Health Information Exchange

Engaging Providers in Health Care Innovation

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Executive Summary

Alberta is a national leader in digital health information integration and delivery but the potential of a digital integrated health record has not yet been fully realized. To transform care so that it is truly focused on the patient, we must provide patients with the information and tools necessary to be active partners in their care. For patients and their care teams to receive maximal benefit from a shared record, all stakeholders – patients, providers and system administrators- must contribute to the health record and be committed to sharing this information locally and provincially across the continuum of care.

The exchange of health information between individuals and across points of care requires a high degree of diligence to ensure patient information is appropriately accessed and used. The *Health Information Act* (HIA) outlines the rules regarding the collection, use and disclosure of health information to ensure that patient information remains private and permits access to authorized health care professionals involved in an individual's care, along with the individual themselves. The rules of health information articulated in the HIA can be translated to an electronic environment, and arguably, the rules of access may be more effectively enforced in an electronic environment.

A significant barrier to generating a comprehensive and integrated electronic health record has been variable user buy-in. Some care providers that are custodians of health information have been reluctant to open their electronic medical records (EMRs), citing concerns of information privacy and non-interoperability of electronic record systems. Care providers also have concerns that integrated health records may lead to confusion in the provision of care if goals of care and roles of team members are not strictly defined. Further, providing care in a paradigm where information is potentially available at all times on all their patients may lead providers to be overwhelmed by health data and a high perceived accountability to respond to that information.

The objective of this document is to demonstrate that the potential benefits of an integrated health record are substantial, and that the concerns of providers can be managed. Health care and medical science should embrace well-proven technologies that benefit their patients. To not innovate within the health care system in the face of compelling evidence is a failure to the citizens that support and use the system.

The objectives of this document are:
1) Outline how digital health information sharing is central to the provision of quality health care.
2) Demonstrate that health care provider/health information custodians have a professional obligation to contribute to a comprehensive electronic health record.
3) Provide recommendations to assist in the transition from a model of segregated health information to an integrated health information paradigm.
4) Provide a framework that can encourage dialogue and action for health care innovation in Alberta.

Key Messages:

- Health is important to all Albertans and health care systems need to place greater focus on promoting and maintaining health

- High quality health information is essential for quality health care. Patients and their care teams should have access to the best information whenever and wherever it is needed.

- Integrated health records that allow secure health information exchange will improve health care delivery in Alberta by ensuring patients get the right care, with the right providers at the right time.

- A focus on integrated care needs to involve secure communication between all stakeholders (including the patient).

- An integrated care model requires that all stakeholders commit to work collaboratively for the health of Alberta's citizens and advancement of the entire health system.

- Alberta is a Canadian leader in health information sharing and has the capacity to move swiftly to a model of highly integrated care.

Introduction

Rising health care costs, an aging population and a high burden of complex chronic disease has necessitated a change in conventional approaches to the provision of health care. The hospitalization of Albertans living with complex chronic conditions is very costly, but more importantly, some are potentially preventable. The status quo is not acceptable and the province of Alberta is committed to improving the health care provided to its citizens. Integrated health care models provide the greatest promise of providing seamless health care that is more efficient, more effective, safer and most importantly, patient-centred.

Developing a highly integrated health care system that uses a digitally integrated health record is a provincial priority. At a high level, integrated care means that health care in Alberta should be coherent and synergistic. Citizens should be able to engage with health care providers in the community, in clinics or hospital environments, and have confidence that all providers have access to the same high quality health information so that the care they receive is coordinated and appropriate.

The exchange of health information lies at the foundation of our health care system, and is the cornerstone of integrated care. Discussions between patients and their care teams are used to identify patient concerns and formulate investigation or care plans that address those concerns. This dialogue around mutual goals helps build therapeutic relationships that can make the attainment of these health goals more feasible and the experience more satisfying. Frequent contact between patients and their care teams- in person, by phone or electronic means- has been shown to significantly improve health outcomes and satisfaction with care[1][2][3]. Conversely, poor communication between patient and provider or between care team members can result in errors, inappropriate treatment, and poor clinical outcomes. Ultimately, incomplete or dysfunctional information exchange can erode the quality of the care provided and reduce confidence in the system that provides it.

