improvements Enabling Health System Sustainability .... 25
  - Government Priorities ............................................................... 27
  - Sustainment of IM/IT Assets ....................................................... 31
  - Enabling Competencies .............................................................. 32
  - Leverage Across the BC Public Sector .......................................... 36

**Strategic IM/IT Priorities** .......................................................... 38
  - Information Technology Enablers .................................................. 38
  - Information Management Enablers .............................................. 40
  - Process Redesign and Change Management .................................... 43

**Strategy Roadmap** ................................................................. 45
  - COPD Improvements ................................................................ 45
  - Improvements in Other Chronic Diseases ....................................... 47
  - Care Delivery Improvements Enabling Health System Sustainability .... 48
  - Government Priorities ............................................................... 48
  - Sustainment of IM/IT Assets ....................................................... 48
  - Enabling Competencies .............................................................. 49
  - IM/IT Strategic Decisions ............................................................ 49
  - Leverage Across the BC Public Sector .......................................... 50

**Challenges** ............................................................................. 52

**Moving Forward** ................................................................. 53
  - Where Do We Go Next? ............................................................. 53
  - Addressing Gaps and Issues ....................................................... 54

**Appendix A – BC Health Sector IM/IT Strategy Summary** .......... 56
**Appendix B – BC Health Sector IM/IT Strategy Roadmap** .......... 57
Executive Summary

Information Management/Information Technology Vision

To ensure health care information is accessible, when and where it is needed, to support personal health, health care decision making, and health system sustainability.

Background

Beginning early in 2008, the Ministry of Health Services initiated the development an integrated BC Health Sector Information Management/Information Technology (IM/IT) Strategy (the “Strategy”) to ensure the alignment of IM/IT initiatives and investment with BC’s overall health sector strategies and priorities.

The Strategy has been developed under the direction of the BC eHealth Strategy Council which includes representation from the major health care organizations and stakeholders in the Province.

Through the process of developing the Strategy, the eHealth Strategy Council members and the organizations they represent have committed to:

- develop an agreed provincial Health Sector IM/IT Strategy aligned with provincial health sector priorities, identifying key areas of focus;
- align IM/IT plans in each organization with the strategy;
- contain IM/IT costs by expanding shared services (reducing duplication in organizations); and
- ensure that the privacy and confidentiality of health information is protected.

The Strategy will be revised on an ongoing basis as the Ministry’s overall provincial health strategy is further developed.

Focus

One of the key focus areas of the Strategy is chronic disease prevention and management (CDPM). The Ministry of Health Services spent $2.89B in 2006/07 on chronic diseases and anticipates a 60 per cent per cent growth in demand by 2025\(^1\). CDPM involves multiple caregivers and the effective deployment of integrated IM/IT solutions has the potential to enable better coordination of CDPM efforts to improve quality of care, patient outcomes, and reduce costs.

Through consultation with health sector stakeholders, Chronic Obstructive Pulmonary Disease (COPD) has been selected as a starting point for improving the coordination of care. COPD is a significant chronic disease and a primary cause of hospital admissions through emergency departments (EDs) in BC. IM/IT solutions developed in support of integrated care for COPD will later be expanded to support integrated care for other diseases and patient groups.

Additional key focus areas of the Strategy include care delivery improvements enabling health system sustainability and other government priorities. Particular attention will be

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\(^1\) Health System Planning Division, BC Ministry of Health Services.
paid to the ongoing sustainment of IM/IT assets and the development of core enabling competencies. This will ensure that IM/IT investments provide value by contributing towards the improvement of care and a reduction in hospital visits while reducing the overall cost of health care delivery.

The primary focus areas of the Strategy and a high-level implementation timeline are illustrated in the diagrams below.

**Provincial Health Sector IM/IT Strategy High-Level Summary**

(See Appendix A – BC Health Sector IM/IT Strategy for more detailed view)
Roadmap for Implementing the IM/IT Strategy

<table>
<thead>
<tr>
<th>2009/10</th>
<th>2010/11</th>
<th>2011/12</th>
<th>2012/13</th>
<th>2013/14</th>
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<td>COPD improvements</td>
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<td>Improvements in other chronic diseases</td>
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<tr>
<td>Initiatives underway in all health authorities</td>
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<tr>
<td>Care delivery improvements enabling health system sustainability</td>
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<tr>
<td>Citizen centredness, First Nations, eHealth, public health, shared services, etc.</td>
<td>Other government priorities</td>
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<tr>
<td>Sustainment of IM/IT assets</td>
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<tr>
<td>Sustainment needs and strategy</td>
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<tr>
<td>Governance, information access/privacy, shared services, process redesign</td>
<td>Enabling competencies</td>
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<tr>
<td>Acute systems, clinical registries</td>
<td>IM/IT Strategic decisions</td>
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<tr>
<td>Clarity on provincial strategic directions for IM/IT enablers</td>
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<tr>
<td>Leverage HIAL → IAL, Explore other opportunities</td>
<td>Leverage across broader public sector</td>
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<tr>
<td>Reduced health care costs</td>
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<tr>
<td>Citizen engagement, Public health etc.</td>
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<tr>
<td>Ongoing operational viability of IM/IT solutions</td>
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<tr>
<td>Effective strategic management of health IM/IT</td>
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<tr>
<td>Leverage of health IM/IT investments</td>
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Benefitting British Columbians

Implementation of the Strategy will contribute towards the realization of a range of benefits, including:

- The achievement of better health outcomes, a reduction in complications and exacerbations, and fewer emergency visits and hospital admissions for patients with chronic diseases as a result of:
  - electronic care plans and electronic health records that are shared across the care team,
  - online tracking by patients against their care plans,
  - electronic communication between patients and members of their care teams, and
  - improved access to health information materials.

- Improved First Nations’ health through a focus on chronic disease prevention and management, and community-based supports such as telehealth and community electronic medical records (EMRs).
• A more positive health system experience for all citizens as a consequence of:
  o better access to their health information and the ability to communicate electronically (if they choose) with members of their care team,
  o care providers having the ability to access the clinical information they need, eliminating the need have tests repeated or information resent, resulting in faster service, and
  o the implementation of standard practices and protocols which contribute towards consistent access and treatment.

• The containment of health care costs through:
  o improvements in chronic disease prevention and management, reducing the demand for expensive acute care services,
  o a reduction in the number of unnecessary diagnostic tests,
  o shared services collaborations, and
  o efficiency and productivity improvements in health care organizations.

• An improved health provider experience through better access to information, sharing of information, and streamlined processes such as referrals.

• Improved responses to outbreaks such as H1N1, SARS, West Nile Virus, Avian Influenza and other communicable diseases aided by public health information systems.

• Continued access to health services ensured through the maintenance of the information systems upon which these services rely.

• Improved information privacy through access models that allow for access only on a need-to-know basis.

**eHealth Strategy Council Endorsement**

The eHealth Strategy Council has overseen the development of the BC Health Sector IM/IT Strategy and endorses the content and recommendations. Council membership includes:

- **Michael MacDougall**
  Chief Operating Officer, Strategic Innovation, Ministry of Health (Chair)
- **Philip Barker**
  Vice President, Information Management, Fraser Health Authority
- **John Bethel**
  Assistant Deputy Minister, Ministry of Labour and Citizen’s Services
- **Stephen Brown**
  Chief Administrative Officer, Ministry of Health Services
- **Catherine Claiter**
  Chief Information Officer, Vancouver Island Health Authority
- **Michael Epp**
  Chief Operating Officer, College of Physicians and Surgeons of BC
- **Joe Gallagher**
  Chief Executive Officer, First Nations Health Council
- **Malcolm Griffin**
  Chief Information Officer, Interior Health Authority
- **Andrew Hazlewood**
  Assistant Deputy Minister, Population Health and Wellness Division, Ministry of Healthy Living and Sport
- **Wendy Hill**
  Assistant Deputy Minister, Health Authorities Division, Ministry of Health Services
<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bob Bell</td>
<td>Chief Operating Officer, HealthLinkBC</td>
</tr>
<tr>
<td>Michael Marchbank</td>
<td>Executive Vice President, Provincial Health Services Authority (PHSA)</td>
</tr>
<tr>
<td>Elaine McKnight</td>
<td>Assistant Deputy Minister, Health Sector IM/IT Division, Ministry of Health Services</td>
</tr>
<tr>
<td>Marshall Moleschi</td>
<td>Registrar, College of Pharmacists of BC</td>
</tr>
<tr>
<td>Bob Nakagawa</td>
<td>Assistant Deputy Minister, Pharmaceutical Services, Ministry of Health Services</td>
</tr>
<tr>
<td>Dave Nikolejsin</td>
<td>Chief Information Officer, Ministry of Labour and Citizen's Services</td>
</tr>
<tr>
<td>Dr. David Ostrow</td>
<td>Interim Chief Executive Officer, Vancouver Coastal Health Authority</td>
</tr>
<tr>
<td>Dr. Mark Schonfeld</td>
<td>Chief Executive Officer, BC Medical Association</td>
</tr>
<tr>
<td>Cathy Ulrich</td>
<td>Chief Executive Officer, Northern Health Authority</td>
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<tr>
<td>Howard Waldner</td>
<td>Chief Executive Officer, Vancouver Island Health Authority</td>
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</table>
Introduction

Patients with chronic disease and the frail elderly in care currently utilize a large amount of health system resources ($2.89B and $1.73B respectively in 2006/07) and demands are expected to grow rapidly (60 per cent and 75 per cent growth respectively by 2025)\(^2\). Consequently, improving access to coordinated, efficient, comprehensive care across health system service lines for those having chronic diseases and/or reaching advanced ages is a priority for the health system.

The management of chronic disease involves many caregivers and is a priority area for improving coordination across the system. Improving coordination between primary care physicians, specialists, hospitals, pharmacies, laboratories, residential care settings and others will improve quality of care and convenience for both patients and providers. It may also result in cost savings while maintaining or improving service quality.

Chronic Obstructive Pulmonary Disease (COPD) will be the initial focus for improving the coordination of care. It is a significant chronic disease that crosses multiple service lines and is a primary cause of hospital admissions. Implementing an integrated care approach to COPD will require the coordination of multiple care providers and systems across several service lines. By focusing first on COPD, a foundation supporting integrated care will be established that can later be extended towards other conditions and patient groups.

While enabling improvements to in chronic disease prevention and management is a key area focus, the Strategy acknowledges the broader requirement for IM/IT support by also focusing on care delivery improvements enabling health system sustainability and other government priorities. In support of these key areas of focus, particular attention will be paid to the ongoing sustainment of IM/IT assets and the development of core enabling competencies. This will ensure that IM/IT investments provide value by contributing towards the improvement of care and a reduction in hospital visits while reducing the overall cost of health care delivery.

The Strategy embodies a commitment that has been made by the eHealth Strategy Council, and all of the organizations it represents, to:

- develop an agreed provincial Health Sector IM/IT Strategy aligned with provincial health sector priorities, identifying key areas of focus
- align IM/IT plans in each organization with the strategy;
- contain IM/IT costs by expanding shared services (reducing duplication in organizations); and
- ensure that the privacy and confidentiality of health information is protected.

**IM/IT Vision**

To ensure health care information is accessible, when and where it is needed, to support personal health, health care decision making, and health system sustainability.

\(^2\) Health System Planning Division, BC Ministry of Health Services.
Strategy Purpose and Scope

Substantial work has been done in BC in recent years to implement IM/IT solutions within the health care sector. These solutions have improved patient care in many areas but, to date, they have not been sufficiently coordinated across health sector organizations to enable true transformation of health care delivery and improved citizen health. The purpose of the IM/IT Strategy is to ensure the alignment of IM/IT initiatives and investment with BC's overall health sector strategies and priorities. The Strategy will be used to set direction for all BC health care delivery organizations and will function as an alignment guide for each organization in the development of their own IM/IT plans.

