

Primary Prevention of Cardiovascular Disease on Prince Edward Island: An NP-led Initiative

Ellen E. Christie

University of Prince Edward Island

March, 2018

In partial fulfillment of the requirements for the degree of Master of Nursing

TABLE OF CONTENTS

List of Tables.....	iii
Abstract.....	iv
Acknowledgments.....	v
Background.....	1
Part I: The Nature of the Need.....	3
Contributing Factors.....	4
Impact of the Problem.....	12
Promising Approaches.....	16
Target Population.....	22
Part II: Project Goals and Objectives.....	23
Rationale to Support Objectives.....	24
Part III: Project Design and Implementation.....	25
Accessibility.....	26
Public Participation.....	26
Health Promotion.....	27
Appropriate Skills and Technology.....	27
Intersectoral Cooperation.....	27
Program Overview.....	28
Program Activities.....	30

Part IV: Project Evaluation.....	35
Objective #1.....	36
Objective #2.....	37
Objective #3.....	37
Objective #4.....	38
Objective #5.....	39
Implications for Future Programming.....	39
Part V: Knowledge to Action Plan.....	40
Audience.....	40
Medium.....	40
Part VI: Budget.....	42
Part VII: Implications for Practice.....	42
Professional Role, Responsibility and Accountability.....	43
Conclusion.....	45
References.....	46
Appendix A.....	66
Appendix B.....	67
Appendix C.....	69
Appendix D.....	73

List of Tables

Table 1: Planning Activities and Timeline.....	67
Table 2: Personnel Budget.....	73
Table 3: Equipment & Material Budget.....	73

Abstract

In Prince Edward Island (PEI), the ever-rising prevalence of chronic diseases such as cardiovascular disease (CVD) represents the most significant strain on healthcare resources (Health PEI, 2013a). Cardiovascular disease is considered to be preventable, particularly when risk factors such as diabetes, hypertension, and dyslipidemia are detected and treated early (Public Health Agency of Canada [PHAC], 2016a). When risk factors are left untreated, and CVD develops, critical complications such as heart failure, acute coronary syndrome, stroke, and death can occur (PHAC, 2016b). Factors that contribute to the lack of appropriate, evidence-based CVD prevention in PEI include a lack of access to primary care providers, a lack of strategic health policy for the prevention and management of CVD, and poor adherence to clinical practice guidelines among primary care providers across Canada (Canadian Medical Association [CMA], 2011; Kreamsoulas & Anand, 2010; Mosca et al., 2005). A recent shift towards primary prevention of CVD has begun with promising approaches for more effective primary prevention seen on an international, national, and provincial scale. A nurse practitioner-led CVD primary prevention program can improve access to high-quality, evidence-based care to those adults at risk of CVD through care plans aimed at risk factor stratification, health promotion, and illness prevention. The proposed program will fill a gap in existing healthcare programming and is designed to decrease rates of morbidity and mortality related to CVD in PEI.

Acknowledgments

I would like to sincerely thank my family, friends, colleagues, and classmates for their unwavering support throughout this experience. I would also like to thank Dr. Janet Bryanton for the invaluable guidance and support she provided to me over the last four years.

I would like to acknowledge my co-supervisors, Dr. William Montelpare, Terri Kean, and Patrice Drake for their assistance and guidance throughout this project.

Primary Prevention of Cardiovascular Disease on Prince Edward Island: An NP-led Initiative

Background

In 2013, approximately 2.4 million Canadians over the age of 20 years were living with a diagnosis of cardiovascular disease (CVD) (Public Health Agency of Canada [PHAC], 2016b) and 90% of Canadians were living with at least one risk factor of CVD (Government of Canada, 2017). Cardiovascular disease is a group of disorders that affect the heart and blood vessels and include ischemic heart disease, cerebrovascular disease, peripheral vascular disease, heart failure, rheumatic heart disease, and congenital heart disease. In Canada, these conditions are the second leading cause of death and disability (PHAC, 2016a). Risk factors for CVD include age, genetic predisposition, smoking, diabetes, hypertension, and dyslipidemia (PHAC, 2008). Complications of CVD include angina, myocardial infarction, transient ischemic attacks, stroke, cardiac arrhythmia, and heart failure (PHAC, 2017; World Health Organization [WHO], 2007).

Cardiovascular disease accounted for over 30% of deaths on Prince Edward Island (PEI) in 2009, the third highest CVD-related mortality rate in the country (Statistics Canada, 2015). Rates of comorbid risk factors which include diabetes, hypertension, and dyslipidemia are also higher on PEI than the national average (Government of Canada, 2017; Government of PEI, 2016; Lee et al., 2009). In 2013, Health PEI identified high rates of CVD as a cause for concern and a critical area for action within the provincial healthcare system. This prompted further discussion and development of disease prevention strategies in the province (Health PEI, 2013b).

Cardiovascular disease is considered preventable, particularly when risk factors such as diabetes, hypertension, and dyslipidemia are detected and treated early (PHAC, 2016a). Many individuals rely on their primary care provider to assist them to screen and to manage their CVD risk factors. Prince Edward Island has long struggled to recruit and retain primary care providers.

Island residents without timely access to primary healthcare are therefore at risk of developing complications related to CVD such as heart failure, acute coronary syndrome, stroke, and death. These conditions not only have significant personal ramifications for those individuals at increased risk but are associated with costly and preventable emergency department visits, hospitalizations, and workforce losses (Canadian Institute for Health Information [CIHI], 2012; Lorig, Sobel, Ritter, Laurent, & Hobbs, 2001; MacColl Institute for Healthcare Innovation, 2010; PHAC, 2009).

The PHAC (2013) defines primary prevention as “activities aimed at reducing factors leading to health problems” (p. 1). In the context of CVD, primary prevention is aimed at risk factor identification and management. Research supports primary prevention strategies in CVD. Tu et al. (2017) report that when high-quality CVD prevention strategies are implemented, complications can be reduced, quality of life improved, and economic burden decreased.

Nurse practitioners (NP) on PEI can play a valuable role in primary prevention strategies for CVD. These professionals possess a broad set of clinical competencies and a distinct philosophy of care (Stephens, 2012). Nurse practitioners provide high-quality CVD prevention and management to their patients (Allen et al., 2002; Bauer, 2010; Jackson, Lee, Edelman, Weinberger, & Yano, 2011; Mason, 2003; Ohman-Strickland et al., 2008) and are well placed to encourage a healthy lifestyle, as well as monitor for and treat CVD risk factors (Liddy et al., 2012).

Part I: The Nature of the Need

Rising rates of chronic diseases, such as CVD, represent the most significant strain on healthcare resources (Health PEI, 2013b). Beyond increased healthcare system demands, CVD has far-reaching impacts which include workforce absenteeism and loss of productivity (Elmslie, 2013). As a result, the rapidly rising costs associated with chronic disease management in Canada has now surpassed economic growth and threatens the sustainability of provincial governments nationwide (Elmslie, 2013). Such costly trends are of particular concern in provinces where rates of chronic disease are high, such as PEI.

Cardiovascular disease accounted for over \$300 billion in direct and indirect costs to the Canadian healthcare system in 2008 (PHAC, 2008). Evidence-based prevention of CVD is critical to maintain the sustainability of the healthcare system nationally and provincially (Health PEI, 2013b). Costly and preventable emergency department visits, hospitalizations, and workforce losses may be avoided through early disease screening, detection, and treatment (CIHI, 2012; Lorig, Sobel, Ritter, Laurent, & Hobbs, 2001; MacColl Institute for Healthcare Innovation, 2010; PHAC, 2009).

Cardiovascular disease risk factors such as diabetes, hypertension, and dyslipidemia are pervasive in PEI with rates that surpass those in other provinces. In 2013, approximately 9% of PEI residents had a diagnosis of diabetes and over 20% had a diagnosis of hypertension. These percentages reflect only the individuals with a formal diagnosis. Many more individuals are unknowingly living with these conditions, which could further add to the number of those at high risk to develop CVD (Health PEI, 2013b). These figures highlight the need for timely access to high quality, evidence-based primary healthcare services to prevent and manage these conditions (Epping-Jordan, Pruitt, Bengoa, & Wagner, 2004; Liddy et al., 2012; Tu et al., 2017; Wagner,

1998). Despite this, many at risk do not have access to a primary care provider (Statistics Canada, 2013).

Given the costs associated with CVD management, effective and targeted primary prevention of these conditions is imperative. Increased prevalence of CVD risk factors (specifically diabetes, dyslipidemia, and hypertension) and lack of access to primary prevention services necessitate alternative approaches to CVD prevention on PEI (Health PEI, 2013b).

Contributing Factors

Many factors contribute to the lack of appropriate, evidence-based primary prevention of CVD. Such factors include lack of access to primary care providers, lack of a provincial strategic health policy for the prevention and management of CVD, and poor adherence to clinical practice guidelines among primary care providers (Canadian Medical Association [CMA], 2011; Kreamsoulas & Anand, 2010; Mosca et al., 2005).

Lack of access to primary care providers. There are several issues which contribute to the shortage of primary care providers for PEI residents at risk of CVD. These challenges include a deficit of family physicians in PEI communities and limited use of NPs.

Statistics Canada reported that over 10% of PEI residents did not have a family physician in 2015 (Statistics Canada, 2015). To address unaffiliated patients, Health PEI developed a Patient Registry Program in 2007. This program pairs patients without a provider to the next available physician or NP (Health PEI, 2013a). While the Patient Registry Program is a valuable method to pair patients in need with available primary care providers, it does not capture those who have not registered with the program, those waiting for a replacement provider as a result of retirement, or those who have departed from the province (MacDonald, 2017). Many individuals enrolled in the program wait for over a year to be assigned to a primary care provider. In 2017,

the number of patients enrolled in the Patient Registry Program fell to less than 7000 (Canadian Broadcasting Corporation [CBC], 2017b), however, based on Statistics Canada data, the number of those on the Provincial Patient Registry captures less than half the number of individuals on PEI without a primary healthcare provider. Individuals who do not have access to a primary healthcare provider must rely on walk-in clinics and emergency department services for their healthcare needs (Health PEI, 2013b; Statistics Canada, 2013).

