



GETTING IT RIGHT

PATIENT CENTRED INFORMATION TECHNOLOGY

A DISCUSSION PAPER BY BC'S PHYSICIANS

JANUARY 2004

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EXECUTIVE SUMMARY

The importance of Information Technology (IT) in health care has gained much attention recently. Federal reports such as Romanow (2002) and Kirby (2002) have touted the use of IT and Electronic Medical Records (EMRs) as essential components of improving Canada's health system. The federal government has allocated \$1.1 billion over the last several years to Canada Health Infoway¹ to develop IT systems, including electronic records.

The BCMA outlines a vision for health IT in BC, as follows:

“That practising physicians take a leading role in supporting the development of affordable, integrated, and easy to use information systems that provide physicians with accurate, secure, complete and timely information to enhance the quality of patient care and increase practice efficiency”.

The BCMA outlines 10 guiding principles for the development of an effective health information infrastructure including:

1. Improving patient care must be the primary goal;
2. Security and privacy of health information must be enhanced;
3. Health information technology should enhance the physician-patient relationship;
4. Incentives for participation are necessary;
5. Physicians must remain the primary custodians of health information;
6. Professional and clinical autonomy of physicians must be preserved;
7. New health IT systems need to be formally, independently evaluated prior to wide-scale implementation;
8. New IT systems should improve practice efficiency;
9. IT systems, including Electronic Medical Records (EMRs), must be affordable for all physician practices and include substantial third party financial support; and
10. Practising physicians, representative and accountable to their professional colleagues, must have direct input into the development of an IT infrastructure for health care.

Other provinces, including Alberta and Ontario, and other countries, particularly in Europe, have taken a proactive approach to the development of health information systems, including Electronic Medical Records (EMRs). These jurisdictions have recognized the importance of providing incentives to encourage the adoption of IT within physician offices in order to improve the quality of patient care.

Despite funding of \$1.1 billion, Canada Health Infoway has been ineffective in establishing an integrated health IT infrastructure. Created in 2000, it was over two years before Canada Health Infoway announced its first initiatives in December 2002, totalling \$21 million (less than 5% of Infoway's original \$500M budget). To date, Canada Health Infoway has committed only \$156 million in funding (less than 15% of its \$1.1 billion). A 2002 report by the Canadian Auditor General raised

¹ In December 2000, as part of the Federal/Provincial Health Ministers Accord, the federal government established Canada Health Infoway Inc., as an arms length organization with a mandate to accelerate the development of health information systems.

concerns about the financial accountability of Canada Health Infoway.² There has also been limited physician input into the direction of Canada Health Infoway and the allocation of IT funds. The recently announced initiatives by Canada Health Infoway, as outlined in Section 2 of this paper, will do little to increase the uptake of information systems in physician offices or to improve the overall quality of care.

There are a number of positive IT initiatives underway in BC, such as PathNET and the Electronic Medical Summary (e-MS) project through the Vancouver Island Health Authority. To date, however, there is no coordinated strategy to involve practising physicians. The recent Information Management/Information Technology (IM/IT) workshop hosted in conjunction with the BCMA in September of 2003 was a positive first step for the BC government, however, more effort is required to engage practising physicians.

In a 2003 survey sent to BC's practising physicians on information systems, doctors recognized the importance of IT applications such as EMRs, pharmaceutical and laboratory information systems.³ Although the BCMA recognizes the potential benefits of such systems, there are significant issues and challenges that must be addressed if a coordinated province-wide health IT infrastructure is to be developed. The two major barriers are: (1) ensuring the protection of patient information, and (2) making IT systems affordable to practising physicians.

The BCMA proposes 22 recommendations to improve patient care and allow for the establishment of an integrated health IT system across BC (see List of Recommendations).

The establishment of an effective IT infrastructure requires dealing with privacy and security concerns. A comprehensive strategy is required that recognizes the role of the practising physician as the primary custodian of patients' health information. Legislation must address privacy and security concerns without placing an onerous burden on physician practices with respect to express consent for direct patient care.

The BC government needs to foster effective public-private partnerships (P3s) in the area of health IT. Software and hardware vendors will continue to play a major role in the development of an IT infrastructure and in computerizing physician offices. The quality of their products must be assured by requiring specific usability requirements in order to qualify as approved vendors under any physician office system program.

The BCMA proposes the creation of a provincial Health Information Technology Committee (HIT), reporting to the BC Health Leadership Council⁴, to oversee provincial health IT initiatives and to help foster greater collaboration. This HIT Committee would include practising physicians, representative of and accountable to their professional colleagues, Health Authority Chief Information Officers (CIOs), and a representative from the College of Physicians and Surgeons of BC. This Committee would oversee a number of IT projects, such as Vancouver Island Health Authority's Electronic Medical Summary (e-MS) initiative.

² April 2002 Report of the Auditor General. <http://dsp-psd.communication.gc.ca/Collection/FA1-2002-1-0E.pdf>

³ This survey was emailed to 4195 physicians in the province of BC. In total there were 992 responses, or approximately a 25% response rate. Almost half of respondents (47%) indicated their practice as GP/Family Medicine.

⁴ The BC Health Leadership Council consists of the six Regional Health Authority CEOs, two Deputy Ministers of Health and three Assistant Deputy Ministers.

Similar HIT Committees should be established at the Health Authority level to allow for local practising physician input. These Health Authority HIT committees would be composed of practising physicians and the Chief Information Officer (CIO) for the Health Authority, and would report to Health Authority Medical Advisory Committees (HAMACs).

To date, British Columbia has lagged other jurisdictions in its financial commitment to health IT.⁵ The BC government should commit \$210M over the next three years, beginning April 1, 2004, to establish an effective provincial health IT infrastructure. The government should also allocate \$19M annually to assist in the computerization of physician offices. As a priority, the BC government should mandate, through performance agreements with Health Authorities, that a minimum of 3% of their total budgets expenditures be directed towards information systems and ensure that Health Authorities are adequately funded to do so.

Compatibility and integration is crucial, as health IT systems must communicate effectively. Evaluation of information systems must be recognized as a fundamental component of any strategy, including the use of pilot projects.

The development of effective information systems is critical for improving the quality of our health care system.

⁵ For more on this refer to Section 2 and Appendix A of this paper.

1. INTRODUCTION

In May of 2002, the BCMA Board recommended that its Information Policy Project Group look further at IT systems, particularly applications such as Electronic Medical Records (EMRs), PharmaNet and PathNET.

The importance of Information Technology (IT) has been raised in numerous health care reform reports. IT has also been advocated as an essential component of primary care renewal. In light of this, the BCMA believes it is essential to provide a vision for IT within BC's health care system. In addition to articulating a vision and providing recommendations, this paper provides an environmental scan on what BC and other jurisdictions have done in the area of health IT.

The BCMA's vision for health Information Technology is:

"That practising physicians take a leading role in supporting the development of affordable, integrated, and easy to use health information systems, which provide physicians with accurate, secure, complete and timely information to enhance the quality of patient care and increase practice efficiency".

In the table below, ten guiding principles are outlined for the development of information systems within the health care sector.

Table 1 Ten Guiding Principles for Health Information Technology in BC	
1.	Improving patient care must be the primary goal.
2.	Security and privacy of health information must be enhanced.
3.	Health information technology should enhance the physician-patient relationship.
4.	Incentives for participation are necessary.
5.	Physicians must remain the primary custodians of health information.
6.	Professional and clinical autonomy of physicians must be preserved.
7.	New health IT systems need to be formally, independently evaluated prior to wide-scale implementation.
8.	New IT systems should improve practice efficiency.
9.	IT systems, including Electronic Medical Records (EMRs), must be affordable for all physician practices and include substantial third party financial support.
10.	Practising physicians, representative and accountable to their professional colleagues, must have direct input into the development of an IT infrastructure for health care.

There are a number of ways in which information technology (IT) can improve the quality of patient care, as listed in the table below.

Table 2
Ways Information Technology Can Improve Patient Care

1. Faster access to health information including improved recall and availability of medical records;
2. Reduction in medical errors through improved legibility of patient records;
3. Facilitating tracking of patients over time for research and improving care for designated populations;
4. Enhanced decision-making for practitioners through increased access to clinical practice guidelines and decision support tools;
5. Greater coordination and integration of care through the increased sharing of patient information among health care professionals; and,
6. Increased privacy and security of patient information.

The success and adoption of IT systems will depend on a number of factors including the development of user-friendly technology, reimbursement that supports the uptake of technology and the establishment of effective privacy safeguards.

Electronic Health Record (EHR) vs. Electronic Medical Record (EMR)

In this paper, an Electronic Health Record (EHR) describes the concept of a longitudinal patient record. It combines both the information from patient contacts with primary health care as well as subsets of information associated with other episodic elements of care. In the UK, the National Health Service (NHS) vision of the EHR is of a longitudinal patient record, anchored in general practice and delivered through extensions to present general practice systems.

An Electronic Medical Record (EMR) is a record in electronic format containing a patient's personal details (name, date of birth, etc.), their diagnosis or conditions, and details about the treatment or assessments undertaken primarily by a physician. Data from the CMA's 2002 Physician Resource Questionnaire (PRQ) indicates that just 3% of Canadian physicians use only electronic media to store active patient records. Among those who use electronic patient records alone or with paper records, only 38% of physicians receive data (i.e. prescription information) directly into their records.⁶

⁶ Shelly Martin, "What paperless office"? Pulse, CMAJ, July 23, 2002; 167 (2) <http://www.cmaj.ca/cgi/content/full/167/2/182-a>

2. ENVIRONMENTAL SCAN

There are a number of jurisdictions that are significantly more advanced in the adoption and use of information technologies within the health care system than BC. Examples of these jurisdictions include:

- Alberta (We//net, Physician Office System Program, Pharmaceutical Information Network and EHR Initiative)
- Ontario (e-Physician Project and Smart Systems for Health)
- United Kingdom (National Health Service)
- United States (Health Maintenance Organizations)
- Netherlands
- Denmark
- Australia
- New Zealand

Alberta

Alberta We//net

In 1996, the Alberta Auditor General's Report drew attention to the serious deficiencies in health information management and communication in that province. This report was released at the same time as a province-wide assessment entitled *Information Management and Information Technology Issues and Opportunities Assessment: A Final Report* (December 1996). Following the Auditor General's Report and the assessment, a semi-independent IT body called Alberta We//net was established in 1997.

The Alberta Medical Association, the College of Physicians and Surgeons of Alberta and the College of Family Physicians of Canada (Alberta Chapter) are constituent members of a medical advisory group for We//net. This advisory group has focused on information management and technology (IM/IT) initiatives on behalf of Alberta's over 5,000 physicians. Alberta We//net oversees a number of projects, including its Physician Office System Program (POSP), Pharmaceutical Information Network (PIN) and EHR Initiative.

Physician Office System Program (POSP)

Alberta's Physician Office System Program (POSP) was created in early 2001 as part of a fee agreement between the government and the Alberta Medical Association. It provided \$5 million in 2001/02 and \$10 million in 2002/03 for doctors wishing to implement computer systems to improve patient care and practice management.

The program offers doctors two levels of financial assistance, each cost-shared between the POSP (70%) and participating physicians (30%). Level I provides \$1,500 per year, per physician, to help

doctors use the Internet to acquire knowledge. Level II provides \$10,000 per year, per physician, to help doctors computerize their offices and develop Electronic Medical Records (EMRs).

Funding for the POSP has since been extended to 2005. POSP now has ~\$36.8 million in funding for 2,138 physicians. Physician response to POSP has been positive, as demonstrated in a preliminary evaluation by Howard Research. Level II usage is on target, while Level I usage is currently under-subscribed.⁷ In the latest Master agreement with the Alberta Medical Association, the provincial government is to provide the POSP with \$65.6 million over the next three years including \$25M in 2003/04, \$20M in 2004/05 and \$20.6M in 2005/06. Each physician registered in the program will receive 48 months of funding to automate their paper-based office and link their practice with various information systems.

The POSP has accelerated the adoption of EMRs in Alberta. As of October 2003, approximately 1,500, or 30% of the province's physicians, had subscribed to the program.⁸

Pharmaceutical Information Network (PIN)

In 2000, a Pharmaceutical Information Network (PIN) taskforce in Alberta recommended the province's pharmacies and doctors develop an integrated computer network to record every prescription, in order to prevent drug abuse and cut costs. PIN provides an electronic record of the medications a patient is taking. For physicians, the PIN system provides a safety check against incorrect dosages or conflicting prescriptions through various warnings. A patient's record may be accessed, with patient consent, by participating physicians, pharmacists and health care facilities.

PIN was first implemented in March 2002 as a pilot project in the communities of Westlock and Leduc. As of December 2002, over 15 sites, as well as 47 physicians and pharmacists, were using the system. Emergency Room doctors at the University of Alberta hospital have also started using PIN. Eventually, the Network is to be expanded to include laboratory results and other diagnostic information, thus laying the groundwork for the adoption of electronic health records in Alberta, as recommended by the Premier's Advisory Council on Health.⁹

In November 2003, Canada Health Infoway announced it will be investing \$16 million for the province-wide deployment of Alberta's PIN.

EHR Initiative

In October 2003, the Alberta government announced an initiative in which physicians, pharmacists and hospitals can access and update medical information online, including a patient's prescriptions and lab results. As part of the \$69 million initiative, the government plans to have over 5,000 providers using the system by spring of 2004. Although patients are required to have their records

⁷ Alberta Medical Association, Alberta Physician Information Management/IT Strategy, February 2003
http://www.albertadoctors.org/office/AMA_IMIT_strat_Feb5_03.pdf

⁸ Walker, Ann. "Will physicians pay the price as family practice goes high-tech?", Medical Post. October 28, 2003 Volume 39, Issue 39

⁹ Government of Alberta News Release, May 6, 2002, "Pilot projects aim to improve patient care through Information Technology" at <http://www.gov.ab.ca/acn/200205/12282.html>

included in the database, it will be optional for physicians to join the network. The Alberta government is to provide financial assistance so physicians can access the database.¹⁰

Ontario

In Ontario, the provincial government's health IT strategy consists of two major components. The first is the Ontario Family Health Network (OFHN) e-Physician Project (e-PP) designed to improve communication and EMR use among GPs. The second, called the Smart Systems for Health Agency (SSHA), is a common information infrastructure to facilitate electronic communication.¹¹

Ontario Family Health Network: e - Physician Project (e-PP)

The *Ontario Family Health Network (OFHN)* was created by the Ontario government in March 2001 to support the creation of Family Health Networks. The government's initial goal for the OFHN was to have 80% of Ontario's eligible family doctors practising in more than 600 networks by the end of 2003/04.

In 2001, the Ontario government established a three year \$150 million fund to provide information systems to support its Family Health Networks. Under this program, named the e-Physician Project (e-PP), the government pays two-thirds of the IT costs when a physician joins a network.

One of the components of the e-PP is a Clinical Data Set (CDS), similar to a minimum or core data set. The CDS is a mandatory requirement for software vendors participating in the e-PP.¹² The Ontario Ministry of Health and Long Term Care sees the CDS evolving into an Emergency Health Record (EmHR) for physicians.

Smart Systems for Health (SSH)

The three major components to Ontario's Smart Systems for Health (SSH) include:

- a managed private network (MPN) for health information;
- a security infrastructure based on public key infrastructure (PKI); and,
- a secure messaging infrastructure (i.e. email), including an online provider directory.¹³

Implementation of the SSH network began in the fall of 2001. There are an estimated 20,000 sites identified for hook-up to the SSH network, including all hospitals in Ontario.

¹⁰ Cotter, John. "Alberta health providers to share patient medical records via computer", Canadian Press, 22 October 2003.

¹¹ Smart Systems for Health Agency – an Overview, Ontario MOHLTC

¹² The CDS is described as the shareable electronic patient demographic and essential "persistent" clinical information necessary to provide informed medical care in the absence of the entire patient record.

¹³ Ontario Hospital e-health council, March 2002

[http://www.oha.com/OHA/MEDIA.NSF/1ec23d8b20bec4820525690f00201d75/8da5fcc34a24c93485256bf90061fa73/\\$FILE/eHealthUpdateMarch2002.pdf](http://www.oha.com/OHA/MEDIA.NSF/1ec23d8b20bec4820525690f00201d75/8da5fcc34a24c93485256bf90061fa73/$FILE/eHealthUpdateMarch2002.pdf)

Ontario Health Service Organizations (HSOs)

Ontario's Health Service Organizations (HSOs) have made significant inroads with respect to IT. An example is the Group Health Centre in Sault Ste Marie, which is Ontario's largest and oldest HSO. The Group Health Centre, which has a roster of 44,000 patients, has used EMRs extensively for over five years. Its \$1 million CliniCare system, which took two years to implement, allows doctors to access patient records from home. It also has a computerized network of appointment scheduling, billing, diagnostic and lab services, medical dictation and internal communications.¹⁴

Canada

IT spending in the health care sector is low in Canada. Currently, IT spending consumes on average about 2.5% of health operating budgets.¹⁵ Health care organizations in the US, in contrast, spend approximately 5% of their budgets on IT, a figure that is projected to increase to 6.9% by 2006.¹⁶

Despite the low level of funding directed towards health IT, there are a number of major initiatives underway at both the federal and provincial levels. Since 1997, the Canadian federal government has invested almost \$1.5 billion on information systems within the health care sector.¹⁷ In a survey of over 150 federally sponsored projects, 53 were tele-health related while 36 involved Electronic Health Records (EHRs). The majority of tele-health projects were directed at people residing in remote and rural areas, while the EHR projects were generally experimental and limited in scope.¹⁸

In 1999, the federal government funded \$80 million for the Canadian Health Infrastructure Partnership Program (CHIPP) to support health communication and information technologies, with the emphasis on telehealth and EHRs. Under the CHIPP program, BC received \$7 million to fund eight IT projects. These eight projects include several regional telehealth projects to deal with mental health, children's health and the transfer of diagnostic images from rural and remote locations. Several of the other regional projects deal with the development of an EHR for certain populations, including children suffering from cancer and mental health patients.¹⁹ Funding for CHIPP ends March 2004.

Canada Health Infoway

In December 2000, as part of the Federal/Provincial Health Ministers Accord, the federal government established Canada Health Infoway Inc. as an arms-length organization with a mandate

¹⁴ Borsellino, Matt. "Rural group care centre is ahead of its time", Medical Post, April 22, 2003 Volume 39 Issue 16.

