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Chronic Disease Management and Primary Care in Alberta

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LIST OF ACRONYMS

ACIC	Assessment of Chronic Illness Care
AH	Alberta Health
AHCP	Allied Healthcare Professional
AHS	Alberta Health Services
AIM	Access Improvement Measures
AMA	Alberta Medical Association
ARP	Alternate Remuneration Plan
CA	Clinical Assistant
CCM	Chronic Care Model
CD	Chronic Disease
CDM	Chronic Disease Management
CHIE	Clinical Health Information Exchange
CIS	Clinical Information System
COPD	Chronic Obstructive Pulmonary Disease
DIMR	Data Integration, Measurement and Reporting
EHR	Electronic Health Record
EMR	Electronic Medical Record
ER	Emergency Room
FCC	Family Care Clinic
FP	Family Physician
GHP	Geisinger Health Plan
GP	General Practitioner
HEDIS	Healthcare Effectiveness Data and Information Set
HHR	Health Human Resource
HIA	Health Information Act
ICD	International Classification of Diseases
ICDC	Interdisciplinary Chronic Disease Collaborative
IH	Intermountain Healthcare
IHA	Interior Health Authority
IMGs	International Medical Graduates
IT	Information Technology
KP	Kaiser Permanente

LPN	Licensed Practical Nurse
NP	Nurse Practitioner
NZ	New Zealand
PA	Physician Assistant
PACIC	Patient Assessment of Chronic Illness Care
PC	Primary Care
PCN	Primary Care Network
PCMH	Patient-Centered Medical Home
PHAC	Public Health Agency of Canada
PHP	Personal Health Portal
PIN	Personal Identification Number
POSP	Physician Office System Program
RN	Registered Nurse
SQUID	Summary Quality Index
TOP	Towards Optimal Practice
VHA	Veterans Health Administration
WHO	World Health Organization



1. EXECUTIVE SUMMARY

Chronic disease management (CDM) is one of the biggest challenges in Alberta's health system. The purpose of this policy paper is to establish that an effective and well recognized primary care system enhances and improves the management of high prevalence and moderately complex chronic diseases. The main focus of this paper is to look into what needs to be in place to help patients with moderately complex chronic disease to avoid becoming patients whose conditions are highly complex. Patients with highly complex chronic diseases constitute part of the 1% of the highest cost health service user population.

The research into best practices and interviews with experts on this topic led to our conclusion that current incentives and structures in Alberta's healthcare system create major barriers for effective management of chronic disease. These barriers include:

- the physician-centric system that pays primary care doctors on a fee-for-visit basis,
- the limited presence of non-physician providers such as nurses, and dieticians in the primary care networks,
- limited access to personal health information that could help patients be better engaged in their own care.

Best practices internationally and in North America use interdisciplinary teams of providers and offer a superior level of patient information sharing. In Alberta, these two areas of weakness combine with lack of access to after-hours care to create significant challenges for chronic disease management.

Alberta's healthcare system makes poor use of performance metrics. The performance indicators currently in place make it difficult to assess how well the system is managing chronic diseases. The author suggests the construction of a Chronic Disease Management index to support the government's monitoring of progress in the healthcare system.

The paper's conclusions are somewhat provocative in terms of policy implications and recommendations. It does not favour the existing funding methods used by the Health Ministry to fund Alberta Health Services. Even though global funding used since the mid-nineties had the potential of freeing up appropriate budget amounts for primary



care, the higher profile of acute care hospitals and the expectations for continuing with the historical budget shares of other services have prevented primary care from having an expanded share. The paper recommends a collaborative, strategic priority driven funding method that strengthens inter-professional team-based primary care. It also makes a strong case for the fast tracking of nurse-practitioner training, especially given the large gap between the estimated demand and the current supply of that stream of professionals. Lastly, the critical role and the potential benefits of information sharing are discussed and the implementation of a personal health portal platform is recommended.



2. SETTING THE STAGE – PURPOSE OF THE PAPER

Chronic diseases such as diabetes, hypertension, heart disease, depression, cancer, stroke, and chronic respiratory diseases cause a lot of suffering for patients and their families over a long period of time. The treatment and management of common chronic diseases also account for up to 80% of total spending in the contemporary healthcare systems in developed economies.

Managing chronic disease is a challenge not only to the healthcare system but also to society in general; many of the factors that lead to chronic diseases go well beyond the health sector itself.¹ Canadian experts in health policy and healthcare practice place Canada well behind the best performing jurisdictions, such as the Netherlands and the United Kingdom, in treating and managing chronic disease (Hutchison, 2013).

The purpose of this policy paper is to determine how an effective and well recognised primary care system in Alberta and other similar jurisdictions in North America can enhance and improve the management of high prevalence, moderately-complex chronic diseases. Examples of these diseases include diabetes, hypertension, asthma, and depression.

This paper:

- examines chronic disease management (CDM) in general, identifies current CDM practices in Alberta’s primary care system, and explores the intersection between primary care and CDM (see Sections 3, 4, and 5)
- analyses barriers to effective CDM in Alberta (see Section 6)
- summarizes best practices in CDM and primary care and identifies lessons for Alberta’s health system (see Section 7)
- suggests how introducing aspects of these systems could improve Alberta’s health system (see Section 8)
- provides policy implications and recommendations to address these barriers (see Sections 9 and 10)

1 The reality of our time is that we are living much longer than previous generations. Yet we are living longer not in perfect health but with an array of chronic diseases. Managing those diseases well is a major challenge facing aging Canadians. Helping us manage these chronic diseases is the major challenge facing the Canadian Health System (Decter, 2011).

The paper does not do an in-depth analysis of any specific chronic disease like diabetes or asthma but deals with chronic diseases in a more bundled way. The analysis focuses only on high prevalence, moderately-complex diseases that are treatable within the primary care setting. Even though CDM goes well beyond primary care and some diseases require major interventions at the secondary and tertiary care levels, the major focus in this paper will be on the effectiveness of primary care as a CDM tool/strategy.



3. CHRONIC DISEASE – PREVALENCE AND COST

3.1 Definition of chronic disease

A chronic disease is a human health condition or disease that is persistent or otherwise long-lasting in its effects. The term chronic usually applies when the course of the disease lasts more than three months. Common chronic diseases include arthritis, asthma, cancer, chronic obstructive pulmonary disease (COPD), depression, diabetes and HIV / AIDS.

The opposite of chronic disease is an acute episode such as major trauma or heart attack. The course of chronic diseases further distinguishes them from recurrent diseases, which relapse repeatedly, with periods of remission in between.

Chronic diseases are a major cause of mortality. The World Health Organization (WHO) reports that chronic non-communicable conditions caused 35 million deaths in 2005 – over 60% of all deaths in the world.

3.2 High Prevalence, Moderately Complex Diseases

Examples of these diseases include diabetes, hypertension, asthma, and depression. A detailed list is provided in Appendix A.

The majority of the one per cent of those patients who use the most healthcare services are chronic disease patients. Appendix B makes this point using Alberta data for fiscal 2010/2011. Ontario data for 2007, received from the Institute for Clinical Evaluative Sciences (ICES), showed similar pattern (Wodchis, 2013).

The most common diagnosis for the highest users includes chronic kidney failure and diabetics with chronic kidney failure. Hypertension alone affects approximately 20% of Canadian adults. Over 20 million visits (6.2% of all visits) to family physicians in Canada were for hypertension. Older 'CD' patients are quite different from working age 'CD' patients. Ninety per cent of seniors have at least one chronic disease, and 77% have two or more chronic conditions.²

2 <http://fcs.tennessee.edu/fcs/Documents/LWWCCProgramFactSheet.pdf>



3.3 Cost of High Prevalence, Moderately Complex Diseases

Considerable information on the cost of health care is available from Canadian and international sources. In 2005, for example, direct³ costs for diabetes, cardiovascular disease, and mental illness in Canada were \$4.2 billion, \$7.6 billion, and \$10.4 billion respectively (Duckett and Peetoom, 2013). Total direct costs for selected chronic diseases were \$35 billion (*ibid.*). Using a 10% ratio (based on Alberta population as percentage of Canada's population), the estimated costs in Alberta were \$3.5 billion.

In the same year, indirect costs for chronic diseases in Canada are estimated to be \$77 billion (*ibid.*), with Alberta's estimated share at \$7.7 billion. The forecast cost estimates for chronic diseases are expected from the Public Health Agency of Canada (PHAC) when it releases its major study on economic burden of illness later in 2014.

3.4 Alberta Individual Patient Data

Table 1 summarizes one-year care histories for eight actual patients in Alberta's health system. Each of the eight has one of the four most commonly diagnosed chronic diseases—diabetes, heart disease, dementia, and rheumatoid arthritis.

The patient specific cost range of \$10,400 to \$116,900 does not provide any startling new information. However, some of the service volume information is definitely attention-getting. The fact that the 80 year old male patient and the 65 year old female patient with dementia as the diagnosis had 88 and 127 physician visits respectively, during one year, raises concerns about the physician remuneration system and its meaningfulness. These large numbers of visits can be interpreted from many different angles.

The drug costs of \$22,700 and \$23,300 for rheumatoid arthritis attest to the economic barrier factor identified in the Interdisciplinary Chronic Disease Collaborative (ICDC) survey conducted by Statistics Canada in 2011. In that survey, a large number of participants said that the cost of pharmaceuticals is a barrier to their ability to manage chronic diseases at an early stage.

3 Direct means a specific draw on health care budgets (Duckett and Peetoom, 2013).

TABLE 1: Case History of Eight Actual Alberta CD Patients During 2010–2011 Fiscal Year

CD Patient medical history	Diabetes		Heart Disease		Dementia		Rheumatoid Arthritis	
	Male	Female	Male	Female	Male	Female	Male	Female
Age	52	55	65	63	80	65	56	77
Years with condition	6.3	0.3	0.4	0.4	1.1	2	3.6	3.6
Hospitalizations	1	1	1	1	1	3	0	0
Total hospitalization cost (\$)	8,500	4,700	9,100	4,400	102,300	69,600	0	0
Visits to ER, day medicine and day surgery	5	9	34	6	7	4	7	1
Total visit cost (\$)	1,500	2,400	7,200	2,300	1,500	1,600	2,100	200
Physician visits	20	20	46	24	88	127	28	16
Total physician cost (\$)	2,900	2,200	3,100	1,400	10,900	7,400	1,500	800
Number of different medications received	4	3	6	9	14	9	10	9
Total drug cost (\$)	1,800	1,100	3,800	3,400	2,200	1,200	23,300	22,700
Total Annual cost (\$)	14,700	10,400	23,200	11,500	116,900	79,800	26,900	23,700

Source: Alberta Health Care data system, received through courtesy of ICBC.



3.5 Grouping of Chronic Diseases

Chronic diseases are grouped in many different ways in the literature. They are ranked by their complexities, disease burden, and by body systems, for example. The grouping, in many instances, can be helpful in deciding on treatment protocols.

However, the value of such grouping is less obvious for patients with multiple chronic diseases. See Peggy's story below, for example. With diagnoses of depression, chronic pain, obesity, osteoarthritis, hypertension, diabetes, hypothyroidism, and congestive heart failure, the challenge becomes how to categorize Peggy.

"Peggy's case" An Example of Complex Chronic Disease

Peggy (not her real name) is a 63-year-old disabled person who is depressed and anxious. She suffers from chronic back pain and is morbidly obese (BMI > 40). She also suffers from osteoarthritis, hypertension, diabetes, hypothyroidism, and recently developed congestive heart failure. Due to her severe obesity she also has dependent edema (chronic leg swelling).

Peggy is on 11 different medications for her chronic conditions, including Senokot (for constipation), morphine (for pain), ramipril (for hypertension and CHF), rosuvastatin (for elevated lipids), spironolactone and furosemide (for CHF and edema), venlafaxine (for depression), ASA (protect the heart), metoprolol (CHF), metformin (diabetes), and pantoprazole (gastroesophageal reflux symptoms).

Peggy is a high user of the Alberta healthcare system. In the last year she has had 23 visits to her family physician, 2 visits to a psychologist, 3 to a cardiologist, 5 to emergency with chest pain and palpitations, and 2 visits to emergency in Nova Scotia while she was on holidays visiting with her family. She also had a number of lab, DI, CT scan, ECG, and cardiac catheter tests.

Source: Dr. Donna Manca, Southside PCN, Edmonton.

3.6 Chronic Disease Management Models – their relevance

The best-known CDM model is called the Chronic Care Model (CCM) developed by Wagner. Wagner's CCM offers a comprehensive and systematic way of addressing chronic diseases. It is an idealized, evidence-based framework that rests on more than 30 specific interventions spanning six key areas: healthcare organization, community resources, self-management support, delivery system design, decision support and clinical information systems (Wagner et al., 1996). Wagner's model anticipates that improved outcomes accrue from productive interactions between 'informed activated patients' and a 'prepared and proactive practice team'.

According to the Chronic Disease Management Team of AHS, even though a model is not exactly followed in their program management, the expanded version of the CCM provides the guiding principles. The main difference between the basic version and the Expanded Chronic Care Model lies in the latter focusing also on population health.

There is also a large body of literature on 'chronic disease self-management models'. These models focus on the understanding of underlying patient behavior factors that can be influenced for better self-management. The Stanford Model and the Flinders Model are the two better known self-management models in the literature. The Stanford Model promotes a six-week, group based course for 10–15 participants with diagnosis of arthritis, diabetes, and other common chronic diseases⁴. On the other hand, the Flinders Model, developed in the Flinders University in southern Australia promotes a person centered focus through emphasis on CD patient goals rather than the clinical goals⁵.