The scope of the Strategy covers IM/IT across the BC health sector, including all six health authorities, the Ministry of Health Services (MoHS), the Ministry of Healthy Living and Sport (MoHLS), First Nations, and private practices.

Examples of the spectrum of IM/IT solutions addressed within the strategy include:

- provincial eHealth,
- primary care and specialist care electronic medical records,
- First Nations community electronic medical records,
- acute systems,
- community care systems,
- emergency & health services systems,
- foundational infrastructure such as network connectivity and telehealth, and
- citizen-oriented solutions such as citizen portals.

Consultation Process

The Strategy was developed under the guidance of the BC eHealth Strategy Council, with the active support of the Health Chief Information Officer (CIO) Council, and has been endorsed by both bodies.

The process began with a current state assessment of BC health care IM/IT, focussing on systems capabilities, risk issues, and support for clinical and organizational processes. The findings of the current state assessment identified a number of gaps and issues that were analyzed in the context of BC's overall health strategy. As a result, five main areas of focus for the Strategy were identified:

1. Chronic disease prevention and management (CDPM),
2. Care delivery improvements for health system sustainability,
3. Government priorities,
4. Sustainment of IM/IT assets, and
5. Enabling competencies.

Engagement with the Primary Health Care Council and the General Practice Services Committee regarding CDPM resulted in the selection of Chronic Obstructive Pulmonary Disease (COPD) as an initial area of focus. The selection of COPD was based on recognition
of the potential for IM/IT solutions to contribute to the improvement of health outcomes in this area. Further dialogue with Primary Health Care, family physicians and specialists helped to identify opportunities for leveraging IM/IT in improving the prevention and management of chronic disease in general.

The First Nations Health Council was engaged throughout the process to ensure that First Nations priorities and needs were incorporated in the development of the strategy.

**Key Strategic Principles**

The Strategy has been developed with the following key principles in mind:

- IM/IT will be employed to address specific, clearly understood health sector clinical and business priorities – not for its own sake.
- IM/IT solutions will be implemented as part of process to redesign business models and business processes to improve outcomes and efficiency.
- Goals will be pursued in a phased, iterative manner.
- Tangible business and IM/IT targets will be identified.
- Progress towards targets will be closely managed and course-corrections will be made as needed where targets are not being achieved in practice.
- The cost and complexity of IM/IT solutions will be monitored and contained.
- Citizens and clinicians will be engaged on an ongoing basis to ensure that IM/IT priorities, timelines and deliverables satisfy user needs.
Alignment with BC Health Sector Strategy

**Summary of BC Health Sector Strategy**

The health system in British Columbia is a complex network of skilled professionals, organizations and groups that work together to create value for patients, the public and taxpayers of the province. One of the key challenges facing BC’s health care system is how to continue improving the quality of services provided to citizens while controlling spending. These elements are the focus of the health system strategy and address both the value of the system to citizens and the long term sustainability of the system. A sustainable high performing health system requires preparing for the longer term future while also improving current performance and addressing immediate challenges.

The health system strategy focuses on preparing for future demand and addressing any current significant gaps in service delivery while paying strong attention to optimizing the efficiency of system design and operations.

Gains can be achieved by a strong focus on quality improvements linked to:

- standardizing best practices,
- implementing system wide clinical guidelines and protocols, and
- addressing patient safety issues.

There are four major strategic themes for the health sector:

1. **Increase Perceived Value for Population and Patient** - communicating a compelling strategic vision for the health care system to the public and patients.

2. **Improve Quality (Appropriately Manage Demand)** – through standardization; improving services to patients with chronic disease, seniors, and patients with mental illness and addictions through redesign of community services including primary care, home and community care, and mental health and addictions; full implementation of guidelines and protocols for high need/high cost patient segments (including chronic disease populations); redesign of laboratory and diagnostic services; alternative approaches to elective surgeries; quality improvement across service delivery lines; patient engagement; and improved patient safety.

3. ** Appropriately Increase Resources (Supply)** – by identifying and closing any critical gaps in care.

4. ** Appropriately Improve Productivity (Operational, Organization, Corporate)** – through one-time cost avoidance (allowing time for longer-term restructuring); service integration and consolidation of clinical and non-clinical services (including shared services across health authorities); strengthening organization capacity; increasing capacity for change management and process redesign to improve operational efficiency; strengthening human resource management capacity; building IM/IT capacity and the eHealth platform for improved patient care and health system planning and management; strengthening financial management systems; developing a long-term physical infrastructure and major equipment plan; and developing comprehensive long-term human resource and IM/IT plans.
**Health Sector IM/IT Strategy Alignment**

The Strategy’s five main areas of focus support the four major strategic themes for the health sector in the following ways:

1. **Increase Perceived Value for Population and Patient** → by establishing a strategic vision for the Strategy and providing direction for IM/IT investments that enable health care system improvements.

2. **Improve Quality ( Appropriately Manage Demand)** → by focusing on chronic disease prevention and management (CDPM) to prevent chronic disease and better manage chronic disease patients in primary and community care, reducing demand on acute resources. CDPM improvements will be driven through prevention initiatives and the implementation of clinical guidelines that provide evidence-based care and reduce practice variation, particularly for patients with multiple chronic diseases. Complementary government priorities such as citizen access, provincial eHealth, specialist referral and First Nations eHealth also support improved care in the community and reduced acute demand.

3. **Appropriately Increase Resources (Supply)** – by deploying solutions such as telehealth, remote access to clinical systems, and the provincial electronic Health Record (EHR), enabling resources to provide care at a distance.

4. **Appropriately Improve Productivity (Operational, Organization, Corporate)** – by enabling care delivery improvements that support health system sustainability, particularly in the health authorities; enabling service integration and consolidation across health authorities (including IM/IT shared services to reduce cost); and providing essential enablers for process redesign.

The ongoing sustainment of IM/IT assets and the development of enabling competencies are important foundation elements of the Strategy.

The "Strategic IM/IT Focus” section provides more details on each of the five focus areas and how they support the overall health strategy.
Current State Assessment

An assessment of the current state of IM/IT solutions deployed throughout the health sector revealed the following observations:

1. There are many opportunities for improving system capability and support for clinical/business processes, including:
   - electronic citizen access,
   - acute care processes (acute clinical systems are largely in place but business processes have not evolved to take advantage of these systems and realize the full value achievable from these investments),
   - community and primary care systems and processes,
   - community EMRs for First Nations community health clinics,
   - collaboration capabilities such as electronic referral and secure messaging, and
   - foundation elements, including broadband connectivity for First Nations and other remote communities, and some aspects of identity management.

2. A number of major systems and infrastructure components within the health authorities and the BC Ambulance Service are aging and will soon need replacing.

3. Historically, a large proportion of IM/IT investment has been focused on acute and regional EHR systems within the health authorities (approximately 40 per cent of the total ongoing capital investment). The concentration of investments in these areas may not be sustainable and the focus may need to shift in order to better align with the priorities of the BC Health Sector Strategy.

4. Funding for IM/IT projects comes from multiple sources and is secured through a variety of processes. A more coordinated approach to IM/IT funding would facilitate project planning and the effective implementation of the Health Sector IM/IT Strategy.

5. Major IM/IT solutions are typically multi-year endeavors that can require a funding commitment over a period of years and an ongoing stream of funding for operations. The annual budget approval cycle can present challenges to the effective management of these large multi-year projects.

6. The potential value of IM/IT investments has not always been fully realized because the associated clinical/business processes have not been transformed to take advantage of them. Increasing the coordination of process redesign across the sector to better leverage IM/IT solution will increase that value.

7. More attention needs to be paid to information management including standards, data quality management, and data stewardship.

8. An appropriate balance must be struck between enabling access to optimize care delivery, citizen health and population-level management, and protecting the confidentiality of patient data. This becomes particularly challenging as provincial eHealth broadens the technical capability for sharing health information.
Strategic IM/IT Focus

The five main areas of focus for the Health Sector IM/IT Strategy are:

1. Chronic disease prevention and management (CDPM),
2. Care delivery improvements for health system sustainability,
3. Government priorities,
4. Sustainment of IM/IT assets, and
5. Enabling competencies.

These areas of focus are illustrated in the following diagram:

(See Appendix A – BC Health Sector IM/IT Strategy for more detailed view)

A number of elements of the Strategy have the potential to be leveraged across the broader BC public sector to improve information sharing and the integration of government-provided services.

Protecting the confidentiality of health information is a key priority for the Strategy. This imperative is discussed both in the "Enabling competencies" section, and under "Information management enablers".
The key elements of each aspect of the IM/IT strategy are described in the sections that follow.

**Current IM/IT Assets**

A significant array of BC health care IM/IT assets are already available or under development. The Strategy provides a focus for leveraging these current enablers in an integrated, aligned fashion, and also identifies new IM/IT assets that need to be developed to address provincial health priorities.

Many of these IM/IT assets also have potential to be leveraged across the broader public sector.

Current health IM/IT assets may be considered in four broad categories: foundations, clinical systems, provincial eHealth and health system and population management.

**Foundational** assets are well-developed in many areas, with shared services collaborations under way. There are gaps in areas such as connectivity in First Nations and other remote communities; as well as an ongoing need to sustain essential infrastructure.

**Clinical systems** support point-of-service care delivery in organizations across BC and capture data that is needed for reporting and analysis at organizational, provincial and national levels. Acute systems are well-developed. Community systems require further development in some areas. Primary and specialist care EMRs are beginning to be adopted through the Physician Information Technology Office (PITO) program. Public health point-of-service solutions are being improved through the implementation of Panorama, family health and environmental health systems.

**Provincial eHealth** solutions are at various stages of development – PharmaNet already provides support for medications and the Health Information Access Layer (HIAL), eHealth Viewer, laboratory and initial diagnostic imaging solutions are being implemented beginning
in 2009. Telehealth implementations are in place across the province but require further integration. Improved support for public health is being addressed through the BC/Yukon Public Health Information Project (PHIP) initiative.

**Health system and population management** solutions include many clinical registries (diabetes, COPD, cardiac, renal, etc.) which are in place today but not integrated on a common platform. The Chronic Disease Management (CDM) Toolkit also provides registry capabilities and enables guideline-based care for several diseases. Provincial data warehousing and analytic capabilities are provided through the Healthideas system. The Patient Safety Learning System (PSLS) supports patient safety management.

### Chronic Disease Prevention and Management

One third of BC residents have one or more chronic diseases and providing their care consumes 80 per cent of the acute, MSP and Pharmacare budgets. As the population ages it is projected that the prevalence of chronic conditions could increase 58 per cent over the next 25 years, with the associated costs conservatively increasing by 79 per cent.

Chronic disease is also a significant issue for First Nations communities. For example, the number of cases of COPD present in First Nations’ populations is 2.3 per cent, as compared to 1.4 per cent in other British Columbians.

The eHealth Strategy Council identified five main process areas essential for improvement in the management of chronic disease, with an initial focus on COPD:

1. population-level prevention and management of chronic disease at the health system, practice and practitioner levels;
2. the creation of care plans for chronic disease patients;
3. the ongoing management of chronic disease patients in the context of their care plans;
4. collaboration and communication across the care team supporting chronic disease patients (including patients themselves and their families); and
5. the management of knowledge related to chronic disease.

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The Strategy will enable the redesign of these processes by leveraging existing technologies, as well as implementing new technologies. Business and clinical areas will need to lead the process redesign work, and be accountable for achieving targets, supported by the appropriate IM/IT enablers. Effective change management, led by the business/clinical areas, will be a key element to ensure that positive improvements are achieved.

