Review of Chronic Care

Commissioned by Veterans Affairs Canada

Submitted by the Canadian Academy of Health Sciences

ABSTRACT

This report presents current best practices and new and emerging trends in treating people with chronic physical health conditions both in Canada and internationally. Five key messages emerged: (1) There is a high prevalence of multiple chronic conditions in the general Canadian population. (2) Patient-centred primary care is required for the effective management of chronic health conditions to ensure comprehensiveness, coordination and continuity of care. (3) Critical elements of such patient-centred primary care models include an interdisciplinary team working with community and specialty resources to ensure needed services and support for patient self-management. (4) Clinicians require guidance and decision making tools that consider the overall burden of diseases to effectively manage care for people with multiple chronic conditions. (5) The Chronic Care Model remains the most promising model of care for people with chronic health conditions, in spite of limited evidence.

Table of Contents

Executive Summary

Veterans Affairs Canada commissioned the Canadian Academy of Health Sciences to provide this report on current best practices and new and emerging trends in treating people with chronic physical health conditions both in Canada and internationally.

Five key messages emerged:

- There is a high prevalence of multiple chronic conditions in the general Canadian population.
- Patient-centred primary care is required for the effective management of chronic health conditions to ensure comprehensiveness, coordination and continuity of care.
- Critical elements of such patient-centred primary care models include an interdisciplinary team working with community and specialty resources to ensure needed services and support for patient self-management.
- Clinicians require guidance and decision making tools that consider the overall burden of diseases to effectively manage care for people with multiple chronic conditions.
- The Chronic Care Model remains the most promising model of care for people with chronic health conditions, in spite of limited evidence.

There is a high prevalence of multiple chronic conditions in the general Canadian population. People with multiple chronic conditions require a patient-centred approach to care. Patient-centred care takes different forms, with the core principle of offering care that fits people, not their diseases or single parts of their bodies. It requires a paradigm shift from acute episodic interventions to a focus on the patient in the context of that person's family or living situation and community.

Patient-centred primary care is required for the effective management of chronic health conditions to ensure comprehensiveness, coordination and continuity of care. Systematic and narrative reviews have found that the implementation of a patient-centred approach is beneficial for people with multiple chronic conditions, although there are mixed results in some measures as a result of limited studies with adequate data to draw definitive conclusions. Critical elements of patient-centred primary care include an interdisciplinary team working with community resources and informal caregivers to ensure needed services and support patient self-management.

The Chronic Care Model remains the most promising model of care. Most chronic care models have several themes in common: a shift from reactive to proactive care; population-based care, including delivering levels of care based on risk-stratification; meaningful health information systems; leveraging community partnerships; supporting self-management and caregivers; using clinical practice guidelines in a way that acknowledges multiple conditions; and continued practice

redesign and improvement. The evidence on the benefits of implementation of the model is promising, albeit inconsistent, so if adopted, it should be carefully evaluated.

Many examples of innovative services and systems that have implemented key elements of a chronic care model already exist within and outside of Canada. These innovations can inspire and drive change, as well as help inform the growing body of knowledge on how care for people with multiple chronic conditions is most effectively managed.

Preface: A message from the President of the Canadian Academy of Health Sciences

On behalf of the Canadian Academy of Health Sciences (CAHS), I am pleased to present this review of chronic care. This review was completed within three month only because of the comprehensive work of two previous expert panels who reviewed care for people with chronic health conditions and optimizing scopes of practice in new models of care

I wish to extend the sincere gratitude of the CAHS to the expert panel for this report, Louise Nasmith MDCM, MEd, FCFP, FRCPSC(Hon), FCAHS, Associate Provost Health, University of British Columbia and Martin Fortin MD MSc CMFC, Professeur titulaire au Département de médecine de famille, U de Sherbrooke; Directeur de la Recherche au CIUSSS du Saguenay-Lac-St-Jean; Hôpital de Chicoutimi; Chaire de recherche sur les maladies chroniques en soins de première ligne. I also want to thank Sonya Kupka MAdEd, RD, for the consulting support and Jose Almirall, MD, MSc, PhD for his research support.

Appreciation is due also to the external reviewers from the Standing Committee on Assessments: Jean Gray CM, MD, FRCPC, FRCP (London), LLD (Dal), DSc (Alberta), FCAHS; Professor Emeritus, Medical Education, Medicine, Pharmacology, Dalhousie University, Muhammad Mamdani, PharmD, MA, MPH, FCAHS; Professor of Pharmaceutical Sciences, University of Toronto and Director, Li Ka Shing Centre for Healthcare Analytics Research and Training and Sharon Straus MD, FRCPC, MSc, HBSc, FCAHS; Professor of Medicine and Director, Division of Geriatric Medicine, University of Toronto.

The leadership of the CAHS brings this review to the attention of Veterans Affairs Canada, confident that it will be of substantial value in national efforts to improve the health of the population and strengthen and sustain the health care system so highly valued by all Canadians.

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Introduction

Veterans Affairs Canada commissioned the Canadian Academy of Health Sciences to provide this report on current best practices and new and emerging trends in treating people with chronic physical health conditions both in Canada and internationally.

The Canadian Academy of Health Sciences provides timely, informed, and unbiased assessments of urgent issues affecting the health of Canadians. An abbreviated process was used for this report, as the authors were able to draw from the findings of two previous assessments (Nasmith et al., 2010; Nelson et al., 2014), which reviewed care for people with chronic health conditions and optimizing scopes of practice in new models of care. This report underwent peer review by members of the Canadian Academy of Health Sciences' Standing Committee on Assessments.

This report begins with developing a common understanding of what it means to live with chronic health conditions. We then focus on the key problem areas within the Canadian health system and how better to accommodate patients with chronic health problems. Within that context, we provide an overview of best practices in managing chronic health problems and provide suggestions for modernizing the ways in which we respond to chronic health problems.

While we have confined this report, according to the statement of work, to an examination of services related to physical health conditions through the publicly funded health care system, it is important to acknowledge that improving the social determinants of health is fundamental to improving the health of people living with chronic conditions (Fang, Kmetic, Millar & Drasic, 2009; Rosella et al., 2014; Fitzpatrick et al., 2015; Millar, 2017).