4 <http://patienteducation.stanford.edu/programs/>; <http://patienteducation.stanford.edu/programs/cdsmp.html>; <http://www.health.vic.gov.au/pch/downloads/factsheet08.pdf>

5 <http://www.health.vic.gov.au/pch/downloads/factsheet08.pdf>



4. PRIMARY CARE

Primary Care is the “level of a health service system that provides entry into the system for all new needs and problems, provides person-focused (not disease-oriented) care over time, provides care for all but very uncommon or unusual conditions, and co-ordinates or integrates care provided elsewhere by others.” (*Starfield, 1998*).

4.1 Access to Primary Care

Most primary care⁶ providers are only accessible during normal working hours. This creates a barrier for most patients. Delays in primary care access can lead to increased visits to emergency. For example, an asthma exacerbation, addressed early through primary care could help a patient avoid a visit to emergency; unfortunately, patients may not be able to see their physician for a number of weeks.

Patients and primary care providers often focus their prevention and screening efforts on the traditional annual physical exam. The traditional exam takes time and is not evidence-based; in fact there is evidence that it is not effective (Krogsboll, 2012). The current incentive system also does not reward timely preventive and screening activity during routine visits. Such screening could add 7.5 hours to a typical family physician’s day, if that physician attempted to satisfy the US preventive task force recommendations (Yarnall et al, 2003). The same would be true for a typical family physician in Alberta. Though some multidisciplinary resources are available for specific diseases such as obesity, resources are lacking to support comprehensive prevention and screening.

⁶ For the purposes of this policy paper it is ‘Primary Care’ that is used to refer to the first level of intervention.

4.2 Compensation for primary care services

The current system of primary care in Alberta uses the fee-for-visit method as the predominant method of paying primary care physicians and assumes the minimal presence of non-physicians in the scene. Typically, family physicians work in solo and small group practices and look after chronic disease patients and non-chronic disease patients in the same office-based practices. In the majority of cases, chronic and non-chronic patients are treated on a piecemeal basis through a “component care” model that provides each service (e.g., lab tests, diagnostic imaging) without any expectation of coordination with the primary care physician or any connection among the individuals that provide each service.

4.3 Primary care initiatives

Recent developments/initiatives in the area of primary care in Alberta are summarized below:

- Before 2005, there were many initiatives to improve primary care by forming multidisciplinary teams. These met with very limited success.
- Primary Care Networks (PCN's) started in 2005. Since their implementation in Alberta, the expectation for more co-ordinated primary care was high. However, after annual spending of approximately \$150 million for each of the last seven years (cumulative spending of \$1 billion including fiscal 2013-14), there is no consensus regarding the value for money PCNs have added.
- The July 2012 Report of the Auditor General of Alberta (pages 25-61) concluded that the Government of Alberta had no way of knowing whether its PCNs were working. The report noted that Alberta Health (AH) and AHS had failed to define clear objectives, performance measures or targets for PCNs, which impedes decision-making about whether to continue, expand or end the program (Auditor General of Alberta, 2012).

The report further states that there were 41 PCNs involving 2,600 family doctors, for which the province has spent \$700 million, with another \$170 million slated for the 2012-13 fiscal year. According to the Auditor General, Alberta Health and AHS did not have systems to evaluate the PCN program and demonstrate that their efforts were bringing the province-wide benefits envisioned for the initiative. The report also notes that most of the 80% of Albertans who belonged to a care network had not been told about it or did not know which one they were assigned to. Furthermore, PCNs did not know the names of the patients they were responsible for.

Family Care Clinics (FCCs) are defined as “local team-based primary health care delivery organizations that provide individual and family-focused primary health care services

that are tailored to meet the health needs of a community⁷. As of 2013, there are three such clinics in Alberta — Edmonton East, Calgary East and Slave Lake. Alberta Health plans to establish as many as 140 FCCs in the province.

The three pilot FCCs have been open since April 2012. According to government sources, initial results suggest a drop in ER visits in Slave Lake and reduced wait times for access to family physicians in two of the three FCCs.

4.4 Current Challenges – Alberta

Current primary care culture in Alberta is predominantly disease/illness-centric and emphasizes the number of visits to a physician. In this culture, patients with additional problems and concerns are not always heard – especially with physicians who limit health concerns to a maximum of two per visit.

According to Dr. Lee Green (Chair, Family Medicine, University of Alberta), two major problems in the reimbursement structure are:

- a single fee for most visits – fee modifiers don't come close to covering the cost of the longer visits that multiple chronic disease patients require for proper management and,
- payment is for face-to-face visits only.

As a result of single fee for most visits, physicians are trying to take care of patients with multiple needs in visits that are too many and too short, and therefore are also non-integrated and inefficient (i.e., costly). As a result of payment for face-to-face visits only, there is no support for doing the extensive between-visit work and co-ordination that CDM requires and thus it does not get done.

The current payment system does not encourage team-based practice. Collaboration among different professionals is lacking. There is also a disconnect between the public health sector and primary care. This disconnect can be illustrated by a maternal care patient who might be looked after by a family physician and a public health nurse, who have no way to co-ordinate their care. Unclear roles and scope of practice creates duplication of services that is further exacerbated by non-collaboration.

The need to visit multiple doctors for the same problem constitutes a challenge for patient accountability as well. Patients are free to see whichever physician they can find access to. One of the factors leading to this behaviour is the patient's lack of access to their own personal health information. This is compounded by the fact that each new physician has to find out all relevant information from the patient and the completeness of that information depends on the patient's ability to recall and articulate it.

7 <http://www.health.alberta.ca/services/family-care-clinics.html>



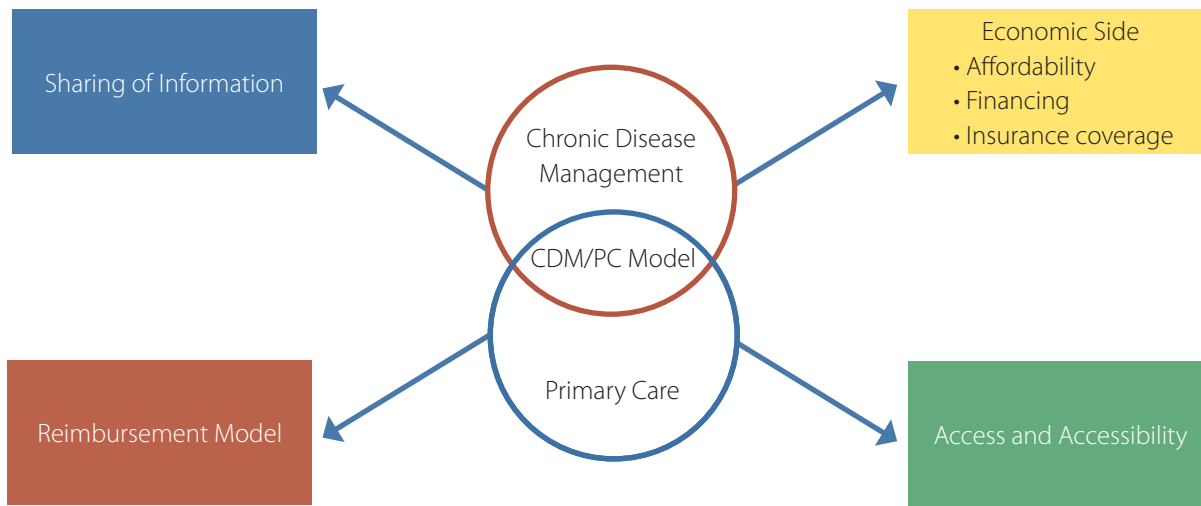
5. INTERSECTION BETWEEN CHRONIC DISEASE AND PRIMARY CARE

Primary care is the ideal setting for the majority of prevention and screening interventions and is the best setting for managing common stable chronic conditions such as hypertension, diabetes, and breast cancer. Thus primary care providers see an 'ocean of symptoms', many of which are normal, undefined physiological symptoms or minor illnesses of no consequence.

The primary care provider's skill is to recognize when symptoms are outside the norm and to know when to intervene or refer. Continuity with a primary care provider facilitates the ability to recognize abnormal patterns in known patients. Therefore, relational continuity is important in providing patients a sense of predictability and coherence.

Primary care providers develop expertise in recognizing and managing common illnesses and will usually refer to specialists when encountering conditions outside their scope of expertise. Primary care providers need timely access to specialists to avoid unnecessary delays in diagnosis and treatment of treatable conditions (Starfield, 1998). Secondary care includes specific targeted services such as gall bladder surgery, knee replacements, heart stents, and consultation with a lung specialist for management of severe emphysema. Tertiary care refers to highly specialized services such as transplants and stem cell therapy, which are usually provided only in major academic centres. Specialists provide secondary and tertiary care.

The common ground between primary care and chronic disease management, which is the core of this paper, is illustrated in the diagram on the next page.



The four boxes refer to the four factors that enable the intersection between primary care and chronic disease management to work. They are shown here as concepts and are followed through during the remainder of the paper. Of the four factors, the top two – information sharing and economic affordability – are considered as key enablers for successful chronic disease management. The bottom two – reimbursement or payment models for physicians/ non physician providers and service access – are key enablers for primary care.

Several factors that affect patient outcomes at the intersection between primary care and chronic disease are discussed below.

5.1 Comprehensiveness and team-based care in Alberta

There are only a few real team-based care practices in Alberta. The majority of full scope family medicine practices are not team-based.

A comprehensive, team-based practice would:

- meet the needs of all patients at their point of entry into the health system, including the needs of patients with known chronic diseases under specialist care
- provide access to an interdisciplinary team for all their medical needs
- avoid costly delays and achieve preventative practices at a lower cost

5.2 Financial incentives in Alberta

Alberta's fee-for-service model rewards acute care and high-volume practices. Fees are tied to the physician and actual patient visits. This fee structure does not support integrated team practices. Alternative payment schedules often include shadow billing based on the fee-for-service model.

According to Dr. Lee Green, the fee-for-service model makes access more difficult, as it does not pay physicians for telephone or email care, which could avoid visits entirely. Nor fee-for-service cover care by team members who could lighten the load for overscheduled physicians. Further, it encourages large numbers of short visits that consume more physician time than fewer, more thorough visits.

Alberta's complex fee code, 03.04J introduced a few years ago, was an attempt to improve CDM; however, this code does not fix the problems with the present models of care in Alberta. For example:

- Prevention and screening are not rewarded with this disease-focused system (based upon International Classification of Diseases (ICD) 10 codes. There are few to no fees supporting preventive activities.
- Many PCN's have non-physician clinicians who develop chronic care plans to meet guideline recommendations for chronic disease patients; however, they are not able to bill for the services through the complex fee code because the patients do not see the physicians. Non-physician clinicians, most of the time, are paid through a salary/contract arrangement.
- Many physicians without interdisciplinary teams bill using the complex fee code without the support of a team to follow up with their patient. The fee rewards the development of a plan that may not be linked to improved outcomes and for which there is no support or incentive to take further action.

Financial incentives that support better coordination of primary care and CDM would:

- Reward efforts to improve practice quality or carry out quality improvement projects
- Allow practices to bill for the services of multidisciplinary teams and non-physician clinicians to manage care plans for patients with chronic diseases
- Provide for the hours needed to meet recommendations for the 10 most common chronic diseases, which are also the ones that primary care can have the most impact on. Physicians would have to spend a considerable amount of extra time, especially for the uncontrolled chronic diseases.

5.3 Accountability in Alberta

Alberta Health does not define or rigorously evaluate the quality of primary care to be provided in Alberta. The government spends many millions of dollars on unproven models of care and on developing new models without adequately evaluating and building on the lessons learned from previous approaches.

Primary care providers lack incentives and resources to evaluate their practices. There are numerous barriers to quality improvement activities in Alberta. Electronic Medical Records (EMRs)⁸ could be a rich information resource; however, in most cases primary care providers do not have access to their EMRs other than through cumbersome search engines on the front end of the EMR database. Quality improvement projects and audits take time away from a billable practice, and such time is therefore costly.

Indicators of a strong primary care system could be identified from the previous work that demonstrated accessibility, comprehensiveness, person-focused care and continuity as important measures (Starfield et al, 2005). In addition to providing financial incentives, a system that integrates primary care and CDM would hold healthcare professionals accountable by:

- rigorously defining and evaluating expectations for the quality of primary care;
- testing and evaluating new models of care to ensure they are delivering the outcomes expected; and
- making EMRs readily available to primary care providers.

5.4 Integration of primary care and chronic disease management in Alberta

Barriers between primary care and specialty care providers prevent them from coordinating or integrating care across all domains of Alberta's healthcare system. Primary care providers are often not adequately informed of the interventions and treatments their patients receive from secondary caregivers. This lack of communication leads to a loss of information and management continuity because patients' management plans are not communicated to healthcare providers who are expected to deliver care. For example, when a patient is discharged from hospital after receiving intravenous antibiotics for a cellulitis, the family physician should monitor and prescribe an oral antibiotic for the partially treated infection. But the family physician seldom receives the necessary information about the culture and sensitivity of a methicillin-resistant staph infection.

8 EMR is a system used within primary and specialist-care clinics to support the management of patient clinical records, such as encounter notes and prescriptions, and assist with business management processes, such as billing and scheduling.