BC has joined the Institute for Healthcare Improvement’s Triple Aim learning initiative in order to better understand new models of care that can improve the individual patient and provider experience and the health of entire communities, at a reasonable per capita cost. BC’s focus on CDPM is aligned with the Triple Aim framework, helping to ensure that strategic investments in various care models are achieving the required outcomes for health system sustainability:

- improvements in individual and population health and functional health status;
- better patient and provider experiences of care; and
- lower per capita costs.

In addition to providing health care providers with the tools they need to better manage individual patient care, IMIT reporting and performance measurement solutions are essential to enabling the health system to monitor and measure the impact of changes to processes of care and outcomes of care, toward Triple Aim outcomes.

**IM/IT enablers for improvements in COPD and CDPM**

The tables below identify the main IM/IT enablers that can contribute to improvements in COPD and CDPM, in the context of redesigned processes. Many of these enablers already exist, or are under development, as discussed under "Current IM/IT assets". Some are new or in the early stages of development.

A number of these enablers can be leveraged quickly while others will take longer. The "Strategy Roadmap" section includes a high-level deployment timeline.

### IM/IT enablers supporting population-level management of chronic disease

<table>
<thead>
<tr>
<th>IM/IT enabler</th>
<th>Current status</th>
<th>COPD/CDPM opportunities</th>
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<tbody>
<tr>
<td>CDM Toolkit</td>
<td>Deployed for several diseases; upgrade underway</td>
<td>Enabling performance measurement and reporting at the patient level (where appropriate), provider, practice, community, health authority and provincial levels. Updates to COPD flowsheet pending finalization of COPD Guideline update (fall 2009). Updates to COPD reports – improved process of care indicators and outcomes of care indicators (run charts) and clinical indicators (key measures, recall reports,</td>
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<tr>
<td>IM/IT enabler</td>
<td>Current status</td>
<td>COPD/CDPM opportunities</td>
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<tr>
<td>patient education reports, etc). Implementation of asthma flowsheet and associated reports. Opportunity to provide shared care flowsheet. Secure, confidential sharing of registry information between practices, within members of the care team. Mechanism to distribute probabilistic registers to practices (technical capacity and supporting business processes in place, but not in use on request from Privacy Branch). Technical capacity to update MoHS probabilistic registers in place but not in use on request from Privacy Branch. For overall health planning purposes, only non-identifiable patient information from the CDM Toolkit is used.</td>
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<tr>
<td>Chronic disease registries</td>
<td>Separate disease-based registries, many managed by PHSA</td>
<td>Long term – improved, integrated registries architecture (multi-disease). For overall health planning purposes, only non-identifiable patient information is used from the registries.</td>
</tr>
<tr>
<td>Population registers</td>
<td>Probabilistic registers maintained by MoHS and securely distributed on request to General Practitioners (GPs) for their patients. Some practice-based registers maintained locally by physicians in EMRs, on paper, or via the CDM Toolkit.</td>
<td>Improve currency of registers and timeliness of data availability for register development (currently annual and sometimes out dated due to lack of the various administrative data sources). Streamline secure register distribution process (e.g. through Physician Private Network/secure email rather than via current encrypted CD mail-out). Develop and distribute complete morbidity-profile/RUB registers for physicians. Permit update of provincial probabilistic registers from corrections provided by physicians (currently a patient consent issue and/or a gap in legislative authority between Personal Information Protection Act (PIPA) and Freedom of Information and Protection of Privacy Act (FOIPPA). Longer term – improved, integrated registries architecture (multi-disease – initial focus on COPD patients and their related co-morbidities (e.g. COPD and any other chronic condition)) and data aggregation and reporting for physician and practice-level reporting, community profiling, HA and provincial health system uses.</td>
</tr>
<tr>
<td>Data warehousing and analytic capabilities</td>
<td>Several MoHS databases – data from MSP, Pharmacare, etc. Healthideas data warehouse</td>
<td>Enabling system-level performance measurement and reporting. Analysis to identify potential COPD and CDPM patients. Ongoing monitoring of population level outcomes. Establishing data linkages &amp; access protocols to allow for CDM Toolkit, EMR/Secure Health Record, health authority and administrative data sources to be available for aggregate/anonymized reporting for health system purposes at the provincial, health authority and</td>
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</table>
### IM/IT enablers supporting care plan development and management

<table>
<thead>
<tr>
<th>IM/IT enabler</th>
<th>Current status</th>
<th>COPD/CDPM opportunities</th>
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</thead>
<tbody>
<tr>
<td><strong>Citizen access</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Citizen portal &amp; personal health record</td>
<td>Access to BC HealthGuide etc. Private sector solutions emerging, as well as the Canadian Medical Association’s (CMA) mydoctor.ca Demonstration project pending (see &quot;Citizen access&quot; section below)</td>
<td>Website enabling development of personal health plans including web-based interactive &quot;coaching tools&quot;. Patient access to EHR, care plan, secure messaging, results, education materials, appointment scheduling, prescription repeats, etc. Ability for patient to provide clinical information (e.g. updates on symptoms for COPD patients) and potential to alert family physician/care team of issues via secure messaging.</td>
</tr>
<tr>
<td>Home monitoring device integration</td>
<td>Various small pilot projects</td>
<td>Integration of glucometers, blood pressure monitors, scales, etc. (less opportunity for COPD).</td>
</tr>
<tr>
<td>Pro vincial eHealth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Integrated electronic health record (EHR) and eHealth viewer</td>
<td>Initial deployment in September 2009</td>
<td>Care team access to lab results, medication profiles, diagnostic images &amp; reports, immunizations, health authority encounters, shared care plan, discharge summaries, etc. Provider access from multiple points of service (e.g.</td>
</tr>
<tr>
<td>IM/IT enabler</td>
<td>Current status</td>
<td>COPD/CDPM opportunities</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Electronic medical records (EMRs) for</td>
<td>~20% of eligible PITO physicians implemented or in progress (30-40% by March</td>
<td>EMRs for communities of practice, respirology clinics, etc. \CAPsabilities to support COPD/CDPM patients include:</td>
</tr>
<tr>
<td>family &amp; specialist practice</td>
<td>2010)</td>
<td>• integrated clinical guidelines and flowsheets, \r\n• support for shared care plan development, \r\n• clinical decision support including alerts &amp; reminders, and \r\n• CDPM patient registries.</td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td>Electronic results distribution</td>
<td>Private sector solutions available for lab etc.</td>
<td>Electronic transmission of lab results, radiology reports, consults, discharge summaries, etc. Electronic receipt into EMR, or access via eHealth viewer.</td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td>Electronic prescribing and clinical</td>
<td>Component of eDrug</td>
<td>Electronic prescribing and related clinical decision support for primary care and specialist practices, particularly for managing complex co-morbid patients taking many medications with multiple care providers.</td>
</tr>
<tr>
<td>decision support</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public health information system (Panorama)</td>
<td>In development Deployment to include First Nations communities</td>
<td>Source of immunization data from public health. Potential to capture immunization data from other sources (e.g. primary &amp; specialist care, hospitals) and enter into Panorama (e.g. important COPD-related immunizations such as influenza or pneumococcal) for access in the eHealth viewer.</td>
</tr>
<tr>
<td>Medication reconciliation</td>
<td>Available now for hospitals via third-party vendors, coming for medical practices &amp; EDs</td>
<td>Particular value for complex, co-morbid patients.</td>
</tr>
<tr>
<td>Electronic capture &amp; sharing of spirometry data</td>
<td>-</td>
<td>Electronic capture of data from spirometers and respirologist interpretation; import into specialist EMRs and acute clinical systems; transmission to primary care practices as part of results distribution; access via EHR viewer. Potential to implement PDF-based solution to begin with, following by structured data later. Improved COPD diagnosis and care delivery, as well</td>
</tr>
<tr>
<td>IM/IT enabler</td>
<td>Current status</td>
<td>COPD/CDPM opportunities</td>
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</tr>
<tr>
<td><strong>Sharing of care planning information</strong></td>
<td>-</td>
<td>Sharing of care plan, action/exacerbation plan, flowsheets, etc. across the care team, including pharmacists (see “Information management” for initial standards agreement required).</td>
</tr>
<tr>
<td><strong>Clinical systems</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Regional integrated EHRs</strong></td>
<td>Implemented and being expanded in all health authorities</td>
<td>Access to health authority EHR information in family and specialist practices.</td>
</tr>
<tr>
<td><strong>Community systems</strong></td>
<td>Implemented to varying degrees across health authorities – some gaps</td>
<td>Support for the workflow of community providers. Source of EHR information on community care provided to COPD and CDPM patients.</td>
</tr>
<tr>
<td><strong>Acute systems</strong></td>
<td>Implemented and being expanded in all health authorities</td>
<td>Potential enabler for automatic admit/discharge notifications. Source of EHR information on ED, out-patient and in-patient care provided to COPD and CDPM patients.</td>
</tr>
</tbody>
</table>
| **Community EMRs for First Nations communities** | Implemented to varying degrees across communities | Two primary community EMRs are in place today:  
- Intertribal Health Authority (ITHA) deployment of the IntraHealth EMR for 10 ITHA FN communities.  
- Cowichan Tribes deployment of Mustimhuw cEMR at 30 sites in BC. |
| **Primary care EMRs for health authority affiliated practices** | Implemented to varying degrees across health authorities | Capabilities to support COPD/CDPM patients include:  
- integrated clinical guidelines and flowsheets,  
- support for shared care plan development,  
- clinical decision support including alerts & reminders, and  
- CDPM patient registries. |
<p>| <strong>HealthLink BC application</strong> | Solution to be selected by early 2010 | Integrated systems solution for HealthLink BC enabling improved phone-based support by nurses, dieticians, etc. |
| <strong>Information management</strong> | | |
| <strong>Shared care plan</strong> | Several shared care plan initiatives across BC | Agreement on the content of the shared care plan and roles and responsibilities (family physician, specialists, etc.) for creating, updating and approving the care plan. |
| <strong>Standard assessment templates</strong> | - | Develop standard assessment templates (e.g. beginning with COPD). |
| <strong>Spirometry report</strong> | - | Develop standard approaches to what information is |</p>
<table>
<thead>
<tr>
<th>IM/IT enabler</th>
<th>Current status</th>
<th>COPD/CDPM opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disease coding</td>
<td>-</td>
<td>Consistent disease coding enabling improved data quality in registries and in the EHR.</td>
</tr>
</tbody>
</table>

### IM/IT enablers supporting communication and collaboration across the care team

#### Care team communication and collaboration processes

- **Referral**
- **Find specialists and other health services**
- **Event notification & follow-up action** (e.g. ED visit, with admission and discharge)
- **Ad hoc communication**

### Information management

<table>
<thead>
<tr>
<th>IM/IT enabler</th>
<th>Current status</th>
<th>COPD/CDPM opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard referral templates</td>
<td>-</td>
<td>Develop standard referral templates (e.g. beginning with referrals between GPs, respirologists and respiratory therapists).</td>
</tr>
</tbody>
</table>