¹⁵ Canada Health Infoway Newsletter, Winter 2003, Volume 01, number 01.

¹⁶ Canada Health Infoway Pan-Canadian EHR Survey Phase I Results and Analysis, January 2003
<http://www.canadahealthinfoway.ca/pdf/EHR-Survey-PhaseI.pdf>

¹⁷ Assadi, Bahman. "Information and Communications Technologies in the Canadian Health System: An Analysis of Federally-Funded ICT Related Projects. June 2003.

¹⁸ Health Canada, Telehealth and EHR: A Guide to Sustainability" http://www.hc-sc.gc.ca/ohih-bsi/pubs/2002_guide_sust_viab/rpt_e.html (August 2002)

¹⁹ The remaining two projects include the Provider Registry and one by the Interior Health Authority to assist seniors in finding the right health and community services. Information on these and other CHIPP projects across Canada can be found at the following Health Canada web site: http://www.hc-sc.gc.ca/ohih-bsi/about_apropos/chipp-ppics/proj/projprov_e.html

to accelerate the development of health information systems. Infoway was provided an initial budget of \$500 million to implement EHRs, telehealth, security, privacy and health surveillance.

Federal, provincial and territorial Deputy Ministers of Health endorsed Infoway's Business Plan and Investment Framework in June 2002. Its goal is to have the major components of an inter-operable EHR in place within five to seven years.²⁰

In December of 2002, Infoway announced its first round of investments estimated at \$21 million. The first of seven projects focus on client and provider registries, as well as system architecture and standards. Infoway has invested in two provider registry projects in BC and Saskatchewan.²¹ Nova Scotia is also developing a privacy toolkit for EHRs.²²

On May 15, 2003, Infoway announced investments of \$135 million for nine projects across Canada.²³ These projects focus on two building blocks for an EHR: Pharmaceutical Information Systems²⁴ and Diagnostic Imaging Systems.²⁵ As part of the 2003 First Ministers' Accord, an additional \$600M was allocated to Infoway (for a total of \$1.1B) over the next three years to support EHRs and tele-health. On July 29, 2003, Infoway released its *Electronic Health Record Solutions (EHRS) Blueprint – An Interoperable EHR framework*, outlining a strategy to implement EHRs across Canada.

In addition to federal initiatives, there are a number IT projects underway in Western Canada. Two examples include the Western Electronic Health Record Collaboration (WERC) and the Western Health Information Collaborative (WHIC). WERC represents a partnership among seven health regions to develop an integrated EHR.²⁶ To date, no costs have been associated with this project.²⁷ WHIC was initiated by the Western Premiers and Deputy Ministers of Health to collaborate on health infostructure initiatives.²⁸ The provider and client registries, as well as Alberta's Pharmaceutical Information Network (PIN), are among the initiatives being piloted.

Information Technology in Canadian Hospitals

Although there have been some positive developments with respect to IT in hospitals, there is room for improvement. A recent survey of hospital IT managers identified that Canada's hospitals are investing only half the amount needed to take advantage of the latest computerized systems. Hospital IT managers in the survey indicate that spending on computerized business and clinical

²⁰ Canada Health Infoway Backgrounder, Investment Framework, December 19, 2002

²¹ The Provider Registry involves a centralized registry of health care provider data on all licensed service providers. It is to support electronic transmittal of patient information by identifying source of information and care givers who are able to access it.

²² Moulton, Donalee. "Toolkit will aid N.S. doctors with feds' privacy legislation", March 18, 2003 Volume 39 Issue 11.

²³ News Release, Canada Health Infoway to invest up to \$135 million in nine projects Canada-wide focusing on automating patient drug information and diagnostic imaging results to improve care, May 15, 2003.

²⁴ Canada Health Infoway is funding five drug information system projects to enable physicians to view a patient's complete drug profile online, order a prescription electronically and receive notification of drug interactions automatically.

²⁵ Canada Health Infoway is investing in four shared diagnostic imaging systems to enable health care providers to view online a patient's test images (i.e. MRIs) and reports, regardless of where test was conducted and from any location.

²⁶ These health regions include Regina, Saskatoon, Calgary HR, Capital Health Authority (Edmonton), Vancouver Coastal and Vancouver Island Health Authorities and Winnipeg Regional Health Authority. Combined they provide medical services to 4.5 million residents and tertiary services to nine million residents across Canada.

²⁷ Barbara, Kermod-Scott, "Western provinces' health records go online", Volume 38, No. 29, August 13, 2002.

²⁸ WHIC participants include BC, Alberta, Saskatchewan, Manitoba, Northwest Territories, Nunavut, Yukon, and key provincial infostructure initiatives including BC's HealthNet, Alberta we//net, and Saskatchewan Health Information Network (SHIN).

solutions will reach on average 2.27% of total operating budgets for 2003/04. The managers stated, however, that IT systems require 3% to 5% to work effectively. Due to this lack of spending, most hospitals aren't implementing new computer technology that could enhance patient care or reduce medical errors.²⁹

The same survey of IT Managers shows that only 25% of Canada's hospitals have been able to afford electronic order-entry systems for pharmaceuticals and only 15% of hospitals in Canada currently have electronic systems for managing diagnostic images, such as CT scans and X-rays. Finally, only 36% of hospitals currently use electronic records.

Pharmaceutical Information Systems in Canada

Information systems on prescription medications vary considerably among provinces. Historically, these databases were developed to process prescription drug claims.³⁰ Nine of ten provinces currently have varying degrees of a computerized pharmacy network in place. The most comprehensive systems include the ability to provide complete patient specific drug profiles to pharmacists at the point of distribution. Comprehensive systems have been implemented in BC (PharmaNet) and Manitoba (DPIN).

International Survey

As seen in the 2001 Harris Interactive survey and as outlined in the table below, there are significant differences among nations in their overall use of electronic records and prescriptions.

Country	Records	Prescriptions
Britain	59%	87%
New Zealand	52%	52%
Australia	25%	44%
United States	17%	9%
Canada	14%	8%

Harris Interactive Survey (2001) conducted for Harvard School of Public Health and the Commonwealth Fund's International Health Care Symposium

The use of electronic records and prescriptions is significantly higher in countries outside North America such as the UK, Australia and New Zealand. Appendix A of this paper describes the use of health IT, including EMRs, in such nations.

²⁹ Jerry Zeidenberg Hospitals underspending on latest technology, study shows. The study, which surveyed 104 senior IT managers in hospitals across the country, was commissioned by Canadian Healthcare Technology magazine, a Toronto-based industry journal. <http://www.globetechnology.com/servlet/ArticleNews/einsider/LAC/20020531/TSHOSP2/techStrategies>

³⁰ http://www.nlchi.nf.ca/pdf/Pharm_Net-Briefing.pdf N&L Centre for Health Information, Newfoundland and Labrador Pharmacy Network: Briefing Note.

3. BC ENVIRONMENT

Background

In BC, there is a lack of investment directed towards IT in physician offices. To date, government's investment in health IT has focused almost exclusively on hospital-based systems. The majority of information systems used in physician offices are limited to electronic claims submission. These systems do not monitor a patient's health care, assist in accessing information on a range of services available, or transmit medical information among providers.

The table below outlines some the challenges facing BC's current health IT system.

Table 4 Challenges Facing BC's Health IT System
<ul style="list-style-type: none">▪ Developing common standards upon which to build an infrastructure▪ Ensuring personal health information will be adequately protected▪ Creating incentives to encourage adoption of IT systems▪ Developing guidelines dealing with the secure transfer of patient information▪ Assembling evidence to demonstrate the effectiveness and usefulness of IT systems▪ Improving integration among various information systems▪ Enhancing IT training opportunities available for health care professionals▪ Ensuring practising physician input into the development of IT systems

BC Government Vision for Health Information Technology

The BC Ministry of Health's vision for IT, as outlined in a 2003 framework document, is the development of a secure and private lifetime health record for each British Columbian that is available 24 hours a day, seven days a week anywhere in the province.³¹ The framework document identifies 21 EHR building blocks, eight of which it states should be developed in phase 1 over 18 months.³²

Recently the BC CIO Council, which consists of the Chief Information Officers (CIOs) for BC's six Health Authorities, and the Ministry of Health, stated they will focus on nine projects through November 2003, including:

³¹ (Framework for an Electronic Health Record for British Columbians, January 2003)

³² These 21 blocks include: Network, Location Registry services, consent service, community health information systems, EMS Primary Health Care, Electronic Access to Diagnostic images, citizen access to health information, client registry services, provincial authentication services, medication profiles, clinical decision support, lab results, integration services, document management capability, PRS, HA Clinical systems, clinical documentation, automated standardized order entry, physician medical office information system and clinical event broker.

1. Physician Information Management/Information Technology (IM/IT) Strategy
2. Electronic Medical Summary (e-MS)
3. Infrastructure
4. BC Health Care Client Identity Management Strategy
5. Provider Registry Uptake
6. Electronic Health Record (EHR) Architecture
7. Diagnostic Imaging Services and Architecture
8. Clinical Broker
9. PharmaNet Uptake³³

In the 2003 BC Budget, the Health Authorities are to receive \$15 million in grants for 2003/04 to support the development of Electronic Health Records.

IT Initiatives in BC's Health Care System

There are a number of IT initiatives underway in BC. One is an examination of information system security standards necessary to protect the collection, transmission, and storage of information among providers, agencies, and government. The idea is to introduce a regulated security standard that health agencies and providers would be required to meet in order to access the system. The impact and costs associated with implementing a security standard in BC are not known at this time.

Another project being pursued with other western provinces is the Provider Registry Project. The goal of this project is to develop a unique identifier for health care providers.³⁴ The 2003 BC Budget notes that the electronic Provider Registry is scheduled for implementation by October 2003.

Some of the more successful IT initiatives to date in British Columbia have been PharmaNet and lab systems such as PathNET, MediNet and CAIS/PHASI II.

PharmaNet

In September 1995, the BC Ministry of Health implemented PharmaNet, which linked community pharmacies, outpatient hospital dispensaries and emergency rooms to a common data-sharing network. Everyone issued a prescription, including residents and non-residents, is registered with PharmaNet, which includes 14 months of all medications dispensed, as well as all recorded adverse drug reactions and clinical conditions.³⁵

The four main reasons why PharmaNet was introduced are to: (1) prevent multi-doctoring by prescription drug users, (2) prevent the prescribing of harmful combinations of prescription drugs, (3) increase cost-efficiencies, and (4) provide fast, interactive access to patient information and personal health numbers.

³³ Health Chief Information Officer Council, "Tactical Plan for Health Information Management in British Columbia" Nine Key Projects in Six Months, May 2003. http://healthnet.hnet.bc.ca/pub_reports/tac_plan_may2003.pdf

³⁴ WHIC Provider Registry System (PRS) Business Design Document V1.1 Accessed from: http://healthnet.hnet.bc.ca/catalogu/provider_registry/index.html#bus

³⁵ HIV/AIDS drugs are the only class of drugs exempted from system. PharmaNet includes patient demographic information, claims information, Pharmacare claims adjudication information as well as information on the practicing status of physicians and dentists.

PharmaNet users sign confidentiality agreements before being granted access and provide unique identifiers when logging into the system. Patients can place a keyword on their profile, limiting access to individuals whom the patient shares the keyword.³⁶ As of October 2001, only 1500 British Columbians had added a keyword to their account.

The first hospital in BC to gain access to PharmaNet was the Royal Columbian in New Westminster in February of 1998. During the trial project, PharmaNet was reported to be of significant benefit.³⁷ A Ministry report entitled *Hospital Access to PharmaNet* notes that implementation costs vary (\$750 - \$10,000) depending on the need for new hardware and wiring. Annual hospital operating costs were also estimated at \$1,000.

A pilot project to connect up to 100 medical practices to PharmaNet was announced in November of 1999, and on March 15, 2000, the Brookwood Family Practice in Langley became the first practice connected to PharmaNet. As of February 2003, there were fewer than 100 active sites. Currently, the Medical Practice Access to PharmaNet project is awaiting approval for a province-wide roll out. In the meantime, there is a 100-site limit restriction until access is authorized to all medical practitioners in the province.

Laboratory Systems

A 2003 report by the Ministry of Health Services notes that there are at least 27 different lab information systems in use by physicians, institutions and Health Authorities across BC.³⁸ At the present time, there is no organized strategy to link these systems with one another or to various clinical systems. The Ministry of Health Services states there is the opportunity to develop a strategy for a province-wide Lab Information System. Lab information is handled by a number of inpatient and outpatient systems. Currently, three of the main lab systems in BC are PathNET, MediNET and CAIS/PHAIS II.

PathNET

Launched in 2001 by MDS Metro Laboratory Services and BC Biomedical Laboratories, PathNET is an electronic lab reporting system for physicians. MDS and BC Biomedical perform 70% of all outpatient diagnostic lab tests ordered by physicians in BC. According to the 2003 BC Laboratory Services Review, PathNET is capable of transmitting about 60% of all outpatient lab test results and over 30% of all test results throughout the province³⁹.

To date, development costs of PathNET are estimated at over \$5 million with annual maintenance costs in excess of \$500,000 per year.⁴⁰ Electronic delivery of lab results via PathNET to the physician office or home is paid by the sending laboratory on a per patient basis and is provided at

³⁶ The keyword on an individual's pharmacy account can be overridden in emergency situations, when the patient is unable provide the information.

³⁷ Emergency Department Access to PharmaNet Pilot Project – Final Report, November 1998

³⁸ BC Laboratory Services Review July 2003 http://www.healthservices.gov.bc.ca/cpa/publications/lab_review.pdf Lack of connectivity makes it difficult to further integrate care as referring physicians and facilities are using different sets of data, lab equipment, standards and patient records.

³⁹ Ibid.

⁴⁰ Interview with Lindsay Allan, General Manager of PathNET, September 2003.

no charge to the physician. Access to PathNET is provided through a secure web-based system and is restricted by passwords and hardware-level authentication. All data transmission uses secure encryption technology using two-factor identification.

PathNET, which is compliant with the provincial data transmission standards⁴¹, also offers test reporting, cumulative charting based on the historical data, and an HL7 interface to software vendors such as Clinicare and Wolf Medical systems. Since its implementation, there has been significant growth in the use of PathNET. As early as October 2001, only 200 physicians had access to PathNET, while now almost 3,100 physicians are using the system. Pilot projects are also underway in five hospital ERs.

PathNET plans to introduce results forwarding and is developing the capacity for desktop electronic order entry by physicians. PathNET is also working with the Health Authorities to share network costs and reduce duplication.

MediNET

MediNET, a privately owned and operated BC company, has been carrying medical information electronically in BC for over ten years. Prior to PathNET over 4,500 providers were using MediNET to access lab reports and prescription information⁴². In addition to accessing PharmaNet, MediNET also helps design and maintain custom web pages. Its appointment scheduler allows patients to request a date and time for an office visit, give a reason for the appointment, and leave contact information. MediNET is also an Internet Service Provider (ISP), giving medical offices access to the Internet at a cost of approximately \$15 per month.⁴³

CAIS/PHAIS II

CAIS/PHAIS II is a public sector system developed by the Provincial Health Services Authority (PHSA) to distribute lab test results to physicians. Currently, the BC Cancer Agency (BCCA) collects lab test results from a number of the publicly funded and private labs. These results are only available to Cancer Agency physicians who have direct access to CAIS. The PHSA is looking at providing web access, similar to PathNET. It is also anticipated that the PHAIS II system will allow for a HL7 LTS type download function.⁴⁴

In the last five years, the Information Technology Group within the BCCA has developed a comprehensive clinical information system (CAIS) to support the information requirements for the provision of cancer care. CAIS manages patient demographic information, disease-site information, patient and resource scheduling, document management and workflow, transcription, result reporting, diagnostic image management and decision support.⁴⁵

⁴¹ In BC the current Lab Test Standard (LTS) defines the business and technical requirements for the electronic exchange of lab test data in BC.

⁴² (Web site: <http://www.medi.net/index.htm>). Medinet was the first vendor to be certified by the Ministry of Health for Access to PharmaNet.

⁴³ Ibid.

⁴⁴ BC Laboratory Services Review, 2003. http://www.healthservices.gov.bc.ca/cpa/publications/lab_review.pdf

⁴⁵ <http://www.hinetbc.org/database/cofull.asp?compno=921>

CAIS services are also being deployed by the Vancouver Island Health Authority (VIHA) for the delivery of diagnostic reports to approximately 60% of its physicians by January 2004. Also an extension of CAIS, 'Clinical Broker' is being implemented at Nanaimo General Hospital to send lab results electronically to clinics in Nanaimo.

Health Authority Initiatives

Provincial Health Services Authority: BC Cancer Agency (BCCA)⁴⁶

The BC Cancer Agency (BCCA), North America's fourth largest cancer treatment centre, is responsible for cancer care across the province and is operated by the Provincial Health Services Authority.⁴⁷

The BCCA is unique in its deployment of information management systems and IT in a provincially decentralized, multi-facility environment. Its high-speed fiber-optic network allows it to operate all programs and facilities with centralized software products, working in a client-server environment. Financial benefits have resulted from eliminating the need for multiple software licenses and maintenance agreements. Standardization of client and server hardware has also resulted in economies of scale in hardware replacement and maintenance costs.

As noted in an article on the BCCA, common and centralized information systems create opportunities for the sharing of resources. Only one medical record is needed for patients, no matter where they access care in the provincial cancer system.⁴⁸

Fraser Health Authority

The Fraser Health Authority (FHA) plan for primary care renewal proposes Primary Care Organizations (PCOs) or physician groups be linked electronically to provide 24/7 access to primary care for designated populations. The FHA plan notes that the success of its plan relies on the ability to exchange timely information. Its strategy includes the development of clinical information systems to support an integrated EMR for targeted PCOs.

The FHA is looking to implement the Picture Archiving Communications System (PACS) to transfer digital x-ray images throughout the region. With Canada Health Infoway grants, the plan is to implement by November 1, 2003 all the features of the PACS at Royal Columbian and Eagle Ridge Hospitals, then begin integration with physician offices.⁴⁹ The FHA's goal is to have PACS functioning in all of its 12 hospitals by December 2004.

⁴⁶ In 1935 a special committee of the BCMA was formed to investigate the growing incidence of cancer. The British Columbia Cancer Foundation established a treatment centre in Vancouver, called the British Columbia Cancer Institute in 1938. Now called the BC Cancer Agency (BCAA) it is operated by the Provincial Health Services Authority.