It is important to acknowledge that improving the social determinants of health is fundamental to improving the health of people living with chronic conditions.

Mental health issues affect the ability of individuals to manage their chronic physical conditions and may be co-morbid conditions with common chronic physical illness, e.g., diabetes and depression. For these reasons, addressing comorbidity is considered within the scope of this report.

Chronic Health Conditions

Chronic conditions share fundamental features: they persist and they require some level of health care management across time. This section of the report presents some data on the prevalence of chronic health conditions, as well as some insights to the experience of living with chronic conditions and the impact on the health system.

Chronic health conditions in the general Canadian population

There is a high prevalence of multiple chronic conditions in the general Canadian population. The greater the number and complexity of chronic conditions, the more vulnerable the patient and the more difficult it is to manage their health. In this report we will use "multiple chronic conditions" to refer to the co-occurring presence of three or more such conditions in the same person.

The greater the number and complexity of chronic conditions, the more vulnerable the patient and the more difficult it is to manage their health.

The estimated prevalence of three or more chronic conditions varies among the studies but is quite high in the general population: 14-38% of Canadian adults (Rapoport, Jacobs, Bell & Klarenbach, 2004; Mokraoui, Haggerty, Almirall & Fortin, 2016). Similar variations in the estimated prevalence, due to methodological differences between studies, were also observed in a systematic review involving several countries (Fortin, Stewart, Poitras, Almirall & Maddocks, 2012).

People are living longer with health issues that they may never have survived in the past, let alone have the ability to live independently in the community. The number of people with multiple chronic conditions increases with aging. A study of Canadians adults found that the prevalence of three or more chronic conditions increased from 4% in the group aged 20-39 years to 42% in the group aged 80 years or older (Rapoport, et al., 2004).

The implications of the increasing number of people with multiple chronic conditions with aging is significant, as the prevalence of Canadians with multiple chronic conditions is already high and further increases are likely.

Living with chronic conditions

Chronic conditions are with people for the remainder of their lives. Grumbach (2003) argued that the goals of chronic care are generally not to cure, but to enhance quality of life and physical, cognitive, and social functionality, prevent secondary conditions, and minimize distressing symptoms.

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All people with chronic conditions have diverse and changing experiences, and all need care and support, inside and outside of the formal healthcare system. Some people with chronic diseases require important but minimal intervention. Others, especially people with multiple chronic conditions that shift as they age or acquire additional conditions or complications, require additional social and healthcare resources. The same person who can readily manage his or her own care for a chronic condition may be unable to navigate the healthcare system or continue his or her self-care when suddenly faced with an acute diagnosis or new chronic diagnosis.

Living with multiple chronic conditions is especially challenging for people as they try to understand and manage their conditions through numerous appointments with different healthcare providers and often various lifestyle and self-care recommendations. Caring for patients with multiple chronic conditions is challenging because it is often difficult to specify the causes of particular symptoms, assessment of many important symptoms relies on subjective report, and patients require care from a variety of providers (Boyd & Fortin, 2010; Stewart et al., 2013; Miller, Steele Gray, Kuluski & Cott, 2015).

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People with multiple chronic conditions are more likely to die prematurely (Koroukian, Warner, Owusu, & Given, 2015), be admitted (Wang et al., 2015) and re-admitted to acute care (Basu, Avila & Ricciardi, 2016), and have longer hospital stays (Skinner, Coffey, Jones, Heslin & Moy, 2016) as compared to those without or with a single chronic condition. They have poorer quality of life and greater disability (Garin et al., 2014; Williams & Egede, 2016). Medication management is often complex, resulting in polypharmacy with its attendant risks of drug interactions and adverse drug events (Duerden, Avery & Payne, 2013; Guthrie et al. 2011; Van den Akker & Muth, 2014). Visits to multiple physicians often result in many confusing medication changes.

Chronic conditions affect the community beyond those with the diagnoses, particularly caregivers. In 2002, there were over 2 million caregivers in Canada aged 45 years and older (Hollander, Liu & Chappell, 2009). Family and community support has a significant impact on a person's ability to manage his or her health. The heavy reliance on family caregivers to support care in the home can be overwhelming, draining and complicated, highlighting the need for the health and social care systems to consider the needs of caregivers as well as individuals with the chronic conditions (Ploeg et al., 2017).

The trajectory of chronic conditions varies significantly over time, as context, age, life situations, and other factors shift. Chronic conditions impact quality of life of those with chronic conditions and their caregivers.

Health system impact

The increasing prevalence of chronic health conditions is also affecting the Canadian health system, generating concern for the sustainability of all publicly funded programs should health care expenditures continue to rise disproportionate to gross domestic product (Nasmith et al., 2010). Most health care spending is concentrated within a very small proportion of the population, referred to as the high-cost users. For example, approximately 1.5% of Ontario's population, account for 61% of hospital and home care costs (Rais et al., 2013). Further study of adults considered to be high-cost users, revealed that this status was strongly associated

with being older, having multiple chronic conditions, and reporting poorer self-perceived health (Rosella et al., 2014).

The remainder of this report will focus on the health care delivery system. Nonetheless, it is important to acknowledge that health care system spending focuses on medical care, which accounts for only 20% of the modifiable determinants of health, while the social determinants of health (health behaviours, physical environment and socioeconomic factors) account for the remaining 80% (McGinnis, M. et al, 2002 and Booske, Athens, Kindig, et al., 2010 as cited in Millar, 2017). The health care system could better manage chronic conditions by increasing mechanisms for partnerships with communities and structures outside of the health care sector to address the social determinants of health (Millar, 2017) and promoting health equities (Andermann, 2011). However, investment in this support is impeded by the entrenched focus on care for acute illness.

What are the problem areas?

> "While the global disease burden has been shifting towards chronic conditions, health systems have not evolved to meet this changing demand. Care is fragmented, focused on acute and emergent symptoms, and often provided without the benefit of complete medical information."
>
> (World Health Organization, 2001, p. 5)

Our current health system was not designed to care for the increasing number of people with multiple chronic conditions. This section identifies two predominant problem areas limiting the evolution of our health system to better meet current needs: the care delivery model and disease-focused evidence.