The degree to which Alberta succeeds in providing integrated care depends on the health care community's commitment to work collaboratively to promote the best outcomes of our citizens. The clinical evidence demonstrating the benefits of multidisciplinary teams in the context of a patient-centered medical home is enormous, and there has been significant investment in the development of Primary Care Networks that offer a variety of highly coordinated health promotion and health care services. However, despite Alberta's innovative approaches to supporting the medical home and developing Canada's first provincial electronic health record, significant gaps exist across the continuum of care in Alberta. The Health Quality Council of Alberta has highlighted the need for greater continuity of care – ensuring coherent and connected health care experiences- to help prevent adverse health events[4]. Central to care

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[1] Pimouguet et al, Effectiveness of disease-management programs for improving diabetes care. CMAJ, 2011, 183(2)
[2] Tricco et al, Effectiveness of quality improvement strategies on the management of diabetes: A systematic review and Meta-analysis. Lancet 2012 Jun 16;379(9833):2252-61
[3] Peterson et al., Evidence Brief: Effectiveness of Intensive Primary Care Programs. VA Evidence Synthesis Program, Feb, 2013.
[4] The Continuity of Patient Care Study, HQCA 2013

continuity and optimal health care coordination is timely access to appropriate health information.

Health Information Sharing – Present & Future

Health information is generated at the level of the patient, and is shared with care providers as an individual moves through the health care system. Their journey through the system may require health education, public health interventions (e.g. vaccination), laboratory investigation, diagnostic imaging or even hospital admission. With each interaction along this journey, more information is generated, linked to the patient and stored in a variety of EMRs and clinical information systems along the way.   We have a diverse health care provider community in the province- physicians, nurses, nurse practitioners; pharmacists, occupational and physical therapists, counselling and mental health specialists and dental practitioners- and each provider will collect and curate health records for the citizens they serve. These various medical records may be conventional paper-based charts or electronic medical records (EMRs) and may be housed at different points of care. The provincial electronic health record (Alberta Netcare, Figure 1) integrates health information from a variety of sources and systems to allow authorized users a view to current laboratory, pharmacy, diagnostic imaging and health services use data. While Netcare is an impressive provincial health care data resource, it is not complete nor is it fully accessible to all relevant health care stakeholders.
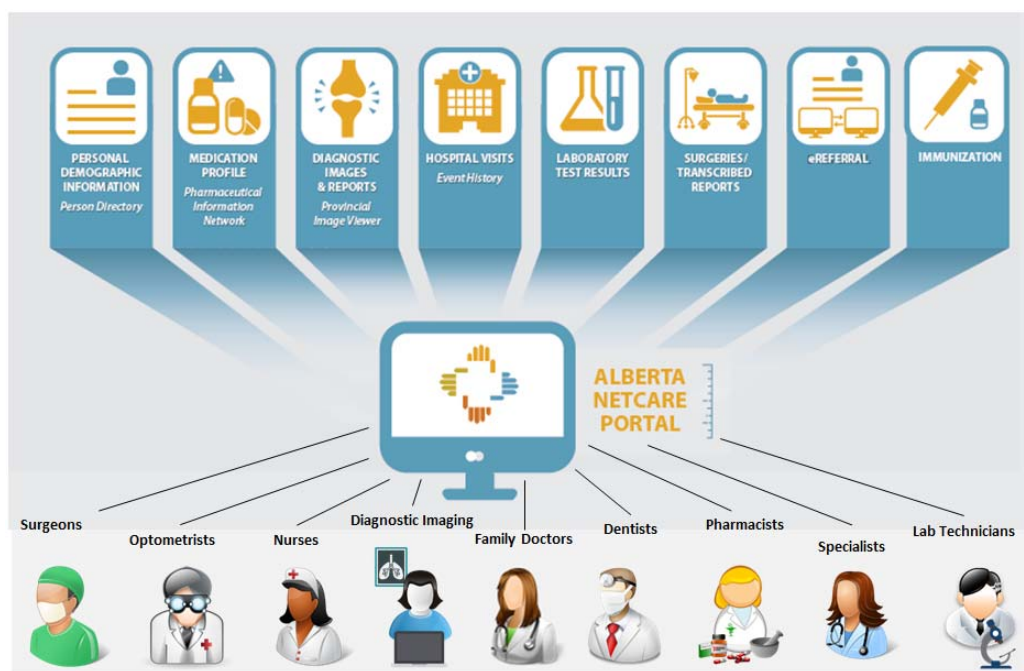

Figure 1- Alberta Netcare

Improving access to Netcare (for both providers and patients) and expanding its content to include clinical data collected by the patient and *all* health care providers is the next necessary step in innovating health care in Alberta. Expanding the potential of Netcare requires us to think