⁴⁷ <http://www.hinetbc.org/database/cofull.asp?compno=921>

⁴⁸ The British Columbia Cancer Agency: A Comprehensive and Integrated System of Cancer Control By Donald R. Carlow, Volume 3, Number 3, Spring 2000 <http://www.longwoods.com/hq/spring00/feature2.html>

⁴⁹ Tactical Plan for Health Information Management in BC: Nine Key Projects in six months, May 2003, Health Chief Information Officer Council

Interior Health Authority

In 2002, the Interior Health Board approved a new health information system, Meditech, to be set up over a three-year period. The cost for the first year of implementation is \$9.35 million. The information system is designed to allow health providers to follow the record of any patient, including lab or radiology results, in the Interior Health Authority (IHA) no matter where they are located. The Interior Health Authority predicts that the system will save \$4.3 million per year in system costs.⁵⁰

A document from the IHA notes that, by March 31, 2005, there are to be 28 acute sites, 70 residential sites and 40 health units referencing the same Electronic Health Record (EHR) and sharing the same master patient index and admission system. By this date, all 1,200 IHA physicians should have direct access to the EHR from their homes, offices and other facilities.⁵¹

In the Interior, a Teleradiology - PACS (Picture Archiving Communications System) project is underway in the Thompson Cariboo Shuswap Health Service Area. The system, which allows radiologists in larger centres to read digital images of x-rays from remote locations, is designed to replace x-ray film with digitized images. Rural communities like Williams Lake and Chase are to be linked to the Digital Imaging Department at Kamloop's Royal Inland Hospital.⁵²

Northern Health Authority

The Northern Health Authority recently announced how they would use their portion of the \$15 million in funding (\$2.65M) allocated to the Health Authorities for EHRs in the 2003 provincial budget. The Health Authority will allocate approximately \$1.68M to improve its network infrastructure and \$1M for purchasing new information systems and software for Mental Health and Community Services.

In Quesnel, GR Baker Hospital has introduced PACS technology at a cost of \$744,000. This technology will allow physicians in Quesnel to view patient x-ray images via an Internet browser and web connection from remote locations like North Cariboo.⁵³

Vancouver Coastal Health Authority

In February 2003, the Vancouver Coastal Health Authority (VCHA) announced an agreement with IDX Systems Corporation to provide the Carecast enterprise clinical system to improve computerized physician order entry (CPOE) and electronic clinical documentation capabilities. The Health Authority will implement *Carecast* first at Richmond General Hospital and Minoru Residence Extended Care facility. VCHA is to upgrade Vancouver General Hospital (VGH), UBC Hospital, the George Pearson Centre and GF Strong facilities to *Carecast*.

As stated in a press release by the Health Authority, the CPOE system will allow physicians to enter orders electronically, thus reducing the risks of illegible handwritten orders, as well as warn about

⁵⁰ Board Approves New Patient Care Information System, June 20, 2002.

http://interiorhealth.ca/Media+Centre/Media+Releases/June/Media_Release_June_20.htm

⁵¹ IHA Rural Health Connecting Communities through Technology, November 2002

⁵² Interior Health Transition News, Number 15, October 23rd, 2002.

⁵³ Northern Health Authority Press Release. "New diagnostic imaging equipment in Quesnel to provide patients faster access to consultations; more accurate diagnosis" <http://northernhealth.ca/phs/news.asp?articleid=852&zoned=1>. October 10, 2003.

possible drug interactions, patient allergies, and overall best courses of treatment as the order is first entered.⁵⁴

The implementation of the PARIS community mental health system in Vancouver and Richmond replaces 30 distinct legacy systems to enable the sharing of community care information across Vancouver/Richmond sites, including emergency rooms.

VCHA's CareConnect project is an ongoing initiative to provide caregivers with integrated access to clinical information from sources within the region, other Health Authorities, private labs, PharmaNet, etc. Implementations to date include:

- Emergency department and pre-admission clinic access to private lab results via PathNET at several VCHA sites
- Pre-admission clinic access to PharmaNet at the VGH site – being expanded to additional sites in conjunction with PathNET
- Remote access to PACS systems to provide physicians with secure, two-factor access to diagnostic images from offices and homes

As part of the federal Primary Health Care Transition Funding (PHCTF), VCHA is providing IT and other funding over three or four years for 15 primary care practices. One of the goals of the project is to encourage primary care practices to adopt electronic medical record (EMR) systems. In support of this goal, VCHA has defined standards for EMRs, short listed vendors meeting these standards, and arranged a vendor open house to allow VCHA primary care providers to view selected systems.

Vancouver Island Health Authority

The Vancouver Island Health Authority (VIHA) operates two major integrated EHR systems; Cerner Millennium in the South area, and Meditech in the Central area. Both projects are at an advanced stage of implementation. Major milestones in early 2004 will include community, acute and emergency applications. The VIHA is also in the final stages of converting all Medical Imaging sites to a standard PACS system (Intelirad), and in collaboration with the PHSA will be operating a region-wide image communication service by March 2004.

One of the major IT initiatives underway in the Vancouver Island Health Authority (VIHA) is the Electronic Medical Summary (e-MS) project. Its project charter defines an e-MS as a subset of patient data suitable for communication among primary health care and other practitioners for the purpose of sharing the care of an individual.⁵⁵ The project is to receive \$2.3M through the Primary Health Care Transition Fund (PHCTF) until 2006. After this period, the possibility exists for a province-wide roll out. The data in the e-MS would be located in physician offices but could be transferred to other GPs, specialists, call-groups and potentially be accessed by Hospital Emergency Rooms.

⁵⁴ Vancouver Coastal Health Authority Selects Carecast™ to Support CPOE, Clinical Documentation Initiative
<http://www.idx.com/corporate/pressrelease.asp?id=F4053A3E987C5A1585256CC60060CB26> BURLINGTON, VT (Feb. 6, 2003)

⁵⁵ VIHA e-MS Project Charter (2003)

On April 1, 2003, Saanich Peninsula Hospital (SPH) Medical Imaging Department introduced a new electronic information system (RadNet) for x-ray and ultrasound exams, as well as a new scheduling system to book patients for Medical Imaging procedures. Patient records for CT scans and bone mineral densitometry procedures at SPH have been recorded in the Ardent system since June 2002. According to the VIHA, with the full implementation of the system at SPH, information will be available electronically for all Medical Imaging and Heart Lung procedures in the South Island.⁵⁶

In concert with other Health Authorities, VIHA is building a high performance regional computer network to deliver inter-regional connectivity to support the delivery of care and medical education province-wide.

Health Authority IT Expenditures

Although the above examples represent positive developments at the Health Authority level, there is an overall lack of funding directed towards IT systems. This is demonstrated in the table below, which summarizes predicted annualized Information Systems expenditures for each of BC's Health Authorities for fiscal 2002/03.

Health Authority	Total Information Systems Expenditures	Total Expenditures	% of Total Expenditure
Interior	\$ 16,481,638	\$941,690,639	1.8%
Fraser	\$13,462,831	\$1,203,637,434	1.1%
Vancouver Coastal	\$46,574,813	\$1,623,889,937	2.9%
Vancouver Island	\$18,677,325	\$994,207,427	1.9%
Northern	\$ 3,989,539	\$381,499,174	1.0%
PHSA	\$ 17,761,365	\$743,783,027	2.4%
Total	\$ 116,947,511	\$5,888,707,638	2.0%

Source: Operation and Administrative Support System (OASIS) and Health Authority Management Information System (HAMIS) as of Jan 2003 (Period 6 Comparison). Health Authority Management Indicators Report, 2002/03: Year-to-Date to September 12, 2002 (Period 6), Ministry of Health Services. Figures use Information systems expenditures from April 1, 2002 to September 12, 2002 annualized over the entire fiscal 2002/03 year.

For information systems to be effective, funding between 3-5% of total Health Authority budgets should be allocated towards IT. This figure is derived from a survey of hospital IT managers who state that between of 3-5% of their operating budget needs go towards information systems to ensure they work effectively.⁵⁷ As the table above demonstrates, all the Health Authorities fall below

⁵⁶ <http://www.viha.ca/news/gazette/pdf/mar26.pdf> Gazette March 26 South Island VIHA

⁵⁷ Jerry Zeidenberg Hospitals underspending on latest technology, study shows. The study, which surveyed 104 senior IT managers in hospitals across the country, was commissioned by Canadian Healthcare Technology magazine, a Toronto-based industry journal. <http://www.globetechology.com/servlet/ArticleNews/einsider/LAC/20020531/TSHOSP2/techStrategies>

this mark. At 5% of total expenditures, BC's Health Authorities would be spending approximately \$300 million on IT, an increase of \$ 180M from 2002/03.⁵⁸ These figures are in addition to the additional \$95M recommended later in the paper that should go towards computerizing physician offices over the next five years.

In summary, significant increases in expenditures need to be made for information systems in hospitals and acute care facilities. These facilities should have electronic access to laboratory, pharmaceutical and diagnostic information, as well as Computerized Physician Order Entry (CPOE) capabilities.

IT/EMR Vendors

In Canada there are a significant number of vendors who provide EMR and other IT related products to physicians. Only eight companies, including Clinicare, York-Med and P & P Data Systems, provide EMRs to over 1,000 users. Clinicare is the largest EMR vendor in Canada, while Wolf Medical Systems has grown rapidly in BC.⁵⁹

At this time, the BCMA is not evaluating these systems and does not think it would be appropriate to recommend one system over the other, for a number of reasons, including differing physician preferences and practice styles.

The CMA will be providing an EMR selection tool by the end of 2003 which will be available on their website (www.cma.ca) in the "practice solutions" area. They may also be contacted directly at 1-800-361-9151.⁶⁰

⁵⁸ This assumes that the Health Authorities spend approximately 2% of total expenditures on information systems for entire fiscal period of 2002/03.

⁵⁹ Most commonly used EMR in BC at the present time is Wolf, which was also used by 7 of BC's 8 primary care demonstration sites. In BCMA Physician Survey on Information Systems, 27% of Electronic Patient Record users identified Wolf Systems as their vendor.

⁶⁰ Brookstone, Alan. "Choosing an EMR system", May 6, 2003 Volume 39, Issue 18 Medical Post.

4. ISSUES AND CHALLENGES

There are a number of factors driving the desire of governments and providers to implement IT systems. One of these is new federal funding. Canada Health Infoway has received funding commitments of \$1.1 billion over the last several years. In 2000, the federal government announced it would also allocate \$800 million through the Primary Health Care Transition Fund (PHCTF) to support primary care reform. More recently, as part of the 2003 First Ministers' Accord, the federal government announced it will provide \$16 billion over five years to the provinces as part of a Health Reform Fund to support primary care, home care and coverage for catastrophic drug costs.

Benefits of IT Systems

The potential financial benefits of Electronic Patient Record (EPR) systems are seen in a report prepared by PriceWaterhouseCoopers for the Canadian Medical Association (CMA). The report notes that implementing EPRs in Canada could provide annual system-wide savings of \$1.1 billion to \$1.3 billion, due to a reduction in duplicate testing, transcription savings, fewer chart pulls and filing time, reduction in office supplies, and reduced expenditures due to fewer adverse drug reactions.⁶¹

Not all benefits of an EMR are measurable in financial terms. Such benefits include improved quality of care, reduced medical errors, and better access to patient information. In the United States, it is estimated that at least 7,000 patients die each year from misread prescriptions and that more than one million serious medication errors occur each year in US hospitals.⁶² Medication errors result in significant financial costs. An American report states that one adverse drug event (ADE) adds an average of \$2,000 (\$2,620 CAD) to the costs of hospitalization. In the US, this translates to \$2 billion (\$2.6bn CAD) per year in hospital costs.⁶³

A British Medical Journal (BMJ) study of GP practices with electronic and paper-based records found electronic records were more legible and understandable, as well as more likely to have at least one diagnosis recorded.⁶⁴ The study notes that good quality electronic records can prompt better care, and improve coordination of care between primary and secondary care.⁶⁵ In a 2003 BCMA survey on information systems, 71% of physicians stated that patient care has improved with the implementation of electronic records in their practice. 73% of total respondents also believe that electronic records can improve work efficiency, while 68% stated they could improve the quality of patient care.

⁶¹ CMA Discussion Paper, Advancing Electronic Health Records, Version 1, May 3, 2002. CMA report notes that this is a conservative estimate and annual savings could be significantly higher.

⁶² http://www.albertawellnet.org/pin/edjournal_012702.html "Project aims to clear up docs' orders: PRESCRIPTION: BETTER HANDWRITING" Publication: EDM - The Edmonton Journal, Allan Chambers Source: INF - Infomart Jan 27 01:00

⁶³ Fact Sheet Computer Physician Order Entry (CPOE) The LeapFrog Group, November 20000. http://www.intensivecareonline.com/PDFs/CPOE_FactSheet.PDF

⁶⁴ In the survey, all 249 paperless records were fully legible, whereas 16 (6%) of the 280 paper based records were totally illegible and 84 (30%) were partially legible.

⁶⁵ Hippisley Cox, et al. The electronic patient record in primary care – regression or progression? A cross sectional study. BMJ, Volume 326, June 28, 2003.

The benefits of information systems extend beyond EMRs. In a 2002 report by the Western Health Information Collaborative (WHIC), the Pharmaceutical Information Network (PIN) Task Force of Alberta estimates that a fully functional PIN that linked physician offices, pharmacies and hospitals together could result in fewer:

- Adverse drug reactions related to hospital admission;
- Hospital admissions related to improved compliance;
- Physician visits related to improved compliance; and
- Long-term-care admissions related to improved compliance⁶⁶.

Computer Physician Order Entry (CPOE)

The true benefits of IT systems are evident when they are able to perform advanced functions such as Computer Physician Order Entry (CPOE). With CPOE, physicians enter orders (i.e. tests, medications, lab requisitions, etc.) into a computer, rather than on paper. The order is automatically checked for potential errors or problems.

The California Healthcare Foundation lists studies showing CPOE can reduce medication errors by as much as 86%. One recent study at Boston's Brigham and Women's Hospital shows that CPOE reduced error rates by 55% – from 10.7 to 4.9 per 1,000 patient days.⁶⁷ Another study conducted at LDS Hospital in Salt Lake City demonstrates a 70% reduction in ADEs after implementation of CPOE.

Despite such benefits, the use of CPOE systems in BC hospitals and physician offices remains low, due largely to the costs involved. The First Consulting Group in the US notes that for an average 500-bed hospital, CPOE systems cost \$7.9M (\$10.4 CAD) to install, and about \$1.35 M annually (\$1.8M CAD) to maintain.

It is important to note that in order to realize the true benefits of CPOE, such applications require an investment in baseline systems (e.g. PharmaNet). Investment in baseline systems in BC has been slow, thus delaying the ability to introduce CPOE.

Although IT applications provide potential benefits to patients, providers and government, there are a number of issues that must be addressed. The two major challenges are the privacy of health information and the cost of systems.

Privacy of Health Information

Health information is one of the most sensitive types of information. It includes data an individual provides to their doctor for the purpose of receiving treatment – from name, and health insurance number, to information about their physical condition, emotional state, personal habits, medication, and family history.⁶⁸ Health information is used for a number of reasons including client care,

⁶⁶ Western Health Information Collaborative (WHIC), Medication Information Strategy White Paper, May 2002, Version 4.0, at http://www.whic.org/public/whatsnew/WHIC_PIN_white_paper_v4.0.doc

⁶⁷ California Healthcare Foundation, "Hospitals Share Lessons Learned from CPOE", Caroline Broder

⁶⁸ http://www.legis.gov.bc.ca/cmt/36thparl/priv_ps/reports/report010320.htm#employee

financial reimbursement, medical education, research, social services, quality assurance, risk management, public health regulation, litigation, and commercial purposes.

There are increasing concerns about the privacy of personal health information as more providers have access to medical records. Without confidence that privacy will be maintained, patients may refrain from disclosing critical information; may refuse to provide their consent to use personal health information for research purposes; may lie about health status; or may simply not seek treatment.⁶⁹ As a consequence, the ability of physicians to provide quality patient care is diminished.

Public Opinion

The public places high importance on the protection of personal health information. A 1999 Ipsos-Reid survey found that 76% of British Columbians believed it is very important that medical information be kept private.⁷⁰ In a 1999 Canadian Medical Association (CMA) public opinion poll, 65% of respondents rated personal health information as the second most confidential piece of information.⁷¹

Current Privacy Environment

In Canada there are significant gaps in the privacy and security of information. This is demonstrated in a February 2003 Canadian Hospital Privacy Survey that assessed hospital compliance with the Canadian Standards Association (CSA) Model Code for the Protection of Personal Information. The survey indicated that only 45% of hospitals had a designated person responsible for privacy. Furthermore, only 50% of hospitals had a written privacy policy; only 33% of hospitals had a privacy training program; and only 27% of hospitals with a website had a privacy policy available online.⁷²

Current Legislative Framework

The Supreme Court of Canada has recognized that Section 7 of the *Canadian Charter of Rights and Freedoms* includes the right to be free of the psychological stress resulting from the unauthorized disclosure of one's personal health information.

Recently the Honorable Roy Romanow, in his report on the *Future of Health Care in Canada* (2002), recommended that amendments be made to the Criminal Code of Canada to protect Canadians' privacy and to explicitly prevent the abuse or misuse of personal health information, with violations in this area considered a criminal offense.

Despite calls for greater privacy protection across Canada, the laws currently in place to protect the privacy of Canadians' personal health information can be best described as a "patchwork". Federal and provincial privacy laws govern their respective public sectors; provincial laws govern various

⁶⁹ Levine, Sara. Fasken Martineau, "Provincial approaches to regulating health care privacy", September 2003

⁷⁰ http://www.legis.gov.bc.ca/cmt/36thparl/priv_ps/reports/report010320.htm#employee

⁷¹ Canadians Perceptions of Health Information Confidentiality, Canadian Medical Association/Angus Reid Survey, 1999 (<http://www.cma.ca/advocacy/news/1999/survey.htm>). Financial (i.e. banking) information was rated as the most confidential.