### Provincial eHealth

<table>
<thead>
<tr>
<th>IM/IT enabler</th>
<th>Current status</th>
<th>COPD/CDPM opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secure messaging</td>
<td>Initial solution in development</td>
<td>Secure exchange of clinical messages across the care team and with patients. Enables simple initial document-based implementation of electronic referral.</td>
</tr>
<tr>
<td>Electronic referral</td>
<td>In early development</td>
<td>Ultimately, electronic creation of referrals in EMR (e.g. family practice), electronic transmission (via HIAL – see below), and receipt in EMR (e.g. specialist). Referral from ED to family practice (including referral of unattached COPD/CDPM patients to family practices with capacity). Potential to leverage electronic medical summary (eMS) work in VIHA. Dependent on agreed standard referral templates.</td>
</tr>
<tr>
<td>Telehealth</td>
<td>Many initiatives across BC, including FN Telehealth Expansion</td>
<td>Remote consultations (e.g. specialist consult, COPD patient education &amp; action planning by respiratory therapist). Continuing medical and clinical education.</td>
</tr>
<tr>
<td>Notification &amp; discharge</td>
<td>Local solutions in some health authorities</td>
<td>Potential to automatically notify family physician, and other members of the care team, of ED visit, admission and discharge. Depends on ability to link patient/client to providers (“Client-provider identity linkage“ foundation). Access to discharge summaries via results distribution (see above) and eHealth viewer (see above).</td>
</tr>
</tbody>
</table>
### IM/IT enabler

<table>
<thead>
<tr>
<th>Current status</th>
<th>COPD/CDPM opportunities</th>
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</thead>
<tbody>
<tr>
<td><strong>Integrated patient scheduling</strong></td>
<td>-</td>
</tr>
</tbody>
</table>

### Clinical systems

| Community Health Access Resource Directory (CHARD) | Pilot deployment of CHARD in VIHA for Mental Health | Potential to focus on COPD-related resources, resulting in improved COPD-related referrals (including respirologists, spirometry services, oxygen therapy, etc.). Potential to leverage CHARD to schedule “pre-referral” consult phone calls between family physicians and specialists. Potential to access referral forms on CHARD website. |

### IM/IT enablers supporting knowledge management on chronic disease

#### Knowledge management processes

- Creation of evidence-based guidelines and protocols
- Quality improvement
- Provider and patient access to guidelines
- Ongoing provider education
- Ongoing patient education
- Provider and patient notification of changes to guidelines

<table>
<thead>
<tr>
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<th>Current status</th>
<th>COPD/CDPM opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CDM Toolkit</strong></td>
<td>Deployed for several diseases; upgrade underway</td>
<td>Enabling performance measurement and reporting at the patient (where appropriate), provider, practice, community, health authority and provincial levels to provide quality improvement feedback (for overall health planning purposes, only non-identifiable patient information is used from the Toolkit).</td>
</tr>
<tr>
<td><strong>Chronic disease registries</strong></td>
<td>Separate disease-based registries, many managed by PHSA</td>
<td>Providing data enabling population health monitoring, quality improvement, research and development of guidelines (for overall health planning purposes, only non-identifiable patient information is used from the registries).</td>
</tr>
<tr>
<td><strong>Population registers</strong></td>
<td>Probabilistic registers maintained by MoHS</td>
<td>Providing data enabling population health monitoring, quality improvement, research and development of guidelines.</td>
</tr>
<tr>
<td><strong>Data warehousing and analytic capabilities</strong></td>
<td>Several MoHS databases (e.g. data from MSP, Pharmacare, etc.) Healthideas data warehouse</td>
<td>Providing data enabling population health monitoring, quality improvement, research and development of guidelines. Enabling system-level performance measurement and reporting.</td>
</tr>
<tr>
<td>IM/IT enabler</td>
<td>Current status</td>
<td>COPD/CDPM opportunities</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Citizen portal &amp; websites</td>
<td>Access to BC HealthGuide etc.</td>
<td>Patient access to education materials; website enabling development of personal health plans including web-based interactive “coaching tools”.</td>
</tr>
<tr>
<td>Provider websites</td>
<td>IMPACT BC, BC Medical Association (BCMA), CMA, etc.</td>
<td>Provider access to guidelines.</td>
</tr>
<tr>
<td>Telehealth</td>
<td>Various deployments throughout BC</td>
<td>Continuing education support for providers in remote communities.</td>
</tr>
</tbody>
</table>

**Foundational IM/IT enablers for improved chronic disease prevention and management**

<table>
<thead>
<tr>
<th>IM/IT enabler</th>
<th>Current status</th>
<th>COPD/CDPM opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information access model</td>
<td>In early development</td>
<td>Develop access model for each process (see &quot;Process improvements for COPD and CDPM” section above) identifying information access needs by role.</td>
</tr>
<tr>
<td>Health Information Access Layer (HIAL)</td>
<td>Deployed in production prototype</td>
<td>Enabling secure exchange of information with provincial eHealth.</td>
</tr>
<tr>
<td>“Client-as-subject” identity management</td>
<td>Client Registry/ Electronic Master Patient Index (EMPI) deployed</td>
<td>Improvements required in client identity practices and technology integration (“active EMPI”).</td>
</tr>
<tr>
<td>“Client-as-user” identity management</td>
<td>-</td>
<td>Secure authentication of citizens using online services (e.g. citizen portal).</td>
</tr>
<tr>
<td>Provider identity management</td>
<td>Provider Registry deployed</td>
<td>Improvements required in provider identity practices and technology integration.</td>
</tr>
<tr>
<td>Client-provider identity linkage</td>
<td>-</td>
<td>Required to support care delivery opportunities such as notification, as well as more accurate population-level analysis.</td>
</tr>
<tr>
<td>Integrated secure network connectivity</td>
<td>Health authorities connected; PITO deploying provider network</td>
<td>Required to support secure sharing of information across the care continuum.</td>
</tr>
<tr>
<td>Network connectivity in First Nations and remote communities</td>
<td>-</td>
<td>Being implemented through &quot;Pathways to Technology Project”, and integration with the eHealth Network Gateway (ENG).</td>
</tr>
</tbody>
</table>
Care Delivery Improvements Enabling Health System Sustainability

All BC health authorities have initiatives underway to redesign clinical and business processes, integrate and consolidate services and implement standardized protocols. These initiatives produce improvements in quality, efficiency and productivity, contributing to overall health system sustainability.

These changes often require essential IM/IT enablers such as regional electronic health records and decision support tools, which become necessary investment priorities for the health authority.

Noteworthy examples of these initiatives within the six health authorities include:

- **Fraser Health Authority - myHEALTHSystem** - The myHEALTHSystem initiative integrates person-centred health information, and standardizes clinical care processes, across the continuum of care to optimize health care for patients and providers. The scope includes an upgrade and consolidation of acute care information systems, acquisition and implementation of a foundational community information system and integration of several key information points across acute care and continuing care. The goal is to interface personal health information and decision-support tools to enable quality health care, and consistent care planning and care experiences, for patients and care providers. For patients this means enhanced quality and safety of their health care because their personal health information will be integrated into a person-centered health record. For clinicians this means integrating health information communication and technologies into clinical practices to facilitate safe, secure, accurate and timely quality care for their patients to support better health care.

- **Interior Health Authority – CONNEX initiative – regional clinical process optimization and standardization.** CONNEX provides an opportunity for clinicians to identify process issues, to make results-orientated changes to those processes based on best practice and to incorporate the newly determined process as a standard way of practice across the health authority. The underlying Meditech technology will support best practice in a standard way across Interior Health, enabling efficiencies and improving effectiveness. The CONNEX initiative provides the foundation to implement advanced clinical systems in the future - these systems provide clinical decision support and improve patient safety. Improved decision-making capabilities at the point of care and introducing systems that reduce errors (such as medication errors) will ultimately improve outcomes and reduce costs.

- **Northern Health Authority – CareNorth** – CareNorth establishes a health care system founded in primary care and community, where every resident has a “primary care home”, providing access and comprehensive, coordinated care. Care North develops multidisciplinary professional teams to establish long-term healing relationships with patients and to help northerners both manage their health and build healthier communities. Care North develops strong and effective relationships among service providers at all levels, at all times working in the best interests of patients. Essential IM/IT enablers for CareNorth include primary care EMRs, connectivity and population-level quality improvement supports.
• **Provincial Health Services Authority – Clinical Information System (CIS)** – the CIS initiative is a transformational journey for the organization and for clinical processes within the organization enabling clinical and organizational transformation. The three goals driving the CIS initiative are: to inform clinical decision making at the point of care; to improve patient safety and support clinical best practice; and to support PHSA to successfully deliver on its organizational excellence strategy. The CIS initiative promotes and enables standardization, digitization and automation of many clinical and clinically-related processes, and creates an environment for comprehensive patient-centric records that allow clinicians to provide the best care to patients.

• **Vancouver Coastal Health Authority** – A key priority for VCH is the containment of human resource costs through the effective management of paid hours. Optimizing resources requires the establishment, adjustment, and maintenance of staffing levels and configurations with defined business and care requirements and variables at the regional, site, and unit levels. In order to achieve this goal, management need to assess, forecast, and manage staffing with a high degree of detail and certainty, particularly as changes to staffing volumes and patterns at the site level involves bargaining unit staff. Two IM/IT enablers are critical to this initiative. Electronic Staff Scheduling and Timekeeping will enable the appropriate deployment of staff to match expected activity patterns. A Decision Support solution will support staff forecasting, case costing, and ongoing monitoring and analysis.

• **Vancouver Island Health Authority – Care Delivery Model Redesign** - Human resource shortages have been identified as a major service delivery challenge for VIHA. In response, VIHA initiated the Care Delivery Model Redesign (CDMR) program in 2007 as one of the central strategies of the People Plan. In the first phase of the initiative, a systematic work-sampling approach captured comprehensive data on variations in care delivery, productive versus unproductive work and scope of practice. Based on these finding, actions plans have been developed to: optimize the roles, scope and function of interdisciplinary care team members; enhance staff education and performance support; improve productivity by eliminating non-value added activities (including system inefficiencies and paper-based charting); decrease costs related to absenteeism, overtime, and injury; and evaluate CDMR outcomes. These plans depend on IM/IT enablers including: structured electronic documentation tools to guide clinical assessment and care planning; integration of biomedical devices into the regional EHR to reduce the need for manual charting; communication devices enabling improved communications across the care team; and learning management technologies to support the integration of new tools into practice as well as ongoing competency assessments.
Government Priorities

In addition to the priorities of chronic disease prevention and management, and care delivery improvements enabling health system sustainability (described in the previous sections), other important government priorities are addressed in the Strategy.

Examples of government priorities which incorporate significant IM/IT elements include citizen access, public health, First Nations health, provincial eHealth, shared services, specialist referral, surgical wait lists, environmental health and health authority reporting.

Citizen access

In today’s world some citizens are demanding more information and support to help them navigate the health care system and, in many cases, to be more actively involved in the management of their own care. They expect more personalized care, better access to specialists and general practitioners and more transparency on the status of their health and treatment plans, all of which can be facilitated by an improved information infrastructure.

The 2008 Throne Speech included the commitment that “citizens will gain new access to their health records and medical information so they can play an informed role in making both preventative and therapeutic care choices”.

The eHealth Strategy Council has developed a citizen access strategy to ensure that the appropriate IM/IT solutions are established to support the commitment. The vision underlying this strategy is that “citizen access will empower citizens to manage their healthcare by providing convenient access to health information and services”.

The following goals support this vision:

- People or a portion of the populace have access to a broad range of health information and are better informed to stay healthy or actively help manage their own care, particularly in the case of chronic diseases.
- Patients have access to safer, higher-quality services enabled through the timely availability of their health information.
- Care providers have the correct and necessary information required to make appropriate and timely clinical decisions concerning patient care.
- Our health system as a whole has improved access to more comprehensive information that enables better informed health service planning and results in increased efficiencies.