Family physician shortages. National growth of physician numbers has outpaced population growth in recent years (CIHI, 2017). Many rural Canadian communities continue to face physician shortages due to maldistribution of practicing physicians with a concentration of physicians in urban areas (CIHI, 2005). Over 50% of PEI's population lives in rural settings. Prince Edward Island has seen a modest increase in practicing physician numbers in recent years (183 physicians per 100,000 in 2012 to 187 physicians per 100,000 in 2016) and yet PEI continues to have the lowest number of physicians per population in Canada and the third lowest number of family physicians when compared to other provinces (Canadian Rural Revitalization Foundation, 2015; CMA, 2015). According to the Government of PEI website, there were 10 family physician positions available as of December 2017; of these 10 positions, 7 were located in rural communities including Alberton, O'Leary, Kensington, and Montague (Government of PEI, 2017).

Young physicians, who replace PEI family physicians who retire, seek a more equitable work-life balance than their predecessors (Chapin, 2016). Health PEI has begun to divide practices previously cared for by one physician into two or three (Wright, 2017). For example, the practice of a recently retired family physician saw approximately 2,600 patients divided among one physician and two NPs (CBC News, 2017b).

As Canadians continue to age, so too does the physician population. As more and more physicians approach 65 years of age, an increasing number are expected to retire or cut back on weekly working hours. This will further limit access to family physicians (Pong, Lemire, & Tepper, 2007). The average age of physicians in PEI is the highest in the country at 53 years and over 30% of those practicing are 60 years of age or older (CIHI, 2016a). As a result, a large number of physicians in PEI are expected to retire within the next decade (Hay Group, 2010).

As a recruitment and retention strategy, Health PEI has invested in the salaries of physicians in the province. Salaries of physicians on PEI are among the third highest in the country; entry-level family physicians earn a base salary of approximately \$148, 499 annually (Medical Society of Prince Edward Island, 2015). The wages paid on PEI are comparable to those offered by Ontario and Alberta governments. However, PEI continues to experience difficulties to recruit adequate numbers of family physicians to practice in the province and to have the highest patient to physician ratio in Canada (CIHI, 2017).

As numbers of medical residents who choose to pursue family medicine residency has declined in recent years (Canadian Resident Matching Service, 2017), there has also been a lack of interest to practice within a traditional family medicine practice across Canada (Brend, 2017). For example, an increased number of new physicians have pursued in-patient hospital practice settings as hospitalists (Brend, 2017). In 2007, Health PEI recruited their first hospitalist physician to care for unaffiliated patients in hospital (CBC News, 2007). Since then, several family physicians have left their family practices for hospitalist positions (Armstrong, 2012). Hospital-based practice allows them to largely avoid the overhead costs and complexities of self-employment required to operate a private medical practice (Brend, 2017; Tanner, 2017). The trend toward less traditional applications of family medicine has resulted from a variety of

factors, which include increased workload within clinic-based environments, physicians' choice to limit scope of practice, remuneration models, desire to maintain acute care knowledge and skills, and work-life balance and quality-of-life concerns (Yousefi, 2013). While total physician numbers in the province have increased in recent years, provincial shortages of primary care providers continue to be a concern in PEI (MacDonald, 2017).

Nurse practitioners. Nurse practitioners are registered nurses with additional experience and education which allows them to autonomously diagnose and treat illness, order and interpret diagnostic tests, prescribe medications, and perform medical procedures (Canadian Nurses Association [CNA], 2016). Across Canada, NPs provide care to diverse patient populations through a broad range of care-delivery methods. The potential that NPs have to improve accessibility and quality of primary healthcare services has resulted in a heightened interest nationwide in the role. As a result, NPs have become recognized as integral members of many provincial healthcare systems. In 2010, primary healthcare NPs were the fastest growing advanced practice nursing role in Canada (Donald et al., 2010).

Nurse practitioners were first implemented in the 1970s and their practice was directed to northern Canada. In 2018, it is not uncommon for Canadian NPs to work with all patient populations in a variety of practice settings that range from community-based health promotion programs to intensive care settings. Nurse practitioners can also be seen in a variety of practice models from working alongside fee-for-service physicians to NP-Led clinics (DiCenso et al., 2010).

Despite strong evidence that supports the integration of NPs into healthcare systems, the profession has been challenged with a variety of barriers (Donald et al., 2010; Wong & Farrally, 2012). A lack of federal and provincial legislation and policy that supports NP practice has been

a significant challenge to the integration of the role. As such, healthcare systems have had to reorganize primary health care service models to build NPs into the system (Donald et al., 2010; Wong & Farrally, 2012). Nurse practitioners have also had to navigate issues that arise from a lack of understanding of the NP role and scope of practice by members of the public and the healthcare system. This potentiates ill-informed conflict among healthcare providers and healthcare consumers. Physician attitudes have also been identified as a barrier to the integration of NPs into the healthcare system (Donald et al., 2010; Hay Group, 2010; Wong & Farrally, 2012). Research indicates that physicians have expressed concern with regards to an NP's ability to autonomously provide high quality, evidence-based, fiscally responsible care to patients (Donald et al., 2010; Hay Group, 2010; Wong & Farrally, 2012). Physicians also have concerns related to professional liability and compensation consequences when working alongside NPs (Wong & Farrally, 2012). As a result of legislative, policy, and interprofessional barriers, NPs have had to work within health systems which limit their scope of practice below the level of their training. This further adds to health system inefficiencies and payment model challenges (Hay Group, 2010; Wong & Farrally, 2012)

On PEI, legislation was introduced in 2006 to permit NPs to practice and since then there has been significant growth in their numbers (T. Kean, personal communication, December 26, 2017). In a 2010 report, the Hay Group identified the importance of NPs as valuable members of the provincial healthcare team. This assertion was based on extensive literature which supports the value of NPs, their successful implementation in other healthcare systems, and the valuable contributions these professionals can have within an integrated healthcare team approach (Hay Group, 2010). In 2011, the University of Prince Edward Island (UPEI) became the third university in the maritime provinces to offer an NP Stream within their Master of

Nursing (MN) programs. Six NPs have graduated from the UPEI NP stream since 2011, and the number of NPs who work in the province has grown 600% (T. Kean, personal communication, December 26, 2017). There are now 30 NPs registered on PEI who work in a variety of settings: e.g., gerontology, nephrology, oncology, endocrinology, and within primary health care (Association of Registered Nurses of Prince Edward Island [ARNPEI], 2017). In the past, PEI lagged behind its Maritime counterparts when comparing ratios of practicing NP to residents, however current data suggest this is no longer the case (Prince Edward Island Statistics Bureau, 2017).

In response to concerns related to access to primary healthcare services, the Liberal Party of PEI led by Wade MacLauchlan campaigned in 2015 on a platform to increase the number of NPs working in PEI. The Liberals also planned to develop a rural NP recruitment program to improve access to NPs especially in rural areas of the province (Liberal Party of PEI, 2015). To date, no such recruitment program has materialized, and residents of PEI continue to express a desire for additional NP availability within the provincial healthcare system (Health PEI, 2017b).

Lack of a provincial cardiovascular strategic plan. Prince Edward Island, like the rest of the nation, has high rates of chronic diseases in a rapidly aging province. Prince Edward Island has successfully developed a number of strategic plans that target chronic illnesses such as diabetes and cancer, however, has yet to pursue a provincial CVD strategy to outline the province's future direction for primary, secondary, and tertiary CVD prevention strategies. A provincial strategic plan is meant to build upon past successes and challenges and identify priority goals, planned methods to achieve the goals, and an outline of how the evaluation of future achievements will be completed (Health PEI, 2017a).

Several Canadian provinces, including British Columbia and Alberta, have implemented Chronic Disease Prevention and Management (CDPM) strategies with promising results. In British Columbia, the use of a CDPM strategy has facilitated collaboration among health organizations and health practitioners to improve care for people with specific chronic illnesses (e.g., diabetes and congestive heart failure). Primary health care providers who work within this strategy report high satisfaction with the strategy. The integration of this strategy has improved the quality of care provided and has seen decreased mortality and hospitalizations for these conditions (Government of Canada, 2007).

Other provinces have addressed the lack of access to care through the development and implementation of a provincial CVD strategy. The province of Nova Scotia developed a strategic plan in 2003 for the management of CVD. This plan identified a shared vision for cardiac health in Nova Scotia and provided a framework to achieve this vision (Nova Scotia Health, 2011). The design of this strategic plan facilitated the collection and reporting of data related to the CVD health, as well as data related to the burden of CVD. The Cardiovascular Health Nova Scotia group has used the data collected to focus on a variety of projects that range from primary to tertiary prevention of CVD (Nova Scotia Health, 2011). Within this vision for cardiac health in Nova Scotia, a program known as Nurse Practitioner Access Clinics was developed. This program, designed to improve access to cardiology services, sees NPs provide CVD care for patients with semi-urgent cardiac referrals (Nova Scotia Health, 2017).

Health PEI developed a chronic disease prevention and management framework in 2013 which sought to provide organization and delivery of services related to chronic disease prevention and management (Health PEI, 2013a). Although this framework is a positive step toward chronic disease prevention and management, there remains a lack of focus and direction

for CVD prevention and management in the province. While the hypertension and diabetes programs under this framework are valuable, they are not formally directed towards the prevention and management of CVD and its costly complications. The lack of a provincial CVD strategy has been associated with excessive direct and indirect healthcare costs for residents of the province (Health PEI, 2014) and limits opportunities to learn more about CVD and its risk factors among the general population. This leaves patients who are at risk of, or currently living with CVD, vulnerable to poor health outcomes.

Poor adherence to clinical practice guidelines. Clinical experts in various fields of medicine routinely develop clinical practice guidelines based on the best evidence available to guide both novices and experts in clinical decision making. Clinical practice guidelines are intended to standardize patient care, reduce costs, and optimize patient outcomes (Field & Lohr, 1990; Mercuri et al., 2014; Stone et al., 2008). National clinical practice guidelines are available for many chronic diseases (e.g., CVD, diabetes, hypertension, and dyslipidemia); however, patients may not receive adequate chronic disease prevention which can result in poor patient outcomes (Davis & Taylor-Vaisey, 1997; Mercuri et al., 2014; Ostbye et al., 2005). Poor adherence to preventive care guidelines among providers is reflected in the patients' inability to reach recommended targets for clinical indices such as blood pressure, low-density lipoprotein (LDL) levels, and fasting blood glucose levels (Liddy et al., 2012). Research also highlights the inability of healthcare providers to achieve adequate risk factor control among patients with dyslipidemia, hypertension, and diabetes (Braga et al., 2010; Goodman et al., 2010; Grover et al., 2011; Tu et al., 2017). Mosca et al. (2005) suggested that due to poor adherence to clinical practice guidelines for CVD management, further preventative interventions are required to improve CVD-associated morbidity and mortality.