carefully about the conventional concept of health information custodianship and develop professional standards for practicing within a paradigm where information is highly accessible to authorized users. It also must consider how to integrate clinical information systems with health records that may have different standards for data management and governance. Success in cultivating and nurturing this health information "ecosystem" (Figure 2) could catalyze the provision of new services that allow citizens a new level of control in the management of their health (such as patient initiated referral, streamlined and transparent triage, and virtual care for example). Further, sharing of heath information between providers involved with a single patient ensures care is tailored, coordinated, economical and safer. Secondary analysis of collected data allows health system administrators and planners to evaluate a variety of clinical and public health outcomes, and delivery of these data back to providers and consumers can ensure the system is always improving.
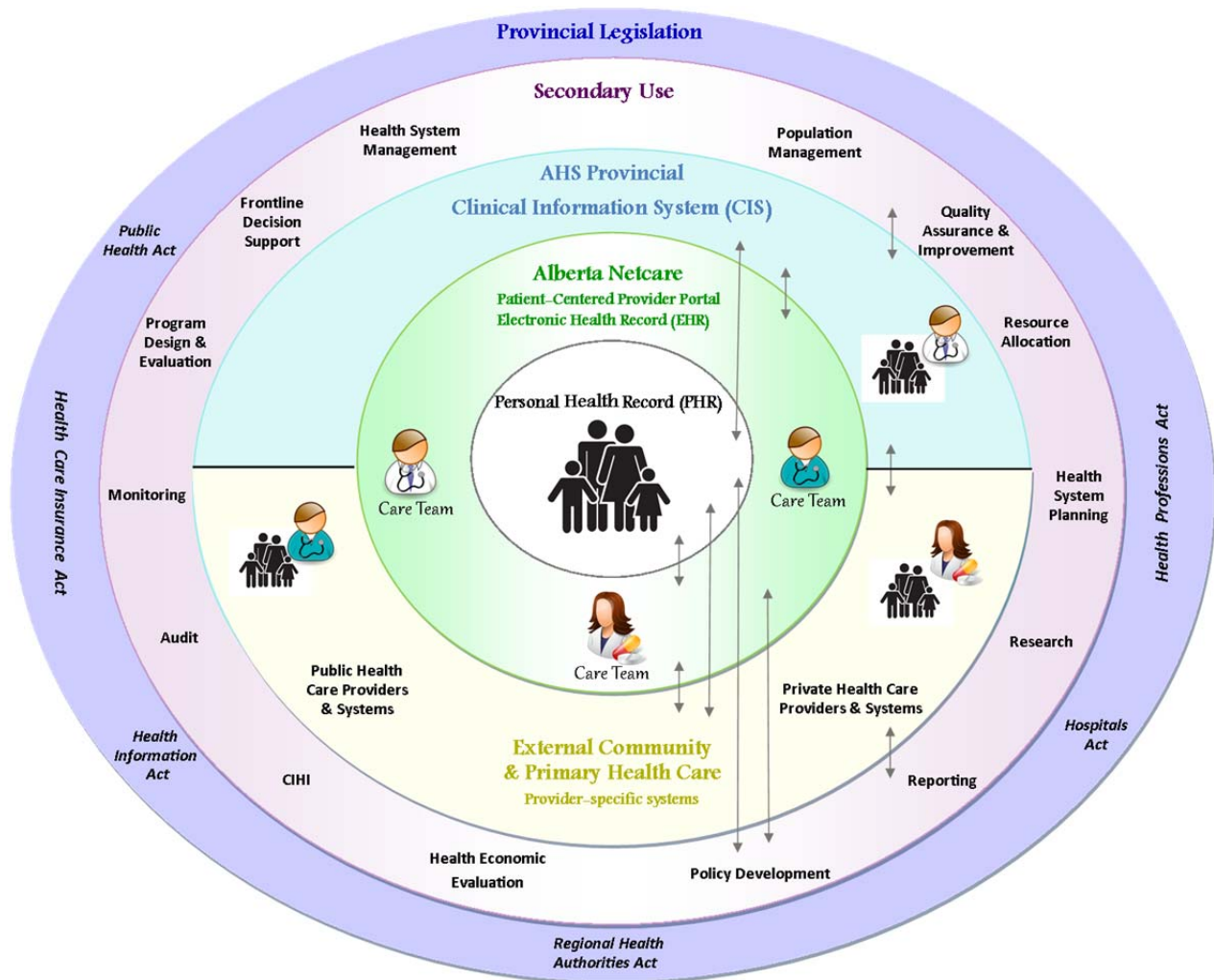

Figure 2- Goal of an interoperable cycle of health information

Digital Health Information Exchange/ Interoperable Health Records/ Integrated Health Record

Digital health information exchange, interoperable EHRs (iEHRs), and an integrated health record (IHR) are synonymous terms, all defining "a secure digital record of an individual's lifetime health history that can be made available to authorized care providers and individuals at anytime and anywhere across the country."[5] Take this one step further, the evolution of Alberta Netcare will give clinicians access to a more comprehensive view of patient records from all systems connected to the network and that the Personal Health Record can leverage to provide Albertans access to their health information. The goal of this integrated system is to provide a longitudinal outlook of a patient's clinical history. This comprehensive record serves to complement—not displace—EMRs and hospital clinical information systems.

Adoption of Integrated Health Records: A necessary step forward.