The citizen access strategy includes four main steps:

1. Implement a project to demonstrate:
   a. Use of technology to support citizen participation in care;
   b. How to support citizens outside the health authority environment;
c. How providers and citizens interact in a citizen access environment;
d. Requirements for a citizen project to be replicated between health authorities; and
e. Specific standards and policies required to further Citizen Access.

2. Develop the next stage of the citizen access approach and implementation plan for the province, including budget. This includes the assessment of any new citizen access proposed projects.

3. Continue to work with Canada Health Infoway on the evolving national consumer health approach and integration with eHealth.

4. Continue to align with the provincial Identity Management solution.

Citizen-centred service

Implementation of the Strategy enables the achievement of three primary desired outcomes that will support the governments’ transformation to citizen-centred services: information sharing for better outcomes, service transformation, and value for money. Ensuring that there is integrated, collaborative work on issues that affect or involve the same client group, or more than one ministry or government organization, is a key government objective.

Three key elements of the citizen-centred strategy are:

- **Connected systems:** the technical means to move information from A to B, as needed and as authorized, while enhancing the protection of privacy.
  - The Information Access Layer (IAL) initiative (an extension of the HIAL initiative within health) will allow for the secure sharing of information across the public sector, including identity information management, information routing, and enforcement of privacy and security policy.
  - The Advanced Communications and Collaboration (ACC) initiative will enable a variety of integrated communication and collaboration solutions across the public sector, including video conferencing, web conferencing, unified messaging, and directory services.
  - The provincial Identity Information Management (IDIM) initiative will ensure the ability to accurately identify citizens to whom services are being provided, and citizens accessing systems and information. Effective identity management is a critical enabler for connected systems.

- **Connected people:** the policies, practices and culture to motivate appropriate information sharing across program and organizational boundaries.

- **Informed decision making:** supporting policy and operational decisions through appropriate use of any sources of relevant information (e.g. for research purposes).

Public Health

The establishment of a public health information system is a federal and provincial government priority and BC is leading the development of the Panorama system for deployment across Canada. The system focuses on managing communicable diseases, providing those responsible for public health across Canada with the real-time ability to collect, share and analyze health information critical for managing communicable diseases in an integrated manner. It will help public health professionals monitor the health of the
population, track immunizations, and respond to outbreaks such as H1N1, SARS, West Nile Virus, Avian Influenza and other communicable diseases.

In BC, Panorama will replace the Integrated Public Health Information System (iPHIS), which currently supports both public and family health functions for public health nurses. The retirement of iPHIS creates a further need to provide solutions enabling family health.

The First Nations Panorama Inclusion Project will improve First Nations public health outcomes through inclusion in BC’s implementation and use of Panorama. This will improve coordination between health professionals; respect the need for community-focused solutions; align with the objectives and relationships set out in BC’s Tripartite First Nations Health Plan; and improve First Nations access to public health services.

Emergency & Health Services are planning to implement the First Watch Syndromic Surveillance System in 2009/10, enabling public health surveillance of emergency dispatch data.

Within the public health community, there is a growing understanding of the relationship between health and the environment, and a desire to determine the linkages between environmental health and communicable and chronic disease. The Environmental Health/Health Protection (EH/HP) initiative will acquire a single solution to replace existing, disparate information systems, and develop the tools and processes to improve information management for field operations, surveillance, research and decision support activities, in the following program areas:

- Water Quality
- Air Quality
- Food Safety
- Community Sanitation & Environmental Health
- Tobacco Enforcement
- Community Care Facility Licensing
- Personal Services

First Nations Health Plan

On November 27, 2006, the Government of BC and the First Nations Leadership Council released "The Transformative Change Accord: First Nations Health Plan – Supporting the Health and Wellness of First Nations in British Columbia" outlining a broad range of enhancements in programs and services that will close the health status gap between First Nations and other British Columbians by 2015. This plan identified actions required in four key areas related to health care: governance, relationships and accountability; health promotion and disease and injury prevention; health services; and performance tracking.

On June 11, 2007, the Province, First Nations Leadership Council and Health Canada signed the "Tripartite First Nations Health Plan" (TFNHP). The TFNHP commits Health Canada to the bilateral accord and ensures that First Nations are involved in decision-making regarding their health.

To enable these changes, priority IM/IT enablers have been identified in four main areas: telehealth, electronic health records, electronic medical records, and an eHealth data centre. An eHealth Centre of Excellence has been established to move forward with these enablers.

The themes and enablers outlined in this Strategy are highly applicable to First Nations communities, particularly given the high incidence of chronic disease. Accordingly, the provincial health sector IM/IT Strategy is well-aligned with First Nations eHealth priorities.
Provincial eHealth

A number of Throne Speech commitments have been made concerning provincial eHealth, including in 2008 (“Patient choice and access will also be improved through major new investments in eHealth”, and “New investments will standardize information technology platforms and provide new tools for better managing and optimizing health expenditures”) and 2009 (“We will invest in leading-edge research infrastructure, in eHealth and “last mile” broadband Internet connections”).

The portfolio of major provincial eHealth initiatives includes:

- Interoperable Electronic Health Record (iEHR),
- Provincial Laboratory Information Solution (PLIS),
- eHealth Drug Project (eDrug),
- Provincial Diagnostic Imaging (CDI) project,
- Public Health Information Project (PHIP),
- Telehealth,
- Provider and Client Registry Systems, and
- the Physician Information Technology Office (PITO) Electronic Medical Record initiative.

Provincial eHealth will enable many aspects of the Strategy, including improvements in chronic disease prevention and management.

Initial discussions have been held with the Yukon on opportunities for partnership in areas of provincial eHealth, as well as other potential collaboration opportunities.

Shared Services

The BC Health Authority Shared Services Organization (SSO) has established a province-wide, consolidated shared services organization across BC’s health authorities, covering areas including supply chain, human resource/payroll, and technology services.

Work is underway in the Lower Mainland, including FHA, PHSA, and VCHA to determine an initial SSO technology services implementation including workplace technology services, data centre services, network services, and architecture and planning. These changes will save money and improve information flow for clinicians and business operations across regions.

Further expansion of shared services and other collaboration initiatives will be considered as part of the implementation of the Strategy.

Surgical Wait Times

The 2007 Throne Speech included the commitment that “A new electronic surgical patient registry will give patients more control over their surgical options, improve public reporting of wait times, and enable better surgical treatment planning”.

The surgical patient registry and a new surgical wait times web site (available in 2010) will improve the quality and range of surgery wait list information available to the general public.
and provide better access to information including patient education and resource information.

Health Authority Reporting

The Ministry of Health Services has mandated that health authorities provide detailed data on a wide range of their activities to the Ministry. This information is essential to enable appropriate funding, program planning, improvement and evaluation.

These reporting requirements include:

- **Minimum Reporting Requirements (MRR)** – home & community care, mental health, and addictions;
- **InterRAI Minimum Data Set (MDS)** – home care and residential care;
- **Discharge Abstract Database (DAD)** – acute care; and
- **National Ambulatory Care Reporting System (NACRS)** – emergency departments.

**Sustainment of IM/IT Assets**

IM/IT enablers that are in place today supporting health system operations, and are important enablers for this Strategy, need to be properly sustained to remain functional.

In addition, new IM/IT enablers are currently being put in place in support of provincial eHealth and other initiatives. Further IM/IT enablers will be added as the elements of this Strategy, supporting CDPM, care delivery improvements, and government priorities, are implemented.

Further analysis will be done on the year-to-year financial requirement to sustain existing and new IM/IT assets across the health system. (see "Next steps").

Collaborative initiatives such as shared services will continue to be employed in order to effectively manage system costs across the sector. As part of managing costs, decisions will need to be made concerning BC’s acute systems strategy. This is discussed further under "IM/IT strategic decisions” in the “Strategy roadmap” section.
Enabling Competencies

Several enabling competencies are required to support the implementation of the Strategy:

- Governance and prioritization
- Information access and privacy
- Architecture and standards
- Information management and data quality
- Process redesign and change management
- Benefits realization and measurement
- Shared services and collaboration
- Technology procurement

Governance & Prioritization

Governance of the Strategy is provided by the provincial eHealth Strategy Council, with links to the Health CIO Council and the Clinical Integration Advisory Council.

Governance connections are in place to the broader public sector through the Office of the CIO, the Council of CIOs, and Alternative Service Delivery, and to First Nations through the Tripartite Strategy Council for First Nations eHealth. The Primary Health Care Council and the General Practice Services Committee are also involved given the key focus on chronic disease prevention and management.

Ensuring effective governance is an evolutionary process often requiring changes over time to respond to changing needs. IM/IT Strategy governance will continue to evolve in order to:
• effectively link the health sector governance and prioritization structure with individual organization governance and prioritization structures (health authorities and Ministry);
• establish connections with other provincial councils including Home & Community Care, the BC Patient Safety & Quality Council, etc.; and
• account for areas such as architecture, standards, information management, and data quality within the governance structure.

Information Access and Privacy

Citizens’ personal health information is highly sensitive and its confidentiality is a high priority for the province. It is used within the health system for a number of purposes including clinical decision making, payment of services, evaluation and monitoring, program development and for research.

Information access and privacy must be balanced appropriately to ensure that the right type of information is available to authorized health care providers when required, for specific purposes, and in a meaningful manner. Authorized users of personal health data have a fiduciary public duty and accountability to comply with legislated provisions that enable information sharing and establish how and when data can be shared across the health sector.

The health sector, to function effectively and efficiently as a system, must understand what type and detail of data is required to meet the needs of the numerous health care organizations and health professions/service providers that collect, use, retain and disclose personal information. Additionally it must identify the specific authorities that guarantee the secure, confidential and private sharing of personal health information. This governance and stewardship based information can then be used to develop appropriate information access models.

Key aspects of privacy include:
• the ability for citizens to access information about who has what data, to see their data and to correct their data.
• the maintenance of trust relationships so that people know who collects, uses, retains and discloses personal health data and for what purposes it is used.
• the secure retention of data and the controls that ensure the “need to know” and “least privilege” principles are applied.

These three key aspects speak to the need for the development of health sector standards for users of the data regarding who can see what type of personal health data, when and for what purposes.

Electronic access to a citizen’s own personal health information creates challenges. Historically, patients would, in person, request to see their information directly from their practitioner or service provider. In an eHealth world, commonly accepted identity attributes, sound verification processes and secure information sharing will enable citizens to electronically access their own personal health information without compromising the security and privacy requirements that protected a paper based information system.

Additionally, access by users of health data will require strong identity management processes and practices that use appropriate types of controls.
The Clinical Integration Advisory Council (CIAC) focuses on the implementation of eHealth privacy policies as part of its mandate to provide advise and guidance on business implementation issues that cross eHealth domains. Examples of privacy-related themes that CIAC advises on include:

- the implementation of disclosure directives, and
- public health access requirements related to laboratory data.

Information access and privacy considerations are discussed further under "Information Management Enablers" in the "Strategic IM/IT Priorities" section.

Architecture and Standards

Historically, each health sector organization has implemented information systems solutions to meet their needs in relatively narrow "silos", such as acute care clinical systems, primary care EMRS, community care systems and registries. To date there has been little in the way of an integrated view of information systems solution across the continuum of care services.

The integrated viewpoint offered by the Strategy provides an opportunity to work towards an architecture that supports integrated processes and workflow, extending across healthcare.

The Health CIO Council and the provincial Office of the CIO play an active role in addressing architecture and standards issues and both the Ministry and the health authorities have established “enterprise” or organization level architecture functions. There is not, however, an integrated body or group to address health IM/IT “infostructure” architecture and standards considerations across the health sector. This challenge will be addressed in the implementation of the Strategy (see "Next steps").