A growing body of research has brought attention to a lack of time available in primary-care physician practices to provide adequate preventative chronic disease care (Ostbye et al., 2005). Yarnall et al. (2009) reported that physicians, with a panel size of 2,500 people, would have to work 22-hour days to meet chronic disease prevention and management guidelines and would have to spend 50% of their time doing chronic disease management and 30% doing primary prevention. Research supports the integration of NPs into primary care settings to improve access and allow time for focused, high-quality chronic disease prevention (Ostbye et al., 2005; Yarnall, Pollak, Ostbye, Krause, & Michener, 2003). A comprehensive provincial CVD strategy that details the role of the NP in the primary prevention of CVD represents a commitment to improved access to high-quality CVD care.

Impact of the Problem

Cardiovascular disease is considered to be preventable if people adopt healthy lifestyles and when risk factors (e.g., diabetes, hypertension, and dyslipidemia) are detected and treated early (PHAC, 2016a). When CVD is left untreated, critical complications such as heart failure, acute coronary syndrome, stroke, and death can occur (PHAC, 2016a). These conditions not only have significant ramifications for those individuals at increased risk but are associated with dramatic direct and indirect costs to the healthcare system and society.

Direct costs. Direct healthcare costs include healthcare provider services, medical supplies, equipment, and pharmaceutical therapy (Boccuzzi, 2003). In 2008, Health Canada reported that CVD accounted for close to \$12 billion annually in direct costs, with over \$5 billion attributed to hospital services, making it the most expensive diagnostic category of illness (PHAC, 2008). Cardiovascular disease and related complications (e.g., heart failure, acute

coronary syndrome, and stroke) accounted for three of the four most expensive medical conditions within the acute inpatient sector of healthcare in Canada in 2005 (PHAC, 2008).

Data specific to the direct costs associated with CVD in PEI are not readily available. However, a large number of PEI residents are at risk for CVD morbidity and mortality secondary to diabetes, hypertension, and dyslipidemia (Health PEI, 2013a). Of the four most expensive chronic diseases on PEI, CVD and its related risk factors account for three, with hypertension costs as the highest (MacSwain, Patterson, Kephart, & Krause, 2016).

Individuals with diabetes are 3 times more likely to require hospitalization for CVD and diabetes contributes to 30% of strokes and 40% of heart attacks in Canada (Canadian Diabetes Association, 2016). By the year 2020, Diabetes Canada estimates 18,000 individuals on PEI will have diabetes, with a cost increase from \$61 million in 2010 to \$81 million: an increase of 33% (Canadian Diabetes Association, 2010).

Hypertension is estimated to be responsible for 50% of deaths due to CVD and is a top risk factor for CVD morbidity and mortality. In 2016, Hypertension Canada estimated that hypertension accounted for 20 million physician visits annually and projected annual costs related to hypertension would reach \$20 billion by 2020 (Hypertension Canada, 2016). In 2013, rates of hypertension on PEI were estimated at 30%, a rate that is expected to rise in years to come (Government of Prince Edward Island, 2016).

Dyslipidemia is a well-established risk factor for CVD (Nelson, 2013) and a main contributor to CVD-related mortality (Joffres, Shields, Tremblay, & Connor Gorber, 2013). A high percentage of individuals with dyslipidemia are either unaware of their dyslipidemia or not being effectively treated (Joffres, Shields, Tremblay, & Connor Gorber, 2013). Rates of

dyslipidemia on PEI are higher than the national average and therefore result in large numbers of PEI residents at risk to develop CVD (Health PEI, 2013a).

These risk factor trends may help to explain why PEI has the highest prevalence of CVD in Canada, and the third highest provincial rate of mortality due to CVD and why CVD is the second leading cause of death in PEI (Government of Canada, 2017; Statistics Canada, 2013). The costs to manage CVD after it is complicated by events such as myocardial infarction and stroke may be avoided through prevention and management of CVD risk factors (Tu et al., 2017).

Cardiovascular disease and related risk factors can often be managed through community-based healthcare which, when accessible, can help prevent disease complications and hospitalizations. Many conditions which are considered CVD risk factors (e.g., diabetes or hypertension) are classified as ambulatory care sensitive conditions (ACSC) (CIHI, n.d.). Ambulatory care sensitive conditions are chronic conditions for which it is possible to prevent acute exacerbations and reduce the need for hospital admission through active management (Health PEI, 2013a). Rates of hospitalization for ACSC have long been used as an indirect measure of access to primary healthcare services, federally and provincially (Sanmartin & Khan, 2011). In 2008, diabetes and hypertension accounted for 16% of Canadian hospitalization for ACSC (Sanchez, Vellanky, Herring, Liang, & Jia, 2008). The high prevalence of diabetes and hypertension in PEI suggests that CVD care gaps exist within primary healthcare, and therefore, patients may suffer from complications of these illnesses. Despite the long-established use of ACSC to measure access to primary healthcare services, other measures such as health system outputs have begun to be used more frequently as measures of access and efficacy of primary healthcare services. These health system outputs include aspects of care such as rates of eye

examinations among those with diabetes, offers of smoking cessation counseling to patients by primary healthcare providers, and measures such as third available appointment data. Through the lens of these new indicators, PEI also falls below national averages with only 43.7% of PEI residents being offered smoking cessation advice by a primary healthcare provider and less than 55% of PEI residents with diabetes undergoing eye examinations (CIHI, 2016b). The data further support concerns related to access to primary healthcare services in the province (CIHI, 2016b).

Indirect costs. Indirect costs of CVD are comprised of the economic burden related to loss of productivity, caregiver burden, disability, and mortality. Although these factors have not been well studied in Canada, they are all contributors to the financial burden of these illnesses (Ball, Campbell, Burke, Pericleous, & Tarride, 2016). In 2008, CVD was estimated to contribute to a loss of approximately \$300 million annually due to loss of productivity (PHAC, 2008) and accounted for the second most significant loss of productivity due to mortality at over \$92 million annually (PHAC, 2008). The costs of caregiver burden and disability with those affected by CVD have not been well studied but are believed to be substantial and in need of further study and intervention (Song et al., 2015). In 2012, approximately 28% of Canadians provided care to a relative or friend with a chronic health condition, and most individuals will, at some point in their lives, provide care to a family member or friend due to injury, illness, or aging (Turcotte, 2015). This can be a fulfilling experience for some; however, caregivers can also suffer physically, psychologically, socially, and financially as a result of caregiving responsibilities (Canadian Public Health Association [CPHA], 2016; Turcotte, 2015). In Canada, CVD is among the top four reasons for individuals to require familial caregiving support (Turcotte, 2015). Cardiovascular disease is the second leading cause of mortality in PEI and may be a significant contributor to loss of productivity in the province.

Promising Approaches

Although CVD is considered preventable, and costs associated with management are significantly high, research, policy development, and program implementation for the primary prevention of these illnesses have not been an area of international attention (Ande, Pinto, & Arnett, 2015). A recent shift towards primary prevention of CVD has begun in some areas and promising approaches to more effective primary prevention of CVD have begun to be seen on the international, national, and provincial scale.

International initiatives. The benefits of using clinical health registry information to guide primary prevention of CVD and improve access to care has been recently seen in the United Kingdom (U.K.) In 2009, the U.K. implemented national health service health checks through which adults between 40 to 75 years of age (without pre-existing diabetes or CVD) became eligible for CVD risk screening every 5 years. Individuals who screen positive for risk factors and disease receive both education and treatment within general clinical practices and online self-management programs. At the time of its initiation in 2009, the projected average net cost benefit of this program was over 55 billion pounds over a 20-year period through reduced CVD events, decreased morbidity, and improved quality of life (DH Cardiovascular Disease Team, 2013). Upon its first official statistical review in 2013, the program had been successful in identifying new risk factors and co-morbidities among many participants. Modest, yet promising improvements were made in the management of co-morbid risk factors such as hypertension and dyslipidemia. This has reduced CVD events (Robson et al., 2013).

National initiatives. The WHO (2007) reports a significant proportion of the morbidity and mortality related to CVD could be prevented through primary-prevention strategies. The WHO provides a framework for the development of primary-prevention strategies designed for a

variety of political, economic, social, and medical circumstances, and urges health system decision makers to use the framework to design primary-prevention strategies for CVD.

In 2014, British Columbia developed and disseminated CVD primary prevention guidelines to primary care providers (British Columbia Ministry of Health, 2014), and in 2016, the Canadian Cardiovascular Society published guidelines for the management of dyslipidemia for the prevention of CVD (Anderson et al., 2016). The development and utilization of these guidelines is in keeping with WHO recommendations and are seen an important step to shift the focus on CVD from secondary and tertiary prevention to primary prevention.

Provincial initiatives. To improve access to primary prevention of CVD care, the government of PEI has developed several strategies which include recruitment and retention incentives to medical residents and practicing physicians and a variety of initiatives from the primary healthcare and chronic disease management divisions of Health PEI (Health PEI, 2017b).

Physician recruitment and retention. Primary care providers play a vital role in the prevention and management of CVD (Liddy et al., 2012). Over the years, to maintain physician numbers in the province, the PEI government has provided a variety of recruitment and retention incentives to medical residents and practicing physicians. These incentives include return-in-service grants, locum support programs, and moving expenses allowances (Health PEI, 2006). Currently, the PEI government funds a Family Medicine Sponsorship Program, where a select number of medical student applicants are chosen and paid a total of \$80,000 over 4 years in exchange for a mandatory 4-year return-in-service agreement (Government of PEI, 2015). Upon graduation and completion of medical residency, the individuals who enroll in the program are assigned to communities with the highest need of primary-care providers by government. Nova

Scotia and New Brunswick also offer financial incentives through a number of programs which include debt-assistance, relocation allowances, and return in service agreements which range from \$20,000 to \$120,000 (Government of Nova Scotia, 2014; New Brunswick Medical Society, 2018). Medical students who have been targeted by these approaches report mandatory return in service agreements are not successful strategies for recruitment. The Canadian Federation of Medical Students does not support these types of recruitment strategies citing poor continuity and quality of care for patients being served by physicians in these arrangements (Canadian Federation of Medical Students, 2013). In a 2012 National Post article, three PEI medical students reportedly called these agreements “crude and coercive” and indicated that students felt forced early in their education to pick a medical specialty that was needed and could be practiced in the province (Blackwell, 2012). Viscomi, Larkins, and Gupta (2013) found strategies such as financial incentives are thought to be only a small consideration for physicians in their decisions about where to practice. Since 2009, 16 of the 25 medical residents recruited by the PEI government have remained in the province to practice (CBC News, 2016a). It is unclear why nine of these physicians left the province, however a variety of possibilities have been discussed (i.e., family reasons, work-life balance, or higher pay scales elsewhere) (CBC News, 2016a).