In 2013, the Health Quality Council of Alberta (HQCA) issued a report on Continuity of Care in Alberta in response to citizen concerns that transitions between points of care were difficult, and incomplete health information exchange was troubling. A catalyst for this report was the death of a young man from complications of testicular cancer surgery. His story was notable for impaired communication between care providers, between disciplines and between providers and the patient. Care continuity is recognized to take three forms: 1) relationship continuity; 2) management continuity; and 3) information continuity. Relationship continuity refers to a longitudinal relationship between a patient and a single health care provider. Relationship continuity is highly desired by patients as it allows for the building of trust and confidence in their care providers. Management and information continuity are related concepts, and have been reported as being more valued to health care providers. Management continuity is the sharing of information on care planning across disciplines, institutions and boundaries, and between providers and patients for the purpose of care delivery. Information continuity is the availability and use of information on past events and personal circumstances to support appropriate care for an individual patient.[6] Collectively, these 3 elements, the collection of information in the context of a strong, longitudinal clinical relationship coupled with the exchange of this information across the continuum of care at critical moments ensure the provision of high quality health care.   Conversely, the absence of one of these elements can lead to errors or sub-optimal care and poor patient outcomes.

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[5] Lau, Francis, Morgan Price, and Jesdeep Bassi. "Toward a Coordinated Electronic Health Record (EHR) Strategy for Canada." *Creating Strategic Change In Canadian Healthcare* (2014): 35.

[6] Haggerty et al, Continuity of care: A multidisciplinary review. BMJ. 2003 Nov 22; 327(7425): 1219–1221.

The report authors identified several areas where the exchange of information should be improved to ensure that care is continuous, focused, and effective. The HQCA made 10 recommendations that related to 6 key interventions to improve continuity of care in Alberta[7]:

1) A provincial clinical information system (CIS)
2) Electronic referral
3) Personal health portal
4) Critical test results management
5) Provider registry
6) Standards of practice

An integrated health record allowing enhanced information exchange is central to most of these recommendations, and ensuring standards of practice with respect to digital information exchange is critical to ensure professional conduct with respect to confidential patient information. A 2016 follow-up report[8] to evaluate implementation of these recommendations has been completed and has documented the significant provincial commitment to establishing a province-wide clinical information system that integrates the health information held within the 1300 existing Alberta Health Services clinical information systems and all community-based primary care EMRs (which include products from 16 different vendors). The province has a well-defined Information Management/Information Technology (IMIT) Strategy[9] developed, but the interconnectedness of these disparate health information systems within Alberta remain limited with the notable exception of Netcare. The report noted a lack of key stakeholder awareness and engagement in the IMIT strategy as a barrier to progress.

Benefits of Digital Health Information Sharing

At the root of the HQCA recommendations is the knowledge that highly informed patients and providers will be better enabled to achieve optimal health outcomes. In the absence of a care provider that is personally familiar with an individual's clinical history, an ability to access quality information and connect with relevant health care team members can promote thoughtful and productive health care encounters across the spectrum of care. Indeed the benefits of integrated care models and IHRs have been well documented, and these benefits are experienced by the patient, the provider and the system itself.

At a patient level, IHRs enable patients/citizens to engage as partners in their health. Access to one's health information through a patient portal to an IHR informs patients on changes to their health status, provides them opportunities to communicate this information to different care team members, and allows them to take an active role in co-ordinating their care by allowing

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[7] Continuity of Patient Care, HQCA 2013
[8] Improving Continuity of Care: Key Opportunities and a Status Report from the 2013 *Continuity of Patient Care Study 2013*
[9] http://www.albertahealthservices.ca/about/Page13114.aspx

electronic appointment scheduling, notifications of appointments and referral status tracking[10] Perhaps more importantly, patients find this access to health information and the engagement it fosters to be highly satisfying and promotes positive clinical outcomes[11]. The ability to seamlessly and immediately share important health or contextual information would eliminate the need to have patients or family members repeat complicated medical histories to multiple care providers at different points of care. Access to high quality health information also allows citizens to be proactive in their health. Reminders about vaccination schedule, information about healthy travel, support for healthy behaviour change and education on injury prevention can be provided directly to the patient on demand through an IHR.