⁷² Priva-c, Canadian Hospital Privacy Survey, March 2003. <http://www.privac.com/includes/content/pdf/PRIVA-C%20Whitepaper%20-%20Canadian%20Hospital%20Privacy%20Survey.pdf>. This was a survey of 100 hospitals from across Canada

care facilities such as hospitals and extended care facilities; and codes of ethics govern health care professionals. While some provinces have adopted legislation that deals specifically with health information, the privacy standards vary among them.⁷³

Currently, six provinces – BC, Alberta, Manitoba, Saskatchewan, Quebec and Ontario – have existing or pending legislation affecting private sector health care. On January 1, 2004, the federal *Personal Information Protection and Electronic Documents Act* (PIPEDA) will apply to all collections, uses and disclosures of personal health information in Canada in the course of commercial activity unless substantially similar laws have been enacted or the Governor in Council has issued an Order exempting an organization or class from compliance with PIPEDA.⁷⁴

In the spring of 2003, the BC government introduced private sector privacy legislation in the form of *Bill 38: The Personal Information Protection Act*. Its passage, however, was delayed after the Office of Federal Privacy Commissioner ruled it was not substantially similar to PIPEDA. On October 6, 2003, Bill 38 passed Third Reading in the legislature and will come into force on January 1, 2004.

Costs of Information Systems

The costs of implementing health information systems are significant. One report from the AC Group notes that the costs associated with the purchase and implementation of an electronic medical record (EMR) system range from \$15,000 to \$30,000 US per physician (\$20,000 to 40,000 CAD).⁷⁵ Another survey from the US estimates the costs of an EMR system per provider as follows:

- Software costs: \$1,600 per year
- Support and maintenance costs: \$1,500 per year
- Hardware costs with a 3 year life span: \$6,600
- Implementation: one time costs of \$3,400⁷⁶

Converting these figures to Canadian dollars, the table below illustrates what the costs would be over a five-year period. Over five years, the average annual costs per physician are \$8,500.

⁷³ Richard Rosenburg UBC Health Information in Canada: Can Privacy be Protected?
http://www.lancs.ac.uk/depts/philosophy/conferences/cepe/accepted/rosenberg_abstract.htm

⁷⁴ Levine, Sara. Fasken Martineau, Provincial Approaches to Regulating Health Care Privacy: An Overview, September 23, 2002.

⁷⁵ ACG 2002 Annual Report Computer Systems in the Physician's Office Electronic Medical Records
<http://www.allscripts.com/ahcs/Executive%20Summary%20-%20EMR%20white%20paper1.pdf>

⁷⁶ A Cost Benefit Analysis of Electronic Medical Records in Primary Care, Samuel Wang et al; 2003 Excerpta Medica Inc. American Journal of Medicine, 2003; 114: 397-403.

Table 6					
Costs of EMR System (per physician in 2002 CAD Dollars)					
	Base/Average				
	1st year	2nd year	3rd year	4th year	5th year
Software (annual license)*	\$2,100	\$2,100	\$2,100	\$2,100	\$2,100
Implementation* (one time)	\$4,500				
Support and Maintenance*	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Hardware (3 year life cycle)	\$8,700			\$8,700	
Total:	\$17,300	\$4,100	\$4,100	\$12,800	\$4,100
5 year total					\$42,400
* Rounded to nearest hundred					
Yearly average over 5 years: \$8.500					

These are significant expenses, however, the net benefits may outweigh the costs. A recent US article on EMRs notes that paper records are estimated to cost approximately \$8 per record per year to maintain, while electronic records can be maintained for \$2 to \$3 per year.⁷⁷ Another survey from the US states that the net benefit from using an EMR over a 5-year period is \$86,400⁷⁸. Of this amount, drug expenditures made up 33% of total savings and 17% came from decreased radiology utilization.

Although there are potential savings with EMRs, it is important to realize, as stated in the previous survey, that for the majority of physicians a large portion of the savings from improved utilization will accrue to the payor (i.e. government), not the practice. It notes, therefore, that payors should offer incentives for providers to use an EMR to control costs. It also recommends that due to quality and cost benefits, EMRs should be used in primary care, and incentives to accelerate their adoption should be considered.⁷⁹

The BCMA believes the adoption of EMRs province-wide, along with their integration with prescription and laboratory systems, will improve patient care in BC. For widespread adoption to occur, however, there must be a coordinated strategy, which includes government funding for their implementation in physician offices.

Other Challenges to the Implementation of Health IT Systems

Aside from privacy and funding, there are other challenges that need to be overcome to help facilitate the implementation of health IT systems. One challenge is the perception among Canadian physicians about IT usefulness. As the table below illustrates, Canada has the lowest percentage of physicians, among five countries surveyed, which believe electronic prescribing of drugs (35%) and EMRs (43%) are very useful.

⁷⁷ "The Benefits of Using and EMR: Return on Investment <http://www.e-mds.com/emds/benefits/benefits.html>

⁷⁸ A Cost Benefit Analysis of Electronic Medical Records in Primary Care, Samuel Wang et al; 2003 Excerpta Medica Inc. American Journal of Medicine, 2003; 114: 397-403.

⁷⁹ Ibid.

Table 7 Physician Perception of “Usefulness” of Electronic Information					
	Percent saying “very useful”				
	UK	New Zealand	Australia	US	Canada
Electronic prescribing of drugs	90	57	55	42	35
Electronic patient medical records	68	49	43	48	43
Source: 2000 International Health Policy Survey of Physicians; Commonwealth fund/Harvard/Harris					

This demonstrates that there is a role that governments and medical associations can play in conveying the usefulness of IT. Once informed about the benefits of EMRs, physicians are more likely to adopt them.⁸⁰

Another challenge to the introduction of EMRs is the lack of common standards.⁸¹ EMR standards are deficient in a number of areas, including medical vocabulary, common identifiers, data exchange, and security. Standards are also lacking for system interfacing and inter-operability. This latter deficiency is especially troublesome because the underlying technology and infrastructure for an EMR must allow for the communication between systems. Until a proper level of integration is achieved, the paper record will remain the most complete information system.

Other challenges to be resolved for the development of a health IT infrastructure include:

- *Developing a health network architecture* – overall there are many systems, each addressing specific aspects of health care delivery like acute care or pharmaceuticals. These systems must interact within a secure environment.
- *Lack of policies on key issues* - the development of key policies central to adopting EMRs has not kept pace.
- *Limited training* - as noted in a December 2000 Infrastructure Tactical Plan by Health Canada, limited skills in the use of electronic information and technology, are barriers to the implementation of electronic records⁸²
- *Fear about how patient information will be used*
- *Fear erosion of clinical and professional autonomy*

⁸⁰ In the CMA’s 2002 Physician Resource Questionnaire more than three-quarters (76%) of physicians said improving how patient information is shared is an important or very important potential benefit of electronic patient records (EPRs). In addition sixty-eight percent indicated that improvements to clinical processes or workflow efficiency – and improvements to continuity of care – are important or very important potential benefit.

⁸¹ A standard is a clearly defined and agreed-upon convention for the operation and behavior of specific computing functions, formats, and processes

⁸² Office of Health and the Information Highway, Health Canada, P/T Advisory Committee on Health Infrastructure Blueprint and Tactical Plan for a pan-Canadian Health Infrastructure, A Report on F/P/T Collaboration for the Planning of the Canadian Health Infrastructure, December 2000 http://www.hc-sc.gc.ca/ohih-bis/available/plan/plan_e.html, July, 2001

5. Recommendations

The following section outlines 22 recommendations to facilitate the development of a health IT infrastructure for BC and to overcome the key challenges of implementing IT systems. A review of these challenges is summarized in the table below.

Table 8 Key Challenges to Implementing Health IT Systems	
1.	Ensuring the privacy and security of patient information in an electronic environment
2.	Significant costs involved to implement and maintain IT systems
3.	Creating incentives for health professionals to adopt Information Systems
4.	Assembling evidence to demonstrate the effectiveness and usefulness of IT systems
5.	Developing common standards for IT systems, particularly Electronic Medical Records
6.	Improving integration among various information systems
7.	Ensuring the clinical and professional autonomy of health professionals
8.	Enhancing the patient-physician relationship in an electronic environment
9.	Enhancing IT training opportunities available for health care professionals
10.	Ensuring practising physicians, representative and accountable to their professional colleagues, have input into the development of IT systems

The 22 recommendations advocated by the BCMA are listed under the following categories:

1. Practising Physician Input
2. Privacy of Patient Information
3. Pharmaceutical Information System
4. Decision Making Support
5. Compatibility / Connectivity
6. Electronic Medical Summary (e-MS)
7. Role of the Private Sector
8. Funding
9. Evaluation

1. PRACTISING PHYSICIAN INPUT

The successful implementation of the recommendations presented in this paper will require the active participation of all major health care stakeholders including physicians, Health Authorities, government and the private sector. The BCMA believes that IT initiatives such as PharmaNet, PathNET and EMRs

Recommendation 1

That practising physicians, representative of and accountable to their professional colleagues, be integrally involved in the development of health information technology for BC.

must be coordinated on a provincial basis and be part of province-wide service plan. Such coordination requires meaningful provider input at all levels. Unfortunately, physician input into the design and implementation of new IT initiatives has been lacking. The recent Information Management/Information Technology (IM/IT) workshop hosted in conjunction with the BCMA in September of 2003 was a positive first step for the BC government; however, more effort is required to engage practising physicians. In one survey, 84% of doctors in Canada stated they are not satisfied with the input they have into the direction of the public health care system.⁸³

With respect to health IT, practising physicians, representative of and accountable to their professional colleagues, must be involved in the development of:

- Federal, provincial and regional health information strategies and plans
- Standards, procedures, legislation and safeguards to protect patient health information, including necessary authentication and authorization mechanisms
- Evaluation criteria for IT projects
- Structural incentives to promote adoption of IT; including a joint national and provincial funding strategy
- A province-wide Electronic Medical Summary (e-MS)

1(a) PROVINCIAL HEALTH IT (HIT) COMMITTEE

There must be a greater level of cooperation among government, practising physicians and the Health Authorities. The BCMA recommends the establishment of a provincial Health Information Technology (HIT) Committee to oversee IT initiatives. The provincial HIT Committee, comprised of practising physicians, representatives from the Ministry of Health and the College of Physicians and Surgeons, and the Health Authority Chief Information Officers (CIOs), would report directly to the BC Health Leadership Council.⁸⁴ Along with developing a joint IT strategy, this committee could identify a specific amount of funds for investment in EMRs and IT, in general. Another function of the HIT Committee would be to identify opportunities where providers can obtain the necessary education and training required to effectively utilize health information systems.

Alberta took the lead in this regard when a semi-independent IT body, We//net, was created as part of the AMA/Alberta Health and Wellness Memorandum of Understanding in 1997. We//net is a joint initiative of Alberta Health, IBM, and health-system stakeholders designed to develop and implement a health information network across the province.⁸⁵

An independent, collaborative Health IT (HIT) Committee consisting of practising physicians and representatives from the Health Authorities would allow for greater physician input and province-wide planning. This is critical for the development of an integrated provincial health IT network.

⁸³ Pollara 2000

⁸⁴ The Leadership Council consists of the 6 Regional Health Authority (RHA) CEOs and the Deputy Minister of Health.

⁸⁵ The Alberta Medical Association, the College of Physicians and Surgeons of Alberta and the College of Family Physicians of Canada (Alberta Chapter) are constituent members of a medical advisory group for the We//net initiative.

Recommendation 2

That the BC government establish a Health Information Technology (HIT) Committee to develop a provincial health IT strategy. The HIT Committee should report to the Leadership Council and include practising physicians, representative of and accountable to their professional colleagues, the Ministry of Health, the College of Physicians and Surgeons of BC, and Health Authority Chief Information Officers (CIOs).

New IT funding, beyond that allocated to the Health Authorities as part of their budgets, should be governed by the HIT Committee under the authority of the BC Leadership Council. Currently, the BC government provides \$4.5 billion in health funding to the Health Authorities. If a 3% target is used, this would equate to approximately \$135 million per year. In Alberta,

administrative expenses for We//net were equal to \$1.5 million for 2001/02.⁸⁶

The BCMA believes that a provincial HIT Committee would be in a much better position to implement necessary system changes. Creating a transparent and open process can only serve to enhance accountability.

1(b) HEALTH AUTHORITY IT COMMITTEES

The recent health governance changes in BC have made it more difficult to ensure adequate practising physician input. In BC there are currently six Health Authorities, including five regional authorities and a Provincial Health Services Authority, which oversees the coordination and delivery of provincial programs and highly specialized health care services (e.g. BC Cancer Agency). The larger and more dispersed regions require new input structures that have not yet been established.

Similar to a provincial committee, the BCMA advocates that health information technology (HIT) committees be established at the Health Authority level. These regional HIT committees would address local practising physician priorities such as the implementation of hospital systems and their integration with physician offices.

Recommendation 3

That Health Authorities establish regional Health Information Technology (HIT) Committees, which include practising physicians representative of and accountable to their professional colleagues, and the Health Authority Chief Information Officers (CIOs), reporting to the Health Authority Medical Advisory Committee (HAMAC).

These committees should be composed of local practising physicians, and the Chief Information Officer (CIO) for the Health Authority and report directly to the Health Authority Medical Advisory Committee (HAMAC). Along with identifying IT education and training opportunities for health care providers, these committees could facilitate links with physician IT leaders in the region's communities. The Health Authority and Provincial HIT Committees would interact with each other by having common representatives, including a CIO and at least one practising physician, on both committees.

⁸⁶ http://www.health.gov.ab.ca/public/document/AR01_02/financials.pdf , Alberta Ministry of Health & Wellness, Consolidated Financial Statements, March 31, 2002

2. PRIVACY OF PATIENT INFORMATION

The BCMA supports the use of IT that improves patient care by giving health care providers access to appropriate information in a timely and secure manner. Improving access to health information, however, should not come at the cost of sacrificing the privacy rights of the individual patient.

Without confidence that their privacy will be maintained, patients may refrain from disclosing critical information, may refuse to provide their consent to use personal health information for research purposes, may lie about health status, or may simply not seek treatment.⁸⁷ A 1999 survey by the CMA found that 11% of the public held back information from a health care provider because they were concerned about whom it would be shared with, or for what purposes it would be used.⁸⁸ In a 2003 BCMA survey on information systems, 81% of doctors identified the unauthorized use of patient data by third parties as a very important concern.

In BC most health care bodies, including hospitals, the Medical Services Plan, PharmaNet and the Ministry of Health, are subject to the privacy protection measures contained in British Columbia's public sector privacy legislation, the *Freedom of Information and Protection of Privacy Act* (FOIPPA, 1996). Prior to January 1, 2004, no privacy legislation covered private sector health care, including physicians' offices. Thus, when a physician in their office provided patient care, the information was not protected by FOIPPA.⁸⁹ Instead, "*The Privacy Code for Private Physicians' Offices*", developed jointly in 1998 by the College of Physicians and Surgeons of British Columbia and the BCMA, protected the privacy of personal information in physician offices.⁹⁰

Although the College's Privacy Code has served physicians and patients well, new privacy legislation came into effect January 1, 2004. The BC government has taken a positive first step in protecting privacy by introducing *Bill 38: The Personal Information Protection Act* (PIPA).

PIPA is a more workable solution than the federal government's *Personal Information Protection and Electronic Documents Act* (PIPEDA)⁹¹. PIPA will require all private sector organizations, including doctor's offices, to comply with rules regarding the collection, use and disclosure of personal information, consent, as well as access to information and security.

Under PIPA (Bill 38), physicians may be found liable if a third party gains unauthorized access to patient records. Recently, the Canadian Medical Protective Association (CMPA) warned that doctors who do not comply with new privacy legislation face increased medico-legal risk and that physicians are responsible for protecting the confidentiality and integrity of records whether in paper or electronic form.⁹² Physicians, therefore, should take reasonable steps to ensure data stored and transmitted electronically is protected from access by unauthorized individuals.⁹³

⁸⁷ Levine, Sara. Fasken Martineau, "Provincial approaches to regulating health care privacy", September 2003

⁸⁸ Canadians Perceptions of Health Information Confidentiality, Canadian Medical Association/A ngus Reid Survey, 1999 (<http://www.cma.ca/advocacy/news/1999/survey.htm>)1,500 Canadians.

⁸⁹ http://www.legis.gov.bc.ca/cmt/36thparl/priv_ps/reports/report010320.htm#employee

⁹⁰ A copy of the CPSBC Privacy Code for Physician Offices can be found at: <http://www.cpsbc.bc.ca/policymanual/p/p5.htm>

⁹¹ For more information see BCMA Policy Backgrounder Privacy Legislation in BC's Health Care System. http://www.bcma.org/public/news_publications/publications/policy_backgrounders/PrivacyLegislation.asp

⁹² CMPA: On the Record, Number 1, September 2002

⁹³ For more on this see BCMA Policy Backgrounder on the Electronic Transfer of Patient Records

The College of Physicians and Surgeons of British Columbia has developed specific requirements for computerized medical records, which should serve as a guide. These requirements include: (1) authenticity and credibility of health information, (2) confidentiality and security of access, (3) security of data over time, and (4) reliability of health information. Johns Hopkins University has also developed guidelines for protecting electronic records, which include compliance with the guidelines and requirements for the privacy, security and confidentiality of medical records as required by legislation, development of internal security and privacy policies, and educating employees about the importance of protecting patient privacy.⁹⁴ A list of these policies and the College requirements are outlined in Appendix C of this paper.

The BCMA recommends that, as a condition of obtaining IT funding, physicians have a privacy plan in place outlining specific security controls. The development of these controls should be part of a "Privacy Toolkit" that could be distributed to physicians outlining a strategy to protect patient information while satisfying legislative requirements. A 2002 survey conducted by the Canadian Institute of Chartered Accountants (CICA) found that more than 80% of small and medium sized businesses, which includes physician offices, were unaware about upcoming privacy legislation.⁹⁵ This "Privacy Toolkit" should be developed jointly by the BCMA, the BC College of Physicians and Surgeons, and the Office of the Information and Privacy Commissioner.

Recommendation 4

That a "Privacy Toolkit" be developed jointly by the BCMA, the BC College of Physicians and Surgeons, and the BC Office of the Privacy Commissioner outlining a strategy to protect patient information within physician offices that meets legislative requirements.