It is difficult to effectively manage chronic conditions within a care delivery model that has an acute and episodic orientation both in the funding of services and in health professionals' training and scopes of practice. Disease-focused evidence creates further challenges, as most clinical guidelines do not consider the additional complexities in improving the health of people with multiple chronic conditions.

Care delivery model

Across the world, health care systems are organized to provide acute illness care (World Health Organization, 2001). Thirteen years after this was written, an 11country telephone survey of adults 65+ found that one-fifth or more of older adults reported receiving uncoordinated care in all countries except France and that accessing primary care and avoiding the emergency department tended to be more difficult in the United States, Canada, and Sweden than in other surveyed countries. (Osborn, Moulds, Squires, Doty & Anderson, 2014).

Increased spending alone has not seemed to improve health care. Among 29 countries that had comparable accounting systems in the Organization for Economic

Co-operation and Development in 2013, Canada was in the top quartile of countries in terms of per-person spending on health, at US$4,569 — less than the United States (US$9,086) which remains the highest spending per person and more than France (US$4,361), Australia (US$4,115) and the United Kingdom (US$3,364) (Canadian Institute for Health Information, 2015).

The reason for these discouraging survey results may be rooted in the origin of the Canadian health care system which was created to cover acute care needs—universal coverage for medically necessary hospital and physician services. Over time, care aides, health professional consultations and prescription medications have been interpreted to be part of this essential health service basket, but only if provided within a hospital setting.

The Canadian health care system has continued to support and expand acute illness care services; however, medically necessary community based services remain discretionary. Each province has instituted different levels of coverage for prescription drugs and also for coverage of professional consultations through home care services, for care aides such as glucose measuring sticks, and for appliances such as walking devices for people with mobility impairments. This patchwork of programs varies in comprehensiveness, eligibility, and access, and consequently there are considerable differences in out-of-pocket expenses for patients with the same health problem (Nasmith et al. 2014).

The Canadian health care system has continued to support and expand acute illness care services; however, medically necessary community based services remain discretionary.

The impact of limited coverage for medically necessary community based services is significant. The cost of medication alone is a major barrier for people with chronic conditions in the community that prevents optimal adherence to medical treatment and results in avoidable morbidity (Nasmith et al. 2014). A recent study examining patient needs and concerns provides further insights on the impact of these limitations in coverage in our current health care system. Ho, Kuluski and Gill (2015) interviewed patients discharged from a complex continuing care and rehabilitation facility in Toronto and found that key discharge concerns included meeting their ongoing needs such as availability of home care, managing daily activities and navigating the pre-disability home.

Because our health system is focused on acute, episodic care, most health professionals' training and scopes of practice also largely reflect this design (Nelson, et al., 2014). Just as care is being shifted into the community, our health professional programs need to provide education in primary care settings to ensure that learners acquire the competencies needed to practice in these settings. In addition, Nelson et al. (2014) concluded that legislation, funding models and labour contracts reinforce the current hierarchies within health care and the professional silos across Canada and identified the need to optimize health professionals' scopes of practice as a key

enabler to transform the Canadian health system. This is particularly important in primary care to ensure access and equity in all regions of Canada.

In some areas we have shifted the system to recognize the need for chronic care, but service delivery is still single disease oriented. As a result, people with multiple chronic conditions go to multiple specialty clinics for treatment, fragmenting care and creating additional burdens related to managing these appointments.

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Disease-focused evidence

The focus on single diseases or conditions rather than on people with multiple chronic conditions can lead to contradictions in treatment recommendations and the need for clinicians and patients to try to reconcile this conflicting information. Boyd et al. (2005) aggregated the relevant clinical practice guidelines for a hypothetical 79–year old woman with chronic obstructive pulmonary disease, type 2 diabetes, hypertension, osteoarthritis, and osteoporosis and estimated that she would be prescribed 19 doses of 12 different medications, taken five times throughout a day, every day. Adverse interactions between drugs and diseases could result.

While the development of evidence-based clinical guidelines has contributed to improved quality of care in many contexts, many clinical guidelines do not consider improving the health of people with multiple chronic conditions. There is a need for more guidelines on chronic diseases that are inclusive of comorbidities and a need for guidance for managing care for people with multiple chronic conditions. Guidance that considers the overall burden of all diseases at the same time, rather than targeting one particular condition, is an example of the type of decision making tools that clinicians require to effectively manage care for people with multiple chronic conditions (Muth et al., 2014; Farmer, Fenu, O'Flynn & Guthrie, 2016; Wallace, Salisbury, Guthrie, Lewis, Fahey, & Smith 2015).

Both a care delivery model that is acute and episodic focused and single disease focused evidence have caused us to persist in practices that fragment care and ignore the additional complexities that come with living with multiple chronic conditions. Health and health care needs have changed, yet corresponding coverage of health services, health professional training and scopes of practice, and to a certain extent clinical guidelines and models of care, have not changed. The result is a health care system that is not well aligned with present population health needs.

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What can be done to change the system to better accommodate patients with chronic health problems?

As previously described, there is a high prevalence of multiple chronic conditions in the general Canadian population. With that understanding, this section of the report describes patient-centred care and proposes that more and better patient-centred primary care is required for the effective management of chronic health conditions to ensure comprehensiveness, coordination and continuity of care.

Patient-centred Care

Although the health system has largely remained focused on acute disease-specific care, the philosophy of care has evolved.

> "Over the last centuries, the field of medicine has evolved from a disease-oriented model where individuals were seen as simple hosts for diseases, to a patient-centered approach where health professionals actively try to engage their patients in treatment decision-making. This deep change in models of care acknowledges that patients are important actors in health fulfillment." (Roy, Levasseur, Couturier, Lindström & Généreux, 2014, p. 1).

As living with multiple chronic conditions becomes the norm for many patients, it is increasingly important to manage chronic diseases from a patient-centred rather than from a single-disease–centric approach (Stewart et al., 2013; Boyd & Fortin, 2010). Table 2 illustrates how these two approaches might differ in caring for patients with multiple concurrent conditions.