Health PEI initiatives. The chronic disease management division of Health PEI is responsible to deliver and improve access to a variety of services and programs for residents living with CVD. Registered nurses and allied health professionals deliver many of these programs and services under the medical direction of specialists such as internists, cardiologists, and respirologists (Health PEI, 2017a). The Provincial Stroke Strategy has resulted in reduced emergency department visits and decreased length of hospital stay among patients, and the PEI Diabetes Strategy has facilitated the integration of a full-time NP into provincial diabetes care.

The Cardiac Rehabilitation Program has yet to report data related to outcomes (Health PEI, 2017a).

In 2006, Health PEI developed a Provincial Stroke Strategy which gave rise to comprehensive stroke care through secondary prevention. This strategy has facilitated the development of guidelines for emergency and inpatient stroke care, as well as access to stroke rehabilitation (Health PEI, 2017a). Since the implementation of the Provincial Stroke Strategy, there has been improved access to stroke care within the acute phase of disease, as well as high-quality stroke rehabilitation. This improved access to high-quality stroke care has led to a decreased length of hospital stay (by approximately 7 days) and the numbers of patients who can return home following rehabilitation increasing from 63% in 2008 to 82% in 2011 (Health PEI, 2013b; Government of Prince Edward Island, 2013). Despite the efforts of the Provincial Stroke Strategy having seen promising results, it does not address primary prevention of stroke, and therefore many individuals continue to be at risk of the devastating effects of experiencing a stroke.

Health PEI launched the PEI Diabetes Strategy in 2014 to identify system gaps and develop further diabetes programming with the goal to enhance prevention, early detection, and management of diabetes (Health PEI, 2014). A national diabetes strategy, first developed in 1999 (The Canadian Diabetes Strategy), has led to significant gains in diabetes care (PHAC, 2015). These gains include improved data collection, the establishment of partnerships between key stakeholders involved in diabetes care nationwide, increased financial support for disease research, and improved measures for early detection and treatment of diabetes (Health PEI, 2013a; Health PEI, 2017a; PHAC, 2015). While evidence has identified ongoing gaps in diabetes care nationwide (CIHI, 2009), the Canadian Diabetes Strategy has contributed valuable resources

and data to develop a framework to guide future disease prevention and management. The work of the Prince Edward Island Diabetes Strategy has provided knowledge and data related to diabetes on PEI, and in 2017, PEI announced funding for a full-time NP devoted to the provincial diabetes program (CBC News, 2017a). It is the hope of this program that access to primary healthcare-based diabetes management will improve provincial statistics related to diabetes-related morbidity and mortality (Health PEI, 2013a).

In 2017, Health PEI initiated a Cardiac Rehabilitation Program designed for patients who meet the following criteria: a) patients who suffered a myocardial infarction; b) patients living with heart failure; or c) patients who underwent invasive cardiac procedures such as angioplasty or cardiac surgery (Health PEI, 2017a). Patients who qualify are referred to a 12-week exercise and education-based program by a physician or NP. A team of registered nurses, physiotherapists, and respiratory therapists run this program under the direction of an internal medicine physician. Although data related to the program's success is not yet available, cardiac rehabilitation programs have been found to improve quality of life, lipid profile, body mass index, blood pressure, resting heart rate, and survival rate among participants in other jurisdictions (Eshah & Bond, 2009). Although this program does not address primary prevention of CVD, it is seen as a positive step in offering comprehensive CVD care in PEI (T. Matthews, personal communication, May 29, 2017). While secondary prevention strategies such as Cardiac Rehabilitation programming have been identified as a valuable aspect of CVD care (Harbman, 2014), primary prevention strategies are also required to encourage the shift from reactive care to chronic disease prevention (Health PEI, 2013a).

Nurse practitioners. Nurse practitioners were added to PEI primary care networks in 2006 and since then have seen their numbers grow 600% (T. Kean, personal communication,

December 26, 2017). Integration of NPs into the provincial healthcare system has resulted in reduced wait times and improved access to safe and effective healthcare services (Barrett, 2013). Nurse practitioners have been identified by Health PEI management as valuable members of the healthcare team and management has expressed interest in the further integration of the role into the provincial healthcare system (Health PEI, 2013a; Health PEI, 2017b).

Many of the NPs who practice on PEI participate in the primary prevention of CVD through the management of risk factors (e.g., diabetes, hypertension, and dyslipidemia). The government of PEI has recently established a full-time position for an NP who specializes in diabetes management for unaffiliated patients. Although this position is not specific to CVD management, diabetes is a significant risk factor; therefore, the care this NP provides may have significant impacts on many persons at risk of CVD.

Nurse practitioners possess competencies including effective communication, collaboration, and leadership skills which foster strength and motivation among healthcare teams and the patients they serve (Watts et al., 2009). The presence of NPs in primary healthcare settings has been shown to have a positive impact on patient outcomes and patient satisfaction (Bauer, 2010; Horrocks, Anderson, & Salisbury, 2002; Russell et al., 2009). Patients under the care of an NP have also reported very high satisfaction ratings for the care provided to them (Health Quality Ontario, 2013; Horrocks et al., 2002; Housholder-Hughes Ranella, Dele-Michael, & Rubenfire, 2015). Nurse practitioners are capable of providing high-quality CVD prevention and management, with improved outcomes in diabetes, hypertension, and dyslipidemia biomarkers in those under the care of an NP (Allen et al., 2002; Bauer, 2010; Jackson, Lee, Edelman, Weinberger, & Yano, 2011; Mason, 2003; Ohman-Strickland et al., 2008). Improved weight management, decreased fat and increased dietary fiber consumption,

improved physical activity practices, and increased medication adherence have also been observed in patients under the care of NPs (Allen et al., 2002; Harbman, 2014). Nurse practitioners who work within CVD prevention and management within primary and acute care settings within Canada have been well studied, which has consistently demonstrated their ability to safely and effectively diagnose and treat illness, order and interpret diagnostic tests, and provide care which results in high levels of patient satisfaction (College of Registered Nurses of Nova Scotia, 2016).

The significant financial and societal burden of CVD and less than optimal outcomes which have been observed and suggest that new and innovative ways to approach primary prevention of CVD are required. Research provides evidence that NPs may be well placed to provide this type of innovative intervention (Russell et al., 2009; Stephens, 2012).

Target Population

The target population for this NP-Led CVD Disease Primary Prevention clinic includes adult men and women who are identified at risk of CVD based on a diagnosis of hypertension, dyslipidemia, or diabetes. Individuals will be accepted into the program if they are PEI residents who are 18 years of age or older, have a Framingham Risk Score of >10%, and have a diagnosis of diabetes, hypertension, or dyslipidemia.

The Framingham Risk Score is a widely used, validated method of predicting CVD risk in asymptomatic patients. This tool compiles patient health information including diagnosis of diabetes, hypertension, dyslipidemia, age, gender, and current cigarette smoking to provide a score which practitioners use to guide treatment of CVD risk factors (Bosomworth, 2011). The Framingham Risk Score will be used to screen all patients for potential eligibility for enrollment in the program (Framingham Heart Study, 2018).

Those who are less than 18 years of age, are pregnant, or have a history of CVD (including ischemic heart disease, cerebrovascular disease, peripheral vascular disease, heart failure, rheumatic heart disease, and congenital heart disease) will be excluded from this program.

Enrollment in this program will be voluntary, and participants can disenroll at any point in care. If at any time patient care exceeds the scope of practice of the NP, care of the patient will be transferred to a physician (ARNPEI, 2012).

Part II: Project Goals and Objectives

The goal for this program is to improve access to a high-quality CVD disease primary-prevention program for those individuals who are identified at risk of CVD disease based on a Framingham Risk Score of > 10%, with a diagnosis of diabetes, hypertension, or dyslipidemia.

There are several objectives for the program, which include:

- By the end of the second year of implementation, the CVD Primary Prevention Program NP will have provided access to high-quality primary prevention CVD care to 800 patients per year.
- By the end of the first year of operation of the program, 60% of program participants with type II diabetes mellitus will achieve target HgA1C levels (<7.0%) within 1 year of program enrollment.
- By the end of the first year of operation of the program, 80% of program participants with hypertension will achieve target blood pressure levels (<140/90 mmHg & <130/80 mmHg for those with diabetes mellitus) within one year of program enrollment.

- By the end of the first year of operation of the program, 50% of program participants with dyslipidemia will achieve target low density lipoprotein (LDL) levels (<3.0 mmol/L) within 1 year of program enrollment.
- By the end of the first year of operation of the program, 80% of the program participants will be satisfied or very satisfied with the care of the CVD care NP.

Rationale to Support Objectives

Martin-Misener et al. (2015) discussed the variety of factors which must be considered when determining an appropriate NP panel size. These factors include NP experience, patient acuity, and adjuvant resources available to the NP clinic. Martin-Misener et al. also identified the difficulty to determine the appropriate NP panel sizes in Canada due to incomplete and inaccurate data collection. Despite these challenges, an estimated NP panel size of 800 patients was selected (Martin-Misener et al., 2015) and is therefore considered an appropriate objective for the first two years of this program.

Toeh, Home, and Leiter (2011) reported a 60% success rate in patients achieving target HgA1c levels within 1 year of diabetes care based on clinical practice guidelines. The diabetes care that will be provided through the NP-led CVD primary prevention clinic will also be based on the Diabetes Canada clinical practice guidelines, and a similar goal of 60% control will be used for this program.

Poor adherence to medication prescribed for chronic illness such as antihypertensives is common. Leung et al. (2016), cites a variety of reasons for this such as patient motivation, medication affordability, and provider prescribing practices. Adherence to antihypertensive therapy has been measured as ranging from 34% to 78% worldwide (Fitz-Simon, Bennett, & Feely, 2005) with Canadian rates at approximately 79% (Statistics Canada, 2015). Research has

found that adherence to CVD medication use is superior in those under the care of a NP (Allen et al., 2002; Harbman, 2014). Based on these Canadian statistics and research related to medication adherence when under the care of a NP, a goal of 80% control for this program is considered attainable.