Providers have frequently cited concerns that IHRs will bring risks of poor quality electronic communication, increased workload and accountability and threaten health information security[12]. While understandable, the adoption of IHRs in other jurisdictions have suggested that these fears are over-stated if not unfounded [13,14,15]. Beyond facilitating clinical communication, the IHRs have been shown to reduce hospitalizations, reduce medical errors (and improve patient safety) improve care efficiency and provides a delivery point for precision health outcomes. The use of IHRs also allow for quality assurance and improvement activities through secondary analysis of collected data. Secondary analyses by providers and health system administrators can be very helpful at identifying variation in process or clinical outcomes so that strategies to eliminate health inequities can be formulated. Using an IHR to identify duplication of services, inappropriate service delivery or non-adherence to best practice guidelines allows the health system administrators to understand conditions associated with sub-optimal practice and design timely and effective interventions to optimize care for all Albertans. The potential of secondary data use to improve care quality and efficiency is well

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[10] Stylus Consulting, "Nova Scotia Personal Health Record Demonstration Project: Benefits Evaluation Report," *infoway-inforoute.ca* (2014) accessed May 13, 2016, https://www.infoway-inforoute.ca/en/component/edocman/resources/reports/benefits-evaluation/1995-nova-scotia-personal-health-record-demonstration-project-benefits-evaluation-report

[11] Huber et al, Int J Integr Care. 2016 Apr 8;16(1):11

[12] Ye et al, Email in Patient-Provider communication: A Systematic Review. Patient Educ Couns, 2010 Aug;80(2):266-73

[13] Liederman et al; Patient-Physician web-messaging: Impact of message volume on satisfaction. JGIM 2005 20:52-57.

[14] Stylus Consulting, "Nova Scotia Personal Health Record Demonstration Project: Benefits Evaluation Report," *infoway-inforoute.ca* (2014) accessed May 13, 2016, https://www.infoway-inforoute.ca/en/component/edocman/resources/reports/benefits-evaluation/1995-nova-scotia-personal-health-record-demonstration-project-benefits-evaluation-report

[15] Miake-Lye, Jessica M. Beroes, and Paul G. Shekelle, "Electronic patient portals: evidence on health outcomes, satisfaction, efficiency, and attitudes: a systematic review," *Annals of internal medicine* 159, no. 10 (2013): 677-687.

recognized and national guidelines for timely and appropriate use of health data have been established and must be recognized in the context of a provincial IHR[16].

Challenges to IHR Implementation & Mitigating Strategies

Provider Satisfaction/Burnout

As electronic health information tools have proliferated across North America, we have learned a great deal about not only the benefits of these tools, but the challenges as well. In moving toward an IHR, we must acknowledge that many health care providers may have some ambivalence, or even resistance to a full digitization of health care. EMR use has been linked to poor professional satisfaction and increased provider burnout[17]. These unfortunate outcomes are most likely when there is poor EMR interface design, onerous data entry expectations, overly complex system design and a high volume of notifications or alerts. However, many providers have also found that they appreciate the ability to remotely access information on their patients and appreciate the potential of these systems in improving the safety and quality of care[18,19].

Provider satisfaction has been found to be highest when individuals feel effective in delivering quality care, and Alberta's health care community should expect an IHR to make their roles more effective and efficient. The role of the IHR is not to clutter the electronic health information space with more tools, but ideally is a seamless integration of existing (and perhaps expanded) EHRs, EMRs and clinical information systems. The American Medical Association has studied the issue of electronic health information tools and its association with physician burnout extensively. This work has led to the following recommendations when implementing health information systems[17]:

1) Providers need to be enabled with knowledge and sufficient training about the new technology.
2) Periodic evaluation of provider satisfaction with technology and system performance is needed to ensure timely problem and solution identification.
3) The technology must be highly usable.
4) The patient-provider interaction should not be compromised by the technology, and data entry solutions must be available (dictation, transcriptionists etc).

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[16] Accessing Health and Health-Related Data in Canada: The Expert Panel on Timely Access to Health and Social Data for Health Research and Health System Innovation. Council of Canadian Academies, 2015

[17] Are EMRs to Blame for Physician Burnout? http://catalyst.nejm.org/electronic-medical-records-blame physician-burnout/

[18] Friedberg M, Chen PG, Van Busum KR, et al. Factors affecting physician professional satisfaction and their implications for patient care, health systems, and health policy. 2013. Available at:http://www.rand.org/pubs/research_reports/RR439.

[19] Reuben DB, Knudsen J, Senelick W, Glazier E, Koretz BK. The effect of a physician partner program on physician efficiency and patient satisfaction. *JAMA Intern Med.* 2014;174(7):1190-1193.

To ensure optimal performance and use of an IHR, awareness and attention to these recommendations are essential.

eSecurity

In July of 2016, the National Health Service in Britain had to cancel *care.data*, a national health information sharing initiative, due to significant concerns regarding eSecurity. Two reviews of the program revealed there were threats to health information safety at several levels that eroded public confidence in the ability of the NHS to engage in secure health information sharing [20],[21]. These reviews led to the following recommendations to promote optimized eSecurity when engaging in health information exchange:

1) Custodians of EMRs/clinical information systems must demonstrate leadership and ownership of data security within their individual health information systems.
2) All health care team members, clinical and administrative personnel require appropriate training, support and tools to ensure they are highly competent and capable of maintaining health information security.
3) All information technology and data security protocols should be developed around the care needs of the patient and the workflow requirements of the users to prevent system "workarounds" that can make health information vulnerable to breach.
4) Computer hardware and software that can no longer be supported must be replaced immediately.
5) There must be periodic reviews, audits and benchmarking on eSecurity activities.