Table 2: Disease-oriented vs. patient-centred care for patients with multiple concurrent conditions

Disease-Specific Care	Patient-Centred care
Strong orientation towards a single disease	All conditions are considered simultaneously without a focus on a particular one
Coexisting conditions are of less importance and an interaction between them is not systematically assumed	Possible interaction between concomitant conditions is systematically taken into account
Treatment oriented by evidence-based guidelines for specific diseases	Guidelines for specific diseases have to be adapted as their strict application is potentially harmful
Treatment seeks to induce remission of the disease in physio pathologic outcomes that may not reflect improvement in patient outcome	Treatment oriented towards outcomes that matter to patients, considering their preferences and integrating biomedical, emotional and social needs
Assumption that treatment will positively affect the accompanying conditions	Polypharmacy and negative drug interactions are a concern- such factors may negate expected benefits
Treating physician acting in solo	Care based on teamwork, which is

	usually generalist-led
Coordination of care is limited	Coordination of care is an essential component

Patient-centred care acknowledges that patients' health problems are not synonymous with their diagnoses and that the health problems of people and populations are not the same as the sum of their individual diseases (Starfield, 2011). Patient-centred care takes different forms, with the core principle of offering care that fits people, not their diseases or single parts of their bodies.

In the context of managing care for people with chronic conditions, it includes (Boyd & Fortin, 2010; Hudon et al., 2012; Stewart et al., 2013):

- being attentive to patient's psychosocial as well as physical needs;
- exploring the patient's concerns and priorities for care thereby legitimizing their experience;
- conveying a sense of partnership between the patient and physician which acknowledges the patient's experience;
- facilitating active patient involvement in decision making which supports the development of an ongoing partnership;
- and coordinating across professionals, facilities, and support systems, including advocacy for the patient's care needs.

Stewart et al. (2000) assessed the association between patient-centered communication in primary care visits and subsequent health and medical care utilization and found that patient-centered practice improved health status (better recovery from their discomfort and concern, better emotional health two months later) and increased the efficiency of care by reducing diagnostic tests and referrals. Nasmith et al. (2010) concluded in a report that narratively reviewed the existing literature that patient-centred approaches have led to improved patient satisfaction scores and improved indicators of safety, patient and provider satisfaction, promotion of self-care, reduced length of stay, and other measures. A recent systematic review (Dwamena et al., 2012) found that training health care providers to be more patient-centred in clinical consultations has generally positive effects on a range of measures relating to clarifying patients' concerns and beliefs; communicating about treatment options; levels of empathy; and patients' perception of providers' attentiveness to them and their concerns as well as their diseases. This review reported mixed results on patient satisfaction, health behaviour and health status, noting there were limited studies with adequate data to draw definitive conclusions.

Practicing with a complex understanding of chronic conditions requires a paradigm shift from acute episodic interventions to a focus on the patient in the context of that person's family or living situation and community. This patient-centred focus includes components of care that are holistic, collaborative and responsive and is

facilitated by a therapeutic relationship (Boyd & Fortin, 2010; Stewart et al., 2013; Sidani & Fox, 2014).

More and better primary care

Patient-centred primary care is required for the effective management of chronic health conditions to ensure comprehensiveness, coordination and continuity of care. Primary healthcare providers and teams are a critical hub of the comprehensive approach required for patient-centred, integrated care that can improve healthcare system efficiency, patient outcomes and satisfaction, and quality of care (Nasmith et al., 2010).

While providing a locus for continuity of patient relationships and knowledge, effective primary care plays an important role in ensuring that people have access to the right care at the right time. Sav et al. (2015) found that appropriate and timely access to health care is the most important priority for people with chronic conditions and their caregivers.

While providing a locus for continuity of patient relationships and knowledge, effective primary care plays an important role in ensuring that people have access to the right care at the right time.

Primary care is foundational, but cannot function in isolation and does not supplant specialist, acute, community, or long-term care or public health functions. Effective management of some chronic conditions may require access to specialists' expertise. Community-based resources, including neighbourhood health educators and social workers, are also effective resources for chronic disease management (Østbye et al., 2005). Coordination of these specialty and community services through primary care is part of the comprehensive approach needed to effectively manage chronic conditions.

Community-oriented primary care is a systematic approach to health care based upon principles derived from epidemiology, primary care, preventive medicine, and health promotion (Longlett, Kruse & Wesley. 2001). It offers the possibility of addressing the environmental and social causes of ill health with the assistance of a primary care physician (Longlett et al., 2001). Community-oriented primary care includes having assigned responsibility for a defined population. The population may be geographically defined or by other characteristics with specialized health needs.

The term "medical home" has been proposed by the College of Family Physicians (2009) to promote patient-centred care in all practices and to help Canadians better understand the intent of primary care initiatives across Canada. The intent of most primary care initiatives is that "the medical home acts as the central hub for the provision and coordination of the medical care services needed by each of its patients (College of Family Physicians, 2009, p.5)."

Among specific pillars, team-based care is highlighted as a key component of the medical home. The importance of teamwork was also stressed in the 2002 Romanow Report that argued that good primary healthcare is based on interprofessional teamwork with access to care available to all, 24 hours a day, 7 days a week.

Studies have demonstrated that interprofessional primary care teams improve patient outcomes, provider outcomes and organizational outcomes (Barrett, Curran, Glynn, & Godwin, et al., 2007). Nelson et al. (2014) conducted a scoping review of the optimization of scopes of practice in emerging models of care and concluded that "Collaboration is widely accepted as an essential element to improving health care delivery and has been shown to improve patient satisfaction and increase job satisfaction among health care professionals through shared workload and a positive impact on patient well-being (p. 59). "

An example of successful implementation of interdisciplinary care and integration of specialists' expertise is the Hamilton Family Health Team. This program has demonstrated improved health outcomes for patients, with better coordination of care, reduced wait times, less stigmatization for persons seeking service, and high satisfaction reported among participating health care professionals and patients (Kates, Crusstolo, Farrar, Nikolaou, 2002, as cited in Nelson et al., 2014). Although this report is not intended to cover mental health care needs, this example of the integration of mental health services into primary care is a promising approach to address the comorbidity often seen when managing chronic conditions.

The integration of mental health services into primary care is a promising approach to address the comorbidity often seen when managing chronic conditions.

Hamilton Family Health Team's Mental Health Program

Since 1994, Hamilton Family Health Team – Mental Health Program has integrated mental health counsellors and psychiatrists into primary care settings. Reaching over 80 family practice clinics, this shared care model addresses issues of poor accessibility and availability of mental health services.