Many physician practices do not have the capability to receive prescription, laboratory or diagnostic information. Results from the CMA's 2002 Physician Resource Questionnaire indicate that only 38% of physicians using EMRs alone or with paper records receive data (i.e. prescription

information) directly into their records.⁹⁶ One of the reasons for this low number is the lack of guidelines dealing with the electronic transfer of health related information. There are insufficient security standards in place in BC to ensure the validity of patient information sent electronically.

Complete guidelines dealing with the electronic transfer of prescriptions and other health related information need to be developed. Physicians could be subject to a College complaint or civil action if privacy is breached. Examples of such guidelines are seen in a 1996 report by a Canadian Internal Task Force, which outlines various principles for the transmission of prescriptions⁹⁷. The

⁹⁴ Sources: Johns Hopkins University Information Security Institute; American Health Information Management Assn http://www.ama-assn.org/sci-pubs/amnews/pick_01/tesa0129.htm, . For full listing of John Hopkin's guidelines for protecting electronic records is provided in appendix G.

⁹⁵ Buckler, Grant. "Firms need to rethink handling of customer data", August 14, 2003. Globe and Mail.

⁹⁶ Shelly Martin, What paperless office? Pulse, CMAJ July 23, 2002; 167 (2) at <http://www.cmaj.ca/cgi/content/full/167/2/182-a>

⁹⁷ These five principles include: 1) The process must maintain patient confidentiality; 2) The process must be able to verify the authenticity of the prescription; 3) Accuracy of prescription must be validated, including mechanism to prevent forgeries; 4) The process must incorporate a mechanism to prevent diversion, so that the prescription authorization cannot be transmitted to more than one pharmacy; and 5) Patient choice must be protected; patient must determine the practitioner to receive the prescription authority. From National Association of Pharmacy Regulatory Authorities. Report on the Transfer of Authority to fill prescriptions by electronic transmission at <http://www.napra.org/practice/information/electronic.pdf>. This task force was appointed by the Inter-Provincial Regulatory Committee.

provincial Health Information Technology (HIT) Committee, as outlined earlier, should develop electronic transfer guidelines that preserve doctor-patient confidentiality.

Although privacy is important in physician offices, it is equally important in other health care settings such as hospitals. Privacy and security of health information in hospitals is lacking, as seen in a recent Priva-C survey⁹⁸. In another survey, 15% of Canadian hospitals had a serious breach of computer security in 2002, while 57% had employees who often bypass security systems because they are too cumbersome.⁹⁹

Recommendation 5

That the provincial Health Information Technology (HIT) Committee develop electronic transfer guidelines that preserve doctor-patient confidentiality.

To deal with such concerns, the government should devise a strategy to ensure hospitals and other health care institutions in BC have measures in place to adequately protect health information. This will require the BC Office of the Information and Privacy Commissioner (OIPC) to play a greater role.

As noted by the BC Freedom of Information and Privacy Association (FIPA), the budget of the OIPC was recently cut by 35%.¹⁰⁰ A press release from the BC Office of the Information and Privacy Commissioner (OIPC) states that continuing cuts to the Office's budget have compromised its ability to act as a watchdog over access and privacy rights in BC.¹⁰¹ More recently, in an October 2003 submission to government, the BC OIPC states that the office can no longer perform all its statutory responsibilities and that it requires additional funding.¹⁰²

Recommendation 6

That the BC Office of the Information and Privacy Commissioner be sufficiently funded to ensure Health Authorities and providers are fully informed about their privacy responsibilities and are able to comply with relevant privacy legislation.

This insufficient funding represents a major concern given the increased responsibilities that the OIPC will oversee when *The Personal Information Protection Act (PIPA)*, comes into effect.¹⁰³ The BCMA recommends that the budget of the

BC OIPC be increased to ensure Health Authorities and providers are informed about their privacy responsibilities and are able to comply with relevant privacy legislation.

⁹⁸ February 2003 Canadian Hospital Privacy Survey by Priva-C (100 hospitals) that assessed hospital compliance with the CSA Model Code for the Protection of Personal Information. From the survey, only 45% of hospitals had a privacy officer or person specifically responsible for information privacy in the organization. Furthermore, only 50% of hospitals stated that they had a written privacy policy; only 33% of hospitals said they had a privacy training program; and only 27% of hospitals with a web site have a privacy policy available online

⁹⁹ Jerry Zeidenberg Hospitals underspending on latest technology, study shows. Canadian Healthcare Technology magazine <http://www.globetechnology.com/servlet/ArticleNews/einsider/LAC/20020531/TSHOSP2/techStrategies>

¹⁰⁰ News Release, New Lan A Big Leap for Privacy Rights in BC, but government must fund it adequately, http://fipa.bc.ca/library/News_Releases/20003.05.02-LegalLeap.txt

¹⁰¹ May 29, 2003 Press Release also notes that BC's OIPC had six times the caseload of Alberta's OIPC in 2000/01, yet only 83% of Alberta's budget. In June of 2003, Alberta's OIPC's budget for balance of 2003-04 was also increased by \$574,000 in anticipation of its new Privacy Legislation.

¹⁰² Special Funding Request for 2003-2004 (Personal Information Protection Act): Submission to the Select Standing Committee on Finance and Government Services, October 24, 2003. http://www.oipc.bc.ca/new/PIPAAbdgtreq20032004_102403_final.pdf

¹⁰³ Along with additional responsibilities section 36 (10) of PIPA gives the OIPC the mandate to inform the public about the legislation. In this document the Privacy Commissioner expects at this time to request some \$500,000 in funding for fiscal year 2004-2005 for administration of PIPA, with that amount not being found within the OIPC's budget allocation for existing responsibilities under the FOI Act.

2(a) PATIENT CONSENT

The issue of patient consent is addressed in all major privacy legislation whether the federal government's *Personal Information Protection and Electronic Documents Act* (PIPEDA) or BC's *Personal Information Protection Act* (Bill 38). Consent is also one of ten principles of the Canadian Standards Association (CSA) Model Code.¹⁰⁴

The BCMA believes express consent, whether verbal or written, should not be required during the course of providing direct patient care or for billing purposes. In such cases consent should be implied. For research purposes, however, express consent should be required. Such a position is consistent with public opinion. As noted in a recent article in the British Medical Journal (BMJ), patients in one study did not want the obtaining of consent to detract from the reason for their appointment.¹⁰⁵

Concerns with PIPEDA

As it relies largely on express consent, the BCMA is concerned with the federal *PIPEDA*. Recent indications suggest that the Office of the Federal Privacy Commissioner may interpret the application of *PIPEDA* to the health sector to require express consent for every episode of care. Requiring patient consent during every patient encounter would pose a significant burden on physicians already working on average over 70 hours per week.¹⁰⁶

The Ontario Medical Association (OMA) notes a requirement of express consent for every single episode of care will mean a significant portion of physician time will be spent obtaining consent from patients and that the need for consent to exchange information between providers for patient care will create enormous systematic barriers, resulting in delays, increased costs and the duplication of services.¹⁰⁷ The OMA is doing a fiscal impact on the practice of medicine if PIPEDA were implemented. Initial results show an overall increase in waiting times and costs to the health care system.

Although the BCMA supports the need for consent to the collection, use and disclosure of personal health information, consent, as stated by the OMA, must be operationalized to not unduly constrain the ability of health care providers to provide care. In some limited circumstances,

Recommendation 7

That an effective strategy be developed, which addresses the issue of patient consent for the collection, use, and disclosure of health information. This strategy should use implied consent for direct patient care and billings, while information for research purposes should require express consent.

¹⁰⁴ The CSA Model Code forms the basis of most federal and provincial legislation passed since 1996 and establishes a minimum standard for the protection of personal information. The Model Code is based on 10 principles including: accountability, purpose, consent, collection of data, storage, use and disclosure, accuracy of information, safeguards, openness, access and compliance.

¹⁰⁵ Patient consent preferences for research uses of information in electronic medical records: interview and survey data, Willison et al BMJ Volume 326, 15 February 2003.

¹⁰⁶ Janus Project Survey 2001.

¹⁰⁷ Letter to Ministers of Industry and Health Re: Application of federal privacy legislation at <http://www.oma.org/phealth/OHA-OMALetter06-23-03.pdf>

exemptions to express consent are warranted to ensure the effective delivery of care.¹⁰⁸

Although any application of PIPEDA should not involve express consent for direct patient care, it is appropriate that written consent be required for research purposes. Unlike PIPEDA, the current BC *Personal Information Protection Act* (PIPA) allows organizations to disclose, without the consent of the individual, personal information for research purposes under certain conditions¹⁰⁹.

2(b) PHYSICIAN AS CUSTODIAN OF PATIENT INFORMATION

Maintaining and updating personal health records is an essential component of the doctor-patient relationship. Although the patient ultimately owns personal health information, physicians act as accountable custodians of medical information they collect, protecting its disclosure through appropriate consent.

For the most part, general practitioners (GPs) are required to keep more comprehensive and longitudinal records of their patients, as they are the main first point of contact with the health care system.¹¹⁰ The College of Family Physician of Canada (CFPC) notes “80% of a patient’s lifetime longitudinal health record resides with the GP”.

Recommendation 8

That the role of physician, as primary custodian and with responsibility for stewardship of patient data, be maintained with the shift to electronic patient information.

The BCMA believes, as expressed by the CFPC, that responsibility for data stewardship be retained by GPs – the health professional most responsible for the coordination of care. Such a view is consistent with public opinion as seen in an Angus Reid Health

Care Information Survey (April 1999) in which patients believed that physicians should have primary responsibility for holding and controlling access to the complete medical record.

3. PHARMACEUTICAL INFORMATION SYSTEMS

In BC, PharmaNet is the system that provides patient prescription information to physicians and pharmacists electronically. In November of 1999, a pilot project was announced to connect up to 100 medical practices to PharmaNet.¹¹¹ On March 15, 2000, the Brookwood Family Practice in Langley, BC became the first Medical Practice connected to PharmaNet. Currently, there is a hundred physician practice limit until access is authorized to all medical practitioners in the province.

¹⁰⁸ Ibid.

¹⁰⁹ These conditions, as outlined in the Personal Information Protection Act, include only if: (a) the research purpose cannot be accomplished unless the personal information is provided in an individually identifiable form (b) The disclosure is on condition that it will not be used to contact persons to ask them to participate in the research, (c) linkage of personal information is not harmful to the individuals identified and benefits are clearly in the public interest.

¹¹⁰ Ipsos Reid survey August 2002

¹¹¹ For further information on PharmaNet see Section 4 of this paper.

An evaluation of PharmaNet pilot sites in 2000 indicated that:

- PharmaNet is of value to physicians
- A vast majority of patients support Medical Practice access to PharmaNet.
- Pilot project sites support the privacy and security safeguards with the exception of the need for written patient consent
- The cost of private sector software is of concern to many participants.¹¹²

Based on this evaluation, the BC Medical Practitioners Working Group recommended PharmaNet be extended to all physician offices subject to the resolution of the requirement for written patient consent versus alternative confidentiality protections.¹¹³

Recommendation 9

That the BC government ensure that all practising physicians in the province be provided electronic access to patient prescription data without charge to the physician.

Physicians have indicated that access to PharmaNet is a useful service. The purchase and maintenance of computer equipment, training and connectivity, however, adds significant costs to physicians.

In BC, ongoing software and hardware costs are borne by the physician. This is unacceptable and not a practical or realistic approach to implementing a province-wide integrated information system. In a 2003 BCMA survey on information systems, 87% of physicians believed that PharmaNet should be expanded to all physician practices in BC, while 90% stated that doctors should not have to pay to use the service, as is currently the case.¹¹⁴

The extension of PharmaNet into hospitals and physician offices presents new privacy and enforcement challenges that need to be addressed. An August 30, 2001, article in the Vancouver Sun notes that five pharmacists were disciplined and fined \$5,000 to \$10,000 by the College of Pharmacists of British Columbia for inappropriately accessing the medication records of colleagues, relatives and friends.¹¹⁵

Although PharmaNet users sign confidentiality agreements prior to being granted access and provide unique identifiers when logging into the system, this does not guarantee the privacy of patient information. One mechanism that can provide further security is when patients place a keyword on their profile, thus, limiting access to individuals with whom the patient shares the keyword. As of October 2001, only 1500 British Columbians had added a keyword to their account. This limited number of people is largely due to citizens not being aware that such a security provision exists.

Recommendation 10

That the security and privacy of electronic prescription information be protected through appropriate safeguards such as auditing systems and patient keywords.

¹¹² Medical Practice Access to PharmaNet, (2001) <http://healthnet.hnet.bc.ca/catalogu/mpppic/mpapfinal.pdf> Published July 11, 2001.

¹¹³ Ibid.

¹¹⁴ In this survey, 72% of respondents believed a province-wide system of PharmaNet would reduce medication costs; over 9% said it would reduce adverse drug reactions and medication errors, while 89% believed it would improve the overall quality of care.

¹¹⁵ Fayerman, Pamela. Take comfort in exposure of druggists, minister says Vancouver Sun. *Vancouver Sun*-- August 30, 2001

4. DECISION MAKING SUPPORT

Decision making support is critical for the success of IT systems as it allows the recall, process and organization of medical knowledge that otherwise may be missed during a clinical encounter. As the current body of medical knowledge is vast and ever changing, it is difficult for physicians to keep up to date on everything, particularly under current working conditions.¹¹⁶

Decision support tools, such as drug-allergy reminders and clinical practice guidelines, provide physicians with information that can reduce medical errors and improve the overall quality of care. As noted by author Robert Weaver, computer technologies that contribute to the knowledge explosion can also be used to bring information under control and help practitioners use it more effectively. A study in the CMA Journal (2003) also found that the number of potentially inappropriate prescriptions issued by primary care physicians was 18% lower for doctors with access to computerized decision-making support.¹¹⁷

Recommendation 11

That decision support tools, which facilitate the physician's clinical decision-making process, be an integral component of information systems and encouraged wherever possible.

Decision Support tools offer opportunities for physicians to more effectively use medical knowledge and make informed decisions, while improving patient care and controlling medical costs.¹¹⁸ Decision Support tools should be integral parts of information systems and encouraged wherever possible.

5. COMPATIBILITY / CONNECTIVITY

Any new IT applications such as prescription, lab or diagnostic systems should be part of a wider strategy that includes Electronic Medical Records (EMRs). Standards that ensure the compatibility and connectivity of systems are critical. Health Authorities should not proceed unilaterally in this respect. As stated by Canada Health Infoway, *“technological alignment and a set of common standards will be critical to reducing costly duplication and enabling the integration and interoperability of existing systems.”*¹¹⁹

A provincial strategy should be developed to ensure the integration of IT systems. In the future, EMRs in physician offices should be able to integrate with outside health information including hospital-based systems, diagnostic and prescription information and lab results. Hospitals should be able to send patient discharge summaries and other relevant clinical information electronically to physician practices. This data, integrated with the development of an EMR within physician offices, should improve the overall quality of medical care.

¹¹⁶ According to latest figures from the CFPC Janus Project Survey, the average GP in BC is working over 70 hours per week including on-call.

¹¹⁷ Tamblyn, Robyn et al. “The medical office of the 21st century (MOXXI): effectiveness of computerized decision-making support in reducing inappropriate prescribing in primary care”. CMAJ September 16, 2003; 169 (6).

¹¹⁸ Weaver, Robert. “Resistance to Computer Innovation: Knowledge Coupling in Clinical Practice” at <http://www.pkc.com/papers/innovation.pdf>

¹¹⁹ Infoway Newsletter, Winter 2003, Volume 01, number 01.

Although the BCMA supports the integration of health IT systems, it opposes the concept of a central repository where identifiable patient information generated in physicians' offices would be stored, and

potentially accessed by third parties such as Health Authorities and government. Inappropriate access or misuse of information would undermine the patient-physician relationship. The Office of the Privacy Commissioner of Canada has stated that having all health information including doctor and hospital visits, prescription, and lab tests in a central repository would significantly undermine privacy rights.¹²⁰

Recommendation 12

That health IT systems be developed which integrate physicians, hospitals, and long-term care facilities through an Electronic Medical Record (EMR).

6. ELECTRONIC MEDICAL SUMMARY (e-MS)

The Electronic Medical Summary (e-MS) project underway in the Vancouver Island Health Authority (VIHA) has received \$2.3M in funding from the provincial government through the Primary Health Care Transition Fund (PHCTF). These funds continue through March 31, 2006, at which time there exists the possibility for a province-wide roll out.¹²¹

The BCMA has expressed its support for the e-MS project, believing that the creation of a complete electronic repository of all health-related information on an individual across all sectors of the health care system is, in the short or medium term, problematic due to privacy issues, financial costs and technological barriers.

A comprehensive Electronic Health Record (EHR) potentially creates information overload and the usefulness of such an extensive health record is questionable. Providers cannot reasonably be expected to extract relevant data from a complete electronic medical history in a realistic amount of time. It is also impractical and costly to convert a patient's entire health record into electronic form.

The e-MS proposed by the BCMA is based on the Cumulative Patient Profile (CPP) as advocated by the College of Physicians and Surgeons of BC under its Committee on Office Medical Peer Assessment (COMPA). The CPP contains a summary of key medical information such as medications, allergies, a problem list and past medical history.

The e-MS represents a method to integrate medical information while ensuring privacy. It could also be used in the future to develop a more integrated EHR and standardize data collection/entry among physicians.

¹²⁰ Thompson, Allan. Toronto Star, "Patients' privacy rights threatened, watchdog warns" November 29, 2002. http://www.privacy.com/privacyhorizon/v001n001/article_3_1.html

¹²¹ In its project charter, VIHA defines an e-MS as a subset of patient data suitable for communication among primary health care and other practitioners for the purpose of sharing the care of an individual. The data in the e-MS would be located in physician offices but could be transferred to other GPs, specialists, and call-group. It could also potentially be accessed by ERs.

Recommendation 13

That following a successful pilot project evaluation, the Electronic Medical Summary (e-MS) be introduced as a necessary feature of any Electronic Medical Record.

In the 2002 primary care report, *Ensuring Excellence: Renewing BC's Primary Care System*, the BCMA recommended that that an Electronic Medical Summary (e-MS) serve as the core data set for the EMR¹²². If the current e-MS pilot project being

facilitated by the Vancouver Island Health Authority (VIHA) is successful, the BCMA advocates that it be expanded province-wide and introduced as a necessary component of any EMR. The e-MS will be vital for sharing patient information, particularly among virtual practice groups.