The Canadian Cardiovascular Society recommends either an LDL < 2.0 or a reduction in LDL 50% for individuals at risk of CVD disease (Anderson et al., 2016). Pharmacologic therapy is largely considered highly effective in the management of dyslipidemia; however, many individuals do not reach treatment target with a single agent. Goodman et al. (2010) found that almost 50% of individuals at high risk of CVD disease being treated for dyslipidemia with one agent did not reach their LDL targets. The NP will vigilantly monitor statin therapy to ensure that LDL targets are reached with one or more agents; therefore an objective of 50% control will be the initial target for the first year of this program.

Patient satisfaction with care is an important indicator in healthcare. Care provided by NPs has been shown in multiple studies to result in high levels of patient satisfaction, with ratings as high as 97% in some studies (Health Quality Ontario, 2013; Horrocks et al., 2002; Housholder-Hughes, Ranella, Dele-Michael, & Rubenfire, 2015; Larrabee, Ferri, & Hartiq, 1997); therefore an 80% satisfaction rating is considered a reasonable goal for this program.

Part III: Project Design and Implementation

A primary health care approach will be used as the basis for the CVD Primary Prevention Program. The primary health care approach is both a healthcare philosophy and a guide for delivery of health services. The primary health care approach encompasses five principles of care: accessibility, public participation, wellness promotion, appropriate skills and technology,

and intersectoral cooperation (CNA, 2005). Each of these principles will be reflected in the CVD Primary Prevention Program.

Accessibility

Cardiovascular disease disproportionately affects low income populations, and these populations typically face greater struggles to access health programs. Accessibility to health programming for all eligible participants is of great importance to ensure program success and positive health results (Demaio, Nielsen, Tersbol, Kallestrup, & Meyrowitsch, 2014). The CVD Primary Prevention Program NP will work closely with government and community supports to ensure all those who face barriers to program participation are provided with options and support to facilitate participation. Every reasonable effort will be made to ensure accessibility to all those eligible for enrollment regardless of income, education, geographic location, social support, culture, or gender.

The CVD Primary Prevention Program will operate during business hours (0800-1600); however evening hours may be possible on a case-by-case basis. If patients require medical care outside the operating hours of the clinic, or if the care they require is outside the NP scope of practice, patients will be referred to their primary care provider, to the program physician consultant, or to the emergency department if necessary.

Public Participation

To ensure the needs of the community are being met by healthcare services community participation in health-related programs is imperative. Without community involvement, progress related to the CVD health of community members will fall short of targets (Demaio et al., 2014). The CVD Primary Prevention Program will focus on empowering and engaging program participants and their significant others. Program participants will be encouraged to

bring family and significant others to their appointments with the NP. Participants will also be asked to evaluate the program following discharge, and feedback provided from these evaluations will be reviewed and integrated into programming as appropriate. Private businesses, such as gyms and hotels, will be formally invited to participate in programming through donations of space, time, and financial support.

Health Promotion

The CVD Primary Prevention Program will integrate principles of health promotion into patient care. The NP will enable program participants and their families to increase control over and improve their health conditions through motivational interviewing, education, and risk factor tracking through the Cardiovascular Age Calculator. Patients will be encouraged to actively participate in their care and track their progress controlling their risk factors. The NP will provide patient referrals to adjunct team members and other healthcare professionals (such as dietitians, respiratory therapists, counsellors) as indicated.

Appropriate Skills and Technology

Programming built upon cost-effective evidence-based strategies to improve health ensures improved patient outcomes, and ongoing feasibility of the program (Demaio et al., 2014). The CVD Primary Prevention Program NP will provide care based on up-to-date Canadian clinical practice guidelines and will work to ensure appropriate use of resources throughout the day-to-day running of the program.

Intersectoral Cooperation

Healthcare delivery should be provided through a system in which the various services/sectors available are integrated into one another and provide a seamless experience for the patient. Primary health care services should be an exceptionally strong and robust aspect of

healthcare services and should exist at the centre of the healthcare system (Demaio et al., 2014).

The CVD Primary Prevention Program NP will work closely with Health PEI Cardiac Rehabilitation Program staff as well as all primary health care providers and services in the province throughout the development, implementation, and evaluation stages of the program. This collaboration will ensure effective integration of the CVD Primary Prevention Program into existing CVD-related primary health care services in the province.

Many aspects of life can contribute to the health and well-being of a community, including the availability of safe and affordable housing, food, and education (Demaio et al., 2014). The CVD Primary Prevention Program NP will work with other sectors including government departments (e.g., Communities, Land, and Environment; Education, Early Learning, and Culture; Workforce and Advanced Learning) and will refer participants to community supports (e.g., Heart and Stroke Foundation, community dietitians, etc.) as indicated.

Program Overview

Entry into the program. The CVD Primary Prevention Program will offer comprehensive CVD primary prevention and risk factor management to patients who meet inclusion criteria. Those who meet inclusion criteria for the program may be referred to the program by registered nurses, primary care providers, emergency department physicians, specialists, and surgeons. Referrals will be accepted via mail or fax.

Upon receipt of the referral, the patient's case will be reviewed and triaged by the NP according to his/her risk factors and current access to a primary care provider (those without a primary care provider will be triaged higher than those with a primary care provider). Triage criteria are provided in further detail in Appendix A. At the time of the patient's first appointment, a comprehensive history, physical assessment, and medication reconciliation will

be completed by the NP. Cardiovascular age will also be calculated using the Cardiovascular Age Calculator and a care plan will be developed in collaboration with the patient.

The concept of cardiovascular age was introduced in 2008 by the Framingham Heart Study and represents the predicted age of an individual's vascular system based on risk-factor measures such as diabetes, hypertension, dyslipidemia, history of or current smoking practices, family history, etc. (Yang et al., 2015). The Cardiovascular Age Calculator is thought to simplify the communication of CVD risk to patients and serves to motivate those at risk to establish heart healthy lifestyles (Yang et al., 2015).

Follow-up appointments will be scheduled to monitor patient progress, evaluate treatment, and facilitate timely adjustments to care plans. Cardiovascular Age will be re-calculated each time a patient's risk factors change (i.e., improved blood work results or reduced blood pressure readings), and the patient will be provided a graph to chart and follow these values.

Care delivery. Care plans will be guided by primary prevention strategies and current clinical practice guidelines and will focus on risk factor stratification, health promotion, and illness prevention. Care plans will strive to take a holistic approach considering the social determinants of health for each patient. These elements will be achieved through comprehensive assessments, ordering and interpretation of diagnostic and laboratory investigations, medication management, and referral to other health professionals as necessary. Psychosocial support, education related to risk-factor stratification (smoking cessation, the importance of diet and exercise, medication adherence, and stress management), and referral to community-based resources (such as mental health services) will also be incorporated into care. Participants will also be given the option to participate in nutrition and physical activity education sessions which

take place within the Health PEI Cardiac Rehabilitation program. This will provide patients with additional knowledge related to CVD prevention and management. Participants in the program will be encouraged to be active partners in decisions related to their health, which will enable further control over their health. This program will also utilize appropriate technology throughout the provision of care, and throughout the development, integration, and evaluation of the program intersectoral collaboration will be sought (CNA, 2005).

Continuum of care. The patients' relationship with the program will exist until all care plan objectives are attained. Upon successful completion of the care plan and stabilization of the patient's risk factors, patients may be discharged back to their primary care provider for ongoing monitoring or remain under the care of the NP until they are assigned to a primary care provider. Upon discharge, a discharge summary will be sent to the patient's primary care provider. Patients who meet inclusion criteria may be re-referred to the program at any time.

Program Activities

To successfully establish the CVD Disease Primary Prevention Program, a number of program activities are required. A timeline of these activities is outlined in Appendix B.

Program funding. The ability to secure funding for this program is of paramount importance and will, therefore, be completed before most of the other activities. The NP will prepare a program proposal detailing the program's purpose, significance, goals, and proposed design, which will be forwarded to the provincial Minister of Health (Mr. Robert Mitchell), the Deputy Minister of Health (Dr. Kim Critchley), the interim Chief Executive Officer of Health PEI (Mr. Keith Dewar), and the Director of Primary Care and Chronic Disease (Ms. Marilyn Barrett). Upon the review of this proposal, a meeting between these individuals, and the NP will

be requested to provide an opportunity to discuss a program pilot and its potential long-term viability.

Recruitment of key stakeholders. For this program to be successful, the support of key stakeholders is imperative. These key stakeholders include senior management within the Department of Health and Wellness, Health PEI, the Medical Society of Prince Edward Island, the College of Physicians and Surgeons of Prince Edward Island, the Prince Edward Island Nurse Practitioner Association, the Prince Edward Island Nurses Union, ARNPEI, and UPEI. Individuals from each of these organizations will be invited to program-building sessions. These sessions will be led by the NP and will begin with a presentation of the program proposal. All in attendance will be provided with an opportunity to share information, ideas, and strategies related to the successful development and implementation of this program. For those who are unable to attend, links to both session documents and video recordings of the sessions will be provided upon request.

Development of evaluation tools and program policy. Consideration and development of an evaluation strategy should be completed prior to implementation of new programs, and in order to build a program amenable to evaluation, the evaluation strategy should be developed alongside the program (Prevention and Population Health Branch, 2010). The CVD Primary Prevention Program will be evaluated using a number of methods including chart audits, the Evaluation Framework for Health Promotion and Disease Prevention Programs, and the Nurse Practitioner Satisfaction Survey (NPSS) (Appendix C). Program policies will also require development prior to program implementation. The development of these policies will mirror those of the Health PEI Cardiac Rehabilitation program and will be used to ensure program quality and participant safety.

Personnel resources. This program will employ one full-time primary health care NP with a specialization in chronic disease management, one full-time administrative assistant, and one physician collaborator (available for 6 hours per week). The human resources department of Health PEI, in collaboration with the Public Service Commission and the NP, will be responsible for creating appropriate job descriptions for these positions. Support from the PEINU and the Union of Public Sector Employees (UPSE) will be required to create these new positions.

The administrative assistant hired for the program will be responsible to respond to general questions about the clinic, book appointments, file chart documents, and provide other administrative duties. The administrative assistant will require training on the OSCAR EMR Clinical Management System.