Information Management and Data Quality

The effective management of information, and the maintenance of high data quality, are essential to the Strategy from three perspectives:

- allowing data to be shared between systems and individuals so that the information is consistent and understood, both provincially and ultimately nationally and internationally;
- allowing data to be integrated in provincial EHR repositories, and accessible in a consistent fashion through the eHealth viewer; and
- allowing data to be aggregated for population-based analysis (provincial, national and international).

The most critical data areas are:

- identity data (citizens/patients and providers) (discussed below);
- the standardization of health concepts such as condition, observation, encounter, case and care plan; and
- clinical nomenclature and coding using recognized standards.

A priority area of attention for information management will be the development of a standardized CDPM information management model, including the shared care plan. This
model will need to address information-related accountabilities (e.g. who can create data, who can approve, who can update, who is accountable for quality, etc.).

Process Redesign and Change Management

Although many IM/IT solutions are in place, much of the process redesign and change management work required to maximize the value obtained from these investments has not yet taken place (e.g. within acute care, enabling electronic clinical documentation and computerized provider order entry). There are opportunities to better coordinate approaches to business process redesign, leveraging current and future system investments, sharing lessons learned, using proven redesign and change methodologies.

Business and clinical areas will need to lead process redesign and change management work, and be accountable for achieving targets - with the support of IM/IT providing the necessary technology enablers.

Benefits Realization & Measurement

The Ministry is working with Canada Health Infoway to implement a coordinated benefits measurement approach across the provincial eHealth projects. There will be opportunities to leverage and refine elements of this approach more broadly across health IM/IT.

Improvements in the CDPM and COPD elements of the Strategy will be tracked through the Practice Support Program and shared care collaboratives.

Shared Services and Collaboration

Shared services and cross-organization collaboration are critical in managing IM/IT costs in health care. The BC Health Authority Shared Services Organization (SSO), described under "Government priorities" above, is a key body enabling collaboration across health care.

Collaboration is also taking place in a number of other venues including:

- the VCHA-FHA Lower Mainland Innovation & Integration Fund,
- shared use of clinical systems including the VIHA-PHSA Cerner collaboration and the VCHA-VIHA PARIS collaboration, and
- the provincial eHealth initiatives.

As part of the implementation of the Strategy, further expansion of shared services and other collaboration initiatives will be considered with a focus on managing costs, including additional shared services in clinical systems areas.

Technology Procurement

Technology procurements will follow standard government policies and processes.

Alternative Service Delivery (ASD) approaches, including Joint Solution Procurement, will continue to be used for major health IM/IT procurements. Examples of ASD-enabled health IM/IT procurements include iEHR/PLIS, Health Insurance BC, Network BC, the Pan-Canadian Health Surveillance Solution and the Strategic Transformation and Mainframe Services (STMS) project.
Many of the IM/IT solutions included in the Strategy have the potential to be used more broadly across the BC public sector, including the HIAL/IAL, shared care plan, client registry, secure messaging, electronic referral, citizen portal, eHealth viewer and telehealth.

In addition, redesigned processes such as shared care planning, referral, and notification have the potential to be utilized beyond the health sector.

**IM/IT solutions**

- The **Health Information Access Layer** (HIAL) being developed as part of provincial eHealth will be extended into the **Information Access Layer** (IAL), enabling the secure sharing of information across the public sector, including identity information.

- The concept within health of a “**shared care plan**” (described in the "Chronic disease prevention and management“ section) has the potential for expansion to a “**shared citizen plan**” including health as well as children & family development, housing & social development, labour, justice, etc. This plan would lay out an integrated “plan of action” for the citizen, to which government service providers would work to provide more directed, seamless, integrated services for the citizen – for example, in settings such as Vancouver’s downtown east side, where citizens today engage relatively independently with a variety of government agencies.

- The health **client registry** and **electronic master person index**, which link citizen identity information from a variety of health information systems, could be extended to link identity information beyond health care.

- **Chronic disease registries** could be extended into broader population-focused registries taking into account other dimensions beyond chronic disease. This concept could be linked with the “**shared citizen plan**” noted above to help identify those citizens who would most benefit from having an integrated plan.

- **Secure messaging** solutions developed for health care, enabling secure e-mail communication between members of the care team, and with the patient, could be extended to provide secure messaging for public sector service providers and the citizens they serve.

- **Citizen health portal** solutions being established in health care could be extended to provide integrated, personalized, citizen-specific services across government.

- The eHealth viewer could be extended to provide an integrated view of citizen information for public sector service providers.

- The **Community Healthcare and Resource Directory (CHARD)** solution, providing a web-based directory of practitioner and community resource information in support of improved referrals, could be extended to include information on resources and services beyond health care.

- **Electronic referral** solutions developed for health care could be extended to allow for client referrals across government agencies.
• Solutions enabling **electronic notification** (e.g., notifying GPs and other care team members of ED visits or acute visits) could be extended to provide notification of relevant events across government agencies.

• The **data warehousing and business intelligence** solutions used for AHIP could be extended to the broader scope beyond health.

• **Telehealth** infrastructure enabling video-based health care consultations could be extended to support other types of interactions between government service providers and citizens.

Clinical/Business Processes

In addition to leveraging specific IM/IT solutions, many of the clinical/business processes being put in place in the highly complex health care setting could be used across government – for example:

• the processes that enable the collaborative development, sharing and management of a **“shared care plan”**

• health collaboration-and-communication processes enabling **referral, access to services** and **notification**

• health-focused models for **information access and sharing** (ensuring better information sharing with enhanced privacy)
Strategic IM/IT Priorities

Strategic IM/IT priorities have been identified in three areas:

- information technology enablers,
- information management enablers, and
- process redesign and change management enablers.

**Information Technology Enablers**

The table on the following page lists the key IT enablers required to implement the Strategy and indicates how they link to the five primary areas of focus of the strategy.

Although all of the IT enablers listed provide necessary contributions to the implementation of the Strategy, the following should be noted as essential core enablers:

- electronic medical records (EMRs) for family practices, specialist practices, and health authority clinics;
- community EMRs for First Nations community health clinics;
- provincial eHealth components, notably the integrated electronic health record (EHR), the integration of clinical data, the eHealth viewer (giving care providers access to the EHR and other capabilities) and the Health Information Access layer (HIAL), allowing for the secure exchange of information between systems;
- health authority regional EHRs and clinical systems including community care and acute care;
- emerging citizen health solutions including citizen portals, personal health records and home monitoring integration;
- clinical registries enabling population-based views of patients and their diseases;
- identity management systems supporting client and provider identity (discussed further under "Information management" below);
- telehealth capabilities supporting First Nations and remote communities; and
- underlying infrastructure, particularly secure network connectivity and information security protections.

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<th>IM/IT Enabler</th>
<th>CDM</th>
<th>Care delivery Improvements</th>
<th>Other government Priorities</th>
<th>MIT Sustainment</th>
<th>Enabling Competencies</th>
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<td>Health Information Access Layer (HIAL)</td>
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Version 1.0  Page 38  October 23, 2009
## IM/IT Enabler

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### Collaboration and communication

- Secure messaging
- Electronic referral
- Notification
- Shared care plan interoperability
- Integrated patient scheduling

### Clinical systems

- Regional integrated EHRs
- Community systems
- Public health information system
- Acute systems including core CIS, laboratory, radiology, pharmacy, surgical, ED, ambulatory
- Diagnostic imaging systems (PACS)
- Community EMRs in First Nations communities
- Primary care EMRs in health authority clinics
- HLBC systems
- BCAS systems
- Private sector laboratory systems
- Private sector radiology systems
- Private sector pharmacy systems

### Health system & population management

- CDM Toolkit
- Clinical registries & population registers
- Patient safety management
- Performance monitoring & reporting systems
- Data warehousing and analytic capabilities
- Business systems (HR/pay, finance, supply chain)
- Staff scheduling systems

### Foundation

- “Client-as-subject” identity management
**IM/IT Enabler**

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<td>“Client-as-user” identity management</td>
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**Information Management Enablers**

A number of core information management policies, practices and standards are essential to the successful implementation of the strategy.

**Information Access and Sharing**

Three main privacy acts, along with a variety of other acts, provide the legislative framework that ensures that information collected, used, retained and disclosed will be done in a manner that respects privacy, ensures appropriate security and meets confidentiality requirements.

- Information held by a health public body is governed by the **Freedom of Information and Protection of Privacy** Act (FOIPP Act). The provisions of Part 2 of the act addresses access to one’s own information held by these bodies while Part 3 addresses collection, retention, use and disclosure of personal information. The basis of this privacy act is legislative authorities.

- The **Protection of Personal Information** Act (PIP Act) covers all private health practitioners and proprietary service providers not covered under the Freedom of Information and Protection of Privacy Act. This act is consent-based and applies to specific interactions, circumstances and relationships between practitioners/service providers and citizens.

- The **E-Health (Personal Health Information Access and Protection of Privacy)** Act relates to the establishment and management of a category of personal information banks as defined in the FOIPP Act called “health information banks” (HIB) and the processes to designate and manage these and the data contained within them. Additionally it allows for individual citizen disclosure directives to be applied to any HIB designated for a health care public body identified in the FOIPP Act, with provision for some HIBs to be exempt from disclosure directives. The designation of HIBs does not apply to practitioner and proprietary service provider databases covered under the PIP Act.
In some cases, other acts provide additional privacy, security and information sharing requirements on use and disclosure of the data. The Ministry of Health Act establishes the responsibility of the Minister for all matters related to public health and government operated health insurance programs and the authority of the Minister as assigned through the various health related acts. Other relevant acts include provincial health program and services foundation acts, health provider and professions related acts, and acts that are under the auspices of the Vital Statistic Agency that establish base identity attributes. Provisions related to establishment of governance bodies, access and information management requirements, information sharing processes, additional privacy or confidentiality requirements exist in the following program acts and the associated regulations: Medicare Protection Act, Pharmacy Operations and Drug Scheduling Act, Hospital Insurance Act, Hospitals Act, Mental Health Act, Emergency and Health Service Act, Vital Statistics Act and Continuing Care Act.

Other acts and related regulations that affect personal health information governance, data requirements, confidentiality and/or use of information collected at the point of service within a health authority or by private practitioners and service providers include the Health Care Costs Recovery Act, Mental Health Act, Community Care and Assisted Living Act, Health Professions Act, Health Authorities Act, and the Patient Care Quality Review Act. In addition, the Health Care (Consent) and Care Facility (Admission) Act establishes the need for individuals or their substitute decision makers to provide consent for most health care, i.e. anything that is done for a therapeutic, preventive, palliative, diagnostic, cosmetic or other purpose related to health. Once consent is achieved the health care provider can collect personal information at the point of service. This act has a relationship to both health services provided by health authorities as well as proprietary service providers and health professionals.

Within the context of these privacy obligations, information must be shared between care team providers, and the citizen, in a manner that allows for the effective, efficient delivery of care, and improvement in health outcomes. This is particularly true for complex chronic disease patients whose care requires collaboration between a number of care team members including the family physician, medical office assistants, dieticians, nurses, specialists, community service providers, and pharmacists.

An integral part of the implementation of the Strategy will be a process-based approach to determine and enable information access requirements, in the context of "least access" and "need to know" given the privacy obligations described above.

For each process area (for example, the five CDPM-related process areas that will be a focus for IM/IT-enabling chronic disease prevention and management), analysis will be conducted to identify:

- the roles of individuals involved in the process,
- information required to support the process, and
- the access-to-information requirements of each role, at each point within the flow of the process.

Based on this analysis, it will be possible to determine an access model for each process, laying out the requirements for implementation of privacy protections in the underlying information systems.