6(a) VIRTUAL GROUPS

IT products have been designed mostly with larger physician groups in mind, however, small group or solo practices should also be able to capitalize on the latest information systems by receiving government funding.¹²³ In BC, there are still a significant number of solo practices.¹²⁴

Given the advances in IT, it is often unnecessary to locate GPs within the same physical space. Many of the advantages of group practice can be realized through the development of 'virtual' groups, separated by distance but connected through IT. The formation of virtual groups should be supported. These virtual groups could share on-call responsibilities, as well as patient information, via an Electronic Medical Summary (e-MS) as discussed above. Virtual groups are more feasible than creating large physician practices in the same location due to considerable capital and transaction costs (i.e. leases, etc.) and geographic considerations.

Recommendation 14

That incentives be developed to support virtual practice groups through the use of information systems that share relevant patient information.

7. ROLE OF PRIVATE SECTOR

The private sector dominates the provision of electronic health (e-health) information. An example of a private sector initiative is PathNET, which involves two private laboratories providing the electronic delivery of laboratory information to authorized caregivers.¹²⁵

Recommendation 15

That the private sector continue to play an integral role in the development and implementation of health IT initiatives.

The private sector will continue to play a significant role in e-health. Given current fiscal constraints, it is appropriate to examine viable options for expanding Public-Private Partnerships (P3s) in health care that

¹²² BCMA Ensuring Excellence: Renewing BC's Primary Care System, September 2002.

¹²³ California HealthCare Foundation, ihealth reports, First Consulting Group September 2002. Achieving Tangible IT Benefits in Small Physician Practices.

¹²⁴ According to a Janus Project survey by College of Family Physicians 22% of BC's GPs work in solo practice.

¹²⁵ For further information on PathNET see section 4 of paper.

can improve access to services. There is no a priori reason to reject P3s, provided they are done within a properly regulated framework with provincially determined quality controls.

7(a) VENDOR CONFORMANCE

Private sector EMR and IT companies must be encouraged to meet specific requirements to qualify as approved vendors under any program to computerize physician offices. Thus, for a physician to be eligible for EMR or IT funding, they would have to select from a number of vendors who meet certain usability requirements. Such an approach has been taken in Alberta where the Medical Association and government, through the Physician Office System Program (POSP), published a document on Vendor Conformance and Usability Requirements (VCUR, 2003). This document outlines certain requirements that EMR/IT vendors must meet to qualify as a designated vendor.¹²⁶ Vendor requirements in the Alberta VCUR document include:

- Common functionalities (audit trail, searching capabilities, data entry)
- Billing (database pre-loaded with current fee schedule)
- Scheduling (multiple users can view and update schedule simultaneously)
- Electronic Medical Record (EMR)
 - General (ability to control access to patient specific data by physician or nurse request)
 - Demographics (single repository for demographic data)
 - Patient Access (physician authorized patient access to health records)
 - Charting (overview of recent and recurring health care encounters)
 - Lab Results (highlights abnormal test results)
 - Medications (integration with Pharmaceutical Information Network)
- Workflow, usability and ergonomics
- Access, privacy, security and technical requirements

The creation a vendor conformance document relevant to BC should be developed by the BC Health Information Technology (HIT) Committee in conjunction with a program to computerize physician offices. This document would outline minimum requirements for approved vendors in BC such as ensuring compliance with privacy legislation and the development of an e-MS.

Recommendation 16

That, in conjunction with the creation of a program to computerize physician offices, the BC Health Information Technology (HIT) Committee establish minimum requirements for health IT vendors operating in BC.

¹²⁶ (VCUR Final Report March 2003).

8. FUNDING

There are significant costs involved in developing and implementing IT systems.¹²⁷ An article from the British Medical Journal (BMJ) estimates the costs of implementing computerized hospital information systems at ~\$50m US (\$70M CAD).¹²⁸ BC needs a significant increase in expenditures for information systems in acute and long-term care facilities. These facilities should have electronic access to laboratory, pharmaceutical and diagnostic information, as well as Computerized Physician Order Entry (CPOE) capabilities.

Recommendation 17

That the BC government mandate in their performance agreements that Health Authorities spend a minimum of 3% of their budgets on IT systems and fund them accordingly. Decisions regarding IT spending that impact medical practice must be approved by the Health Authority Medical Advisory Committee (HAMAC).

The BCMA recommends that the six Health Authorities (HAs) devote a minimum of 3% of their total budgets to IT systems, and that government fund them accordingly. This figure is derived from a survey of hospital IT managers who state that between 3-5% of their operating budget should be directed towards information

systems to ensure they work effectively.¹²⁹ This will require BC Health Authorities to spend at least \$185M on IT for 2003/04. The BC government must ensure that Health Authorities are adequately funded so HAs can spend 3% of their operating budgets on information systems while maintaining high quality care and not redirecting funds from other critical areas such as acute care. Decisions regarding IT that impact medical practice must be approved by Health Authority Medical Advisory Committees (HAMACs).

The Canadian Medical Association (CMA) has estimated the start-up cost of a national health information infrastructure – connecting physicians, hospitals, and long-term care institutions – at \$4.1 billion. These start up costs include an initial capital cost of \$1.6 billion, with 5-year implementation and operating costs of \$2.5 billion. On a per capita basis, the start-up capital costs would amount to approximately \$210 million for BC.¹³⁰

The BCMA recommends that the BC government, through provincial and federal funds, allocate \$210M in start-up funding over the next three years, beginning April 1, 2004, for the development of a comprehensive health information infrastructure that connects physicians, hospitals and long-term care institutions. This funding would go towards information systems that implement electronic health records (EHRs) and Computer Physician Order Entry (CPOE) systems. The \$210M could come from one or more of the following existing revenue sources:

¹²⁷ For Primary Care Demonstration Projects (PCDPs) IT costs have been estimated at between \$20k to \$40k per practising physician.

¹²⁸ Littlejohns, Peter, et al. "Evaluating computerised health information systems: hard lessons still to be learnt", BMJ Volume 326, April 19, 2003.

¹²⁹ Jerry Zeidenberg Hospitals underspending on latest technology, study shows. Canadian Healthcare Technology magazine .<http://www.globetechnology.com/servlet/ArticleNews/einsider/LAC/20020531/TSHOSP2/techStrategies>

¹³⁰ Towards an Integrated Health Care System: Presentation to Consumers' Association of Canada, Saskatoon. Dr. Peter Barrett, Canadian Medical Association, June 15, 2001. In addition, the CMA estimates yearly operating costs after the 5-year implementation period at \$830 million (~\$100M per year for BC).

- \$74 million allocated to BC through the federal Primary Health Care Transition Fund from 2002-2006.
- BC's ~\$2 billion portion of the five year \$16 billion federal Health Reform Fund between 2004/05 and 2009/10.
- \$500M in funding directed to Canada Health Infoway, started in 2000/01, of which very little has been spent.
- New federal IT funding from the 2003 First Ministers' Accord (\$600M): BC ~\$80M
- Current provincial health expenditures (i.e. ~\$10.7 billion in 2003/04)

Beyond this initial allocation of \$210M, annual maintenance costs for health IT systems in BC should be covered by Health Authority budgets.

Recommendation 18

That the BC government allocate \$210M over the next three years to advance the implementation of a health IT infrastructure for the province.

In 1991, the US Institute of Medicine (IOM) issued a report highlighting the deficiencies of paper-based medical records and advocated a movement toward electronic records. The report states that *"the current paper medical record is insufficient in content, format, accuracy, and accessibility to allow a determination of health care effectiveness and outcomes."*¹³¹ To realize the benefits of electronic records, a strategy must be formulated for the widespread introduction of an EMR in physician offices.

In a 1998 Health Information Assessment survey conducted in part by the Alberta Medical Association, physicians identified cost as the major barrier in obtaining information systems and stated that financial assistance would be the best means to facilitate the use of computers in medical practice. In the 2003 BCMA survey on information systems, 43% of physicians identified lack of funding as the main barrier to implementing Electronic Patient Records (EPRs). Most survey respondents also believed that government should pay the majority of costs for information systems within physician offices.

Physicians should not have to bear the costs of IT alone when it also benefits the health care system and improves the quality of patient care. Unfortunately, in BC there has been little financial support for the computerization of physician offices. This differs from the approach other jurisdictions such as Alberta have taken.¹³² In that province, a 2001 agreement between the provincial government and the Alberta Medical Association saw the establishment of the Physician Office System Program (POSP), with \$15 million in funding to support the purchase and integration of computers in physicians' offices. Funding was then increased to \$36.8M to cover over 2,000 physicians through 2005.

In the new Master agreement with the Alberta Medical Association, the provincial government is to provide the POSP \$65.6 million over the next three years including \$25M in 2003/04, \$20M in

¹³¹ <http://www.ama-assn.org/ama/pub/category/2901.html>, Institute of Medicine Committee on Improving the Patient Record.

¹³² Financial assistance for EMRs has been provided in a number of countries as outlined in Appendix A. Overall, EMR use is also considerably higher in those countries that provide financial assistance (i.e. Australia, Denmark, UK etc.).

2004/05 and \$20.6M in 2005/06. Each physician registered in the program will receive 48 months of funding to automate paper-based office systems.

8(a) BC Physician Office System Program

This paper proposes the establishment of a program similar to Alberta's POSP to support the computerization of physician offices in BC. Although the BCMA does not predict 100% uptake by physicians and would not make it mandatory, getting half of the physicians in the province to participate in the program over five years is achievable. This is based on the fact that in Alberta, as of October 2003, approximately 1,500 or 30% of its physicians had subscribed to the program.¹³³ The table below provides further details of a possible physician office system program for BC.

Table 9 Proposed Details of a Physician Office System Program for BC
<ul style="list-style-type: none">▪ Program to be governed by the tripartite Medical Services Commission (MSC)▪ Funding would be available to all practising physicians▪ Interested applicants would submit an application for funding.▪ Funding could go towards the following: computer systems (i.e. hardware and software costs), development of EMR, decision support tools, and training▪ To qualify for funding, physicians must register for the program and be required to meet specific requirements, such as the adoption of an EMR, over 5 years.▪ To cover some of the higher implementation costs, physicians may request to have two or three years of funding up front in their first year.▪ Participants would not be required to use any particular vendor(s). Vendor(s), however, would have to meet minimum conformance and usability requirements▪ Physicians would agree to connect to electronic prescription, laboratory, diagnostic and hospital information systems.

Cost of Proposal

Alberta's POSP program provides \$7,000 per physician per year to implement Electronic Medical Records (EMRs). A recent survey of various vendors notes that the average cost per physician per year for hardware, software and technical support for a complete EMR is \$8,400.¹³⁴ The BCMA recommends, therefore, an annual allocation of \$8,000 per physician to support IT costs in doctor offices.

Physicians who register for the program would be eligible for a total of five years in funding to a maximum of \$40,000. The table below provides an estimate of the projected costs of such a program in BC over 5 years.

¹³³ Walker, Ann. "Will physicians pay the price as family practice goes high-tech?", Medical Post. October 28, 2003 Volume 39, Issue 39. Of this amount approximately 1,000 are in level 2 of the program, which involves the implementation of electronic records.

¹³⁴ (Practice Solutions, Moving Towards and Electronic Health Care Environment; March 7, 2003).

Table 10 Costing for BC Physician Office System Program				
Year	Physician Uptake	~ Number of physicians (a)	Amount Per Year (b)	Total Amount = (a) * (b)
1 st year	10%	789	\$8,000	\$6,312,000
2 nd year	20%	1578	\$8,000	\$12,624,000
3 rd year	30%	2368	\$8,000	\$18,944,000
4 th year	40%	3156	\$8,000	\$25,248,000
5 th year	50%	3946	\$8,000	\$31,568,000
			Total:	\$94.7M

Total number of BC physicians is based on those who billed MSP for at least one service in 2002/03 (7,892). Physician uptake is based on experience in Alberta where over a two year period approximately 1000 or 20% physicians have subscribed to level 2 of their Physician Office System Program (POSP), which involves the implementation of an EMR.

Based on cost projections above, the BC government should contribute an annual amount of approximately \$19M over five years, beginning April 1, 2004, to upgrade physician offices with IT systems. Most of the financial costs could be covered by the funding the BC government is to expected to receive in new federal IT monies (see p. 38 for more details).

The benefits of such a program are clear. It would increase the use of information systems in medical practices with over 50% of physicians in BC using EMRs after five years. This would be a significant achievement.

Recommendation 19a

That the BC government allocate \$95 million over the next five years, beginning April 1, 2004, to support the computerization of physician offices including the implementation of an Electronic Medical Record (EMR).

Recommendation 19b

That any program to computerize physician offices and implement an EMR be governed by the Tripartite BC Medical Services Commission (MSC).

Along with direct funding, the BC government should look at providing other incentives for physicians to adopt IT systems. These incentives should encourage physicians to connect to province-wide IT systems such as the Internet, and pharmaceutical and lab information systems.

Recommendation 20

That the provincial government provide incentives to physicians to connect to province-wide IT systems such as the Internet, and pharmaceutical and lab information systems.

The Ministry document *Information for Health 2002/03–2006/07: A Strategic Plan for Health Information Management in British Columbia*, states that one of its strategies is to “increase access to IT for caregivers and provide Primary Care Project sites with computers and clinical information systems”. Although laudable, funding should not be limited to

Primary Care Project sites, as there are very few of these in the province and most require

physicians to adopt alternative payment models.¹³⁵ Increasing access to IT must be made available to all physicians in the province.

Early adopters and investors must not be penalized, financially or otherwise, for their commitment to IT. Therefore, full funding should be provided to those practices that have already implemented IT systems including an EMR.¹³⁶

Recommendation 21

That any new health IT funding be directed to all physicians including those physicians who have already implemented IT systems, including Electronic Medical Records (EMRs), in their practices.

9. EVALUATION

Another of the strategies mentioned in the government document *Information for Health 2002/03 - 2006/07: A Strategic Plan for Health Information Management in British Columbia* is the need to evaluate tele-health pilot projects. Although evaluation is critical for the success of tele-health, it should apply to all pilot projects including those that support IT applications such as EMRs.

Recommendation 22

That the evaluation of health IT systems be incorporated as a central component of any strategy. This includes the active piloting and evaluating of clinics that use Electronic Medical Records, prescription drug and lab information systems.

Currently, there is a lack of studies done with respect to IT systems specific to the BC context. Further evaluations and studies should be a critical part of major IT initiatives. Unfortunately, in the past there has been a lack of government evaluation with respect to major health care

initiatives. Evidence of this was seen when an earlier external evaluation of the Primary Care Demonstration Projects (PCDPs) was abandoned by the provincial government. The BCMA recommends that proper evaluation is required as a major component for future IT initiatives.

¹³⁵ Currently there are only 8 Primary Care Demonstration Projects (PCDPs) in existence. More are planned as a result of new Primary Health Care Transition Funding but the details have yet to be finalized.

¹³⁶ Alberta's Physician Office System Program (POSP) also provides funding for physicians who have already implemented IT systems and EMRs into their practices.

6. CONCLUSION

The 22 recommendations outlined in this paper will improve patient care and allow for the establishment of an integrated health IT system across British Columbia, resulting in the following benefits:

- Greater practising physician input into the development of IT systems
- Funding to support computerization of physician offices and adoption of EMRs
- Development of an Electronic Medical Summary (e-MS) to facilitate the transfer of vital patient information
- Reduced adverse drug reactions and hospitalizations through electronic ordering
- Enhanced decision-making for physicians including increased access to clinical practice guidelines and knowledge support tools.
- Greater coordination and integration of care through the sharing of patient information among health care professionals
- Increased efficiencies in delivery of care through faster access to information
- Province-wide IT planning
- Greater collaboration between major health care stakeholders
- Increased privacy and security of patient information

Although there are significant costs to the development of health IT systems, they hold enormous potential. Physician uptake in IT applications in BC has been limited due to privacy and security concerns, lack of funding, and unclear standards and legislation. The 22 recommendations advanced in this paper address these issues.

A comprehensive strategy is required that recognizes the role of the practising physician as the primary custodian of patients' health information. Legislation must address privacy and security concerns without placing an onerous burden on physician practices with respect to express consent for direct patient care.

The BC government needs to foster effective public-private partnerships (P3s) in the area of health IT. Software and hardware vendors will play a major role in the development of an IT infrastructure and in computerizing physician offices. The quality of their products must be assured by requiring specific usability requirements in order to qualify as approved vendors under any physician office system program.

The BCMA proposes the creation of a provincial Health Information Technology (HIT) Committee, reporting to the BC Leadership Council, to oversee provincial IT initiatives and to help foster greater collaboration. This committee that includes practising physicians, representative and accountable to their professional colleagues, Health Authority Chief Information Officers (CIOs), representatives from the Ministry of Health and College of Physicians and Surgeons of BC, would oversee a number of IT projects such as Vancouver Island Health Authority's Electronic Medical Summary (e-MS) initiative.

Similar HIT Committees should be established at the Health Authority level to allow for local practising physician input. These HIT committees would be comprised of practising physicians and the Chief Information Officer (CIO) for the Health Authority and report to the Health Authority Medical Advisory Committees (HAMACs).

To date, British Columbia has lagged other jurisdictions in its financial commitment to health IT. The BC government should commit \$210M over the next three years, beginning April 1, 2004, to establish an effective health IT infrastructure. The government should also allocate \$19M annually over five years to assist in the computerization of physician offices. As a priority the BC government should mandate, through performance agreements with Health Authorities, a minimum expenditure of 3% of their total budgets towards information systems.

Compatibility and integration of IT systems is crucial, as they must be able to communicate appropriately. Evaluation of information systems must be recognized as a fundamental component of any strategy including the use of pilot projects.

BC's physicians recognize the importance of IT applications such as Electronic Medical Records (EMRs), prescription and laboratory information systems. The development of effective information systems is critical for improving the quality of our health care system.

LIST OF RECOMMENDATIONS

ENSURING PRACTISING PHYSICIAN INPUT

1. That practising physicians, representative and accountable to their professional colleagues, be integrally involved in the development of health information technology for BC.
2. That the BC government establish a Health Information Technology (HIT) Committee to develop a provincial health IT strategy. The HIT Committee should report to the Leadership Council and include practising physicians, representative of and accountable to their professional colleagues, the Ministry of Health, the College of Physicians and Surgeons of BC, and Health Authority Chief Information Officers (CIOs).
3. That Health Authorities establish regional Health Information Technology (HIT) Committees, which include practising physicians representative and accountable to their professional colleagues, and the Health Authority Chief Information Officers (CIOs), reporting to the Health Authority Medical Advisory Committee (HAMAC).