Its practice structure is unique in its specialized referral system, where psychiatrists see new cases and select follow-ups, review cases with other medical staff, and provide educational support, and physicians can refer patients directly to counsellors who are available onsite. After initial intake, patients can continue seeing a counsellor on an intermittent basis without needing to make an appointment with a physician or a psychiatrist.

Responsibilities of shared care between psychiatrists, physicians, and counsellors depending on patient needs are facilitated through communication sessions and an open referral system. A designated program coordinator manages clinic operations, human resource processes, monitoring, and evaluation.

http://hamiltonfht.ca/i-am-a-patient/mental-health

What are the best practices in managing chronic health problems?

In order to strengthen the primary care system, practice level changes are needed to implement best practices in the management of chronic health problems within the context of a robust primary care system that functions as "the hub for coordination and continuity of care with specialty and acute care and community-based services" (Nasmith et al., 2014, p. 3). The most widely adopted approach to implement best practice in comprehensive care is Wagner's (1998) Chronic Care Model.

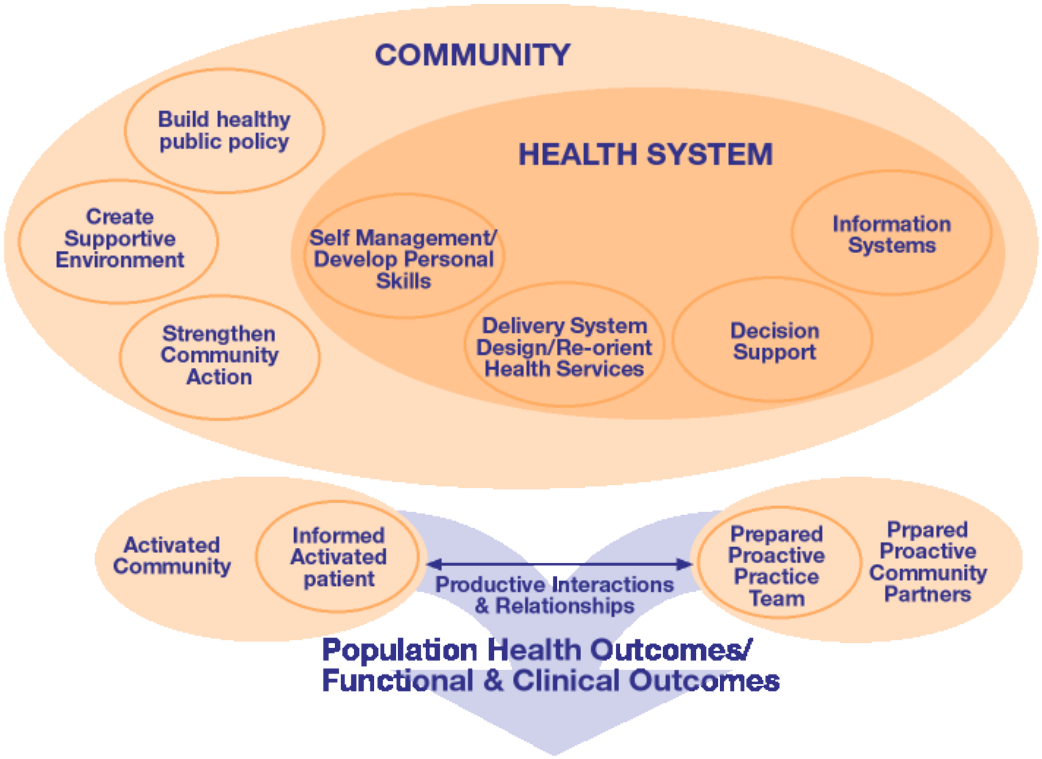
This section describes the chronic care models and summarizes the evidence on the implementation of this model.

Chronic care models

The six elements from the Wagner (1998) Chronic Care Model (health care organization, decision support, delivery system design, clinical information systems, self-management support, and community resources and policies) can be used as a framework to operationalize comprehensive chronic care by transforming primary care teams to be more proactive and to support activated patients.

Developing partnerships with community organizations to meet and advocate for the needs of people with chronic conditions is increasingly important as health care providers strive to influence social determinants of health (Millar, 2017). Barr et al.'s (2003) expanded Chronic Care Model (see Figure 1) deepened the community aspect of Wagner's (1998) model and added the components to build healthy public policy, create supportive environments, and strengthen community action to the health practice elements.

Figure 1: Expanded Chronic Care Model



Created by: Victoria Barr, Sylvia Robinson, branda Marin-Link, Lisa Underhill, Anita Dotts & Darlene Ravensdale (2002)
Adapted from Glasgow, R., Orleans, C., Wagner, E., Curry, S., Solberg, L. (2001). Does the Chronic Care Model also serve as a template for improving prevention? The Milbank Quarterly. 79(4), *and* World Health Organization, Helath and Welfare Canada and Canadian Public Health Association. (1986). Ottawa Charter of Health Promotion.

Nasmith et al. (2010) found that most chronic care models have several themes in common that are linked with improving outcomes and satisfaction: a shift from reactive to proactive care; population-based care, including delivering levels of care based on risk-stratification; meaningful health information systems; leveraging community partnerships; supporting self-management and caregivers; using clinical practice guidelines in a way that acknowledges multiple conditions; and continued practice redesign and improvement.

Chronic care models have been implemented in different ways and to varying degrees in many provinces and in many practices (e.g. family medicine group in

Quebec, the REACH community health centre in BC). The Ontario model of primary care is an example of how the elements of the chronic care model might appear.

Ontario's Family Health Teams

Since 2005, 184 Family Health Teams have been operationalized in Ontario. There are currently over three million people enrolled in Family Health Teams in over 200 communities across Ontario.

Delivery system design: Family Health Teams are primary health care organizations that include a team of family physicians, nurse practitioners, registered nurses, social workers, dietitians, and other professionals who work together to provide primary health care for their community. The programs and services are geared to the population groups they serve, providing primary care services to unique populations of patients with specialized health needs. For example, the Inner City Family Health Team in Toronto serves homeless males and has programs and services that aim to address the high incidence of mental health and addictions.