Lack of Citizen/Patient Trust

The foundation of patient-centred care is that health services are provided to the patient, for the patient, and directed by the patient. As noted in the *care.data* experience[19,20], a lack of patient trust can seriously undermine if not terminate, well-intended health care innovations. Patients must have full knowledge and understanding of what an IHR is and how personal, identifying health information will be shared. They need to know their rights as a patient and the potential benefits and risks of participating in an IHR paradigm. Citizen engagement and consultation prior to full roll-out of an IHR is necessary.

Respecting Patient and Provider Autonomy within an Integrated Model

Health information must be respected as private information, and the *Health Information Act* is legislation that outlines the appropriate disclosure of identifiable health information. The circumstances where disclosure can occur with or without consent are also clearly articulated in the HIA. The HIA does not prohibit digital health information sharing, and there are technological tools that may allow for improved HIA compliance within an IHR.

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[20] Care Quality Commission: Safe data, safe care. July 2016. file:///Users/drabi/Downloads/CQC%20-%20Safe%20data%20Safe%20Care.pdf

[21] National Data Guardian of Health and Care: Review of data security, consent and opt-outs., June 2016. ile:///Users/drabi/Downloads/National%20Data%20Guardian%20Review%20of%20Data%20Security%20Consent%20and%20Opt-Outs.pdf

It is important to acknowledge that different health care providers will collect different types of health information. The health information gathered in the course of a visit with a family doctor would be quite different from that gathered at a routine dental visit. However, the information they collect individually can have value to the other in better serving the patient. With an IHR, a dentist could easily determine if a patient requires antibiotics prior to dental procedures. Information might also be shared in these visits that have no relevance to the care provided by the other provider. In a model of integrated care, there must be consensus on which data elements must be shared to ensure optimal health care provision. It will also be incumbent upon care providers to use an IHR professionally, and only access information that is needed for the provision of patient-centred care. Integrated care models should strengthen therapeutic relationships and promote trust. The development of an IHR must always recognize and respect the primacy of the relationship between care provider and patient, and both parties must feel confident that an IHR will prevent disclosure of highly sensitive information. Further, patients have the right to articulate expectations of privacy around particularly sensitive information and care providers will continue to respect these expectations in integrated health paradigms. The HIA has clear provisions as to when a provider must disclose information and sensitive information that is not of relevance to other care providers for the purposes of clinical decision-making, need not be disclosed. An IHR will be fully HIA compliant, and citizens and providers must be assured that sensitive information will be protected.

Health Information Standards for Collection and Sharing

The Health Information Standards Committee for Alberta (HISCA) is an existing committee that has developed heath information, data and quality standards for Alberta[22]. This committee that is composed of members from a variety of stakeholder groups (including the Alberta College of Pharmacists, the College and Association of Registered Nurses and the College of Physicians and Surgeons of Alberta) has been charged with defining standards for health information collection and dissemination that align with the provincial IMIT strategy. The HISCA has published a list of standards for a number of health care professionals, recognizing the unique contribution each provider makes in the delivery of care. An IHR would require a comprehensive list of standards, specific to each care provider, to ensure consistency and quality in information sharing. The value of such standards extends beyond care delivery and will also facilitate secondary analysis for quality assurance. If all providers within a discipline are collecting and sharing the same information, analysis and comparisons of regional differences in care processes and outcomes are more easily completed. Such analyses can facilitate more timely provision of additional resources where needed.

Movement toward an IHR would require the definition of a "minimum data set" that defines health information that should be documented and shared for the purpose of care quality. For example, an endocrinologist evaluating a female patient with diabetes may need to at minimum report on the duration of diabetes, the treatments received, complications experienced and mental health co-morbidities that may impact self-management. During the context of the clinical encounter, it may be revealed that the patient has had diabetes for 12 years and has no

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[22] http://www.health.alberta.ca/about/HISCA-standards.html

diabetes-related complications. The diagnosis of diabetes was made after the patient developed a sudden weight loss following a therapeutic abortion. The patient is struggling with diabetes self-management and often forgets her insulin and she attributes these challenges to significant personal stress due to an acrimonious divorce.   With a minimum data set, the physician would need to report on the duration of diabetes and the issue of insulin omission, but there would be no obligation of the physician to disclose the pregnancy termination or the source of the patients' stress.   Those involved in this patients care could be assured that they have the necessary information about this patient (long-standing diabetes with challenges to therapeutic adherence) to develop care plans for diabetes but sensitive information is protected.