PRIVACY OF PATIENT INFORMATION

4. That a "Privacy Toolkit" be developed jointly by the BCMA, the BC College of Physicians and Surgeons, and the BC Office of the Privacy Commissioner, outlining a strategy to protect patient information within physician offices that meets legislative requirements.
5. That the joint Health Information Technology (HIT) Committee develop electronic transfer guidelines that preserve doctor-patient confidentiality.
6. That the BC Office of the Information and Privacy Commissioner be sufficiently funded to ensure Health Authorities and providers are fully informed about their privacy responsibilities and are able to comply with relevant privacy legislation.
7. That an effective strategy be developed, which addresses the issue of patient consent for the collection, use, and disclosure of health information. This strategy should use implied consent for direct patient care and billings, while information for research purposes should require express consent.
8. That the role of physician, as primary custodian and with responsibility for stewardship of patient data, be maintained with the shift to electronic patient information.

PHARMACEUTICAL INFORMATION SYSTEM

9. That the BC government ensure that all practising physicians in the province be provided electronic access to patient prescription data at no expense.
10. That the security and privacy of electronic prescription information be protected through appropriate safeguards such as auditing systems and patient keywords.

DECISION-MAKING SUPPORT

11. That decision support tools, which facilitate the physicians' clinical decision-making process be an integral component of information systems and encouraged wherever possible.

COMPATIBILITY / CONNECTIVITY

12. That health IT systems be developed which integrate primary care providers, hospitals, and long-term care facilities through an Electronic Medical Record (EMR), such as pharmaceutical and laboratory information systems

ELECTRONIC MEDICAL SUMMARY (e-MS)

13. That following a successful pilot project evaluation, the Electronic Medical Summary (e-MS) be introduced as a necessary feature of any Electronic Medical Record.
14. That incentives be developed to support virtual practice groups through the use of information systems that share relevant patient information.

ROLE OF PRIVATE SECTOR

15. That the private sector continue to play an integral role in the development and implementation of health IT initiatives.
16. That, in conjunction with the creation of a program to computerize physician offices, the Health Information Technology (HIT) Committee establish minimum requirements for health IT vendors operating in BC.

FUNDING

17. That the BC government mandate in their performance agreements that Health Authorities spend a minimum of 3% of their budgets on IT systems and fund them accordingly. Decisions regarding IT spending that impact medical practice must be approved by the Health Authority Medical Advisory Committee (HAMAC).

18. That the BC government allocate \$210M over the next three years to advance the implementation of a health IT infrastructure for the province.
19. (a) That the BC government allocate \$95 million over the next five years, beginning April 1, 2004, to support the computerization of physician offices including the implementation of an Electronic Medical Record (EMR).

(b) That any program to computerize physician offices and implement an EMR be governed by the Tripartite BC Medical Services Commission (MSC).
20. That the provincial government provide incentives to physicians to connect to province-wide IT systems such as the Internet, and pharmaceutical and lab information systems.
21. That any new health IT funding be directed to all physicians including those physicians who have already implemented IT systems, including Electronic Medical Records (EMRs), in their practices.

EVALUATION

22. That the evaluation of health IT systems be incorporated as a central component of any strategy. This includes the active piloting and evaluating of clinics that use Electronic Medical Records (EMRs) prescription drug and lab information systems.

APPENDIX A

INTERNATIONAL HEALTH IT SUMMARY

United Kingdom (UK)

In the UK IT systems are widely used in primary care. As stated in a recent article of the British Medical Journal (BMJ), almost all British GPs use computer-based records.¹³⁷

In 1989 the UK Department of Health introduced a plan for the direct reimbursement of general practice computer costs tied to a process of software accreditation. The British support their commitment to primary care by using some of their general medical services funds to reimburse GPs for a range of costs, including computers. Currently, £40 to £45 million per annum (\$89M to \$100M CAD) is available in general medical services for IT, of which £12 million (\$27M CAD) is earmarked for the maintenance of current systems.

In 1996, 96% of general practices in the UK were computerised, and now about 15% run "paperless" consultations. The Department of Health target is that all clinicians have access to electronic patient records by 2008¹³⁸

In 1998, the National Health Service Information Authority (NHS IA) published *Information for Health: An Information Strategy for the Modern NHS 1998-2005* defining a national strategy for IT. The objectives of the program included using funds for technology more efficiently while providing 24-hour access to patient records through the implementation of a longitudinal electronic health record (EHR). The NHS IA estimated that the first seven years of implementation would require an investment of approximately \$2.5 billion (CAD).¹³⁹

The 1998 strategy stated that by 2005 they intended to have:

- all GP practices connected to NHSnet to provide appointment booking, referrals, radiology and lab results in all parts of the UK. Currently, approximately 97% of GP practices are connected to NHSnet;
- community prescribing with electronic links to GPs and the Prescription Pricing Authority;
- a National Electronic Library for Health accessible through local intranets in all NHS organizations;
- the full implementation of EHRs at the primary care level;
- all acute hospitals with Level 3 electronic patient records;
- the electronic transfer of patient records between GPs; and
- 24-hour emergency care access to patient records.¹⁴⁰

¹³⁷ Benson, Tim. "Why general practitioners use computers and hospital doctors do not – Part 1: incentives", BMJ 2002; 325:1086-1089 (9 November 2002)

¹³⁸ Ibid.

¹³⁹ Environmental Scan – Alberta POSP Document.

¹⁴⁰ Protti, Denis. "Question: What Might Canada Learn from the UK? Answer: Commit, Commit, Commit, Electronic Health Care", Volume 1 <http://www.longwoods.com/eh/eh11/eh11pd.html>

The National Health Service (NHS) spent approximately £1 billion on IT in 1998-99¹⁴¹. In July 2000, the British government released its *NHS Plan* - a ten-year plan to reform and reinvest in the health care system. This plan included a £250 million (\$558M CAD) investment in IT, and a promise that 75% of hospitals and 50% of primary care trusts have electronic patient record systems by 2004.¹⁴²

Despite these significant investments, the Wanless report (2002) called for an immediate doubling of expenditure on health IT from £12 billion (\$27 billion CAD) over five years¹⁴³. In response, the UK's labour government is to boost spending on NHS information systems by £5.3 billion, (\$12 billion CAD) over three years.

Currently, the key document outlining much of the new reforms in IT in the UK is *Delivering 21st Century IT Support for the NHS: National Strategic Programme*. This strategy, to be completed by 2008, has four parts including to implement:

- A broadband network linking healthcare providers - a £45 million upgrade to the NHSnet for hospitals, GPs and NHS trusts was recently announced.
- Electronic prescriptions - Partnerships have been created with the private sector to conduct three pilot trials.
- Electronic bookings of appointments – will allow patients to book appointments with specialists of their choice, and to change appointments when needed.
- National EHR - The first generation of a national, electronic patient record is expected to appear by the end of 2005. A full system is expected by 2008¹⁴⁴.

As stated in an article by Professor Denis Protti, the areas in which Canada has the most to learn from the UK are in their commitment to planning, funding, primary care, the Internet, standards and electronic records.¹⁴⁵ Details of the UK's specific health IT initiatives are outlined in the table below.

¹⁴¹ Brian McAvoy, *Models of Primary Health Care: The UK Experience*, http://www.drsorg.au/new_doctor/74/mcavoy.html

¹⁴² *The NHS Plan: A plan for investment, A plan for reform* Accessed from: <http://www.nhs.uk/nationalplan/npch4.htm>

¹⁴³ The Economist, "Computerising the NHS: The health service's IT problem", October 17, 2002.

¹⁴⁴ Jerry Zeidenberg. British Aim for national electronic health record <http://www.canhealth.com/apr03.html>. April 2003 Canadian Health Care Technology

¹⁴⁵ Protti, Denis. "Question: What Might Canada Learn from the UK? Answer: Commit, Commit, Commit, Electronic Health Care", Volume 1 <http://www.longwoods.com/eh/eh11/eh11pd.html>

Table 11 UK IT Initiatives in Health Care	
Initiative	Details
Lab-Links	Allows laboratory results to be sent electronically to practices and filed in a patient's EMR. According to the government, more than half of general practices have access to Lab-links.
NHSnet	Links general practices, hospitals and other NHS establishments to provide appointment booking, referrals, radiology and lab results.
Electronic Records Development and Implementation Programme (ERDIP)	<ul style="list-style-type: none"> ▪ Sponsored by the National Health Service Information Authority (NHS IA) for the UK and is part of their ten-year strategy to modernize the healthcare system. ▪ Primary focus is clinical and data/information standards to break down physical and geographical boundaries between organizations. ▪ Working on defining standard information flows and translating consent data into access permissions.
Primary Care Information Services (PRIMIS)	<ul style="list-style-type: none"> ▪ Launched in 2000 by the UK NHS IA. ▪ Provides training and assistance to information facilitators employed by Primary Care Groups ▪ Provides list of certified clinical software vendors who have met NHS IA and PRIMIS requirements. ▪ Published guidelines describing what patient data to record in practices.
Sources: ES – POSP; Majeed, Azeem. "Ten ways to improve information technology in the NHS", <i>BMJ</i> volume 326, 25 January 2003.	

Denmark

In 1996 and 1999, the Danish Ministry of Health launched national strategies for the development of an Electronic Patient Record (EPR) in the health care sector.¹⁴⁶ Like the UK, Denmark is not a leader in using IT systems in hospitals. However, when it comes to the use of information systems and electronic records in physician offices they are ahead of most countries. In Denmark, over 90% of its 3,500 GPs have computers and EPRs. In addition, almost 90% of those GPs with computers use them to send and receive clinical Electronic Data Interchange (EDI) messages such as discharge letters, lab requests and results, referrals and prescriptions. About 85% of the GPs are able to send electronic prescriptions and all of its 332 pharmacies are able to receive such prescriptions.¹⁴⁷

The reason for such high rates of use is the communication benefits it brings providers. GPs in Denmark now report a much-improved dialog with hospitals. Currently, GPs are automatically

¹⁴⁶ Andesen, Stig, et al. A comparative study of EPR projects in Denmark, 2002.

¹⁴⁷ POSP: What can be learned about physician office computing from the Danes?

notified when their patient is registered in an Emergency Department and discharge summaries arrive within 1-3 days as opposed to over 4 weeks.

In 1997 the PLO, an organization representing GPs, and County Associations created the Out of Office Hours (OOH) Service. There are 30 OOH services across Denmark that provide patients with access to a GP after hours and on weekends. The primary purpose of the OOH computer system was to send prescriptions directly to a pharmacy, and also generate a report, which is sent electronically to the appropriate GP.

All OOH services use the same computer system, therefore, all GPs participating in the program are required to use it. As a further incentive, the PLO developed the formats for data exchange between the OOH computer system and physician office systems. Some counties in Denmark are also providing GPs with no interest loans so that they can purchase systems. GPs may receive up to 10,000 Kr (\$2,000 CAD) for start up costs plus an additional 2,000 Kr/year (\$415 CAD) for 2-3 years to use electronic communications.¹⁴⁸ The majority of counties in Denmark have now developed regional strategies for the development of EPR systems within the health care sector.¹⁴⁹

Netherlands

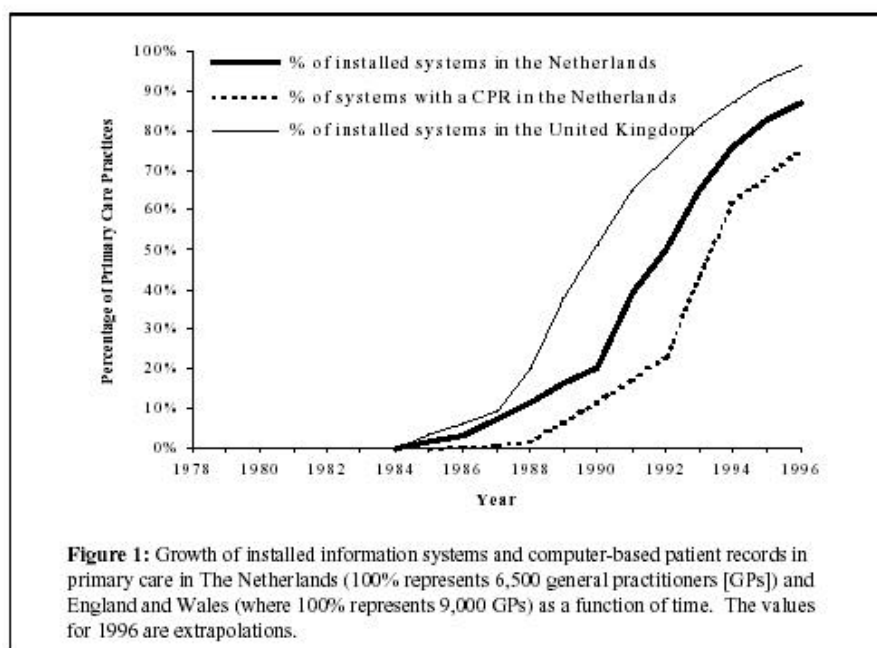
According to a Harris Interactive survey (2003), 88% of GPs in the Netherlands are using EMRs; 31% use Personal Digital Assistants (PDAs) and 100% use the Internet and computer in their practices.¹⁵⁰ These rates reflect the recent widespread adoption of information systems into physician practices. In June of 1992, only 38% of Dutch GPs had introduced computer-based patient records. The growth of information system in Dutch offices and the UK is demonstrated in the figure below.

¹⁴⁸ Ibid.

¹⁴⁹ Andesen, Stig, et al. A comparative study of EPR projects in Denmark, 2002.

¹⁵⁰ HarrisInteractive, Health Care News "European Physicians Especially in Sweden, Netherlands and Denmark, Lead U.S in use of EMRs.

Figure 1: Information Systems in the Netherlands and the UK



Source: Office of health and information Highway, International Activities towards Electronic Health Records: Unique Identifiers and PKI http://www.hc-sc.gc.ca/ohih-bis/pubs/1998_ehrdse/records_e.pdf

Reasons for the high use of EMRs in the Netherlands include the early and active role of professional organizations in recognizing the potential of computer-stored patient records. Professional organizations also issued guidelines for information systems in general practice, evaluated available systems, and provided postgraduate training to prepare physicians to use the systems. Most importantly, professional organizations successfully urged the government to reimburse GPs for the introduction of EMRs.¹⁵¹

Australia / New Zealand

According to a 2001 Harris Interactive Survey, 25% of primary care physicians use EMRs in Australia, while 52% use them in New Zealand. The proportions of primary care physicians who were using electronic prescribing are 44% in Australia and 52% in New Zealand.

Australia

Recently, Australia began trials for a proposed national electronic health information network called HealthConnect. HealthConnect is a voluntary program to enable the electronic collection, storage

¹⁵¹ <http://www.cdm.lcs.mit.edu/courses/6893-S95/emr-medline.html#94028370>. The introduction of computer-based patient records in The Netherlands; Ann Intern Med (5A6), 1993 Nov 15; 119 (10): 1036-41; van der Lei J et al.

and exchange of patients' health information with privacy safeguards.¹⁵² The goal of HealthConnect is to introduce a 'lifetime' EHR system.

In Australia, financial and technical support is provided for the implementation of computer systems within its Divisions of General Practice.¹⁵³ Australia's practice incentive payment program provides additional funding to practices that provide data to the government, use prescribing software by the majority of GPs in a practice and demonstrate the capacity to send and receive data through a modem and e-mail account.¹⁵⁴

New Zealand

The decision by the New Zealand government in the early 1990s to invest in a health information management infrastructure has positioned it as a leader in health IT, particularly within primary care. In New Zealand, 95% of GP offices are computerized and almost 75% use their systems to electronically send and receive clinical messages, including lab and radiology results, discharge letters and referrals.¹⁵⁵

New Zealand's IT infrastructure includes a National Health Index (NHI), a Medical Warning System (MWS), a national clinical coding system for primary care (Read) and hospitals (ICD), and the early adoption of HL7 as the standard for health messaging. The NHI is a population-based register of health care patients in New Zealand. Currently, between 93% and 95% of its citizens have a personal identifier. The register maintains records of names, aliases, addresses, and date of birth to enable the positive and unique identification of an individual. The MWS is a database that stores information to assist in the clinical decision-making such as records on an individual's allergies, as well as relevant medical and family history.¹⁵⁶

Another major IT initiative in New Zealand is HealthLink. It was established in 1996 to provide Electronic Data Interchange (EDI) services in the health sector. Originally used for reporting pathology and radiology results, it now includes payments to physicians and the management of health insurance claims. The system also supports chronic disease management programs, surveillance, screening and notifiable disease reporting. HealthLink provides health information communications services to 2,700 organizations and 95% of the clinics in New Zealand.¹⁵⁷

Along with this infrastructure, national privacy legislation (New Zealand Privacy Act, 1993) and a Health Information Privacy Code has been in place for approximately 10 years. These initiatives have provided the essential building blocks for a national EHR implementation.¹⁵⁸

¹⁵² Medical Post, Volume 38, No.24, June 18, 2002. "National health-care network trials begin", Chris Pritchard.

¹⁵³ The Team in Primary Care: A New Vision, New Ways to Work, Montreal September 19 and 20, 2002. http://www.chsrf.ca/programs/commissioned/projects/record_e.pdf. These Divisions organize GPs from a specific area into larger groups. Overall the average division has 142 GPs and serves on average 130,000 people

¹⁵⁴ Ibid.

¹⁵⁵ Protti, Denis. E-MS: Lessons from other jurisdictions, Background Research June 17, 2003.

¹⁵⁶ http://www.hc-sc.gc.ca/ohih-bsi/pubs/1998_ehrdse/records_e.pdf

¹⁵⁷ Environmental Scan: Physician Office System Document.