Through the development, implementation, and evaluation stages of the CVD primary prevention program, the NP will be required to have strong communication and leadership skills. The NP will also be required to closely consult with other healthcare professionals, and therefore must be capable and willing to foster healthy relationships with other members of the healthcare team. To facilitate these relationships, the NP will be available one-half day per week to collaborate with adjunct program team members. The NP will be responsible for triaging referrals, building care plans in collaboration with patients and other health care providers as indicated, and providing care to patients enrolled in the program. This care will include reconciling medications, taking histories, and completing physical assessments, prescribing and titrating medications, ordering and interpreting laboratory and diagnostic tests, and consulting with other health care providers as necessary. The NP will require advanced knowledge and assessment/diagnostic skills in CVD health and advanced patient education skills for the day-to-day running of the program. Experience in CVD as a registered nurse or NP will be considered

an asset for this role; however the successful candidate will also be required to complete certification in diabetes education prior to the program launch.

A consulting physician will also be required; therefore, the NP will consult with the PEI College of Physicians and Surgeons very early in program development to discuss the program and determine an appropriate internal medicine physician or group of physicians who may be willing to join the CVD Primary Prevention Program as a physician consultant for up to 6 hours each week. This consultation will typically take place through telephone communication. In the event the patient needs to see the physician consultant due to scope of practice limitations, arrangements will be made at that time depending on the acuity of the patient concern.

Space & equipment. This program will be located in the Steele Building at UPEI (in close proximity to the Cardiac Rehabilitation Program, to facilitate the sharing of resources). This building has parking within close proximity to the entrance, several bathrooms, and is wheelchair accessible. This program will require an office for the NP, two clinic rooms, a reception counter with storage space, and a waiting area. Two clinic rooms, each with an exam table, counter-top sink, two chairs, and storage space will be required. A full list of projected equipment requirements is detailed further in the budget (see Appendix E).

Health provider notification. Health professionals from the Queens East and Queens West primary care networks who will be referring patients to the program will be notified of the program's purpose, goals, and services as well as the referral procedure via a Health PEI memo. A sample referral form will be attached to this memo, which will be similar to referral forms utilized by healthcare providers (brief health history, current medications, and the reason for referral). This memo will also offer details for information sessions and contact information for

the NP. Follow-up office calls will also be used to offer information sessions to referring health professionals who are interested in further information.

Healthcare system notification. Information related to the existence of the program and its purpose, goals, and services will be prepared by the Health PEI communication team and disseminated to all departments within the healthcare system including provincial emergency departments and critical care areas (intensive care units, pre-surgery clinics, etc.), the five Primary Care Networks, provincial home care offices, community based dieticians and diabetes educators, provincial laboratories, and provincial diagnostic imaging departments. Managers of these departments will receive a memo detailing the program and will be encouraged to work with the NP to arrange program information sessions for their staff. Although all departments within the healthcare system will be notified of this program, a program pilot will first begin in the Queens East and Queens West primary care networks. Departments outside of Queens East and Queens West primary care networks will be notified of the geographic limitations of the pilot phase but will be encouraged to look forward to province-wide programming. The program pilot will assist the program development team to build a province-wide program and integration plan.

Public awareness campaign. It will be important that the public are aware of the existence of this program to ensure its success. Media will be used to inform the public of the purpose, the goals, and the services of the program, as well as the scope of practice of the NP. These messages will be prepared by the media relations team at Health PEI and submitted to provincial and regional newspapers including the Guardian and the Eastern Graphic. Canadian Broadcasting Corporation Radio and Television will also be notified of the program. The PEI Nurses Union and ARNPEI will be provided with a similar article geared towards health

professionals and will be encouraged to post this article on their respective websites. Brochures will be made available in all primary healthcare settings, as well as emergency departments and walk-in clinics which will detail the purpose, goals, and services of the program, as well as the scope of practice of the NP. Each of these forms of communication will be developed in close partnership with the key stakeholders from the Department of Health and Wellness, Health PEI, PEINU, and ARNPEI. The NP contact information will be provided on each of these publications.

Data collection. The NP will collaborate with Health Information Specialists at Health PEI to facilitate the collection of relevant data for program evaluation. This collaboration will begin very early within the program development stage to ensure all forms, processes, and documentation allows for meaningful data extraction.

Part IV: Project Evaluation

Program evaluation is an integral part of program development, success, and longevity. Program evaluation strategies should be considered through the planning and implementation of the program, as well as at regular intervals throughout program operation. Use of a program evaluation framework can be valuable when constructing a program evaluation strategy, as it can assist to determine the objectives of the evaluation, the roles and responsibilities of those involved in the evaluation, the most appropriate methods of evaluation, the foci for data collection and reporting, and how the results will be disseminated and used (Prevention and Population Health Branch, 2010).

To build an evaluation strategy for the CVD Primary Prevention program, an evaluation framework outlined by the Prevention and Population Health Branch of Melbourne Australia will be used. At the time of program development, program evaluation will be thoroughly discussed

and planned. From the key stakeholder group, an evaluation committee will be developed and led by the NP. This evaluation committee will include program participants and family members to ensure consistent consideration for program evaluation through the program development phase and will be responsible for formal program evaluation and reporting. At the time of formal reporting at the completion of the first year of programming, the evaluation committee will be responsible for reporting on aspects of process, impact, outcome, and implications for future programming and services. The NP will be responsible for data collection related to program participant statistics.

Process evaluation measures how well programs have been implemented. The goal of this component of program evaluation is to identify potential or emerging problems and determine if modifications to the program or methods of evaluation must be made. Impact evaluation is used to determine the immediate effect that the program has had on the target population (Round, Marshall, & Horton, 2005). Outcome evaluation is used to determine the long-term effects of programs and is used to determine changes in rates of morbidity and mortality, behaviour changes among program participants, and improvement in quality of life (Round, Marshall, & Horton, 2005).

Objective #1

By the end of the second year of implementation, the CVD Primary Prevention Program NP will have provided access to high-quality primary prevention CVD care to 800 patients per year. This objective aims to measure the number of patients who receive care from the CVD Primary Prevention Program and will be evaluated by counting the number of program referrals received, the wait time for the third next available appointment with the NP, and the number of patients who have been discharged from the program. These indicators will seek to determine if

modifications to the referral process, program activities, or staffing are required to ensure effective program operation.

Data will be collected by the administrative assistant and submitted to the Health PEI Health Information team for statistical analysis. At the end of the second year of program operation, indicators for NP utilization will be examined to guide further program development.

Objective #2

By the end of the first year of operation of the program, 60% of program participants with type II diabetes mellitus will achieve target HgA1C levels (<7.0%) within 1 year of program enrollment. This objective aims to measure the number of patients with a diagnosis of type II diabetes enrolled in the program who successfully achieve Diabetes Canada recommended targets for diabetes management, thereby reducing CVD risk. This objective will be evaluated through analysis of patient program referrals for inclusion of necessary detail related to patients' diabetes diagnosis and current treatment, analysis of HgA1c levels pre and post programming, and the number of program participants who have reached target HgA1c levels within 6 months of program enrollment. Patient data will be collected through chart audits completed by the NP and submitted to the Health PEI Health Information team for statistical analysis. At the end of the first year of program operation, indicators for diabetes management will be examined to guide further program development.

Objective #3

By the end of the first year of operation of the program, 80% of program participants with hypertension will achieve target blood pressure levels (<140/90 mmHg & <130/80 mmHg for those with diabetes mellitus) within 6 months of program enrollment. This objective aims to measure the number of patients with a diagnosis of hypertension enrolled in the program who

have successfully achieved Hypertension Canada recommended targets for hypertension management, thereby reducing CVD risk. This objective will be evaluated through analysis of patient program referrals for inclusion of necessary detail related to patients' hypertension diagnosis and current treatment, analysis of blood pressure levels pre and post programming, and the number of program participants who have reached target blood pressure levels within 6 months of program enrollment. Patient data will be collected through chart audits completed by the NP and submitted to the Health PEI Health Information team for statistical analysis. At the end of the first year of program operation, indicators for hypertension management will be examined to guide further program development.

Objective #4

By the end of the first year of operation of the program, 50% of program participants with dyslipidemia will achieve target low density lipoprotein (LDL) levels (<3.0 mmol/L) within 6 months of program enrollment. This objective aims to measure the number of patients with a diagnosis of dyslipidemia enrolled in the program who have successfully achieved Canadian Cardiovascular Society recommended targets for dyslipidemia management, thereby reducing CVD risk. This objective will be evaluated through analysis of patient program referrals for inclusion of necessary detail related to patients' dyslipidemia diagnosis and current treatment, analysis of cholesterol levels pre and post programming, and the number of program participants who have reached target cholesterol levels within the 6 months of program enrollment. Patient data will be collected through chart audits completed by the NP and submitted to the Health PEI Health Information team for statistical analysis. At the end of the first year of program operation, indicators for dyslipidemia management will be examined to guide further program development

Objective #5

By the end of the first year of operation of the program, 80% of the program participants will be satisfied or very satisfied with the care of the CVD-care NP. This objective aims to measure patient satisfaction with the NP care provided in the program. A letter will be sent to the developer of the NPSS requesting permission to use this tool in this program. This objective will be evaluated using an adapted version of Nurse Practitioner Satisfaction Survey (NPSS) (Agosta, 2009). The NPSS will be mailed to program participants by the administrative assistant after 6 months of program participation. The survey will be accompanied by prepaid postage to the Health PEI Health Information team, who will analyze and report results.

The NPSS is a validated tool developed to measure patient satisfaction with primary health care NP care. The survey consists of 28 questions with 5-point Likert-type responses ranging from strongly disagree to strongly agree. Additional demographic information is collected within the survey (Agosta, 2009). At the end of the first year of program operation, results of the NPSS will guide ongoing programming and will be used to promote the value of NP care in chronic disease management.

Implications for Future Programming

Following the collection of data for all aspects of the evaluation, the data will be analyzed, interpreted, reported, and disseminated. The disseminated report results will be discussed among the key stakeholders, and future directions of the program will be determined. Throughout program operations, informal evaluations of the program will be welcomed from all program participants, staff, and key-stakeholders. These evaluations will be directed to the evaluation committee members for consideration.

Part V: Knowledge to Action Plan

The Canadian Institute for Health Research (CIHR) defines knowledge translation as “...a dynamic and iterative process that includes synthesis, dissemination, exchange and ethically-sound application of knowledge to improve the health of Canadians, provide more effective health services and products, and strengthen the healthcare system” (Straus & Leung, 2010, p.3).

Dissemination of the CVD Primary Prevention Program results will be important to ensure program success and longevity. A comprehensive knowledge-to-action plan for the dissemination of program results is required to develop and integrate a CVD Primary Prevention Program into existing health services, with the intention to improve access to primary prevention of CVD to PEI residents.