Formalized Information Sharing Framework

Health information standards will define what health information is being shared, however there needs to be a very explicit understanding of how the health care provider community will use this information within their professional role. A formalized information sharing framework that outlines how providers will share and manage health information while ensuring compliance with professional and privacy standards needs to be developed.

Expectations for Health Information Sharing

Within multidisciplinary care teams, different providers have different roles with an over-arching objective to better the health of the citizen. However, an over-burdened primary care system has led to the expansion of traditional roles played by allied health professionals. For example, the role of pharmacists has been expanded to include the prescribing of medications. The benefit of such expanded roles is that it allows patients options in terms of how best to meet their personal health goals. If a person has high blood pressure and has been prescribed an anti-hypertensive medication by their doctor, they can follow up with a pharmacist for assistance with medication adjustment until their target blood pressure is achieved. Community-based pharmacists, nurses and licensed health educators are often far more accessible to patients and use of these resources off-loads busy primary care doctors. However, the potential challenge with extended roles is that the responsibilities of providers can overlap, and there is the risk of providers working at cross-purposes of the goals of care, care plans or the rationale for plans are not known to all involved. IHRs would allow for the coordination of activities among care providers with similar roles. The potential of IHRs are not just in the enhanced sharing of information, but also in the enhanced coordination and organization of that information. An integrated care model would necessitate the development of clear care plans, pathways and managers to ensure that care is logically and coherently delivered. Transition to an integrated care model would mandate that there is consensus around role definition, team organization, care pathways and protocols to promote autonomy in care team members and system efficiency.

Professional Competency in Integrated Care

The importance of professional collaborations in the provision of health care is recognized across health professions. Similarly, the responsibility of health care providers to document clinical interactions is a responsibility shared by all care providers and all documents must meet

a common standard. While working within an integrated paradigm may seem to present new questions and potential challenges, the professional role and obligations will not practically change. Performing these roles with new tools that provide expanded information is the change providers need to prepare for. Ensuring stakeholder cooperation within an integrated care model will necessitate that professional organizations recognize the needs of their membership with respect to orientation and training to an IHR and the embedded minimum data standards, care planning and coordination tools. Professional organizations will also need to play an active role in encouraging use and support of an IHR among their membership.

Promoting IHR Success Through Strategic Planning

The development of an IHR requires cooperation and coordination of several stakeholders across the health system and across the health provider community.   The development of a Provincial Health Information Strategy will be necessary to ensure the efforts of stakeholders in IHR development are synergistic, and that Alberta's health care community is positioned to succeed in this important innovation. The Provincial Health Information Strategy should focus on four key areas:
1) The development of a comprehensive Alberta Health Services Clinical Information System
2) Movement of secured health information from community EMRs into Netcare
3) The evolution and expansion of Alberta Netcare and the Personal Health Portal
4) Development of processes and policies for secondary data use

Moving Forward

The time has come to elevate and innovate health care/health care delivery in Alberta. There is a strong commitment to the development and implementation of an IHR in Alberta. The IHR is part of a larger vision to place the patient at the center of their own health, and providing them with the tools and the data to ensure the best care regardless of time or point of care. However the receptivity to this new integrated paradigm has varied by provider group. Physician reluctance to digital health information exchange and communication has been very well studied. However the understandable concerns about health information security and workflow have not been substantiated in large-scale studies of integrated health models [23,24,25].Provider reluctance can no longer be a barrier to progress.

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[23] Liederman et al; Patient-Physician web-messaging: Impact of message volume on satisfaction. JGIM 2005 20:52-57.

[24] Stylus Consulting, "Nova Scotia Personal Health Record Demonstration Project: Benefits Evaluation Report," *infoway-inforoute.ca* (2014) accessed May 13, 2016, https://www.infoway-inforoute.ca/en/component/edocman/resources/reports/benefits-evaluation/1995-nova-scotia-personal-health-record-demonstration-project-benefits-evaluation-report

[25] Miake-Lye, Jessica M. Beroes, and Paul G. Shekelle, "Electronic patient portals: evidence on health outcomes, satisfaction, efficiency, and attitudes: a systematic review," *Annals of internal medicine* 159, no. 10 (2013): 677-687.

Change Management

Significant progress has been made and there are several key achievements that suggest that realizing the goal of a provincial IHR is possible:

1) Alberta Health and Alberta Health Services have declared an IHR as a key priority to achieving better health and better health care in the province.
2) Alberta Netcare provides an Information Sharing Framework that can be used as a starting point to expand health information sharing and create new information co-ownership agreements.
3) The AMA is championing the potential of an IHR and supports participating in integrated care as a professional responsibility.
4) Pharmacists have demonstrated leadership in sharing all dispensed medication information in Netcare.
5) There is considerable health IT infrastructure in place that can be leveraged as we transition to an IHR paradigm.
6) Existing health information legislation permits information sharing and conditions of that sharing can be strictly enforced within an IHR.