The sharing of First Nations health information is an essential tool in generating data to monitor health status and to measure improvements in First Nations health. First Nations involvement in how data is used is key to the Tripartite Data Sharing Agreement. In the
agreement, data usage will be monitored for appropriateness and new data sets will be created to improve the quality of information about First Nations health. The agreement will give First Nations a voice in determining the research agenda and ensuring that research will have a positive impact on First Nations people. The data sharing agreement is a key element of recognizing and respecting First Nations as full partners in decision-making.

A tripartite committee will be established to create a clear process for First Nations data access, and will develop a set of common community-level data indicators that will be available to communities. As well, there are both provincial and federal privacy laws that must be followed and First Nations health information governance must be respected, including the First Nations OCAP principles (Ownership, Control, Access and Possession).

Identity Management

There are two distinct but related types of identity management that need to be addressed in the Strategy:

- **Service provision** focus - accurate identification of citizens/patients to whom services are provided, and of care providers as they provide these services.

  Positive identification of citizens/patients and care providers is an essential foundation for the strategy. Inaccurate identification of a patient can result in serious safety exposures.

  In addition to the information systems solutions needed (Client Registry/EMPI; Provider Registry; a solution for linking patients with their care providers; and "active" integration of operational systems with these identity systems), clinical and business practices need to be improved to ensure that, for example, patients presenting at points of services are positively identified before they are registered for service.

  The consistent use of photo ID, and increased adoption and recording of the Personal Health Number, will be important elements. Enhancements to the CareCard, the primary identification element currently used in BC health care, may be considered. In addition, ongoing effort needs to be applied to remediating existing identity issues such as duplicate identities.

- **System user** focus - accurate identification of citizens/patients and their care providers as users of information systems.

  Health solutions for citizen and provider online identity will leverage and align with provincial initiatives including the provincial Identity Information Management (IDIM) initiative, and use of the BCeID for providers.

Shared Care Planning

The introduction of the concept of the shared care plan enables new and improved models of care, strengthening partnerships between patients and their team of health professionals, including the patient’s family physician, nurses, dietitians, pharmacists, specialist physicians and community agencies, and improving the planning and coordination of the patient’s care.

For shared care planning to work effectively, not only do a number of IT enablers need to be put in place (including the ability to collaboratively create a care plan in a clinical system, and to share the plan electronically between systems and with the EHR), but in addition a number of information management elements need to be put in place. Agreement needs to be reached on:
• the content of the shared care plan;
• clinical standards for each items within the care plan;
• roles, responsibilities and accountabilities for each member of the care team (including the patient) in creating, updating and approving the care plan; and
• the presentation of the shared care plan (e.g. different presentations for different roles to support their workflow).

Standard Templates and Coding

Before processes can be automated and supported by the electronic storage and exchange of information, agreement must be reached on the structure of the information that will be captured and shared, and how individual data items within the structure will be defined and coded. For example, in implementing an electronic referral process, there will need to be a standard referral template (the content of which may vary depending on the nature of the referral). Similar standards will need to be agreed for assessments, discharge summaries, shared care plans (as noted above).

In many cases, there may be opportunities to begin improving processes without having all of the integrated IT enablers in place, by first agreeing on template standards and implementing them on paper. For example, referrals could be improved through the use of standard referral templates, as opposed to different forms created by each referred-to service provider.

In addition, consistent coding standards (e.g. ICD10, SNOMED-CT) need to be implemented, to ensure data quality in:

• the consistent sharing and understanding of clinical information and concepts as an integral part of care delivery;
• the bringing together of patient-specific data as part of the integrated EHR; and
• the aggregation of data for meaningful population-based analysis.

Implementation of coding standards will require agreement to be reached on the coding standard(s). Training and education for providers and their support staff is also needed to ensure standards are applied correctly and consistently in practice.

Process Redesign and Change Management

To achieve value from IM/IT solutions, investments must be made in people (change management) and processes (process redesign) in addition to the underlying technology enablers.

Specific areas of focus for process redesign will be the five main process areas essential for improvement in the management of chronic disease, and the sub-processes within each of these areas. They are:

• population-level management of chronic disease;
• the creation of care plans for chronic disease patients;
• the ongoing management of chronic disease patients in the context of their care plans;
• collaboration and communication across the care team; and
• the management of knowledge related to chronic disease.
Business and clinical areas will need to lead the process redesign work, and be accountable for achieving targets - with the support of IM/IT providing the necessary technology enablers. Process redesign will be implemented using disciplines such as LEAN, with the ongoing engagement of clinicians and other providers.

The fullest value will be achieved from IM/IT when it enables transformational change. Transformational change is a journey that will produce significant challenges, but will reap the greatest amount of benefits.

Effective change management disciplines, led by the clinical/business areas, will need to be applied to:

- manage the transition from current state roles, processes, workflows and technologies to the desired future state;
- provide direct and indirect support to those impacted by the change through engagement, communications, education, training, transition/change coaching support, clinical workflow redesign, and reward and recognition programs;
- implement strategies such as peer championship and support, super user training and the management of clinical transformation through iterative change and course correction cycles; and
- sustain new behaviors through the delivery of coordinated ongoing communication, engagement, training and support processes.

Clear, consistent communication will be a key element of the change management strategy. Human resource capacity issues will need to be addressed – both in terms of clinical staff and IM/IT resources. Particular attention will be devoted to change management around the adoption of new technologies and practices in First Nations communities.
Strategy Roadmap

The high-level timeline below illustrates the roadmap for implementing the Strategy:

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The sections below address each phase, describing the overall approach and identifying related activity across health organizations.

**COPD Improvements**

**Timing: 2009/10-2011/12 (improvements to follow as part of broad CDPM focus)**

IM/IT enablers for improvements in COPD will be identified and implemented as an integral part of the development and rollout of the new COPD module for the Practice Support Program. The COPD module will be ready by fall 2009, and will be deployed on a pilot basis to selected primary care practices within all geographical health authorities in 2009, with expanded deployment taking place in 2010.
Of the IM/IT solutions described in the "IM/IT enablers for improvements in COPD and CDPM" section, the following are the main opportunities that will be considered to support the practices engaged in the PSP focus on COPD in 2009/10 and 2010/11:

- the CDM Toolkit (to be upgraded by late 2009), potentially including a shared care flowsheet;
- the COPD registry;
- deployment of provincial eHealth viewer solutions, providing access to lab data, medication profiles and diagnostic images and reports;
- implementation of electronic medical records through the PITO program, both for family practices, and for specialist practices including respirologists;
- secure messaging solutions enabling the secure exchange of clinical messages across the care team, and in future with the patient;
- telehealth solutions, such as expansion of the asthma/COPD telehealth program in IHA;
- access to immunization data captured in the Panorama public health surveillance system;
- electronic distribution of diagnostic results and other reports;
- access, within each geographical region, to the health authority integrated EHR;
- medication reconciliation capability supported through access to PharmaNet - initially through third-party vendors, and ultimately as an integral part of the eHealth viewer;
- expansion of the CHARD resource directory to give providers easy access to information regarding available COPD service providers including respirologists, spirometry services and oxygen therapy providers; to schedule “pre-referral” phone consults between family practitioners and specialists; and, potentially, to provide web access to referral forms;
- shared care planning enablers, leveraging existing initiatives and in parallel developing standard provincial models;
- the piloting of a citizen portal and/or personal health record for COPD patients;
- initial electronic referral solutions - for example, leveraging the secure messaging infrastructure, or EMR-to-EMR referrals (between two EMRs supported by the same vendor), or standardization of referral templates (e.g., for respirology referral) as a necessary stepping-stone towards full electronic referral;
- the electronic capture and sharing of spirometry results;
- electronic notification to the family physician, and other members of the care team, of COPD patient ED visits, admissions, and discharges;

In addition, opportunities to leverage IM/IT enablers will be identified in support of the Lower Mainland Innovation & Integration Fund (LMIIF) project to improve COPD diagnosis and management in VCHA and FHA (including improved patient access to spirometry testing services). The IM/IT enablers noted above will be of value in supporting this initiative - particularly the electronic capture and sharing of spirometry results.

Current health authority IM/IT plans include the following additional examples of COPD-related initiatives:

- IHA’s plan includes a CDPM-COPD initiative in 2010/11-2012/13, to align with the Strategy, and
VCHA’s plan includes an initiative to identify and address patient and information flow issues for COPD patients, particularly at the boundaries between family practice, specialist practice, hospital clinics, and community services.

**Improvements in Other Chronic Diseases**

**Timing: 2010/11-2013/14**

Based on the lessons learned from the COPD initiatives described above, IM/IT enablers that proved useful will be expanded to other chronic disease populations, aligned with CDPM clinical improvement initiatives.

In addition, several IM/IT enablers will be more robust and ready to deploy more broadly:

- the provincial eHealth viewer solutions will be more integrated, offer access to more data, and will be streamlined for usability based on lessons learned and clinician feedback;
- progress will have been made on provincial shared care plan standards, templates and practices;
- PITO electronic medical records will be more pervasive;
- CHARD will have been upgraded to CHARD II enabling broad provincial deployment, allowing for web-based updates by users and provincial authentication (BCeID);
- secure messaging solutions will be more robust, and will be accessible by patients;
- electronic distribution of diagnostic results and other reports will be better integrated;
- medication reconciliation capability will be supported through the eHealth viewer;
- citizen portal and/or personal health record solutions will have been piloted;
- electronic referral solutions will be more robust and standardized; and
- electronic notification solutions will be more robust and standardized.

These improvements will be leveraged for COPD as well as the other chronic diseases.

Current health authority plans include the following examples of CDPM-related initiatives (as well as many other initiatives related to CDPM underpinnings including adoption of provincial eHealth, implementation of primary care and community systems.

- IHA’s plan includes tele-cardiology and tele-home care monitoring initiatives;
- FHA’s plan includes an initiative to integrate CDPM systems with FH clinical systems;
- PHSA’s plan includes initiatives supporting the Centre for Population & Public Health; Health Access and Disease Surveillance; and the Mental Health & Addictions Knowledge Hub;
- NHA’s plan includes the CareNorth initiative to establish a “primary care home,” providing access and comprehensive, coordinated care through multidisciplinary professional teams (also the Aboriginal Health Collaborative imitative noted below); and
- VCHA’s plan includes the Central Coast Aboriginal IHN, which will focus on improved coordination of care and chronic disease prevention and management in aboriginal communities, and an initiative to address information flow issues for CDPM patients in general, based on the lessons learned from the initial focus on COPD.
Several CDPM-related initiatives are underway in First Nations communities, including the following:

- Mobile Diabetes Telemedicine Clinics for FN communities in the Northern Interior (soon to be implemented in Southern communities);
- Northern Health Aboriginal Health Collaborative including patient registries, proactive patient recall and use of the CDM Toolkit and EMRS;
- TeleWoundCare in NH, with a primary focus to support Home Care Nurses and staff in FN communities providing wound care. Project funding is shared between Canada Health Infoway and FNIH;
- TeleOphthalmology co-sponsored by the Inter Tribal Health Authority and the Vancouver Island Health Authority;
- TelePsychiatry services in VCH in Bella Bella; and
- First Nations inclusion in VIHA Bridges/PathWays EHR and eReferral initiative.

**Care Delivery Improvements Enabling Health System Sustainability**

Care delivery improvement initiatives that are dependent on IM/IT are underway in all health authorities - examples of these initiatives are described in the "Care delivery improvements enabling sustainability" part of the "Strategic IM/IT Focus" section.

It is anticipated that all health authorities will continue to push forward with existing and new improvement initiatives to reduce their operating costs, throughout the duration of this strategy.

**Government Priorities**

Several government priority initiatives are currently underway as described in the "Government priorities" part of the "Strategic IM/IT Focus" section.