Audience

The target population for this CVD Primary Prevention Program knowledge-to-action plan includes healthcare professionals (including physicians, NPs, registered nurses, dietitians, physiotherapists, etc.), senior management within the Department of Health and Wellness, Health PEI, the Medical Society of Prince Edward Island, the College of Physicians and Surgeons of Prince Edward Island, the Prince Edward Island Nurse Practitioner Association, the Prince Edward Island Nurses Union, ARNPEI, UPEI, and the general public.

Medium

Healthcare providers. Upon completion of the first year of programming, a brief program fact sheet will be prepared and sent to healthcare providers province-wide in a Health PEI memo. This fact sheet will remind healthcare professionals of the program and review eligibility criteria, referral process, and contact information. Statistics will also be provided including the number of referrals the program has received, the number of patients discharged

from the program following successful achievement of health targets, the number of patients who remain active in the program, and participant statistics related to reduction of CVD risk.

Following the completion of the first year of programming, a submission to the Canadian Journal of Cardiology will be prepared for publication of program results.

Stakeholders. Following program evaluation at the end of the first year of programming, the CVD Primary Prevention Program NP will be responsible for producing a summary report which details the operation of the program, results of evaluation, and implications for future programming. This summary report will be made available to senior management within the Department of Health and Wellness, Health PEI, the Medical Society of Prince Edward Island, the College of Physicians and Surgeons of Prince Edward Island, the Prince Edward Island Nurse Practitioner Association, the Prince Edward Island Nurses Union, ARNPEI, and UPEI. Several weeks following the dissemination of this report, a series of meetings will be organized to provide key stakeholders (those who were involved in program development) with a program update and information related to future directions. These meetings will be available via teleconference for those who are unable to attend.

General public. A short interview with CBC News radio and television and the Guardian newspaper will be sought to enhance public knowledge of the program, its eligibility criteria, and its success in its first year. This interview will be sought in February to coincide with Heart Month (Heart and Stroke Foundation of Canada, 2018). Following the second year of program operation and in preparation of the formal evaluation report, a second series of meetings for key stakeholders, as well as an information fact sheet, and interview series with media providers will be organized to provide further detail about the activities of the program and its future directions.

Part VI: Budget

All health programs require support for various resources including personnel, space, equipment, and supplies to achieve its goals and objectives (McKenzie, Neiger, & Thackeray, 2013). Developing a program budget to support these resources is key in the initial stages of health program development and implementation and should be formally evaluated at regular intervals (Rajan, Barroy, & Stenberg, 2016).

The CVD Primary Prevention Program will employ a full-time NP and an administrative assistant. The salaries of these professionals will be estimated in the budget at the highest pay scale available to ensure accurate representation of possible program costs. The physician will be compensated with an NP consultation fee of \$5,000.00 as per the collective agreement. The program will also require fully accessible office space in which to operate, as well as a range of equipment and supplies. A financial breakdown of budgetary costs is outlined in further detail in Appendix D.

Part VII: Implications for Practice

The utilization of an NP in the prevention of CVD on PEI provides an opportunity for both PEI residents, as well as the provincial health care system. This program will also provide NPs across the province to engage in a formal role in primary prevention of chronic illness. The NP within the CVD Primary Prevention Program will have the opportunity to work collaboratively with patients and families, as well as other members of the healthcare team to provide high quality, evidence-based care.

The practice of the program's NP will be based on the Canadian Nurse Practitioner Core Competencies, which were most recently revised in 2010 (CNA, 2010). The core competencies outlined in this framework guide NP practice and can be used by NPs to support their self-

reflection, self-evaluation, and continuing competence (CNA, 2010). The framework lists four categories of competencies which include: Professional Role, Responsibility, and Accountability; Health Assessment and Diagnosis; Therapeutic Management; and Health Promotion and Prevention of Illness and Injury (CNA, 2010).

Professional Role, Responsibility and Accountability

This competency category includes four categories of advanced nursing practice including clinical practice; collaboration, consultation and referral; research; and leadership. These four categories are fundamental to the practice of an NP and must be pulled through the other three categories of competencies (CNA, 2010).

Collaboration, consultation, and referral. The CVD Primary Prevention Program NP will work closely with all members of the healthcare team to build an informal team of physicians, NPs, registered nurses, and allied health professionals. These professional relationships will allow patients to move smoothly from the care of the NP to other health providers (and back again), and ensure patients receive the care they require from the most appropriate care provider. The professionals who become involved in the program will also have the opportunity to learn about the role and scope of practice of the NP and work together to achieve shared goals for patients and the health system at large.

Research. Nurse practitioners are expected to not only actively use research but to take a leadership role in the development, dissemination, and implementation of evidence in their practice (CNA, 2010). The process of program development and implementation will ensure care provided by the CVD Primary Prevention Program will be based on the most up-to-date health evidence related to CVD and its risk factors. After the program commences, the NP will ensure that the care delivered is based on current evidence through continuing medical education,

professional development, and through active participation in program evaluation. The NP will work with the Health PEI Quality and Patient Safety team to establish research goals and evaluation methods for the program. Discussion and collaboration with health researchers will also be sought to facilitate research development.

Leadership. A strong clinical background, paired with advanced-practice knowledge and education, place NPs as leaders within the healthcare team. The CVD Primary Prevention Program NP will serve as a mentor and resource for all program participants, health care students, and other healthcare providers.

This leadership role that the NP will take within the CVD Primary Prevention Program will serve as a vehicle for further education related to the role and scope of practice of the NP, as well as the promotion of role development provincially. The NP will also be well placed to observe, study, and participate in an organizational change aimed at creating an environment with supports safe client care, collaborative practice, and professional growth.

Integration of an NP into the realm of CVD primary prevention on PEI will have a number of healthcare system implications. When forecasting these implications through the lens of the Canadian Nurse Practitioner Core Competencies, benefits in health care system collaboration, continuity of patient care, development of research, and strengthening the health care system may be observed (CNA, 2010). The proposed integration of an NP into the CVD Primary Prevention Program can set the stage for further implementation of NPs within primary prevention programming for chronic disease. These types of programs hold promise in improving access to high-quality chronic disease prevention and shifting the health care system focus from a reactive to preventative scope.

Conclusion

Although CVD is considered to be a preventable disease, high rates of CVD-related morbidity and mortality in PEI has led to a significant strain on the provincial healthcare system. Research has found that high-quality CVD prevention strategies can reduce complications of the illness, improve quality of life, and decrease the economic burden of this disease (Tu et al., 2017). Nurse Practitioners have become recognized as integral members of many provincial healthcare systems, through their ability to improve accessibility and quality of primary healthcare services (Donald et al., 2010). An NP-led CVD primary prevention program can improve access to high-quality, evidence-based care to those adults at risk of CVD, which will fill a gap in existing healthcare programming and will seek to decrease rates of morbidity and mortality related to CVD in PEI. Leadership and collaboration among healthcare system decision makers and multidisciplinary healthcare professional teams will be required to move this program forward beyond this proposal stage.

References

- Agosta, L. J. (2009). Psychometric evaluation of the Nurse Practitioner Satisfaction Survey (NPSS). *Journal of Nursing Measurement, 17*(2), 114-33. doi:10.13072/midss.357
- Allen, J. K., Blumenthal, R. S., Margolis, S., Young, D. R., Miller, E. R., & Kelly, K. (2002). Nurse case management of hypercholesterolemia in patients with coronary heart disease: Results of a randomized clinical trial. *American Heart Journal, 144*(4), 678-686. doi: S0002870302001413
- Ande, J. P., Pinto, F. J., & Arnett, D. K. (2015). *Prevention of cardiovascular disease: From current evidence to clinical practice*. Cham, Switzerland: Springer.
- Anderson, T. J., Gregoire, J., Pearson, G. J., Barry, A. R., Couture, P., Dawes, M.,...Ward, R. (2016). 2016 Canadian cardiovascular society guidelines for the management of dyslipidemia for the prevention of cardiovascular disease in the adult. *Canadian Journal of Cardiology, 32*(11), 1263-1282. doi: 10.1016/j.cjca.2016.07.510
- Armstrong, N. (2012, February 2). Two island doctors leave practice for hospital. *The Guardian*. Retrieved from <http://www.theguardian.pe.ca/news/local/two-island-doctors-leave-practice-for-hospital-95131/>
- Association of Registered Nurses of Prince Edward Island. (2012). *Nurse practitioner standards of practice*. Retrieved from <https://www.arnpei.ca/data/Nurse%20Practitioner%20Standards%20for%20Practice.pdf>
- Association of Registered Nurses of Prince Edward Island. (2017). *NP fact sheet*. Retrieved from <https://arnpei.ca/images/pdf/NP%20fact%20sheet%201.pdf>

- Ball, G., Campbell, K., Burke, N., Pericleous, L., & Tarride, J. (2016). Indirect costs associated with cardiovascular disease in Canada: A literature review. *The Journal of the International Society for Pharmacoeconomics and Outcomes Research*, 19(3), 49. doi: 10.1016/j.jval.2016.03.122
- Barrett, M. (2013). *Nurse practitioners play a critical role in Island health care*. Retrieved from <http://www.healthpei.ca/index.php3?number=1040319&lang=E>
- Bauer, J. C. (2010). Nurse practitioners as an underutilized resource for health reform: Evidence-based demonstrations of cost-effectiveness. *Journal of the American Academy of Nurse Practitioners*, 22(4), 228-231. doi:10.1111/j.1745-7599.2010.00498.x
- Blackwell, T. (2012, February 21). P.E.I. med students decry 'crude' tactics that could force them to practice on the Island. *The National Post*. Retrieved from <http://nationalpost.com/news/canada/med-students-decry-p-e-is-crude-tactics-to-make-them-practice-in-province>
- Boccuzzi, S. J. (2003). Indirect health care costs. In W. S. Weintraub (ed) *Cardiovascular health care economics*. Totowa, NJ: Humana Press.
- Bosomworth, N. J. (2011). Practical use of the Framingham risk score in primary prevention. *Canadian Family Physician*, 57(4), 417-423. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3076470/>
- Braga, M. F., Casanova, A., Teoh, H., Dawson, K. G., Gerstein, H. C., Fitchett, D. H.,...Leiter, L. A. (2010). Treatment gaps in the management of cardiovascular risk factors in patients with type 2 diabetes in Canada. *Canadian Journal of Cardiology*, 26(6), 297-302. Retrieved from <https://www-ncbi-nlm-nih-gov.proxy.library.upei.ca/pmc/articles/PMC2903985/pdf/cjc26297.pdf>