There are also silos between primary care providers and the public health system. Mothers are required to bring their babies in for three well-child public healthcare visits in the first 6 to 9 months as well as see their family physician. This duplication is a burden and cost for both the mother and the system and in some cases leads to confusion and anxiety when mothers receive differing advice.

In a three-page summary, Lapins and Andres (2014) cross-mapped attributes of primary care into components of an Expanded CDM Model and identified key strategies for integrating chronic disease and primary care in Alberta⁹.

5.5 Integration elsewhere in Canada

Some jurisdictions in Canada are starting to develop integrated care models. Four patient examples of contrast between fragmented care and integrated care were received from Dr. Renee Lyons of Bridgepoint Health in Ontario. One of those cases is summarized below. The full version of all four is presented in Appendix C.

Amina Patel, 65 year old female with multiple diagnoses: diabetes, hypertension, heart disease (had bypass surgery), breast cancer (had surgery and chemotherapy), chronic pain, and depression.

Under the current scheme, she will receive fragmented acute-care centric services – in and out of acute care services – and seen by her family physician and endocrinologist until she is admitted to a nursing home.

With integrated care, she will receive care from physicians of different specialties in a “one-stop shop” setting. In this scenario, the patient, the family physician and the specialists are working together with the patient’s home-care providers. After several weeks, she will be discharged home with a care-maintenance plan.

⁹ Summary chart obtained from the authors.



6. BARRIERS TO CHRONIC DISEASE MANAGEMENT

Many studies document a variety of barriers to effectively managing chronic diseases. For this paper, we focus on one specific Alberta report. The 2011 ICDC study/survey sought to describe barriers to accessing primary care and allied healthcare professionals, for adults with chronic conditions. The ICDC worked with Statistics Canada to collect information on the current state of care and barriers to access in Western Canada. The survey gathered information from 1,849 respondents who had at least one of four chronic diseases: hypertension, diabetes, heart disease, and stroke. The research report published in March 2013 “Barriers to Care for People with Chronic Health Conditions,” based on the above mentioned survey listed a number of barriers.

The findings from the survey and report were categorized into three groups of barriers:

- Access/provider-related barriers to primary care;
- Economic/Financial barriers; and
- Insurance/Geographic barriers.

Under the Access/provider-related barriers to primary care, the first one mentioned is that one in 10 patients experienced difficulty receiving primary healthcare services. Patients reported provider-level barriers (difficulty getting an appointment, waiting too long for one or waiting too long to see a doctor) nearly twice as often (65.7%) as system/patient-level barriers. Provider barriers occurred even more often for those with 2 or more chronic conditions. The second point made was that a majority (68.1%) did not have after-hours access to a physician (not including the ER). This percentage was greater (72.4%) in those identified as having 2 or more chronic conditions. It was also mentioned that in patients who had been to the ER in the last year (8.1% of survey respondents), 1 in 3 felt that their last visit could have been avoided had their regular general practitioner (GP) been available. The fourth point was regarding non-physician providers. Respondents reported that allied healthcare professionals (AHCPs), such as nurse practitioners or dieticians did not usually work in the same office as their GPs. Of those who reported other healthcare professionals in their GP’s office (24.2%), only 6.1% actually received care from them, resulting in a very under-utilized source of primary care. A great majority (87.3%) said they were willing to see a nurse practitioner if their GP was not available.

Under the Economic/Financial barriers category, the key point made was that Patients facing economic barriers were 30% to 50% less likely to be taking preventative medications (statins) for cardiovascular disease risks. Patients faced difficulty paying for services, equipment, or medications. Of those surveyed, 12% reported experiencing these difficulties in the past year, which increased to 20.9% for those with 2 or more chronic conditions. About 78% of survey respondents indicated that financial barriers were more likely to prevent them from obtaining prescription drugs. It was mentioned that financial barriers were significantly associated with an increased risk of hospitalization or ER visits.

The third category, Insurance/Geographic Barriers, also identified a number of factors. Of people surveyed, 14.1% lacked prescription drug coverage, mainly because of access issues (51.9%) such as affordability, not offered, or not eligible. The geographical scope of the study was Western Canada. Alberta residents experienced less insurance barriers than non-Alberta residents. The highest out of pocket costs were reported in those over 65, with at least 2 chronic conditions. Another interesting point was that while few people (2.7%) reported geographic barriers to primary care, many more (20.3%) reported barriers to specialist care. Albertans had the highest interest in using tele-health and email for self-care, compared to other western provinces. People were more interested in using tele-health for primary care than for a specialist.



7. BEST PRACTICES IN CDM/PC

According to Perleth *et al* (2001), best practice in health care is defined as the ‘best way’ to identify, collect, evaluate, disseminate, and implement information about as well as to monitor the outcomes of health care interventions for patients/population groups and defined indications or conditions. Information is required on the best available evidence on safety, efficacy, effectiveness, cost effectiveness, appropriateness, social and ethical values and quality of the health care interventions (*ibid.*).

While there is no consensus regarding the definition of ‘best practice’ primary care model for CDM, the author’s familiarity with the international health jurisdictions and personal experiences resulted in this list of best practices. This list was vetted through an advisory panel of experts for validation. An informal survey with the stakeholders was also conducted. Macleans ranking of Canadian universities and Macleans past ranking of health regions that placed Edmonton’s Capital Health region in the top position for two consecutive years was kept in mind while doing this table. The list of best practices/jurisdictions was finalized with input/endorsement of the advisory panel.

The table in Appendix D outlines a summary of Best Practices in the implementation of primary care to deal with chronic disease management. The table provides information on the country and/or jurisdiction, key features of the health system, status of health record automation, and lessons for Alberta.

Summary observations

Like many things in life, best (or better) practices can be plotted on a continuum. On the one end of the spectrum is Kaiser Permanente’s exemplary model of totally interactive primary care and chronic disease management. Kaiser has become the benchmark operation for electronic information sharing with 100% adoption of multi-functional EHR and EMR. Through KP Connect, physicians and patients can review all medical records including lab results, appointments, and prescriptions through a secure system.

On the other end of the spectrum are solo primary care physician clinics unconnected with any other professionals and the patient information is totally paper-based. Taber Clinic, which is an amalgam of ARP and fee-for-service family practices, supplemented by a staff nurse practitioner paid through PCN funding, falls somewhere in the mid-range of that continuum. The synergy required to create an environment for population health promotion is not yet present in the Taber clinic setting, despite their desire to do so.

Placed in between the Kaiser and solo practice extremes are nationwide health systems of the United Kingdom, New Zealand, and the Netherlands, where most physicians (up to 98%) use EMRs in offering primary health care to their chronic disease patients. In the UK, nurse practitioners play an important role; there is one nurse practitioner per three family physicians, makes the two types of practice very complementary. In the Netherlands, 97% of the practices have arrangements for after-hour care (compared to 43% in Canada). New Zealand has been ranked as the best country in patient-physician communication.

Several best practices from the US health care were also reviewed. The Mayo Clinic in Rochester, Minnesota has an excellent team based care approach. The EMR system, accessible by patients and providers, functions very well. The Cleveland Clinic in Cleveland, Ohio and the Geisinger Health System in North Eastern Pennsylvania both have an interactive on-line appointment system and online access to personal clinical data including lab results, medication lists, and hospital discharge instructions. An almost perfect (99.9% accuracy) drug dispensing system has been mentioned as a key feature of the Veterans Administration (VA), the largest integrated health care system in the US. The VA also has a well developed accountability measurement framework.

Three Canadian best practice examples have been summarized- all from Western Canada. The Waneta Primary Care Clinic, located within the Interior Health Authority, in Trail, BC constitutes a success story of a physician-nurse practitioner collaborative practice. Personal communication with the clinic staff confirmed high satisfaction level among the providers. The other two are Alberta examples – Taber Clinic in Taber, Alberta and the Southside PCN in Edmonton, Alberta. In both of these practices, non fee for service method of Physician payment is in place and also staff include nurse practitioners. The functionality of EMR is also superior than in many other Alberta practices. Crowfoot Clinic in Calgary has been pointed out as a ‘best practice’ but not enough evidence was found to include Crowfoot in the table.



8. CHRONIC DISEASE MANAGEMENT AND PRIMARY CARE – “MADE IN ALBERTA” SOLUTION

How can an effective primary care system in Alberta improve the management of high-prevalence, moderately-complex chronic diseases? The answer covers five broad areas:

- the roles of professional groups and patients;
- secondary prevention;
- personal health portal, integration, and transformation at the population and system level;
- individual level information sharing for professionals and patients; and
- the case for measures and a CDM index.

8.1 Role of different professional groups and patients

Even though there is no clear consensus regarding the roles of different professions, it is possible to delineate their current roles and the salient issues for each group. For at least for some professions, we describe the desirable state.

Family Physicians

Most family physicians (FPs) are compensated on a fee-for-service basis in Alberta. To optimize their income, FPs need to see an estimated six patients per hour. This creates a challenge for FPs to dedicate adequate time to chronic disease patients. The six patient per hour statistic was used to compute ARP payment amounts for the non-fee-for-service FPs in the 1990s.

Issues have been raised regarding ‘non-accountability’ for physicians, particularly FPs, practicing in Alberta and Canada. There is no routine quality assessment and monitoring of family physicians in Alberta. Dr. Lee Green has observed that “the norm in the US is that practices routinely report their Healthcare Effectiveness Data and Information Set (HEDIS) measures for preventive and CDM services, access, and patient satisfaction, but that is unthinkable in Alberta. Neither the infrastructure nor the incentives to do it – or

to make use of it for improving quality – exist (with the notable exception of the too-small Towards Optimal Practice (TOP)¹⁰ and Access Improvement Measures (AIM)¹¹ programs). The physician culture will not accept it, and the profession does not trust government’s (appropriate use of those measures)...”

Nurse Practitioners

Nurse practitioners are educated within the nursing model, which includes a holistic focus that:

- encompasses health and illness;
- emphasizes prevention, wellness, and patient education; and
- stresses the importance of the individual as the primary leader in their own care.

As a result of this broad education, nurse practitioner practice is interpersonal and interactive, stressing communication and independent decision making (Wong and Farrally, undated).

In Alberta, nurse practitioners are able to perform some duties not included in traditional nursing such as ordering diagnostic tests, performing annual check-ups, and managing chronic disease. They are also able to prescribe certain medications – a role that continues to expand.

Dr. Donna Manca, a researcher and family physician in Edmonton, Alberta, explains the NP role in Alberta as follows:

“I think a medical home model works—one where patients know who is responsible for their care. My practice in the south-side PCN is a coordinated integrated working relationship with a nurse practitioner. Our nurse practitioners recognize the family physicians as the responsible clinician for the patient, and they understand their boundaries. Things then work well as we work together and know who is responsible for what. The nurse practitioner helps manage within their scope and keeps me informed so that our patients receive the care they need. I work with two NPs at present who assist me with my

10 The Toward Optimized Practice (TOP) program supports physician practices, and the teams they work with, by fostering the use of evidence-based best practices and quality initiatives in medical care in Alberta. The program offers a variety of tools and services to help physicians and their colleagues meet the challenge of keeping practices current in an environment of continually emerging evidence.

The program is overseen by representatives from each of the four sponsoring bodies: Alberta Medical Association, Alberta Health, Alberta Health Services and the College of Physicians and Surgeons of Alberta. (<http://www.albertapci.ca/AboutPCI/RelatedPrograms/Pages/TOP.aspx>)

11 Alberta AIM (Access, Improvement, Measures) is a program that helps clinics in primary care networks improve patient care and redesign office practices to improve efficiency. The AIM program has six learning sessions. Healthcare teams that have been through AIM report better patient access, increased practice efficiency, smooth flow of work, higher morale, the ability to take on more patients, increased revenue and, most importantly, better and more comprehensive patient care. (<http://www.albertapci.ca/ABOUTPCI/RELATEDPROGRAMS/AIM/Pages/default.aspx> <http://www.albertaim.ca/index.php/about-aim/what-is-alberta-aim#why-you-need-alberta-aim>)



complex diabetic patients, patients needing assistance with weight loss, and frail patients.

I have encountered problems when other providers (e.g., a pharmacist) see my patient outside of my setting. They do not recognize that I am the responsible clinician. Instead of referring the patient back to me (e.g., a woman complains of feeling sweaty) they refer my patient to another provider (e.g., a menopausal clinic). Eventually, after hundreds of dollars of inappropriate investigations the patient themselves return to me for assessment and treatment since the problem was not menopause, etc.”

The notional funding pool for nurse practitioners appears to be insufficient. Salary is the main method for paying NP’s and AHS is their largest employer. There are exceptional arrangements under which only a few NP’s get paid on a fee-for-service basis. The current compensation for NPs in Alberta does not allow them to reach their full potential.

Registered Nurses

Registered Nurses are frequently not part of the primary care team in Alberta, but are prominent team members in examples of high-functioning medical home practices. RNs can:

- function as chronic disease managers, maintaining contact, and supporting patients on care plans between office visits;
- see patients for planned medication checks and adjustments under standing orders and protocols;
- work out shared goal-setting plans with patients; and
- conduct a great deal of the patient education that is needed for successful patient self-management of chronic conditions

At present these functions are not reimbursed in Alberta, and hence RNs in practice are seldom used to their potential. RNs effective role in Health Link Alberta is to be noted. Health Link provides health advice and information through a toll-free phone number to all Albertans; access is 24 hour, 7 day a week and support is provided by experienced registered nurses and other health-care professionals.¹²

Case Managers

Case managers play a critical coordination/communication role in a team-based clinic. A case manager can be either a nurse or a nurse practitioner or any other professional with appropriate training and experience. As above, this role is most often filled by RNs in effective medical home practices.