As further government priorities are identified, this strategy will be adjusted to address them.

**Sustainment of IM/IT Assets**

As noted in the "Sustainment of IM/IT assets" part of the "Strategic IM/IT Focus" section, further analysis will be done to identify the year-to-year financial requirement to sustain existing and new IM/IT assets across the health system. Once this work is done, a plan will be put in place to ensure that sustainment needs can be supported.

Decision-making in a number of key IM/IT areas will be aligned with this approach particularly around the provincial strategy for acute care systems - described in more detail in the "IM/IT strategic decisions" section below.
Enabling Competencies

BC’s IM/IT enabling competencies will continue to be developed on an ongoing basis. Particular focus will be given in 2009/10 and 2010/11 to:

- **Governance & prioritization** - expanding on the development of this strategy to more tightly link the eHealth, CIO Council and Clinical Integration Advisory Council governance and prioritization structure, with local governance and prioritization in each organization (health authorities and Ministry); and to put in place connections to other provincial councils and bodies;

- **Information access & privacy** - using a process-oriented approach to ensure that information is shared appropriately between care team providers, and the citizen, within the context of legislated privacy obligations;

- **Shared services and collaboration** - through the BC Health Authority Shared Services Organization, and through other collaborative partnerships; and

- **Process redesign and change management** - ensuring that value is obtained from IM/IT investment through a more coordinated approach to process redesign and change management.

IM/IT Strategic Decisions

A number of provincial-level strategic IM/IT decisions need to be made to enable the fulfillment of the Strategy.

The two primary areas where decisions need to be made are:

1. **Acute systems** - as noted in the "Current state assessment" section, the largest current IM/IT investment area province-wide is in acute and regional EHR systems. Significant progress has been made since the health authorities were formed to consolidate systems and reduce the number of vendors and instances. Five predominant vendor solutions are currently in use in the province, with varying degrees of integration, capability and user deployment.

   A decision will need to be made as to whether the status quo will continue, or whether further consolidation is desirable. The decision will need to take into account the significant costs of consolidation, balanced with the long-term financial and integration benefits, and the opportunity cost of other initiatives that would need to be set aside while consolidation takes place. The scope of this decision should include core acute clinical system capability (ADT, orders, results, etc.) as well as pharmacy, laboratory, radiology, perioperative and ambulatory care.

2. **Chronic disease registries** - there are many (perhaps as many as a hundred) separate clinical registries in place in BC today, each focusing on a particular disease or population (e.g., diabetes, renal, cardiac, etc.). In addition the CDM Toolkit includes registry capabilities. These registry solutions have grown organically and independently. They do not integrate with one another, or with provincial eHealth, hence developing a integrated cross-continuum view of information for patient with multiple chronic diseases is challenging at best. There are also potential privacy-related issues related to the use of nominal patient data in registries. A strategy will need to be developed through the CIAC, CIO Council and eHealth Strategy Council to address these issues, including the future role of the CDM Toolkit.
Other decisions that need to be made are more focused on the specifics of how certain capabilities will be provided, including:

- the shared care plan – roles, responsibilities, accountabilities, processes, standards, system interoperability, etc.;
- the citizen portal, personal health record, and home monitoring;
- computerized provider order entry (CPOE) (e.g. ePrescribing and diagnostic orders) in primary and ambulatory care – and the associated clinical decision support architecture, including source-of-truth and replication strategies for clinical data;
- real-time system-wide measurement and reporting, to permit quality reporting to providers and health care organizations on outcomes, at the patient level (where appropriate), provider level, practice level, community level, HA level, and provincial level;
- secure messaging;
- notifications;
- electronic referral;
- First Nations community EMRs;
- First Nations data sharing and integration including provincial eHealth and registries;
- new clinical content in provincial eHealth (e.g., spirometry results, clinical encounters, and clinical reports);
- radiology system solutions for private radiology clinics; and

**Leverage Across the BC Public Sector**

Work is already underway to plan for expansion of the Health Information Access Layer (HIAL) into the Information Access Layer (IAL), enabling the secure sharing of information across the public sector.

In the short-to-medium term, other opportunities should be explored for potential leverage including existing or in-progress solutions:

- client registry and electronic master person index,
- eHealth viewer,
- CHARD,
- data warehousing and business intelligence solutions,
- telehealth,
- secure messaging,

and emerging or future solutions:

- the shared care plan,
- citizen health portal,
- chronic disease registries (new architecture),
• electronic referral, and
• electronic notification.
# Challenges

Key challenges related to the implementation of the Strategy are outlined below, along with the mitigation approaches.

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Mitigation</th>
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<tr>
<td>Balancing between protecting the confidentiality of patient data, and</td>
<td>Implementation of the process-based approach described in &quot;Information access and sharing&quot;. The Clinical Integration Advisory Council, accountable to the eHealth Strategy Council, has been formed with a focus on “pragmatic implementation approaches for eHealth and its associated policies/legislation and programs”.</td>
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<td>enabling access to optimize care delivery and citizen health.</td>
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<td>The wide variety of funding sources for IM/IT initiatives challenges the</td>
<td>Include business process redesign as an integral part of the plan to ensure that real change occurs, and benefits are realized. Align and integrate governance and decision-making processes related to IM/IT investments across the health sector – linked to overall health sector strategic, tactical and operational planning. Focus the strategy to begin with on leveraging existing IM/IT assets, and on reaching decisions related to longer-term initiatives.</td>
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<td>execution of an integrated plan.</td>
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<td>The impact of the global recession creates short-term challenges in access</td>
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<td>to funding.</td>
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<td>Agreement needs to be reached across all provider bodies (representing</td>
<td>Create clarity on governance and decision-making processes related to CDPM-related clinical delivery models. Use the IM/IT opportunities as a catalyst to accelerate agreement on clinical delivery models.</td>
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<td>family practices, specialists, home and community care, etc.) on clinical</td>
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<td>delivery models enabling improved chronic disease prevention and</td>
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<td>management. IM/IT enablers can then implement in a consistent way across</td>
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<td>the province.</td>
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<td>Recruiting qualified IM/IT professionals will continue to be challenging.</td>
<td>Develop and implement an IM/IT resourcing strategy. The global economic downturn has, in the short term, reduced the overall demand, and hence increased the available supply, of qualified IM/IT professionals.</td>
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<td>Care delivery organizations need help to deal with the changes required</td>
<td>Develop and implement effective change management strategies. Clearly communicate the benefits of the proposed changes. Assess the overall change agendas province-wide and prioritize the changes which will provide the greatest benefit for the least cost and risk.</td>
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<td>to make substantive improvements in chronic disease prevention and</td>
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<td>management and other care delivery improvements.</td>
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Moving Forward

Where Do We Go Next?

An effective health sector IM/IT strategy, and associated plans, must evolve and continuously improve to ensure continued alignment with changing health sector and other government priorities. This document represents health sector IM/IT strategic thinking at a moment in time but does not represent the end of related efforts.

A number of the important next steps that will follow the publication of this first version of the Health Sector IM/IT Strategy are outlined below:

**Health Sector Strategy Alignment**

1. Update the Strategy to support the provincial health sector strategy as it evolves (including health authority alignment).

**Chronic Disease Prevention and Management**

2. Participate in further development of the COPD collaborative/Practice Support Program, and other COPD-related initiatives, to plan out and implement IM/IT improvements.

**IM/IT Strategic Decisions**

3. Develop the acute systems strategy.

4. Develop a strategy, business case and timeline for the future implementation in acute care settings of computerized provider order entry (CPOE) and clinical decision support.

5. Develop a chronic disease registries strategy.

**Enabling Competencies**

6. Further integrate IM/IT governance, prioritization and decision-making across health organizations, and implement regular reporting to governance of progress towards the implementation of this strategy.

7. Implement the process-based approach to determining information access requirements.

8. Expand shared services and other collaboration initiatives with a focus on cost management, including consideration of further shared services in clinical systems areas.

9. Develop a more coordinated approach to process redesign and change management, aligned with the overall health sector strategy.

10. Establish provincial healthcare architecture and standards bodies to define and oversee agreed health IM/IT “infostructure” architectures and standards.

**Financial**

11. Develop detailed implementation plans, and identify IM/IT investment requirements, for each of the five elements of the strategy:

   - chronic disease prevention and management;
   - care delivery improvements;
   - other government priorities;
• sustainment of health IM/IT assets - identifying the year-to-year financial requirement to sustain existing and new IM/IT assets across the health system; and
• enabling competencies.

12. Determine funding options to address investment requirements, with a focus on 20010/11-2012/13.

Overall

13. Continue to work with the Yukon to determine areas of potential collaboration.

14. Publish annual updates to this strategy.

Addressing Gaps and Issues

The findings of the current state assessment identified a number of gaps and issues that need to be addressed in order to support BC’s overall health strategy priorities. These issues are addressed in the Strategy as follows:

1. Opportunities for improvement in terms of system capability and support for clinical/business processes.
   ➔ System gaps and process improvement to be prioritized and addressed as an integral part of the strategic focus on chronic disease prevention and management, care delivery improvements, and other government priorities.

2. Aging systems and infrastructure.
   ➔ Sustainment of health IM/IT assets is one of the five strategic focus areas – beginning by identifying the year-to-year financial requirement to sustain existing and new IM/IT assets across the health system.

3. The trend towards large investments in acute and regional EHR systems in health authorities may need revisiting to ensure alignment with the Strategy?
   ➔ To be a key consideration in the development of the acute systems strategy.

4. Lack of a coordinated approach to IM/IT funding.
   ➔ As part of enabling competencies, further work will be done to integrate IM/IT governance, prioritization and decision-making across health organizations.

5. IM/IT budget cycle should be reviewed.
   ➔ IM/IT investment requirements will be identified for each of the five areas of strategic focus, and funding options will be identified with a focus on 2009/10-2012/13.

   ➔ Aligned with the overall health sector strategy, a more coordinated approach to process redesign and change management will be developed.

7. More attention needs to be paid to information management.
   ➔ As part of enabling competencies, further work will be done to improve information management including identity management and the development of a standardized
| 8. | Balance between enabling access to optimize care delivery, citizen health and population-level management, and protecting the confidentiality of patient data. | A process-based approach will be implemented to determining information access requirements, and the Clinical Integration Advisory Council will continue to work on collaboratively-developed access and privacy solutions. |
Appendix A – BC Health Sector IM/IT Strategy Summary

BC Health Sector IM/IT Strategy

Strategy Focus Areas

Chronic Disease Prevention & Management
- COPD
- Other chronic diseases
- Population-level management
- Care plan creation
- Management against care plan
- Care team communication & collaboration
- Knowledge management

Care Delivery Improvements Enabling Health System Sustainability
- IM/IT enabling care delivery efficiencies and cost savings
  - Process redesign
  - Standardization
  - Patient safety
  - Evidence-based guidelines

Government Priorities
- Citizen access
- Citizen-centred service
- Public health
- First Nations health
- Provincial eHealth
- Shared Services
- Specialist referral
- Surgical wait times
- Environmental health
- HA reporting

Sustainment of IM/IT Assets
- Health system & population management
- Clinical systems
- Provincial eHealth
- Foundations

Enabling Competencies
- Governance & prioritization
- Architecture & standards
- Business/clinical process redesign
- Shared services & collaboration
- Information access & privacy
- Information management & data quality
- Benefits realization & measurement
- Technology procurement

Leverage Across BC Public Sector

Current IM/IT Assets

Version 1.0  Page 56  October 23, 2009
Appendix B – BC Health Sector IM/IT Strategy Roadmap

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<th>2009/10</th>
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