Self-management supports: Family Health Teams also focus on chronic disease management and health promotion and disease prevention activities, working closely with other health care and community-based organizations, and act as 'patient navigator' to help guide patients through the health care system.

Health care organization: An innovative incentive-based funding system, has been developed primarily from fee-for-service primary care practices. Most physicians in Family Health Teams are remunerated through either salary or blended capitation.

Information systems: Increased patient access to 24/7 care is delivered through a combination of teletriage services and extended office hours and the use of improved information technologies, specifically shared medical records.

Decision support: Family Health Teams have access to embedded decision supports within shared medical records (e.g. reminders, risk calculation tools, algorithms for medications, access to guidelines).

http://www.health.gov.on.ca/en/pro/programs/fht/

Preliminary observations of these Ontario Family Health Teams suggested high satisfaction among patients, higher income and more gratification for family physicians, and trends for more medical students to select careers in family medicine. (Rosser, Colwill, Kasperski & Wilson, 2011). A five-year evaluation of the Family Health Team model of primary care also produced encouraging results: improved access for the patients to most primary care health services (access to

mental health services was the most notable exception), a broader scope of services related to prevention and health promotion (ranging from lifestyle classes to health screening and vaccination reminder calls), very good internal care coordination but less effective specialist care coordination, increased patient and family-centredness related to having enough time to talk and seeing the same physician at their regular place of care, effective patient support for chronic disease management leading to improved blood pressure control among those with hypertension, cardiovascular disease, or stroke, and improved A1C blood sugar control among diabetics (The Conference Board of Canada, 2014) .

The Ontario evaluation of this approach to primary care suggests that the system-wide implementation of the chronic care model is helping people to manage their chronic health problems; however, more research is needed, as all the elements of the model were not explicitly examined in this evaluation.

The strength of the evidence for chronic care models

A scan of the current literature revealed that there is a need for more research and trials of these 'real world' interventions, as we still do not have strong evidence on effective implementation of the complete chronic care model (Smith, Wallace, O'Dowd, & Fortin, 2016). There is considerable variation between studies regarding the combination and implementation of elements (Davy et al., 2015), studies use a wide range of measures, with little consensus between studies (Drouin, Walker, McNeil, Elliott & Stolee, 2015) and frequently the evidence is insufficient to draw firm conclusions (Hopman et al., 2016).

There is considerable variation between studies regarding the combination and implementation of elements, studies use a wide range of measures, with little consensus between studies, and frequently the evidence is insufficient to draw firm conclusions.

A systematic review that included relevant case series and case studies found that implementation of the chronic care model is associated with improvements to healthcare practice or health outcomes for people living with chronic disease (Davy et al., 2015). Smith et al. (2016) examined interventions designed to improve outcomes in people with multiple chronic conditions in primary care and community settings and found modest improvements in mental health outcomes from seven studies that targeted people with depression, and in functional outcomes from two studies targeting functional difficulties in participants. This systematic review, however, did not find clear positive improvements in clinical outcomes, health service use, medication adherence, patient-related health behaviours, health professional behaviours or costs.

Another systematic literature review (Hopman et al., 2016) found that providing comprehensive care for patients with multiple chronic conditions or frailty might result in more patient satisfaction, less depressive symptoms, a better health-related quality of life or functioning of multi-morbid or frail patients, but the evidence is

limited. No evidence was found for a beneficial effect of comprehensive care on caregiver-related outcomes.

A systematic review on the economic impact of integrated care models for patients with chronic diseases found predominantly positive economic impacts of integrated care models (having at least two components of the chronic care model) for patients with chronic diseases (Desmedt, et al.,2016). Another, however, found no evidence that comprehensive care reduces the number of primary care or GP visits or healthcare costs and the evidence was insufficient regarding the use of inpatient care (Hopman et al., 2016).

The promising, albeit inconsistent, results speak to the need for further research on managing chronic conditions through primary care. Research design needs to account for the many confounding variables that are inevitable in a 'real world' primary care setting and needs to use consistent outcome measures that matter both to patients and the healthcare system.

There are new data emerging that demonstrate positive and promising results for the implementation of interventions that integrate chronic disease prevention and management in primary care.

There are new data emerging that demonstrate positive and promising results for the implementation of interventions that integrate chronic disease prevention and management in primary care (Fortin et al., 2016). The Canadian Institute for Health Research's Signature Initiative on Community-Based Primary Health Care Research will produce some further evidence for best practices in managing chronic conditions.

Canadian Institute for Health Research's Signature Initiative

Launched in 2012, the Canadian Institute for Health Research's Signature Initiative funded twelve teams to implement cross-jurisdictional programs in improving access to Community-Based Primary Health Care for vulnerable populations and chronic disease prevention and management.

Research is underway to address individual, social and structural determinants of health that lead to or reinforce conditions of vulnerability (e.g., stigmatization, migration), and by focusing on vulnerable subgroups that are at greater risk of poorer health outcomes and experiencing challenges in equity of access to Community-Based Primary Health Care.

The teams are collaborating on a set of common indicators to measure the impact and benefits of this research investment on the provision of primary health care.

http://www.cihr-irsc.gc.ca/e/43626.html

The Wagner and the expanded Chronic Care Models provide useful frameworks to organize practice elements to improve management of chronic conditions. The 2010

Canadian Academy of Health Sciences report (Nasmith et al.) examined these elements and identified what is most important to address in order to transform care for Canadians with chronic health conditions. The following and final section of this paper draws from the Canadian Academy of Health Sciences report to respond to Veteran's Affairs Canada question on how to modernize our approach to caring for people living with chronic conditions.

How can we modernize the ways in which Canada responds to chronic health problems?

Increasingly, people are living with multiple chronic conditions. And yet most health services are still organized around a single condition or disease, with funding mechanisms that prioritize acute care. In addition there is limited formal connection to sectors that provide social care, making it difficult for people with multiple chronic conditions to navigate the system and make decisions, as well as for health care providers to provide optimal care.

A patient-centred approach and a more robust primary care system that includes the elements of the chronic care models is needed to effectively respond to chronic health problems. A common vision for the Canadian healthcare system would provide much needed strategic direction, while accommodating the necessary flexibility in interpretation and implementation at a provincial/territorial, regional and community level.