12 <http://www.albertahealthservices.ca/223.asp>



Social Workers, Mental Health Workers and Other Providers

Depression and other mental health conditions constitute the biggest chronic disease burden among all illnesses. Because family physicians do not have time in clinic to effectively deal with mental illnesses, the role of care-givers with special training cannot be overemphasized.

Psychologists and psychiatrists have the training to deal with mental health issues. However, the broader training of social workers to deal with a variety of health and non-health issues makes the inclusion of social workers advantageous in CDM teams, especially for high-needs populations.

Patients

Even though there have been recommendations over the decades regarding transforming the health system into a patient-centric one, the system is not designed around patient service needs. One example is the family physicians' practice of shutting their doors at 5:00 p.m. Another is the lack of assistance for navigating the complex healthcare system.

Case managers are not a regular feature of primary care practice. This problem is most severe for patients with multiple chronic diseases since they need care coordination most, but their illness often reduces their own ability to manage it.

There is a lot of research on patient engagement and how patients can play a larger role in their own care. One size does not fit all; patients vary widely in both their ability to be involved in their own care and the extent and nature of the involvement they prefer. The system as it currently operates provides little support for patient engagement at all, let alone tailoring it to individual patients' needs and preferences.

As discussed earlier, chronic disease self-management models provide a platform for CD patients to be involved/engaged in their care. For example, the Stanford Model, built upon providing a six-week course to a group of 10-15 participants, can provide enough coaching for self-efficacy for a group of diabetes and arthritis patients.

8.2 Primary Prevention, Screening, and Secondary Prevention

To optimize CDM, a two part prevention strategy needs to be in place. Primary prevention and screening takes place at the population level. Secondary prevention applies to patients who are diagnosed with one or more diseases. The two are further described below.

Primary Prevention and Screening

Primary prevention generally involves the prevention of diseases and conditions before their biological onset. Preventing environmental exposures, improving human resistance to disease, and educating the public to reduce or give up risk-taking behaviour are all primary prevention measures. Proper nutrition, appropriate exercise, and smoking cessation constitute some specific examples.

Screening involves periodic exams and testing to detect illness before it becomes symptomatic. Common examples include mammography and colonoscopy. Screening is valuable only if certain conditions are met. The disease has to be common enough to be a public health burden, it has to have a long enough phase after it begins but before symptoms appear, there has to be an examination or test that will reliably detect it without generating excessive false positive results, there must be an effective treatment, and there has to be an advantage in treating it early.

The rate of return from screening and prevention programs depends on the type of program. While the prevention outcome from the small investment in polio vaccination can be significant, the marginal benefit from an obesity prevention/management program is often trivial (because available treatments have limited effectiveness) (Dr. A. Sharma, personal communication).

Organizationally, one of the key questions regarding primary prevention and screening is “who is in the lead role”. While public health typically plays a lead role in health promotion, environmental health, and public health hygiene, primary care providers often have the central role in disease prevention and screening. The current models of primary care, designed to address acute care and symptomatic disease issues, are not optimal for primary prevention and screening. The situation is compounded by a reimbursement system that disfavours the often time-intensive process of educating patients about prevention and screening, and that encourages fragmented care.

Secondary Prevention

Secondary prevention of chronic diseases focuses on effective management of diseases in the early stages to slow or prevent progression and reduce complications. This is in contrast to tertiary prevention, which is a last-ditch effort to prevent death, disability, or organ failure for patients who already have adverse effects from their disease. A classic example is emergency heart catheterization and stenting in an attempt to save the life of a patient with coronary heart disease whose disease has progressed to a heart attack.

Secondary prevention typically involves a regular plan of care, ongoing monitoring of physical examination findings and laboratory tests, use of medications for which good evidence of benefit exists (e.g., aspirin for patients with coronary heart disease), and interventions such as diet and exercise that can reduce the severity of the disease.

8.3 Integration

The literature on coordinated care is full of information about the improvements in patients' care when it is delivered in an integrated model. The sample case histories (see Appendix C) of people from age 40 to 82 with a multitude of complex chronic conditions with a similar comparative picture of siloed care versus integrated care demonstrate the CDM potential in Alberta.

Another success story is shown in Appendix E, Bernice's story, presented by the Ontario Ministry of Health and Long Term Care, shows significant cost savings and a better health outcome. The overall treatment cost for a five-year period is reduced from \$500,000 to \$100,000 due to care provided through Ontario's newest initiative: "Community Health Links In Action."

The suggestions that follow put forward ways to push the CDM envelope forward under several broad headings.

Population Level

Most of the 1% of the population that consumes 35% of all health dollars is CD patients with multi-morbidity. However, that population is not the main focus of the paper. Patients who have one or more chronic diseases represent 10% of the population. With effective management, healthcare providers can help prevent these patients from progressing to the 1% group that consumer 35% health spending. Following is a list of suggestions (categorized under short-, medium-, and long-term) to keep them from progressing into the high-morbidity 1% group:

Short-Term:

- Change payment models to remove barriers to effective secondary prevention (CDM) services in primary care.
- Reform information management to support practices in CDM.

Medium-Term:

- Implement EMRs with sophisticated disease management, panel management, and patient-portal functions in all primary care practices.
- Expand CD workshops for educating patients. In Alberta, AHS has started such workshops particularly for diabetes.
- Implement province-wide measurement and evaluation for screening, prevention, and disease management process and outcome.

Long-Term:

- Establish a culture of team- and systems-based care, measurement, systems thinking, and quality improvement.

8.4 System Level Funding

Physician Funding System

Numerous books and reports, including Romanow (2002) and Kirby (2003), emphasized the need for primary care reform. A major recommendation in many reports has been the need to reform the fee-for-service payment method. Although health policy experts disagree on many issues, they largely agree on the shortcomings of fee-for-service payment (Feder, 2013). Feder notes that ‘the inefficiency of a payment method that rewards increases in service volume, regardless of health benefit, has become practically indefensible’. Alberta lags behind other provinces in terms of physician payment reform. According to recent figures, Alternate Remuneration Plans account for about 18% of the total fees paid to physicians (CIHI, 2013). The most recent agreement between the Alberta Medical Association and the Alberta Ministry of Health continues to use fees for services as the main payment method for the remainder of this decade.

In spite of all the criticisms about the fee-for-service system and the greater benefit of other approaches, why does it not change? Referring to ‘Inertia’ as one of the biggest factors would be an understatement. Physicians enjoy the freedom of sending bills to a single payer, the Alberta Ministry of Health, and the Alberta Medical Association has been very protective of that arrangement. The same is true for all the Provinces. Very effective negotiations by the provincial medical associations and the continuation of fee for service have resulted in a 30% (in constant dollars) increase in average physician earning between the years 2000 and 2012 in Canada (Grant et al, 2013). The changes

that have been brought about in Alberta can at most be called ‘tinkering at the margin’ without any significant impact on the system. These changes include PCN implementation in 2005; the introduction of the 03.04J code for continuity of care; and most recently, FCC (Family Care Clinics).

Funding System for Other Service Delivery

The policy Alberta Health follows to fund AHS can best be described as global funding. At the highest level, AHS continues to provide funding allocations that more or less ensure no change from prior years’ share of funding for acute in-patient, acute out-patient, and continuing care. Alberta Health is making significant progress with implementing Activity-Based Funding to allocate funds to individual sites or providers. In spite of the obvious benefits of team-based primary care practice, it has not been easy for the health system to free up (acute care) dollars to improve the primary care and CDM. A line item or protected envelope funding, or perhaps funding specifically targeted jointly by AHS and AH, would ensure a financial guarantee for this practice.

Alberta has some significant success with targeted funding. Between 1998 and 2008, a targeted funding method called province-wide services was in place in Alberta for providing dollars for high-cost and hi-tech services usually delivered in Calgary or Edmonton. A number of different evaluations and audits confirmed that the province-wide services model achieved its program objectives.

8.5 Information Sharing

A patient’s health information is spread across multiple systems and in multiple locations. Chart A attempts to show the major health data repositories. Health information collected at each patient’s visit includes basic but crucial data elements such as blood pressure, allergies, diagnosis, and co-morbidities and all the history of prescription medications (both dispensed and non-dispensed without a breakdown).

As shown through the red bar (EMR list) on the left side of the chart, EMR is partially connected with the rest of the health data banks. Most EMRs connect with NetCare data but in a one-directional way. At this time, no EMR data is shared with NetCare but the laboratory and diagnostic imaging data that are on NetCare, for example, can be accessed by EMR. In other words, there is no direct feed from EMR to anywhere.

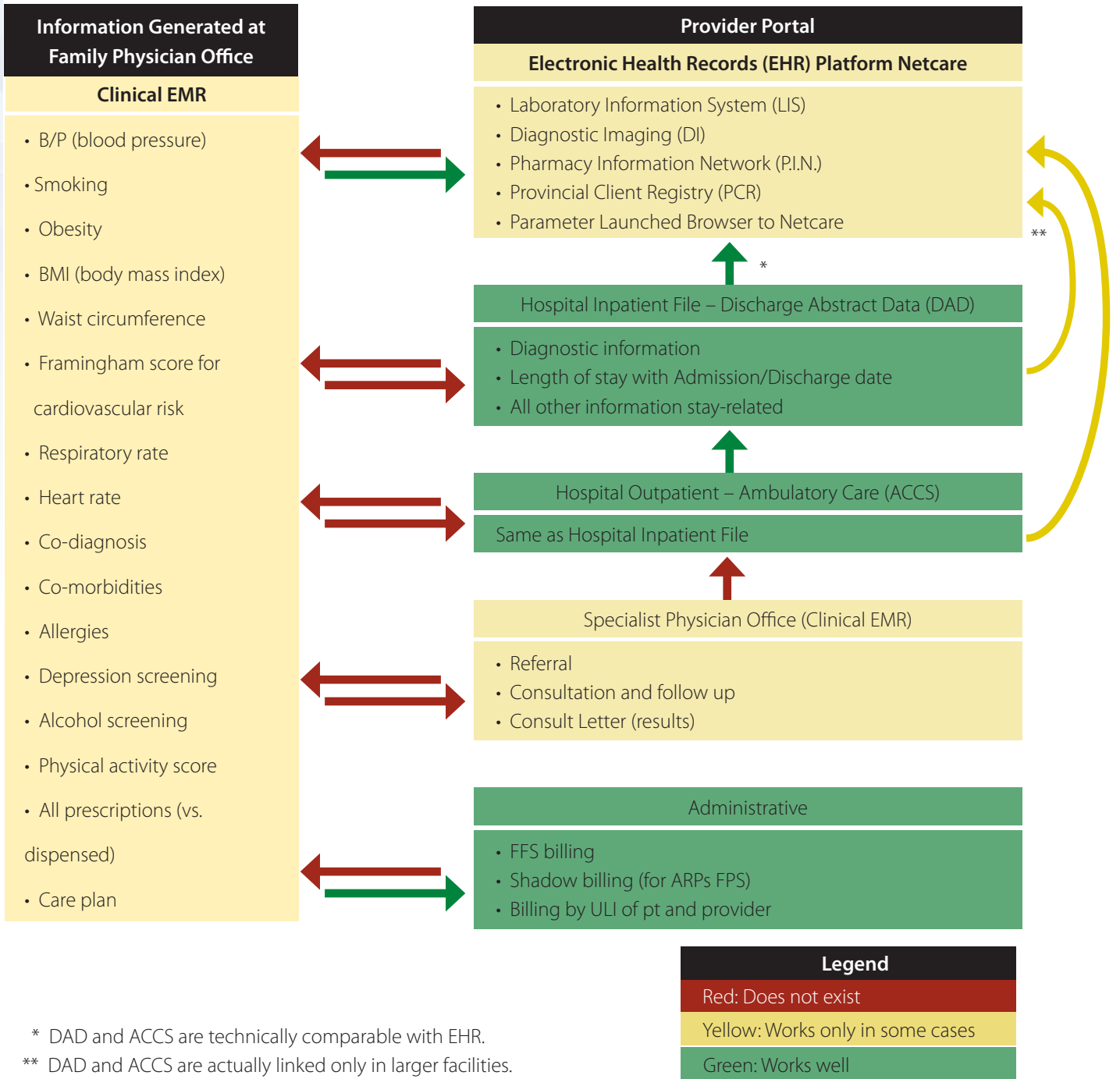
The top yellow box (EHR Information) is one of the more recent additions to the overall health information repository. The EHR has an access platform called Netcare. The Netcare portal accesses very important data sets including pathological laboratory results, diagnostic imaging information, information on prescriptions dispensed, patient demographics, physician information, and facility location information.



The three green boxes on the right side are mature data sets that have evolved over the many decades and contain patient-level information for the hospital admission files; the hospital-based ambulatory data system (e.g., ER visits and hospital-based clinics), and fee-for-service billing data.

The good news is that the interconnectivity among the three green boxes is close to perfect. For the Personal Health Portal (PHP) to be effective, there must be full interconnectivity between the EHR and all EMRs and all other clinical data sets.

Chart A
Electronic Medical Records (EMR) and Data Connectivity for Chronic Disease Management



Removal of Information Sharing Barriers

Many times, the ambiguities in the *Health Information Act* are thought to be responsible for difficulties in Alberta's much-needed information sharing. While this might be addressed when the Act is amended (currently under way), the need for direct language that encourages sharing has been repeatedly raised by the provider and research community.