¹⁵⁸ http://www.health.gov.au/healthonline/ehr_pta.pdf Australia National Electronic Health Records Taskforce

United States

Although the use of EMRs has been historically low in the US, the use of IT systems has increased significantly. A 2003 Harris Interactive survey found that 11% of doctors currently use electronic prescribing and 30% now use EMRs. Those surveyed said that these applications have improved overall patient care.¹⁵⁹ According to an American Medical Association (AMA) study, about 35% of physician practices in the US are also electronically connected to and exchanging information with hospitals and insurers.¹⁶⁰

The United States spends significantly higher amounts on health IT than Canada. According to a document by Canada Health Infoway, health care organizations in the US spend approximately 5% of their budgets on IT, a figure that is projected to increase to 6.9% by 2006.¹⁶¹ A 2003 article in the *Economist* magazine predicts that the average American hospital's operating budget for IT will grow by 10-15% a year between 2003-05. The same article notes that some health care buyers in the US are rewarding hospitals when doctors enter drug orders and treatments on computers.¹⁶²

Health Maintenance Organizations (HMOs)

Health Maintenance Organizations (HMOs) in the United States are making significant advances with respect to IT. Kaiser Permanente, its largest HMO, will spend \$1.8 billion (US) over the next three years to make medical records electronically available to its 8.4 million patients and 12,000 physicians.¹⁶³ This represents on average \$600M per year or \$50,000 (\$66,000 CAD) per physician per year.¹⁶⁴

One of the main reasons HMOs have invested so heavily in IT systems are for the various benefits that can be gained, such as reductions in adverse drug reactions and duplicate tests.

¹⁵⁹ Volume 3, Issue 6, April 17, 2003. "eHealth's Influence Continues to Grow as Usage of the Internet by Physicians and Patients Increases. http://www.harrisinteractive.com/news/newsletters/healthnews/HI_HealthCareNews2003Vol3_Iss06.pdf. For those who have adopted e-prescribing 69% within their practice said it improved efficiency; 67% said it saved practice money; 74% said improved patient satisfaction; and 79% said it delivered better care. For EMRs, 58% of doctors stated it improved overall efficiency; 74% said it saved practice money; 78% said it improved patient satisfaction; and 87% said it helped deliver better care

¹⁶⁰ Chin, Tyler. More than a third of medical practices are electronically connected at http://www.ama-assn.org/sci-pubs/amnews/pick_02/tesb0114.htm

¹⁶¹ Infoway Pan-Canadian EHR Survey Phase I Results and Analysis, January 2003 <http://www.canadahealthinfoway.ca/pdf/EHR-Survey-PhaseI.pdf>

¹⁶² "American health care Is IT the cure?", *The Economist*, May 10, 2003; pg. 54-55.

¹⁶³ Kaiser Permanente, headquartered in Oakland, Calif., announced in February that it would adopt an EPR from Epic Systems, based in Madison, Wisconsin, for all Kaiser's 29 hospitals and 423 medical offices spread across nine states as well as the District of Columbia.

¹⁶⁴ *BMJ*, Feb 15, 2003; 326:352.

APPENDIX B

REVIEW OF IT RECOMMENDATIONS: PROVINCIAL AND FEDERAL HEALTH CARE REPORTS

Over the past several years there have been a number of reports, both provincially and federally, on how to reform the health care system. A common theme of these reports is to use Information Technology (IT) to improve health care and to facilitate necessary changes to the system. The BCMA Information Policy Project Group reviewed the recommendations from the Fyke Commission (Saskatchewan, 2001); Mazankowski (Alberta, 2002); Romanow (Canada, 2002) and Kirby (Senate, 2002), as well as from the BCMA report *Ensuring Excellence: Renewing BC's Primary Care System* (September, 2002) and the CMA report *Advancing Electronic Health Records in Canada* (June, 2002).

Overview

The federal reports of Romanow (2002) and Kirby (2002) provide the most comprehensive recommendations with respect to IT and privacy. The Mazankowski report (2002) is unique, however, as it views the Electronic Health Record (EHR) as an essential tool to track health care usage and facilitate the adoption of Medical Savings Accounts.¹⁶⁵

The BCMA recognizes and appreciates the importance that the Romanow and Kirby reports place on the security and privacy of patient information. With respect to privacy, however, the Romanow report goes the furthest in stating it should be a criminal offense for anyone to acquire, use or share another person's personal health information for purposes that are unrelated to the management of the health of the person.

Although the BCMA supports modifications to the Criminal Code to better protect personal health information, it has concerns about the creation of an electronic database of personal health records as advocated in the Romanow report. These concerns were recognized by the former Federal Privacy Commissioner, George Radwanski, who stated that such a notion would significantly undermine privacy rights and that the idea of having all health information, including doctor visits, prescription, hospital visits and lab tests, in some giant database is quite terrifying. Overall, he notes that Romanow falls short in discussing privacy safeguards and over looks the hazards of such a database.¹⁶⁶

An additional concern with respect to the Romanow report is that it includes no timeline for electronic records and contains no mention of new funding besides the earlier \$500 million investment to Canada Health Infoway. The report merely states that further funding, "if necessary", should come only after discussion by the federal, provincial and territorial health ministers. This is in contrast to

¹⁶⁵ Medical Savings Accounts (MSAs) are usually set up by employers or the government. The payor purchases an insurance policy for beneficiaries who are given more autonomy to utilize services they feel best meet their needs, within pre-defined limits.

¹⁶⁶ Thompson, Allan. Toronto Star, "Patients' privacy rights threatened, watchdog warns" November 29, 2002. http://www.privacy.com/privacyhorizon/v001n001/article_3_1.html

the Kirby Commission Report, which advocates that the federal government commit \$2 billion over five years to support the development of an integrated EHR system throughout Canada.

The major problem with the federal and provincial reports is that they are too focused on the creation of an Electronic Health Record (EHR). The BCMA believes that the creation of a complete electronic repository of all health related information on an individual is, in the short or medium term, improbable due to privacy issues, financial costs and technological barriers.

Transforming the complete repository of health information of a patient is problematic. In some cases, patients have had the same family physician for 20 or 30 years. It is impractical, costly and unnecessary to attempt to convert these large patient charts into electronic form. As described earlier in the paper, the BCMA recommends that as an achievable short-term goal, an Electronic Medical Summary (e-MS) be developed as the initial core data set for an EMR.

The BCMA views the recommendations outlined in the BCMA paper *Ensuring Excellence: Renewing BC's Primary Care System* (September 2002) and the CMA's paper on *Advancing EHRs in Canada* (June 2002) as sound and consistent with the recommendations presented in Section 5 of this paper. A comprehensive review of the major recommendations from these reports, and the federal and provincial reports, is provided below.

Fyke Report (2001)

The 2001 Fyke Commission report on Medicare in Saskatchewan recommended the adoption of a province-wide Electronic Health Record (EHR). The report states that the EHR is the *"cornerstone of an efficient and responsive health care delivery system, quality improvement and accountability [and that] without it, the prospects for a patient-friendly health care system, optimal teamwork, and efficiency are dim."*

Mazankowski (2002)

The Mazankowski report in Alberta report (January, 2002) makes of a number of IT recommendations, including:

- *Developing and implementing an electronic health record.*
- *Starting with a debit-style electronic health card to track and improve outcomes in health, allow individuals to track their own use of health services and the costs involved, and provide the essential tools if further steps are taken to introduce new approaches to funding health services.*
- *Providing long term funding for technology and information technology systems.*
- *Setting province-wide standards for information technology.*

Kirby: Senate Committee Report (2002)

The Senate Committee report (October, 2002) headed by Senator Michael Kirby states that implementing a coordinated system of EHRs throughout Canada would require \$2.2 billion and that without such coordination the one-time costs of EHR deployment, according to Canada Health Infoway data, would equal \$3.8 billion. The Senate Committee report makes the following health IT recommendations:

- *The federal government provide additional financial support to Canada Health Infoway Inc. so that Infoway develop, in collaboration with the provinces and territories, a national system of electronic health records.*
- *Additional federal funding to Infoway amount to \$2 billion over a five-year period, or an annual allocation of \$400 million.*

Protection of Personal Health Information

The Senate Committee report notes that health IT provides an opportunity for increased protection of privacy, as compared to paper records, through more effective security safeguards to restrict access and enhanced tracking features to audit all transactions.

As a result of its findings, the Senate Committee report makes the following recommendations with respect to the privacy of health information:

- *The federal government work to achieve greater consistency and/or coordination across federal/provincial/territorial jurisdictions on the following key issues:*
 - *Need-to-know rules restricting access to authorized users based on their purposes;*
 - *Consent rules governing the form and criteria of consent in order to be valid;*
 - *Conditions authorizing non-consensual access to personal health information in limited circumstances and for specific purposes;*
 - *Rules governing the retention and destruction of personal health information;*
 - *Mechanisms for ensuring proper oversight of cross-jurisdictional electronic health record systems.*
- *Canada Health Infoway Inc. and other key investors structure their investment criteria in such a way as to create incentives for developers of EHR systems to ensure practical and pragmatic privacy solutions for implementing the following:*
 - *State-of-the-art security safeguards for protecting personal health information and auditing transactions;*
 - *Shared accountability among various custodians accessing and using EHRs;*
 - *Coordination among custodians to give meaningful effect to patients' rights to access their EHR, rectify any inaccuracy and challenge non-compliance.*

- *Key stakeholders, including the federal, provincial and territorial Ministries of Health, Canada Health Infoway Inc., the Canadian Institute for Health Information and Canadian Institutes of Health Research, undertake the following:*
 - *Rigorous research into the determinants affecting Canadian attitudes regarding acceptable and unacceptable uses of their personal health information;*
 - *Informed and meaningful dialogue with key stakeholders, including patient groups and consumer representative*
 - *An open, transparent and iterative public communication strategy about the benefits of EHRs.*

Romanow Report (2002)

With respect to health IT, the Romanow Report (November, 2002) states that action needs to be taken on three important fronts including: (1) putting essential information management and technology systems in place; (2) improving ability to assess and manage the potential benefits of health care technologies; and (3) expanding applied research capacity across the country.

With regard to EHRs and privacy, the report makes the following recommendations:

- *A personal electronic health record for each Canadian that builds upon the work currently underway in provinces and territories.*
- *Canada Health Infoway should continue to take the lead on this initiative and be responsible for developing a pan-Canadian electronic health record framework built upon provincial systems, including ensuring the interoperability of current electronic health information systems and addressing issues such as security standards and harmonizing privacy policies.*
- *Individual Canadians should have ownership over their personal health information, ready access to their personal health records, clear protection of the privacy of their health records, and better access to comprehensive and credible information about health, health care and the health system.*
- *Amendments should be made to the Criminal Code of Canada to protect Canadians' privacy and to explicitly prevent the abuse or misuse of personal health information, with violations in this area considered a criminal offense.*
- *Canada Health Infoway should support health literacy by developing and maintaining an electronic health information base to link Canadians to health information that is properly researched, trustworthy and credible as well as support more widespread efforts to promote good health.*

Canadian Medical Association (2002)

The CMA paper *Advancing Electronic Health Records in Canada* (June 2002), discusses the development of a national EHR. It lists the key issues that need to be addressed prior to its implementation including:

- Appropriate government support and funding
- Creation of standardized core data set from which to build the EHR
- Resolving issues of privacy and custodianship of data, including the creation of common security standards
- Demonstrate value and benefits of EHRs
- Physician support and input

The CMA paper makes 20 EHR recommendations as outlined in the table below.

Table 12 CMA Recommendations in Advancing Electronic Health Records in Canada	
1.	The CMA Privacy Code forms the criterion against which the standards and procedures for the use and dissemination of personal health information are formed.
2.	Work begin immediately to engage the public in meaningful discussion on the implications of the electronic storage of personal health information, the practical solutions that both patients and physicians will require including the development of a manageable consent process.
3.	One of the first priorities for government must be the development and facilitation of a coordinated strategy for moving EHRs forward.
4.	Work be done to better define the issue of custodianship, use, disclosure and access, when the definitive health record might be virtual and brought together when and where it is required.
5.	Governments not be the custodian of the record.
6.	Organized medicine play a lead role in developing the necessary authentication and authorization mechanisms for physicians to ensure proper security.
7.	The Federal Government take the necessary steps to ensure that the pan-Canadian implementation of the EHR is supported by the necessary security infrastructure.
8.	Further evidence be sought to define the impact of EHR's on quality of care and patient safety.
9.	A business case for EHR's be developed and communicated to physicians as a critical element of the buy-in and change management process.
10.	A structure of financial incentives be developed to promote the adoption of information technology.
11.	Governments emphasize the use of incentives for the adoption of EHR's and provide assurances that physicians will not be unduly coerced, including the holding back or reduction of billings.
12.	The development of a national core data set be given priority and done in partnership with physicians
13.	Comprehensive educational and change management programs be in place to support the transition to EHR in practice.
14.	A national standards body be established or recognized, and provided with the necessary power and resources to begin developing standards, with the meaningful input of the CMA.
15.	Rigorous and ongoing evaluation be a key component of EHR implementation.
16.	A tripartite governance structure be created that provides for meaningful input from payors, providers and the public.
17.	A national funding strategy must be developed that identifies a known, consistent and dedicated amount of funds that will be earmarked for investment in EHR and ICT in general.
18.	Government funding, at all levels, needs to be made available for the development, implementation and ongoing operation of EHR's.
19.	Further discussion and articulation of the financial responsibilities of governments and that of physicians take place, with respect to EHR implementation and maintenance.
20.	Governments recognize that significant investment must be made in the development of national standards that will guide and govern issues of privacy, security, custodianship, portability and compatibility, to realize the incremental advancement of EHR's into a national network. ¹⁶⁷

¹⁶⁷ CMA Paper: [Advancing Electronic Health Records in Canada](http://www.cma.ca/staticContent/HTML/N0/I2/General/ADVANCING_ELECTRONIC_HEALTH_RECORDS2.pdf), Canadian Medical Association Working Principles and Recommendations, Discussion Paper, Amended Version June 20, 2002.
http://www.cma.ca/staticContent/HTML/N0/I2/General/ADVANCING_ELECTRONIC_HEALTH_RECORDS2.pdf

BCMA (2002)

In 2000 the BCMA embarked on a review of its primary care system. The culmination of this initiative was the development of the paper *Ensuring Excellence. Renewing BC's Primary Care System* (September, 2002). Although this paper focuses on primary care renewal, the paper has a number of recommendations relating to IT including:

- *That health information policies be developed in BC that protect patients' privacy rights and facilitate the effective sharing of information.*
- *That practising physicians, through their representative organizations, be integrally involved in the development and implementation of a province- wide health care IT system and infrastructure.*
- *That the BC government, directly or through federal initiatives, fund the initial purchase, ongoing connectivity and data management, training and upgrading costs of integrated IT systems in physicians' offices.*
- *That IT systems be developed which integrate primary care providers, hospitals, and long-term care facilities through an Electronic Medical Summary (EMS) and core data set.*

APPENDIX C:

REQUIREMENTS AND GUIDELINES FOR PROTECTING COMPUTERIZED MEDICAL RECORDS

Table 13 Computerized Medical Records Requirements (CPSBC)	
1. Authenticity / credibility:	system must allow for contemporaneous recording of data in which date and time of entry is automatically entered into record. An inalterable log should identify access to record.
2. Confidentiality / security of access:	physician's duty to protect confidentiality of patient communications and information applies irrespective of form in which it is stored or transmitted. If patient data is to be transmitted, the record and data must be secure from third party interception. This requires encryption of the data, a system of authentication of the transmitter and the receiver of the data, and a system to ensure integrity (non-corruption) of the data. There must be a system of codes and passwords and, where applicable, restricted levels of access to the computerized record. There must be system to identify and record identity and location of all who access system
3. Security of Data over time:	must be adequate backup of system to prevent loss
4. Reliability:	Software system must be tested regularly to ensure that it is performing properly and that data is not being lost. System should be robust enough to integrate other patient information received from laboratories, x-ray facilities, consultants and other agencies. Any document or communication related to the care or treatment of a patient should become part of the medical record. This may include records of telephone discussions and any e-mail correspondence. The record system should be capable of absorbing, directly or by scanning, narrative reports such as consultation letters, hospital summaries, etc. Summarizing consultation or other information, with destruction of full text is not acceptable.
<i>Source: College of Physicians and Surgeons of British Columbia (CPSBC), October 2002</i>	

Table 14
Johns Hopkins' Guidelines for Protecting Electronic Patient Records

- Comply with the guidelines and requirements for the privacy, security and confidentiality of medical records as required by legislation.
- Develop internal security and privacy policies.
- Educate employees about the importance of protecting patient privacy.
- Be careful about displaying patient data on unattended computer monitor.
- Keep computers away from public view and access.
- Use screen savers.
- Use encryption.
- Periodically change user IDs and passwords.
- Do not share your user ID and password with others and do not write them down.
- Revoke IDs and passwords as soon as authorized users resign or are fired.
- Use audit trails to track when a record is accessed and by whom.
- Install firewall software.

*Sources: Johns Hopkins University Information Security Institute; American Health Information Management Assn
http://www.ama-assn.org/sci-pubs/amnews/pick_01/tesa0129.htm*

LIST OF ABBREVIATIONS

ADE	Adverse Drug Effect
BCCA	British Columbia Cancer Agency
BCMA	British Columbia Medical Association
CFPC	College of Family Physicians of Canada
CPSBC	College of Physicians and Surgeons of British Columbia
CHIPP	Canadian Health Infostructure Partnerships Program
CIO	Chief Information Officer
CMA	Canadian Medical Association
CMPA	Canadian Medical Protective Association
CPOE	Computer Physician Order Entry
EDI	Electronic Data Interchange
EHR	Electronic Health Record
EMR	Electronic Medical Record
EPR	Electronic Patient Record
e-PP	Electronic Physician Project
FHA	Fraser Health Authority
FIPA	Freedom of Information and Privacy Association
FOIPPA	Freedom of Information and Protection of Privacy Act
GP	General Practitioner
HL7	Health Level Seven
HMO	Health Maintenance Organization
HSO	Health Service Organization
IT	Information Technology
IHA	Interior Health Authority
LIS	Laboratory Information System
LTS	Laboratory Test Standard
MSP	Medical Services Plan
NHA	Northern Health Authority
NHS	National Health Service
PACS	Picture Archiving Communication System
PDA	Personal Digital Assistant
PHCTF	Primary Health Care Transition Fund
PHSA	Provincial Health Services Authority
PIN	Pharmaceutical Information Network
PIPEDA	Personal Information Protection & Electronic Documents Act
POSP	Physician Office System Program
SSH	Smart Systems for Health
VCHA	Vancouver Coastal Health Authority
VIHA	Vancouver Island Health Authority
WERC	Western Electronic Record Collaboration
WHIC	Western Health Information Collaborative

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