Providing all political or technical barriers can be removed, the only remaining barrier to achieving the goal of an IHR is complete provider and citizen engagement. Engagement in an IHR is not only congruent with professional roles, but would also appear to be a professional obligation. However, how this new professionalism is defined, executed and evaluated needs to be explicated.

A thoughtful and well articulated change management strategy will be essential to ensure a smooth transition from our present state to a state of fully integrated care. All stakeholders must view an IHR as valuable, and change will occur successfully if the change is viewed positively. It will be incumbent upon the leadership of health care provider professional, regulatory and licensing organizations to champion this change and it will be critical that the province is prepared with strategies to mitigate perceived risk, and provide optimal support for transition.

Several Providers- A Single Vision

The expectation for participation in an IHR has been clearly communicated to the care provider community, now what is required is to establish a transition plan that is not only acceptable, but also meaningful to the care provider/physician community. Herein, we will outline a framework of action for transition to an IHR.

Provider Engagement

There are several health professionals that work collaboratively within our health system, and may be independent health information custodians. The autonomy of the care provider and the sanctity of the therapeutic relationship must and can be respected in an integrated care paradigm. Defining partnership and data sharing agreements between care providers will be an important step in this process.

Recommendations:	Timeline for Delivery
1) Professional regulatory bodies need to formally recognize the professional responsibility to share information in a more comprehensive Alberta Netcare environment, and create standards of practice to guide their membership in practice. Each college is encouraged to put forth a discipline-specific plan of action.	2017/18
2) Promote leadership from within by engaging professional associations and requesting a "Declaration of Intent". Such declarations would help mobilize memberships around the common goal of an evolved Alberta Netcare.	2017/18
3) Engage professional regulatory and education bodies to discuss education and competency building in information exchange and management.	2016/17
4) Review and revision of the provincial information sharing agreement to include all new care partners	2017/18

Citizen Engagement

Albertans value their health. A desire for improved care continuity that is focused on their priorities has been clearly articulated and an IHR has been identified as key strategy in delivering the care Albertans want.   However, full potential of an IHR can only be realized if citizens use the IHR, and their success with this tool will be enhanced if they understand the functionality and possible limitations of the tool.

Recommendations:	Timeline for Delivery
1) Citizen/patient health information education and helpline available with the release of the Personal Health Portal.	2016/17
2) Strategy to maximize awareness of shared health information, shared decision making and the IHR.	2017/18
3) Elicit citizen/patient input on the IHR initiatives including any concerns about enhanced health information paradigms.	2017-2020
4) User support/help line services need to be developed and deployed at time of IHR implementation.	Needs to be available at rollout

Ensuring a Safe Environment

Ensuring health information is secure is of utmost importance. Ensuring that all data sharing agreements are compliant with the HIA is critical. Further, the HIA itself needs to be re-examined to ensure that there are no policy barriers to IHR implementation.

Recommendations: **Timeline for Delivery**

1) Review and amend clinical practice guidelines, standards or professional organization statements to support and promote digital information exchange.   2017/18

2) Identify IHR activity pilot projects and evaluations of IHR, including the Community Information to Netcare Limited Production Rollout, to ensure implementation success.   2016/17

3) Identify integrative technology solutions to facilitate creation of more comprehensive Alberta Netcare and Personal Health Portal environments and expanded IHR functionality across the province   2017/18

4) Consult, assess and amend the HIA and any of its regulation(s) as required to remove any legislative barriers to IHRs.   2017-2019

5) Consult and develop an information sharing framework that is inclusive and appropriate for a diverse care provider community.   2018/19

6) Outline rapid scale-up plan   2018/19

Technical and Analytic Considerations

Ensuring secure exchange of discrete information with existing EMRs and other provincial clinical information systems is necessary to establish an IHR. Once established, the IHR will offer tremendous opportunity for secondary data analysis at provincial level so that care processes can be monitored and improved. The degree to which rational, evidence-based care is being delivered can be evaluated and consumer feedback can be elicited regularly.

Recommendations:	Timeline for Delivery
1) A nimble and effective technical support response must be available to all users of the IHR to minimize disruptions in care and ensure optimal function of the IHR.	Needs to be available at time of rollout
2) User authentication must be simple and allow seamless access to all domains of the IHR.	2017/18
3) The Alberta Netcare policies restricting secondary data use need to be amended.	2017-2019
4) An IHR user feedback program should be designed and evaluated to assess satisfaction and perceived quality of system	2017/18
5) A data management and evaluation team should be identified to complete de-identified health services use assessments.	2017/18
6) Health services evaluation advisory group should be established to ensure appropriate and thoughtful evaluative strategy.	2017

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