With the experience of the inconsistencies generated by various vendors among EMR files, it is necessary to create the position of an EMR Data Champion, with the role of working with both physicians and other providers. The FP-led EMR should not only result in a paperless office for all Alberta family physicians, but it must also move to include leadership by and information relevant to other chronic disease-primary care providers such as the nurse practitioners, physical therapists, optometrists and chiropractors.

Availability of appropriate information can improve both self-managed care and care by health service providers. The information sharing journey is well underway. However, Alberta and Canada lag far behind the Netherlands, the UK and Kaiser Permanente and Inter Mountain Health in the U.S. (a Kaiser physician is able to see the entire history of a patient during an office/clinic visit). For example, a typical diabetes patient enrolled in Kaiser Permanente can email her complaints/health status changes to the Care Team and expect a response within 48 hours. She also can take a look at her personal charts at the health portal to which she has secure password-protected access.

In Alberta, the current status of information sharing at an individual patient level is nowhere near the Kaiser Permanente level. At this point the only source of information is a paper copy from the family physicians' paper files or printed from the EMR. However, with what is planned, the state seen at Kaiser may be possible. That potential is delineated below in short-, medium-, and long-term achievements:

Short-Term (Next 2 years, 2013 to 2015)—Populated PHP

- Today, a minority of family physician offices remain paper-based, using the same system used in the '50s and '60s. But the same is not true for the offices of nurse practitioners, physiotherapists, optometrists, dentists and other primary care providers. A paperless system across the stakeholder groups will allow for improved information sharing.
- From 2006–2007 to now, the Government of Alberta has spent about \$300 million on POSP (Physician Office System Program) to implement EMRs in the offices of family physicians. While that has contributed in the automated EMR for about 60% of them, these EMRs do not interchange data, provide patient portals, or have adequate reporting capability to support CDM or quality improvement. These deficits must be remedied to achieve the potential of EMRs for improving care.

Medium-Term (Three years, 2014 to 2017)—Totally Linked Data Sets

- As shown in Chart A, EMR is one of the main components of the entire proposed integrated system. The medium-term goal is to ensure links among all the components so that providers have access to all the longitudinal data of their entire patient population.

Long-Term (Next five years, 2014 to 2019)—Kaiser-Level Interactive E-mail

- This is the total implementation of a 'Kaiser' layer in Alberta's electronic information system. This is the ideal state outlined in Chart A. At this stage, all Albertans will have access to all of their individual health records. The information system will also have interactive communication—online email/video conference—with secure messaging system between patients/families and their healthcare team members.

8.6 In search of an index for measuring Chronic Disease Management

Successful management strategies are built on the premise that we cannot manage what we cannot measure. It is in this light that the author sought to explore the existence of measures for CDM. In an ideal situation, it would be beneficial for health managers, auditors, and policy makers to have some tools to measure the performance of different CDM strategies. Our literature search did not identify an all-encompassing composite index that could be used to measure CDM. In the absence of a CDM index, it is possible that CDM-related primary healthcare indicators can be used as proxies to measure the performance of CDM.

According to Nietert et al (2007), the Summary Quality Index (SQUID) can be used to track quality of care among patients and primary practices that use an electronic medical record. The MacColl Centre developed the ACIC (Assessment of Chronic Illness Care), and PACIC (Patient Assessment of Chronic Illness Care) measures based on Wagner's Chronic Care Model (CCM). The ACIC was developed as a practical tool to help teams improve care for chronic illness at the community, organization, practice and patient level. The ACIC provides subscale scores corresponding to each of the CCM elements, as well as an overall score. The PACIC measures specific actions or qualities of care, congruent with the CCM, that patients report they have experienced in the delivery system. It is not clear to what extent the ACIC and PACIC tools have been used on multi-morbid/complex patient populations.

According to Spenceley et al (2013), the lack of an accountability framework in Alberta's health system has resulted in a situation where there are no clearly defined outcomes or measures. The authors contend that system redesign requires consistently defined and

measured performance indicators and supports to meet expectations. Spenceley et al (2013) note that it is an essential and urgent priority in Alberta to establish a robust, mandatory accountability and performance management framework around primary care, one that:

- reflects the core attributes of strong primary care systems;
- focuses on improving the value and quality of care provided to patients/ population; and
- promotes continuity of care and integration across health-care services.

To meet this goal, the authors propose an accountability framework for moving primary care reform ahead in Alberta. Alberta Health Services is in the process of redesigning its performance measures following a governance review. Whereas past measures focused on hospital-based care, the new focus will be on patient needs and patient safety.

This paper proposes that an all-encompassing CDM Index would be a good management tool for policy makers, managers and auditors. The creation of a composite quality health performance index cannot be simple. The challenge is that of aggregation. In other words, how do we develop a meaningful metric from a pool of mix and match individual measures.

There is also an underlying risk that the methodology used to compile the results in an index does not accurately represent the performance that is being measured. If that risk is mitigated, such an index would capture the management aspects of different chronic diseases. It is important to ensure that the index undergo inter-jurisdictional review/ scrutiny to ensure that it can be compared across jurisdictions that construct a similar index. The actual development of the index is beyond the scope of this paper.

8.7 Consumer Health Technology and CDM

With the proliferation of new waves of new technology, questions are being raised regarding benefits to be reaped from expanding EHRs and EMRs further. The new waves include hand-held devices used by patients to remit real-time information on blood pressure and blood glucose readings. While the potential benefits from this level of automation can be very high, the challenges of aligning all these initiatives in a standardized format are daunting.

8.8 An Idealized Primary Health Care Structure for Alberta

Dr. Lee Green has provided his vision for an ideal primary health care system for Alberta. Green's made in Alberta solution is presented in Appendix F.



9. POLICY IMPLICATIONS FOR ALBERTA

Four major policy implications follow from the research analysis done in this paper:

9.1 Barrier of Financial Structure

In the absence of a targeted line item funding method for the non-physician segment of a multidisciplinary team, funding for nurses, NPs, and other primary care workers has been that of tin-cup mentality. The program leads and executives have to go begging to receive funds. Only a paradigm shift in funding policy that ensures a guaranteed funding amount for CDM/PC can bring about the change that was envisioned in the past but that has not yet happened. A funding schema that is integrated with the rest of AHS funding (*a la* province-wide services) is essential. The proposed framework would be that a CDM/PC clinic is funded similarly as a hospital receives a global budget and in turn pays all staff, excluding physicians. Physicians get paid from a separate pool, i.e., the Medical Services Budget at the Ministry.

This will require a business plan that shows exactly what will be delivered and how that translates into more and better care for fewer dollars. Alberta already has the highest expenditure per adjusted capita in the country, which makes the further injection of new money unlikely and unnecessary. Political strength and lobbies for the other major sectors (acute in-patient and out-patient and continuing care) make it hard to achieve, but resources could be moved incrementally, as long as there was a clear return on investment. Such dollar shifts to primary care become easier to justify if they are supported by results analysis done through appropriate analytics.

9.2 Access to Prescription Drugs

Alberta has a number of different prescription drug plans administered by different entities. During the last 10 years, the Government of Alberta has been examining the desirability/feasibility of consolidating the fragmented prescription drug plans, but that has not happened yet. In the context of this policy paper, a properly designed provincial pharmacare plan has the potential of dealing with the economic/affordability barrier mentioned in the ICDC 2013 report.

9.3 Health Human Resource Mix

Health human resources policy for CDM/PC should be the subject matter of an entire policy paper. However, our focus here is on the demand–supply gap for nurse practitioners. Several best-practice examples of primary care, including within Canada, suggest a physician/non-physician mix of caregivers for effective and accessible primary care. The most commonly recommended family-physician-to-nurse-practitioner ratio appears to be 3:1 (United Kingdom practice), implying that for every three family physicians, there should be one nurse practitioner. For team-based care to work effectively, other professionals, as appropriate, need to be factored-in to ensure a culture change in patient care.

Given that there are about 4,000¹³ family physicians licensed to practice as FPs and about 315 (as of September 2011) nurse practitioners in Alberta, the current ratio is 12:1. For the ratio to be 3:1, a total of 1,300 nurse practitioners are needed. With the demand–supply gap of 1,000 NP full-time equivalents and with annual production of 50 NPs within the province, everything else being equal, it will take 20 years for the supply side to match the demand side. Moreover, 20 years is an underestimate because of population growth and population aging impacts. Also, medical schools will potentially produce more family physicians over this time period, requiring additional NPs to ensure the ratio.

While a shortage of overall healthcare workers is not an issue, from an health human resource (HHR) optimal mix perspective, the severe gap between demand and supply needs immediate attention. Alberta Health, Alberta Health Services, and Innovation and Advanced Education need to have a well-coordinated priority plan for training of extra NPs that includes at least doubling the training quota for NPs.

One possible source for NPs is to provide NP training to some of the first batch of the IMGs (International Medical Graduates) who are waiting to go through the exams to eventually qualify to practice medicine in Alberta. If it is designed properly, the

13 Based on Humphrey's April 2012 evaluation of the use of the "continuity of care" billing code 03.04Ja

likelihood of success is high. For example, as a two-part professional recognition: 1) train as an NP and 2) after five years' of successful NP practice, an automatic granting of a medical practice license. However, there is no consensus regarding the trainability of IMGs into NPs. Some argue that IMGs are better candidates to be trained as Physician Assistants (PAs), Clinical Assistants (CAs), or as Limited-Scope physicians with a restricted license. HHR policy makers need to examine this as an option. Another option would be fast-tracking NP training of registered nurses who are being replaced by an increasing number of LPNs in the system. An estimated 420 NPs will be needed in Alberta if and when all of the proposed FCCs will be in place.

9.4 Standardization of EMR and Linkage with Other Health Data

Since the beginning of the EMR initiative in Alberta, the lack of a common platform has been a major problem. This is the case after Alberta has spent many hundred million dollars since the days of 'Wellnet' in the 1990s. There are 13 vendors in place and not even two vendors use a common platform. EMR (Electronic Medical Records) standardization should be done through a two-pronged approach:

- EMR should be shareable among physician offices to maximize information access. The sharing is also helpful in the event of patient or physician changes, because the records are transferable without losing continuity.
- NPs and other professionals engaged in primary care should have EMR access as well.
- Additionally, links between EMRs and the rest of the Clinical Information System (CIS) have the potential to strengthen CDM/PC database and eventually lead to improvements in patient care, surveillance, and research. The links and appropriate sharing of patient level data cannot be done well without a revamped *Health Information Act* (HIA).

9.5 Consumer Health Technology

New technology has far reaching implications for IM/IT policy. The current initiative of setting up EPIC—a mega-clinical system in the AHS Edmonton Zone—may not potentially align with the new waves of technology. An overhaul of IT policy and priorities is needed to ensure security, alignment, and access to the much needed information.



10. RECOMMENDATIONS

10.1 Short-term

The short-term implementation timeline is estimated to be between two and three years.

Develop CDM Implementation Measures

Given that measurements should be an integral part of any strategy / policy, we recommend developing meaningful, pragmatic metrics that measure the progress of CDM implementation and its associated quality. Ideally, these measures should be specific, achievable, reliable and timely. Currently, AHS's quarterly performance reports only include in-hospital admission rates for Ambulatory Care Sensitive Conditions patients. While there are many potential measures and metrics, this paper recommends adding the following four¹⁴ additional measures:

- Difficulty getting after-hours care without going to the ER;
- Used ER in past two years;
- Same or next day appointment with an FP ; and
- Waited six days or more for getting an appointment with an FP.

It is also recommended that a small set of measures as above be continued without changes for a minimum of five years. With frequent changes in leadership in the past 10 years, including five different Health Deputy Ministers and a growing number of AHS CEO's, there have also been continual changes in system measures. Without continuity of measures, the system cannot track its own progress.

Dollar Implications

From budget neutral to small dollar amounts.

¹⁴ Commonwealth Fund International Health Policy Survey of Sicker Adults in eleven countries, 2011

Establish National EMR Standards

Resurrect the Federal- Provincial -Territorial process that established the Canada Health Infoway in 2003 and establish a nationally standardized EMR as the highest priority. Given Alberta's progress on EHR to date, Alberta is a good lead candidate province to lead this process. Set a two-year time limit to come up with a plan and allow another two years for implementation.

Dollar Implications

No new dollars—re-prioritization through intra and inter-provincial dialogues.

10.2 Medium/Long Term

The long-term implementation timeline is between three and five years.

Team-Based Primary Care Clinics

Given that between 68 and 72% of chronic disease patients did not have access to after-hours primary care services and lack of access was flagged as the number one barrier in the ICDC – Statistics Canada Survey, we recommend setting up team-based primary care clinics to ensure availability of evening and weekend services. Each of these clinics must have a full-time case manager with training in nursing.

Dollar Implications

This is expected to be budget-neutral. Leadership is needed for the transformation from solo (FP) practices to group practices. Even if FCC's will likely contribute to this, non-FCC group practices are to be encouraged. Salaries and benefits of the case managers are to be negotiated between the AHS budget and the medical services budget.

Fast track training of physician extenders

Currently Alberta faces a large gap between the demand and supply of physician extenders such as NPs, Physician Assistants and Clinical Assistants. A reprioritization of training for these professionals, on a fast track basis, is recommended through opening up additional seats in post-secondary institutions/hospitals. In the likely event of a surplus in the supply of family physicians, a reduction in the number of medical seats can be an enabler for physician extender seats.