The 2010 Canadian Academy of Health Sciences report (Nasmith et al.) called for Canada's healthcare system to "be integrated, patient-centred, and population-based, with primary care practices as the hub for coordination and continuity of care with specialty and acute care and community-based services." This integrated healthcare system will:

- have primary care practices that are responsible for a defined population;
- be person-centred (and family or friend caregiver focused);
- provide comprehensive services through interprofessional teams;
- link with other sectors in health and social care; and
- be accountable for outcomes.

The report (Nasmith, et al. 2010) proposed a strategy for moving forward, including six equally essential enabling recommendations:

1. aligning system funding and provider remuneration with desired health outcomes;
2. ensuring that quality drives system performance;
3. creating a culture of lifelong education and learning for healthcare providers;
4. supporting self-management as part of everyone's care;
5. using health information effectively and efficiently; and

6. conducting research that supports optimal care and improved outcomes.

There has been progress in many areas that will contribute to more effective management of chronic conditions. For example, considerable efforts are underway across the county to ensure all Canadians have access to primary care. The shift from individual general practitioners to groupings of practitioners in primary care is further evolving, including an expanded role for other health professionals. However, more work is needed to fully embed team based care, ensure integration and coordination within health care, as well as link with other sectors in health and social care.

While attention is needed in a number of areas to transform the Canadian health system, the remainder of this report will focus on the two elements that may hold the greatest potential for improving the health of people with chronic conditions: team-based patient-centred primary care and supported self-management.

Team-based patient-centred primary care

Patient-centered care is best enabled through a system that permits the time and relationships needed for health professionals to engage in comprehensive, continuous and integrated care (Nasmith et al., 2010). The chronic care model is firmly rooted in the integration of evidence-based clinical guidelines, in a context that allows healthcare providers to spend enough time with people with chronic conditions to interpret these guidelines for each context and to support people in decision-making and integrating changes into their daily lives (Nasmith et al., 2010).

Patient-centered care is best enabled through a system that permits the time and relationships needed for health professionals to engage in comprehensive, continuous and integrated care.

However, most Canadian remuneration agreements do not support team-based care that acknowledges the comprehensive and coordinated approach to care needed to address the complexity of life and health for people living with chronic conditions. For example, physician payer models that code one disease or issue at a time (i.e., fee for service) neither account for the complexity of most people's conditions nor provide for the conversational and relationship time that comprehensive, patient-centred models require (Nasmith et al., 2014).

Fee for service remuneration complicates collaboration across professions and service delivery settings when payment is tied to particular health care professional types (e.g., physicians) or to certain settings (e.g., hospitals) but not to other collaborative models (e.g. primary care clinics with nurses, pharmacists, dietitians, counsellors) (Nelson et al., 2014).

New approaches to remunerations are needed to promote team based, patient-centred care. The previously mentioned Hamilton Family Health Team's Mental

Health Program, for example, uses a blended capitation system as an enabler to build their interprofessional team.

It is important to include specialty care as part of the health care team for patients with chronic health conditions. Innovative application of the fee-for-service physician payer model has been used to increase access to specialists within primary care and collaboration across service delivery settings, supporting patient-centred care. For example, in British Columbia fee for service billing codes allow specialists and family physicians to have point of care telephone consultations. The program seeks to reduce potential visits to the emergency department and long wait times to see a specialist; further evaluation is needed.

Rapid Access to Consultative Expertise

Rapid Access to Consultative Expertise (RACE) provides real time access to 200 specialists within primary care. Family physicians and nurse practitioners in the Vancouver/Coastal Health Region can call one phone number for a consultation from a current selection of up to 28 specialty services for real-time telephone advice. It is reported that 80% of calls are returned within ten minutes.

This point of care, "just in time" advice is promoted as simplifying the patient journey, improving patient outcomes and reducing system costs. There were 20,000 calls in the first five years.

An educational interaction with knowledge transfer is encouraged when the specialist answers the call. In the spirit of "capacity building", specialists are recruited for their interest in teaching and communication as well as their recognition as key opinion leaders.

http://www.raceconnect.ca/

The prevailing primary care remunerations may not allow for sufficient time for patient-centred care or for team-based care. While the research is still emerging, it is clear that a payment system for all healthcare providers—not just physicians—that blends elements of capitation, quality, salary, infrastructure, and fee-for-service promises to drive patient-centred care (Nasmith et al., 2010; Nelson et al., 2014).

The need for time and relationships is especially important when managing care for people with multiple chronic conditions. Current remuneration agreements do not support team-based care that acknowledges the comprehensive and coordinated approach to care needed for people with multiple chronic conditions. Fee for service payment systems may also inadvertently create incentives that promote dependency rather than support self-management (Nasmith et al., 2010).

Supported self-management

Supported self-management acknowledges the importance of the central role that patients have in managing their own care. Self-care of some kind is an inherent requirement of living with chronic conditions, since "healthcare professionals may only interact with people with a chronic disease a few hours a year—the rest of the time patients care for themselves" (Department of Health, 2004. p.6).

The scope of self-care is highly dependent on the interest and capacity of individuals and their circumstances (Phillips et al., 2015). At the same time, both the chronic care model and some definitions of patient-centred care highlight a desire to "increase their capacity to self-manage and otherwise participate in their health" (Lewis, 2009, p. 9 as cited in Nasmith et al., 2014).

There are two sides to supported self-management: what is the person with chronic conditions doing to manage their own care, and what are providers doing to help people be more engaged in their self care? This form of engagement is what the Wagner model refers to as the "activated patient" (Wagner, 1998, p. 3). A recent study demonstrated that supported self-management for people with multiple chronic conditions can be effectively integrated into primary care (Fortin et al., 2016).

The patient-as-professional concept acknowledges the expert participation of patients in interprofessional teams, including their contributions to managing and coordinating their care. However, not all patients might desire this level of involvement and clinicians' time constraints are a barrier (Phillips et al., 2015). Clinicians were also concerned that not all patients have the required knowledge for this role, and those who do are time-consuming for the clinician. This is a challenge in a busy practice where they do not have the time necessary to clarify misinformation or to research alternative treatments that may not be evidence based.

Patient education and support to enable self-care are essential aspects of chronic care management. As the hub for care coordination and the most frequent point of contact within the health system, primary care providers play an important role in helping people learn about their chronic conditions and what they need to do to improve their overall health and well-being. Referral to relevant community-based services that support and meet patients' needs is an important part of the provision of care and self-management.

Patient education and support to enable self-care are essential aspects of chronic care management.

An example of extensive supports for self-management is Kaiser Permanente's HealthConnect®. There is not yet a comparable Canadian electronic health system with this capacity.

Health Connect®

Kaiser Permanente's 'HealthConnect®' links patients to their health care teams, their personal health information and the latest medical knowledge.

Activities such as lifestyle modification, medication management, patient education, laboratory results monitoring, and management of adverse events are all coordinated through the program, which helps guide the patient through both short- and long-term care decisions.

Members are supported to manage their own conditions and care by having 24/7 access to their health information and health management tools to email their care providers, schedule appointments and refill prescriptions.

Members can access My Health Manager from anywhere in the world via mobile apps.

https://share.kaiserpermanente.org/total-health/connectivity/

Self-management may extend beyond an individual's capacity to cope with disease and ability to develop personal skills for health and wellness, and include their capacity to develop strategies for action in the community as well as to transform the health system. The Patient Voices Network is one example where a provincial government has established formal mechanisms and supports to enable patient engagement.

Patient Voices Network

Created in 2009 as part of the British Columbia's Ministry of Health 'Patients as Partners' strategy, the Patient Voices Network is a community of patients, families and caregivers. Supported by the BC Patient Safety and Quality Council, the Patient Voices Network works with health care partners to improve the health care system.

Members of the network participate in volunteer opportunities with health care partners who are looking for the patients' perspective to improve quality of care. Volunteers bring their own lived experiences within the health care system to a variety of activities. For example, patient volunteers may sit on working groups, help develop programs and resources, and teach care providers about the patient experience. Volunteers receive training, education and ongoing support so that they can have meaningful impacts.

https://patientvoicesbc.ca/

All people with multiple chronic conditions require some supports for self-management if they are to successfully promote their own health. The level of involvement by people with chronic conditions and their families in their care will vary, as will their interest in influencing the health care system.

Summary

There is a high prevalence of multiple chronic conditions in the general Canadian population. People with multiple chronic conditions require a patient-centred approach to care. Patient-centred care takes different forms, with the core principle of offering care that fits people, not their diseases or single parts of their bodies. It requires a paradigm shift from acute episodic interventions to a focus on the patient in the context of that person's family or living situation and community.

Patient-centred primary care is required for the effective management of chronic health conditions to ensure comprehensiveness, coordination and continuity of care. Critical elements of patient-centred primary care include an interdisciplinary team working with community and specialty resources to ensure needed services and support patient self-management.

The Chronic Care Model remains the most promising model of care. There is not yet strong evidence to support its use so if adopted, it should be carefully evaluated Many examples of innovative services and systems that have implemented key elements of the model already exist within and outside of Canada. These innovations can inspire and drive change, as well as help inform the growing body of knowledge on how to most effectively manage care for people with multiple chronic conditions.

Key messages

- There is a high prevalence of multiple chronic conditions in the general Canadian population.
- Patient-centred primary care is required for the effective management of chronic health conditions to ensure comprehensiveness, coordination and continuity of care.
- Critical elements of patient-centred primary care include an interdisciplinary team working with community and specialty resources to ensure needed services and support for patient self-management.
- Clinicians require guidance and decision making tools that consider the overall burden of diseases to effectively manage care for people with multiple chronic conditions.
- The Chronic Care Model remains the most promising model of care for people with chronic health conditions, in spite of limited evidence.

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Appendix: Chronic Health Conditions in Veterans

Veterans have a high prevalence of multiple chronic conditions, which is similar to the general Canadian population. Seventy four percent (74%) of Veterans are living with at least one chronic condition. In a direct comparison with the general Canadian population (using 2012 Canadian Community Health Survey data as a comparator, age and gender adjusted), these Veterans were found to have higher rates of arthritis, back problems, cardiovascular conditions (high blood pressure, heart disease, stroke effects), gastrointestinal conditions (bowel disorder, ulcers), migraines, obesity, hearing problems and chronic pain or discomfort (Thompson et al., 2014). This study also reported that three or more co-occurring chronic physical health conditions were present in 30% of these Veterans, but did not provide a direct comparison to the general Canadian population.

Conventionally we look at health behaviors as key contributors to chronic conditions, since the accumulation of unhealthy life-style habits is associated with a higher likelihood of suffering from multiple chronic conditions (Fortin et al., 2014). Smoking rates are lower in the Veteran population and respiratory conditions and cancer are the only two chronic conditions where the prevalence in these Veterans is not higher than the Canadian population (age and gender adjusted).

The majority of Veterans who reported having chronic health conditions diagnosed by a health professional attributed their conditions to military service, as did many with a disability (Thompson et al. 2011). There are some data from the same report suggesting that Veterans living with chronic conditions might be coping differently than the general Canadian population (Table 1). Veterans report lower levels of life stress and similar rates of heavy alcohol use in a direct comparison to the general Canadian population, but other measures such as self-rated health, satisfaction with life and sense of community belonging are lower than the general Canadian population. Also, compared to the general Canadian population, Veterans were more likely to have experienced a time in past year where they felt that health care was needed but did not receive it (Thompson et al., 2013).

Table 1: A direct comparison of Veterans to the general Canadian population (Thompson et al., 2014).

Veterans seem better off in some areas	Veterans seem worse off in other areas
↑High school graduate ↓Low Income ↓Perceived life stress ↓Daily smoking	↓Post-secondary ↓Self-rated health ↓Satisfaction with life ↓Sense of community belonging ↑Restriction of activity ↑Need help with ADL ↑Unmet health care need

While the prevalence, manifestation and history of Veterans' chronic conditions may differ from the general Canadian population; there are commonalities in terms of the care goals. We did not discover any evidence suggesting it would be beneficial for Veterans and their families to receive services as a separately defined population. Veterans and their families should be well served within existing models of patient centred primary care that include an interdisciplinary team working with community and specialty resources to ensure needed services and support for patient self-management.

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