Dollar Implications

Depending on the training program, the additional costs would be borne by the health system or Alberta Innovation and Advanced Education. However, these costs are estimated to be relatively small.

11. CONCLUSION

It is unfortunate that Alberta and Canada lag behind countries such as the UK and the Netherlands in the areas of primary care and CDM. As argued in the paper, moving away from the physician-centric system where physicians are paid through a fee-for-service method of payment is a must in making the system truly patient-centric. The other must in making the system truly patient-centric is patient engagement. While patient engagement can be encouraged through multiple avenues, making personal health data easily available to patients is an expedient way of achieving this. Patient education must be bundled with access to secure health information to avoid misuse and misinterpretation. Best practice summaries, specifically Cleveland and Mayo Clinics, provide notable examples of patient engagement.

In Alberta, the current health services delivery model is conducive to the proposed transformation. Unfortunately, the global funding model that the Ministry uses to fund Alberta Health Services does not support the transformation. With everything else remaining constant, true team-based care will continue to struggle as it has in the past, unless resources are freed from the acute sector for primary care services. One may have to look into line item funding ear-marked for team based care through salaried nurses / nurse practitioners for these models to work. To start with, it may have to be done incrementally and through a joint initiative between the Ministry of Health and AHS.

For a transformation of this magnitude, multi-party collaborative dialogue is critically important. The Ministry of Health and AHS must work together with the College of Physicians and Surgeons of Alberta, the Alberta Medical Association, College & Association of Registered Nurses of Alberta and other professional associations towards building a win-win patient-centric model that prevents many Albertans from becoming a Peggy (see Section 3) in our health system.

12. ACKNOWLEDGEMENTS

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13. APPENDICES

High- Versus Low-Prevalence CDs

High-Cost Users—Healthcare Cost Concentration

Patient Care Histories

Best Practices in CDM and PC

Bernice’s Story

An Idealized Primary Health Care Structure for Alberta – A Vision by Dr. Lee Green

Appendix A. High- versus Low-prevalence CDs

The Economic Burden¹⁵ of High-Prevalence Chronic Conditions in Alberta

Chronic Condition	Economic Burden (in \$CDN millions)	Population Affected	Average Cost per Person (in \$CDN)
Diabetes	174	67,473	2,573
Chronic obstructive pulmonary disease, advanced coronary artery disease, other dominant chronic	15	315	50,693
Hypertension	182	115,856	1,571
Depression	108	55,717	1,933
Arthritis	42	17,126	2,440
Breast cancer	17	3,094	5,353
Stomach or intestinal ulcers	8	3,429	2,456
Thyroid disease	38	25,802	1,461
Osteoporosis	14	5,079	2,682
Asthma	77	37,932	2,021
Alzheimer's disease and other dementias	229	6,852	33,447
Total	\$ 904	338,675	\$ 2,670

The Economic Burden of Low Prevalence Chronic Conditions in Alberta

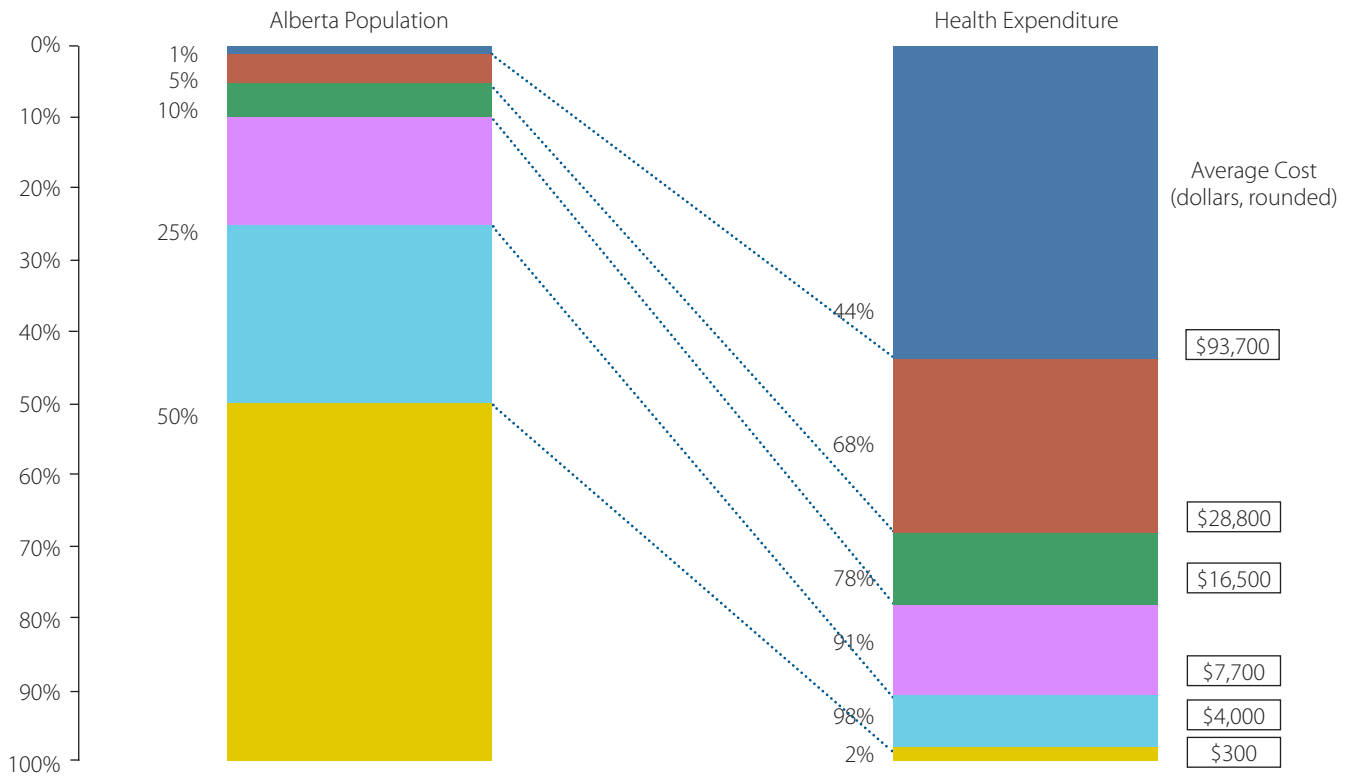
Chronic Condition	Economic Burden (in \$CDN millions)	Population Affected	Average Cost per Person (in \$CDN)
Gaucher disease	Data not available	Data not available	Data not available
Multiple sclerosis and other progressive neurological disorders	87	5,533	15,759
Cystic fibrosis	5	401	13,617
Cerebral palsy	8	573	13,590
Hodgkin's disease	3	36	74,695
Total	\$ 103	6,543	\$ 15,742

Note: Data in these tables reflect the total average cost of these diseases per person in Alberta during the 2010-2011 fiscal year.

¹⁵ Accounts for direct health services costs only – figures received from Data Integration, Management and Reporting (DIMR), Alberta Health Services

Appendix B. High-Cost Users – Total Health Care Cost

(Excluding Continuing care and Allied Health) by Percent of Population
Alberta 2010/2011



Source: Alberta Health Services

Note: 2010/11 Population used in above calculations includes anyone active in Alberta at the end of the fiscal year or anyone who died within the fiscal year.

Appendix C. Patient Case Histories

Chronic disease management and the complex patient – scenarios
Li Ka Shing Knowledge Institute, St Michael's Hospital and the Bridgepoint
Collaboratory for Research and Innovation, Bridgepoint Health

Amina Patel: Stroke, diabetes, high blood pressure and living alone

Amina is 65 years old and is admitted to hospital with double vision. Her double vision is due to reduced blood flow to the nerve that travels between her brain and right eye, and is a consequence of her longstanding diabetes and high blood pressure.

She also has had heart disease treated with bypass surgery and breast cancer treated with surgery and chemotherapy within the last 3 years.

Both her diabetes and high blood pressure are poorly controlled.

She has chronic pain and is depressed.

She lives alone in public housing and is separated from her husband. She has one son in the GTA but he is not very supportive. CCAC and volunteer agencies are providing her with help with light housekeeping, groceries, etc. She is independent in her activities of daily living (e.g., bathing, feeding, toileting and transfers).

She currently sees a family doctor, a cancer specialist and an endocrinologist at St. Michael's. She does not see a cardiologist or psychiatrist.

What will likely happen in acute care:

- She will stay in hospital for about 1 week while we try to have her seen by an ophthalmologist and to sort out a discharge plan.
- Her level of function is likely to decline as a result of the double vision, and it may or may not resolve.
- She will continue to see her family physician and endocrinologist, who will likely continue to struggle to help her manage her diabetes and blood pressure well.
- Her chance of suffering another complication in the next few years is very high, and it would not be surprising if she is admitted to a nursing home within 3 to 5 years. She is also quite likely to be admitted to hospital several times in the next few years.
- It is very unlikely she will be involved in a research study, and therefore we will not learn very much from her experience.



What could happen with integrated care:

- She could stay in hospital for only 1 or 2 days, basically just to get an MRI and make sure her double vision is not due to a serious infection or mass lesion in the brain.
- She could be seen 1 to 2 days after discharge at an intensive complex patient clinic, where she could be seen as frequently as necessary (e.g., daily) by general internists, endocrinologists, psychiatrists, ophthalmologists, and a range of rehabilitation specialists. This would be a “one stop shop” for patients like her, with specialists working together, in collaboration with the patient’s family physician, the patient’s home care providers, and the patient. These health care providers would work at both the east and west campuses of the unified organization.
- After a few weeks she would hopefully be eligible for “discharge” from this clinic. She would be able to return if anyone involved in her care felt she would benefit, and she would have a maintenance plan that likely includes her family doctor working in collaboration with home care providers, mental health care providers, etc.
- If her diabetes, high blood and depression are better controlled, her quality of life might be improved. She would also be expected to survive longer.
- She would be enrolled in one or more studies so that we can learn how to provide better and more efficient care to patients like her, and reduce her need for acute care hospital admissions.

Robert McDonald: alcohol dependence, liver disease, trauma with severe head injury

Robert is a 70 year old executive who works in a downtown bank. He is married and has 3 children, one of whom lives in Toronto.

He has had alcohol dependency for many years, for which he has sought treatment. Although he has managed to stop drinking intermittently, he has always returned to drinking. He describes his work as satisfying but stressful and his relationship with his wife as volatile.

His drinking has been severe enough to cause important liver disease. He has vomited large amounts of blood twice during the last three years, both of which required admission to hospital, and were due to complications from his alcohol-induced liver disease. He does not take the medications prescribed to prevent future bleeds regularly.



He used to have a family doctor, but got fed up because every time he needed to be seen the wait time was too long, and when he did see the family physician she didn't seem to be aware of what the liver specialists had done. He therefore sees a combination of specialists on an ad hoc basis, and is usually referred by his brother who is a physician.

One evening after work he got into a fight at a local bar, hit his head on the counter and lost consciousness. He was rushed to the emergency department where he was found to have bled around his brain.

What will likely happen in acute care:

- He will undergo emergency surgery and be in the intensive care unit for four days. When transferred to the ward, he develops marked confusion and a severe pneumonia. He does not eat for many days, and becomes weak and de-conditioned. Four weeks later, when transferred to a rehabilitation facility he is severely de-conditioned, and it takes another 4 weeks before he is ready to be discharged home. He is counseled about the importance of avoiding alcohol, but he has no appointment with a family doctor or any kind of addiction services. He starts drinking almost immediately after returning home. He is likely to die of complications of his alcoholic liver disease in the next 3-5 years.

What could happen with care integration/ management:

- He would have had a family physician who is part of a family health team and is able to see him promptly when needed, and could attempt to address his issues with alcohol consumption and medication adherence. Therefore, the trauma that led to his hospital admission and surgery might have been avoided in the first place.
- In the hospital, he would have immediately been identified as being at risk for post-operative confusion and appropriate interventions to prevent it would have been instituted. He would have started physiotherapy immediately, with a focus on preventing muscle loss, and he would have been transferred to a 'high-intensity' rehabilitation ward earlier, where his medical and rehabilitation issues could be managed at the same time. He would have been seen by a service with expertise in addictions and mental health, and a plan to prevent the resumption of alcohol would have been instituted while still in hospital in collaboration with his primary care team, with whom he would have an appointment 4 days after discharge. If he is able to reduce the amount of alcohol he consumes, and to address some of the psychosocial issues that may be contributing to it, his quality of life and life expectancy will be improved.

Jim Wolski: Disabling multiple sclerosis, job loss

Jim is a 40 year old sales clerk who had multiple sclerosis diagnosed 15 years ago.

What will likely happen:

- He is treated with a variety of medications, some of which initially appeared to be slowing the progression of his disease, but recently they don't seem to be working any more. He is now deteriorating steadily, and his MS doctor has told him that he doesn't have any more MS-specific treatments to offer him anymore.
- Jim becomes frustrated, and even goes to the United States to get the "liberation therapy" which initially seems to help. However, he continues to get worse. He can no longer walk on his own, and suffers a fall which lands him in the hospital. He is unable to continue his job as a sales clerk due to his mobility issues and increasing fatigue. After losing his job, he moves into a low income housing unit, situated in an economically disadvantaged part of town where he is pick pocketed. On top of his health conditions he is dealing with an infestation of bed bugs and cockroaches in his apartment. In the midst of all of this his partner of 20 years leaves him and he has no one left to turn to.

What could happen with care integration management:

- Initially, he would be seen in the same MS clinic, but when his mobility starts to decline, he is transferred to an interdisciplinary clinic which is staffed by a variety of health care providers (speech language pathologists, social workers, psychologists, neurologists, urologists, psychiatrists, etc.) who work closely with his family physician. He doesn't fall, and isn't admitted to hospital. The likely impact of his illness on his partner is recognized. Although he and his partner do split up, this is done amicably. He starts an employment retraining programme well before he loses his job, which prepares him for a new job where he can sit at a desk and spend most of his time on the phone. He moves into an apartment that is suited to his mobility needs, and he has the appropriate community supports to live in the apartment with assistance.

Vivian Choi: confusion, functional decline

Vivian is an 82 year old woman who lives in supportive housing. She has a history of stroke (mild residual right-sided weakness), type 2 diabetes mellitus (DM), hypertension and osteoporosis (previous hip fracture). She is on multiple medications. No use of alcohol or tobacco. She uses a cane for ambulation and is otherwise independent in her instrumental activities of daily living (IADLs). She requires assistance from a personal support worker (PSW) for bathing.

The PSW has noted she has become increasingly confused and agitated over the last few weeks. She has also been noted to be incontinent of urine and her apartment is increasingly unkempt. She was seen by her family physician who tried to arrange lab work but the patient did not return for follow up.

She has no family or close friends and is socially isolated.

What may happen:

- The PSW calls 911 and the patient is taken to SMH ER for admission. The patient is admitted to medicine for several days for work up of her confusion. She becomes deconditioned while in hospital and is also noted to be increasingly confused because she is in a strange environment, has a UTI, and, evidence of a recent stroke. Her hospital admission is prolonged and given her cognition and lack of supports, she is placed on a waiting list for long-term care and sent home to wait via Home First. While waiting for long-term care she falls and fractures her hip.

What could happen with integration between SMH and Bridgepoint:

- Her family MD is able to quickly arrange an admission to an 'acute geriatric assessment and treatment' unit at Bridgepoint where she receives a comprehensive assessment including a workup of her cognition and incontinence. She is admitted this unit for 5 days and during this time she is found to have had a recent stroke and a urinary tract infection. Her confusion settles with adherence to good sleep hygiene (avoiding use of sleeping pills that cause confusion), treatment of her UTI, participation in intensive PT/OT (including coverage on weekends) and adequate nutrition and fluids.
- She is discharged after 5 days but continues in an outpatient mobility rehabilitation program. She returns to her home in the community and is followed in the day hospital, alongside her family physician. Once she is discharged from the day hospital, she is referred to the day program for ongoing social engagement.



Appendix D. Best Practices CDM and PC

Country/ Organization	Key Features	Status of Information Management / EMR ¹⁶ – EHR ¹⁷	Lessons for Alberta
International Best Practices			
United Kingdom (England) National Health Service	<p>Primary Care Trusts are responsible for primary health services</p> <p>96% of physicians receive patient satisfaction data</p> <p>On average, one nurse practitioner (NP) per 3 full time general practitioners (GPs)</p> <p>GPs and their practice teams share a significant role in care coordination</p>	<p>NHS Care records (UK's EHR) are available nationwide (automatically created for each NHS patient)</p> <p>In 2008, 90% of primary care practices had EMRs</p> <p>Access to personal level information is restricted only to authorized care givers with appropriate smart card and PIN (Personal Identification Number)</p> <p>High performance in chronic care management may be attributed to the push towards health information technology use</p>	<p>Information automation is a crucial tool in chronic care and prevention</p> <p>Nurse practitioners can play a vital role in CDM</p> <p>To achieve a 3:1 nurse practitioner to general practitioner ratio, Alberta needs to produce/fast track a significant number of additional NPs</p>
Netherlands	<p>Ranked highest in Access Measures, including cost-related access problems and timeliness of care</p> <p>In 2010, ranked first in the Overall Safe Care Measures category (Canada ranked fifth)</p> <p>In 2010, 97% of practices had arrangements for after hour patient care (43% in Canada)</p> <p>Health insurance for primary care is compulsory</p> <p>In 2010, 99% of chronically ill patients had a regular doctor</p>	<p>98% of primary care practices use EMRs (as of 2008)</p> <p>E-prescribing used by 71% of practices in 2010</p> <p>In 2010, 95% of physicians routinely received alerts or prompts for drug dose or interaction (a first place ranking). Canada had 20% – a last place ranking.</p> <p>EHR does not store information on a national database (it must be requested from a patient's GP)- this is considered to improve security since physicians do not have access to all patients data</p>	<p>After hours care gives patients better access to timely care</p> <p>Alerts or prompts to physicians improve quality and timeliness of care</p> <p>EMRs allow healthcare providers to make more efficient decisions about diagnosis and treatment</p>

¹⁶ For a definition of EMR, see Section 5.

¹⁷ EHR (electronic health record) is a collection of technical services that allow electronic health records of patients to be accessed and updated by authorized health care providers, regardless of where health care providers and patients are located within Alberta. The EHR includes access to directories of patients, health care provider directories, repositories of lab test results, diagnostic images such as X-rays, medication histories, clinical reports, and other essential health care data about patients.



Appendix D (continued)

Country/ Organization	Key Features	Status of Information Management / EMR ¹⁶ – EHR ¹⁷	Lessons for Alberta
<p>New Zealand (NZ) National Health Service</p>	<p>Basic primary health coverage universal and funded through taxes</p> <p>In 2010, NZ was ranked second to last in the chronic care category, but first in the categories of engagement/patient communications with their physicians</p> <p>After hours care is arranged by GPs but at higher charges than during the day (therefore, many patients opt to use the emergency department)</p>	<p>EHR includes primary care records, problem lists, clinical progress notes, ordering tests/ medications, test results, and reminders</p> <p>Healthlink integrates communication with system</p> <p>GPs can utilize a system that automatically assesses risks by pulling data from a patient's EHR.</p> <p>EMR use by primary care physicians was 97% in 2011 (92% used at least 9 of 14 health information capacity functions)</p> <p>Primary Care (PC) IT systems have been in place for 20 years (including EHR, electronic messaging)</p>	<p>Health Data Automation is a crucial tool in chronic care and prevention</p> <p>A lot to learn from the NZ success stories re: patient engagement – a big enabler for effective patient care</p>
US Best Practices			
<p>Kaiser Permanente (KP) San Francisco Bay Area, USA</p>	<p>No Kaiser family physician has solo practice</p> <p>20 to 40 PC physicians per office</p> <p>PC physicians work alongside assistants and NPs to increase the number of staff</p> <p>PC physicians can be doctors in internal medicine, pediatrics, and obstetrics as well as family doctors (therefore, they can perform more procedures and reduce the number of specialist visits)</p> <p>PC physicians are paid on a salary and financial incentives are available for quality, patient satisfaction, group contributions (these incentives are not related to the quantity of services offered)</p> <p>2002: over 95% of physicians had a laboratory, imaging, or pharmacy on site</p> <p>Patient self- management has worked well</p> <p>Offers chronic disease (CD) self management workshops to promote self-care</p>	<p>In 2013, Kaiser had a 100% adoption of multi-functional EHR/EMR (KP Health Connect)</p> <p>Physicians and patients are able to review medical records, check lab results, immunizations, and can order prescriptions and request labs and referrals. To provide better access, KP has created a Smartphone app for users to check their health info, refill prescriptions, and make appointments.</p>	<p>Connections between EMR and EHR benefit CDM and primary care</p> <p>Data sharing helps patients take a more active role in their own care</p> <p>Group practices require cost-effective office management</p> <p>Emphasis should be placed on measurement and team based care</p>



Appendix D (continued)

Country/ Organization	Key Features	Status of Information Management / EMR ¹⁶ – EHR ¹⁷	Lessons for Alberta
<p>Mayo Clinic Rochester, Minnesota, United States</p>	<p>Emphasizes a team approach in its model of care</p> <p>Standardizes best practices and spreads them throughout the organization</p> <p>The Mayo Clinic Care Network is a collaboration with other community medical providers to give patients access to Mayo expertise and resources in their community</p> <p>Website has information for patients (i.e. symptom checker, first-aid guide, health information) and for medical professionals (i.e. educational material). Website also allows patients to request appointments, log into their personal accounts, find a doctor, read about diseases/treatments, and download Mayo's apps.</p>	<p>EMRs electronic files can only be viewed by authorized users</p> <p>Working on new technology initiatives for EMRs (computer ability to offer diagnostics)</p> <p>EHRs are available for patient access to aid in self-management</p> <p>Electronic personal health records can be accessed over the internet and allow patients to access their individual data and aid in self-management. Patients can add information such as cholesterol level, blood pressure, and exercise and dietary habits for disease prevention.</p> <p>Various mobile apps for Apple allow patients to connect with each other and with health care providers. Apps can also instantly provide physicians with patient details, allow them to communicate with patients eye-to-eye, and increase communication with their staff.</p>	<p>Standardized best practices benefits care providers as well as patients</p> <p>Giving patients access to medical records helps support self-management of chronic diseases</p>



Appendix D (continued)

Country/ Organization	Key Features	Status of Information Management / EMR ¹⁶ – EHR ¹⁷	Lessons for Alberta
<p>Cleveland Clinic Cleveland, Ohio, United States</p>	<p>Achieved recognition for excellence in nursing</p> <p>Multispecialty academic medical centre</p>	<p>EMR system (DrConnect) allows physicians to obtain real-time updates about patients' treatment by Cleveland Clinic, which emphasizes that DrConnect can enhance physician-physician communication, but should not replace traditional forms of communication such (i.e. the phone).</p> <p>EMR system also in place for private practice physicians</p> <p>EMR system is described as an "interoperable EMR" connecting a private physician EMR with those of other providers</p> <p>Offers online access to patient information for self-management</p> <p>Patients can register online for MyChart (online personal health record portal that allows patients to schedule appointments, request prescription refills, review test results & medications, and obtain general health & preventive care information). A new, more transparent MyChart is being implemented to give patients full access to their medical records (thus enabling them to play a bigger role in self-care).</p> <p>Patients can obtain a second opinion from a clinic specialist online, at a cost through MyConsult</p>	<p>EMR system should integrate hospitals and health centres with private practices to provide better data sharing for optimal care</p> <p>Full health information should be easily accessible by patients</p>

Appendix D (continued)

Country/ Organization	Key Features	Status of Information Management / EMR ¹⁶ – EHR ¹⁷	Lessons for Alberta
<p>Geisinger Health System Northeastern Pennsylvania, United States</p>	<p>Integrated delivery system comprised of 700 physician employees and 55 clinical practice sites</p> <p>Diverse groups of participants (clinical, operational, financial, payer, patient, or consumer) convene for major innovation initiatives</p> <p>Uses Continuous Quality Improvement</p> <p>Offers financial incentives of up to 20% cash compensation per physician for patient satisfaction, quality, value goals including overall bundle score improvements</p> <p>Split incentive payments to encourage team-based care and support</p> <p>Includes round the clock primary and specialty care access, Geisinger Health Plan (GHP) funded nurse care coordinator in each practice site, predictive analytics to identify risk trends, home based monitoring, interactive voice response surveillance</p> <p>Detailed monthly performance reports of quality and efficiency results are provided to each medical home practice and are reviewed together by an integrated GHP practice site team monthly.</p> <p>Primary care places special emphasis on prevention and treatment of chronic conditions and offers unique services such as “Diabetic Nurse Consultative Services” and “High Blood Pressure Clinic”</p> <p>Initiated a program focused on preventative care for CD care</p> <p>After visit summary is provided to each patient showing how he or she is doing compared to the goal and explains the risks associated with failing to achieve the goal.</p>	<p>All lab results, notes and studies completed at Geisinger sites are available to any provider</p> <p>Patient care plan needs are identified electronically and incorporated into physician order sets along with EHR based maintenance alerts</p> <p>Hardwired reminders and alerts into EHR to enhance care consistency and reliability, especially related to diabetes and coronary care and ensuring adults receive preventative health screenings</p> <p>Online access to personal clinical data includes all lab results except HIV (auto released in 72 hours); problem list, medications and immunizations; after visit summaries and hospital discharge instructions; physician progress notes</p> <p>EHR access is provided to all participants (helps decrease repeat testing and improves coordination of care between healthcare and providers).</p>	<p>Health information should be easily accessible by any health provider so that if a patient visits a different physician, all his or her records are updated and available</p> <p>EHR-based maintenance alerts are helpful for care delivery</p> <p>Patients’ access to their health information helps them play a larger role in their own care</p> <p>Financial incentives to healthcare providers help improve quality of care</p> <p>The use of teams and a strong accountability measurement framework should be emphasized</p> <p>Strong links to acute care and specific strategies to transition patients back to acute care help reduce readmissions</p>



Appendix D (continued)

Country/ Organization	Key Features	Status of Information Management / EMR ¹⁶ – EHR ¹⁷	Lessons for Alberta
<p>Veterans Health Administration (VHA) United States</p>	<p>Largest integrated healthcare system in the US</p> <p>Adapts to patients' needs (i.e. made mental health care a priority and allocated additional funds to mental health since the percentage of veterans with mental illness continues to rise, integrated women's medical systems into their system since the number of women veterans is increasing)</p> <p>VHA continues to train health professionals through their academic affiliations, support research and training programs</p>	<p>Helped develop VistA (a low-cost, open source EMR system which has been adopted by all veterans' hospitals).</p> <p>Has cut down on dispensing errors (achieved a prescription accuracy rate of 99.9%)</p> <p>Improved efficiency by 6% by eliminating unnecessary costs and admissions</p> <p>Users of VistA are given barcodes which can be scanned with wands</p> <p>Patients can access and update personal health records online</p> <p>Doctors can access patient records, order prescriptions, view X-rays, and graph a chart of risk factors and medications to decide treatments</p>	<p>EMR help reduce errors, eliminate unnecessary costs, and improve efficiency of care</p> <p>Healthcare providers should adapt to the needs of their location patient populations</p> <p>The use of teams and strong accountability measurement framework should be emphasized</p>
<p>Intermountain Healthcare (IH) Salt Lake City, Utah, United States</p>	<p>Provides 23 hospitals, over 185 clinics and over 32,000 employees</p> <p>Transformed themselves from a system of independent hospitals that competed against each other to an integrated system of co-operating hospitals</p> <p>In 2012, they conducted an assessment to identify the health needs in the areas that their hospitals serve</p> <p>The American Hospital Association named IH on the 2013 "Health Care's Most Wired Hospital" list and also named IH as being among the most technologically savvy hospitals in the U.S. in 14 out of 15 years</p>	<p>Has an agreement with 3 other healthcare systems to share patient medical information through the new Clinical Health Information Exchange (CHIE)</p> <p>Patients have access to their health information through My Health patient portal (a free service available to patients 18 years and older)</p> <p>Another service available to patients is Intermountain Livewell (a website that promotes life-long habits for healthier living)</p>	<p>Used effectively, technology can optimize care delivery</p> <p>Information sharing improves quality and reduces costs</p> <p>The use of teams and strong accountability measurement framework should be emphasized</p>



Appendix D (continued)

Country/ Organization	Key Features	Status of Information Management / EMR ¹⁶ – EHR ¹⁷	Lessons for Alberta
Northshore University Health System Evanston, Illinois United States	<p>Fully integrated healthcare system that includes 4 hospitals and 10,000 employees</p> <p>Earned Magnet Designation for high quality nursing</p> <p>Physicians' practices have evening, weekend, walk-in hours driven by patient demand</p> <p>Nearly 40% of appointments are made on a same day basis</p> <p>Enhanced communication between physicians allows access to patient information between different departments (i.e. physician, specialist, lab results) as soon as results/ information is released</p>	<p>National leader in using innovative technology including advanced EMR</p> <p>Uses EMR and patient portal to drive patient involvement</p> <p>EMR has a centralized data source that can be shared across more than 75 locations</p> <p>EMR allows all patient information to be available to all physicians</p> <p>Physicians can conduct virtual rounds on patients (they can check on patients' status electronically at the end of the day and handle care needs online)</p> <p>Reduced turnaround time for test results (decreased from 2-3 days to just one in many cases)</p> <p>More accurate billing</p> <p>Reduced 80% of medical errors</p>	<p>EMRs improve communication, and allow physicians to treat patients in a more timely and effective manner</p> <p>Patients can go to any physician through use of EMR making off hours care more accessible</p>
Canadian Best Practices			
Waneta Primary Care Clinic Trail, British Columbia, Canada	<p>Uses a collaborative team (physician and nurse practitioner) to deliver patient care</p> <p>Sets up patients as partners in their own care</p> <p>Goal is patient-centered practice with nursing and medical approaches acting complementary to improve care</p> <p>All providers do their own billing, which reduces the need for additional staff</p>	<p>Functioning EMR (TELUS Physician Solutions)</p> <p>EMR allows for daily lab and diagnostic imports (therefore, the turnaround on test results is seamless and has reduced patient wait times)</p> <p>EMR allows greater understanding of patient population (thus they can direct their care to suit those needs)</p> <p>A patient's hospital data can be accessed remotely through the IHA (Interior Health Authority) portal in connex</p> <p>Giving patients online access to their records is a future goal (currently, information from a patient's chart is shared freely with the patient only if they ask for it or if the clinic feels it is in the patient's best interest to have this information).</p>	<p>Integration is often easier in a smaller setting</p> <p>Healthcare teams need support from all levels of government</p> <p>Support GP's who understand collaborative practice to partner with NP</p> <p>Clinics should promote shared care and shared responsibility between healthcare teams and patients</p>



Appendix D (continued)

Country/ Organization	Key Features	Status of Information Management / EMR ¹⁶ – EHR ¹⁷	Lessons for Alberta
<p>Taber Clinic Taber, Alberta Canada</p>	<p>Physicians are paid through an Alternate Remuneration Plan (ARP).</p> <p>Aims to integrate care between the clinic, hospital and community services (i.e., Home care, mental health, public health and CDM)</p> <p>Team-based approach to care which allows a patient to interact with a variety of team members depending on their needs</p> <p>Each physician team includes a Medical Office Assistant and 1 RN shared by 2 physicians. The practice also shares an NP, LPNs, a Registered Psychiatric Nurse, a Behaviorist, a Dietitian, a Diabetic Nurse Educator, an RT, and Health Coaches.</p> <p>Each provider's role is continuously reviewed to ensure the right person does the right work at the right time.</p> <p>Continually works at clinic practices and workflow in order to maximize their adherence to guideline directed health management while maintaining operational efficiency</p> <p>Minimizes delays for appointments, resulting in clinical improvements</p>	<p>Centralized patient network links information between hospital and clinic</p> <p>Clinic records are accessible at the ER, making information accessible after hours</p> <p>Extended team members use clinic EMR</p> <p>Proactive care planning; e.g., lab work before visits; proactive identification and contact regarding patient need for preventative care</p> <p>Panel of patients – remuneration through Alternate Relationship Payment (based on geography)</p>	<p>Team-oriented care is effective</p> <p>Health professionals must recognize others' strengths and actively involve them</p> <p>Care providers must be open to feedback</p> <p>Accessible electronic health records are crucial to integrating care</p> <p>Funding is needed for improvements</p> <p>Human resources mix is also crucial to improvement</p> <p>ARP – not fee for service; allows the team to work together at full scope of practice — Physicians do not need to see every patient with every visit to the clinic</p> <p>Consequences if panel of patients not looked after – accountabilities</p>
<p>Edmonton Southside Primary Care Network Edmonton, Alberta Canada</p>	<p>Works with 138 family physicians in 30 clinics</p> <p>Comprehensive family medicine provided by multidisciplinary teams that include physicians, registered nurses, nurse practitioners, dietitians, mental health coordinators, respiratory therapists and exercise specialists</p> <p>Focus is on health promotion, disease/ injury prevention, and care of medically complex/ chronic disease patients</p> <p>Offers workshops in mental health, geriatrics, prenatal care, exercise, healthy eating and weight management</p> <p>Employs 6 nurse practitioners, funded by the PCN</p>	<p>Each clinic has its own EMR; team members within the clinic document all patient care on one medical record</p> <p>Initial steps are being taken to let patients book appointments online</p>	<p>Providing services through a PCN reduces the number of ER visits and hospitalizations</p> <p>Patient satisfaction increases when family physicians are more accessible</p> <p>Integrated team members in a family physician's office are key to improving patient access and building better teams</p> <p>Clinic-based teams help build a team that better reflects the patient population it serves</p>



Appendix E. Bernice's Story: Ontario's Health Link

http://www.health.gov.on.ca/en/pro/programs/transformation/com_bernice.aspx

Community Health Links in Action - Bernice's Story

Bernice is a senior who lives at home independently.

A personal support worker from the Community Care Access Centre (CCAC) visits once a week and her children are regular visitors.

One day Bernice falls and gashes her arm...

Bernice's Actual Story



She calls 9-1-1 and is taken to a hospital in ambulance. Bernice is treated in hospital and sent back home.

Her family doctor isn't notified and Bernice receives no follow up care. When the personal support worker comes she's surprised to find out that Bernice was injured.

1 year passes

Bernice falls again and breaks her hip. She is sent to the hospital by ambulance.

She waits three days in the emergency room.

When a space opens up, Bernice is transferred to another hospital for surgery.

Bernice recovers in hospital for the next six months.

She catches Methicillin-resistant Staphylococcus aureus (MRSA), an infection common in hospitals.

As a result of her declining health, Bernice sells her house and moves to a long-term care home.

Result

To care for Bernice over the next five years will cost the health system close to \$500,000.

Her Potential Story with Health Links

EMS provide first aid and her primary care provider is notified.

Because Bernice has a number of chronic conditions and health needs, Bernice falls into the category of a "complex patient" and as her primary care provider is part of a Health Link, she is captured through this work. Bernice's primary care provider discussed the creation of a coordinated care plan with her and as part of Bernice's care plan, her doctor makes a geriatric assessment referral. Bernice's children go with her to the appointment and learn how they can improve Bernice's functional ability.

Bernice attends a falls prevention program, where she makes new friends and starts going to bingo.

One day, while leaving bingo, Bernice falls on the ice and breaks her leg. She is taken to her local community hospital.

Hospital staff call the designated referral hospital and Bernice is transferred right away for surgery. Bernice's primary care provider is notified of Bernice's situation.

Following her successful surgery, Bernice is transferred back to the community hospital, where she recovers.

1 week passes

She is discharged to a transitional care program with a complete discharge plan.

1 month passes

Bernice is back at home with ongoing support to help maintain her functional ability.

Result

To care for Bernice in her home, with access to health care in the community, will cost the health care system about \$100,000 over the next five years.

Appendix F. An Idealized Primary Health Care Structure for Alberta—

A Vision by Dr. Lee Green

The characteristics of primary health care systems that deliver the best patient outcomes, patient satisfaction, and sustainability both financially and organizationally are well known. Successful systems feature team-based care, proactive chronic disease management, pervasive and sophisticated use of information technology both at point of care and for quality management, payment structures that incentivize intended effects, and integration of social determinants of health with medical care. These features are exemplified by large integrated delivery systems (IDS), such as Kaiser or the VA. However, Alberta is not an IDS and realistically will not become one in the foreseeable future. It is nonetheless possible for Alberta to transform primary health care in the province toward such a higher-quality, more-efficient goal. Becoming an IDS will not be necessary, but a significantly higher degree of both organization and accountability will be.

Transformation will require a combination of push and pull. The push will require changing the payment system to remove the current perverse incentives toward churning volume and “whites of the eyes” visits, replacing them with incentives that reward efficiency and quality. It will also mean substantially increasing both routine measurement and reporting, and regular evaluation. The pull will require providing substantial support for transformation at the practice level, and for integration of social services with practice.

The intended result (and what regular evaluations should assess for) will be to steadily move Alberta’s family doctors, over a period of 5 to 10 years, away from today’s cottage industry and toward a more modern model of primary care. Rather than physicians providing care with some staff helping them, family physicians will lead teams responsible for defined panels of patients. Much of the care provided will not be at visits, but by telephone or electronic contacts. Much of the team’s work will not be at visits at all, but reviewing individual patients’ status for planning and progress toward shared goals set with the patient, as well as reviewing their entire panel for missed opportunities, planning outreach, and the like. Visits will often be with nurse-practitioners, nurses, dietitians, pharmacists, or physiotherapists than the physician. The team will work to insure that patients consistently and reliably receive the evidence-based care for prevention and chronic disease management that is appropriate for them. The physician’s direct patient care work will be largely on diagnosis and management of acute and undifferentiated problems.

The practice will be much more closely integrated with the PCN than is currently the norm. Individual practices will need the support of the larger organization to have the financial management, information management, change management, operational management, and quality improvement expertise to deliver care at this level. Many PCNs will become supergroups, taking on direct management of member practices. Routing a substantial component of reimbursement through PCNs may become the norm. Standalone solo practice will still be an option, but will generally be hard-pressed to deliver the level of service needed to earn higher reimbursement rates.

More than one payment model can facilitate this transformed practice landscape. Payment to the practice or PCN may be based on risk-adjusted capitation, or on a modified fee-for-service schedule. In either case the actual rate per capita or per unit of service will have to be scaled up or down based upon measures of access, process, and outcomes. For example, the capitation rate received by practices achieving same-day access, low risk-adjusted hospital and ED admission rates, and high rates of screening and disease management service delivery will be significantly augmented. As another example, fee for service rates for practices choosing that route, caring for patients with high burden of illness and /or social needs and documenting a full range of integrated services for them, will be substantially greater than for practices with healthier patient panels. Ultimately, the province will probably evolve to some form of value-based purchasing.

Programs such as TOP and AIM will be significantly expanded, at least for a number of years during the transformation. This new model of care requires skill sets that have not historically been part of primary health care. There will be a substantial need for TOP and AIM, as well as for the ACFP and the universities, to provide training for all members of the team. Physicians will need to learn new skills and a new culture of team work. RNs will take on pivotal roles in teams and practice to their full scope, and as their education has historically been hospital-oriented, will need substantial training in chronic care management, shared goal-setting, and similar PCMH-critical skills.

The measurement and evaluation requirements for this new model of care are significantly increased over the current situation, but are quite feasible. The level of measurement needed is routine in well-run health systems in other jurisdictions, and the wheel need not be re-invented. Re-thinking Alberta's legislation relevant to information handling will likely be needed, however.

Finally, it may be necessary to reconsider patient responsibilities, as other well-managed health systems have done. In exchange for easy access and improved services, patients may need to agree to seek care within their practice or PCN unless urgent needs require otherwise, and may have to accept some degree of accountability as the practices do.

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