- Brend, Y. (2017, May 4)). We're graduating more doctors than ever, so why is it so hard to find a GP? *CBC British Columbia*. Retrieved from <http://www.cbc.ca/news/canada/british-columbia/bc-doctor-shortage-medical-fees-1.4100251>
- British Columbia Ministry of Health. (2014). *Cardiovascular disease: Primary prevention*. Retrieved from <http://www2.gov.bc.ca/assets/gov/health/practitioner-pro/bc-guidelines/cvd.pdf>
- Canadian Diabetes Association. (2010). *At the tipping point: Diabetes in Prince Edward Island*. Retrieved from <https://www.diabetes.ca/CDA/media/documents/publications-and-newsletters/advocacy-reports/canada-at-the-tipping-point-prince-edward-island-english.pdf>
- Canadian Diabetes Association. (2016). *Diabetes in Prince Edward Island*. Retrieved from <https://www.diabetes.ca/getmedia/30d13558-44a6-4499-9a3b-0bd30ab4f4c5/diabetes-charter-backgrounder-pei-2016-06.pdf.aspx>
- Canadian Federation of Medical Students. (2013). *Medical students concerned over proposed review of PEI medical school funding*. Retrieved from <http://www.cfms.org/attachments/article/113/Press%20Letter%20-%20PEI%20Guardian.pdf>
- Canadian Institute for Health Information. (2005). *Geographic distribution of physicians in Canada: Beyond how many and where*. Retrieved from https://secure.cihi.ca/free_products/Geographic_Distribution_of_Physicians_FINAL_e.pdf
- Canadian Institute for Health Information. (2009). *Diabetes care gaps and disparities in Canada*. Retrieved from https://secure.cihi.ca/free_products/Diabetes_care_gaps_Disparities_aib_e.pdf

- Canadian Institute for Health Information. (2012). All-cause readmission to acute care and return to the emergency department. Retrieved from https://secure.cihi.ca/free_products/Readmission_to_acutecare_en.pdf
- Canadian Institute for Health Information. (2016a). *Physicians in Canada, 2015: Summary report*. Retrieved from https://secure.cihi.ca/free_products/Summary_Report_2015_EN.pdf
- Canadian Institute for Health Information. (2016b). *Primary health care in Canada: A chartbook of selected indicator results, 2016*. Retrieved from https://secure.cihi.ca/free_products/Primary%20Health%20Care%20in%20Canada%20-%20Selected%20Pan-Canadian%20Indicators_2016_EN.pdf
- Canadian Institute for Health Information. (2017). *Physicians in Canada, 2016: Summary Report*. Retrieved from https://www.cihi.ca/sites/default/files/document/physicians_in_canada_phys2016_en.pdf
- Canadian Institute for Health Information, (n.d.). *Ambulatory care sensitive conditions hospitalization rate*. Retrieved from https://www.cihi.ca/en/phc_policy_acsc_en.pdf
- Canadian Medical Association. (2011). *CMA position statement: Ensuring equitable access to care: Strategies for governments, health system planners, and the medical profession*. Retrieved from <https://www.cma.ca/Assets/assets-library/document/en/advocacy/PD14-04-e.pdf>
- Canadian Medical Association. (2015). *General practitioners/family physicians per 100,000 population by province/territory, 1986-2015*. Retrieved from https://www.cma.ca/Assets/assets-library/document/en/advocacy/14-FP_per_pop.pdf

- Canadian Nurses Association. (2005). *Primary health care: A summary of the issues*. Retrieved from https://www.cna-aiic.ca/~media/cna/page-content/pdf-en/bg7_primary_health_care_e.pdf?la=en
- Canadian Nurses Association. (2010). *Canadian nurse practitioner core competency framework*. Retrieved from http://www.cno.org/globalassets/for/rnec/pdf/competency_framework_en.pdf
- Canadian Nurses Association. (2016). *Nurse practitioners*. Retrieved from <https://cna-aiic.ca/en/professional-development/advanced-nursing-practice/nurse-practitioners>
- Canadian Public Health Association. (2016). *Caregiver burden takes a toll on mental health*. Retrieved from <https://www.cpha.ca/caregiver-burden-takes-toll-mental-health>
- Canadian Resident Matching Service. (2017). *2017 R-1 main residency match - First iteration Table 17: Match results for CMGs by discipline preference*. Retrieved from http://carms.ca/wpcontent/uploads/2017/05/Table_17_Match_Results_for_CMGs_by_Discipline_Preference_English.pdf
- Canadian Rural Revitalization Foundation. (2015). *The state of rural Canada 2015*. Retrieved from <http://sorc.crrf.ca/pei/>
- CBC News. (2007, February 20). QEH hires hospitalist. *CBC Prince Edward Island*. Retrieved from <http://www.cbc.ca/news/canada/prince-edward-island/qeh-hires-hospitalist-1.683016>
- CBC News. (2016a, December 7). Health PEI on why doctors are leaving the province. *CBC News Prince Edward Island*. Retrieved from <http://www.cbc.ca/news/canada/prince-edward-island/pei-doctors-oncologist-leaving-1.388587>

- CBC News. (2016b, March 2). P.E.I. residency program recruits new doctors, says province. *CBC News Prince Edward Island*. Retrieved from <http://www.cbc.ca/news/canada/prince-edward-island/pei-doctors-residency-program-1.3473086>
- CBC News. (2017a, November 18). Nurse practitioner hired for province's diabetes program. *CBC News Prince Edward Island*. Retrieved from <http://www.cbc.ca/news/canada/prince-edward-island/nurse-practitioner-hired-diabetes-program-1.4408575>
- CBC News. (2017b, June 15). Passing the stethoscope: New doctor found for Cornwall practice. *CBC News Prince Edward Island*. Retrieved from <http://www.cbc.ca/news/canada/prince-edward-island/pei-cornwall-doctor-retiring-1.4161708>
- Chapin, L. (2016, April 8). New Charlottetown and Summerside family doctors now fee-for-service. *CBC News Prince Edward Island*. Retrieved from <http://www.cbc.ca/news/canada/prince-edward-island/pei-family-doctor-pay-salary-1.3527658>
- College of Registered Nurses of Nova Scotia. (2016). *Nurse practitioner-sensitive outcomes: 2016 summary report*. Retrieved from <https://crnns.ca/wp-content/uploads/2016/04/NP-Sensitive-Outcomes-2016-Report.pdf>
- Davis, D. A., & Taylor-Vaisey, A. (1997). Translating guidelines into practice. A systematic review of theoretic concepts, practical experience and research evidence in the adoption of clinical practice guidelines. *Canadian Medical Association Journal*, 157(4), 408–416. Retrieved from <http://www.cmaj.ca/content/157/4/408.full.pdf+html>
- Demaiio, A. R., Nielsen, K. K., Tersbol, B. P., Kallestrup, P., & Meyrowitsch, D. W. (2014). Primary health care: A strategic framework for the prevention and control of chronic non-communicable disease. *Global Health Action*, 7. doi:10.3402/gha.v7.24504

- DH Cardiovascular Disease Team. (2013). *Cardiovascular disease outcomes strategy: Improving outcomes for people with or at risk of cardiovascular disease*. Government of the United Kingdom. Retrieved from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/217118/9387-2900853-CVD-Outcomes_web1.pdf
- DiCenso, A., Bourgeault, I., Abelson, J., Martin-Misener, R., Kaasalainen, S., Carter, N.,...Kilpatrick, K. (2010). Utilization of nurse practitioners to increase patient access to primary healthcare in Canada- Thinking outside the box. *Nursing Leadership, 23*, 239-259. doi:10.12927/cjnl.2010.22281
- Donald, F., Martin-Misener, R., Bryant-Lukosius, D., Kilpatrick, K., Kaasalainen, S., Carter, N.,...DiCenso, A. (2010). The primary health care nurse practitioner role in Canada. *Nursing Leadership, 23*, 88-113. doi:10.12927/cjnl.2013.22271
- Elmslie, K. (2013). *Economic burden of illness in Canada, 2005-2008*. Public Health Agency of Canada. Retrieved from <http://www.ccgh-csih.ca/assets/Elmslie.pdf>
- Epping-Jordan, J. E., Pruitt, S. D., Bengoa, R., & Wagner, E. H. (2004). Improving the quality of health care for chronic conditions. *Quality and Safety in Health Care, 13*, 299–305. doi: 10.1136/qshc.2004.010744
- Eshah, N. F. & Bond, A. E. (2009). Cardiac rehabilitation programme for coronary heart patients: An integrative literature review. *International Journal of Nursing Practice, 15*(3), 131-139. doi:10.1111/j.1440-172X.2009.01738.x.
- Feild, M. J., & Lohr, K. N. (1990). *Clinical practice guidelines: Directions for a new program*. Washington, DC: National Academy Press.

- Fitz-Simon, N., Bennett, K., & Feely, J. (2005). A review of studies of adherence with antihypertensive drugs using prescription databases. *Therapeutics and Clinical Risk Management, 1*(2), 93-106. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1661615/>
- Framingham Heart Study. (2018). *Cardiovascular disease: 10 year risk*. Retrieved from <https://www.framinghamheartstudy.org/index.php>
- Goodman, S. G., Langer, A., Bastien, N. R., McPherson, R., Francis, G. A., Genest Jr, J. J., & Leiter, L. A. (2010). Prevalence of dyslipidemia in statin-treated patients in Canada: Results of the DYSlipidemia International Study (DYSIS). *Canadian Journal of Cardiology, 26*(9), 330-335. Retrieved from <http://pubmedcentralcanada.ca/pmcc/articles/PMC2989357/>.
- Government of Canada. (2007). *Chronic disease prevention and management*. Retrieved from <https://www.canada.ca/en/health-canada/services/health-care-system/reports-publications/primary-health-care/chronic-disease-prevention-management.html>
- Government of Canada. (2017). *Heart disease-heart health*. Retrieved from <https://www.canada.ca/en/public-health/services/diseases/heart-disease-heart-health.html>
- Government of Nova Scotia. (2014). *Provincial incentive programs*. Retrieved from <https://physicians.novascotia.ca/incentives.html>
- Government of Prince Edward Island. (2013). *Quality and access to timely stroke care services improving*. Retrieved from <http://www.gov.pe.ca/peihealthsystems/index.php3?number=news&newsnumber=9075&dept=&lang=E>

- Government of Prince Edward Island. (2015). *Family medicine sponsorship program*. Retrieved from <https://www.princeedwardisland.ca/en/information/health-and-wellness/family-medicine-sponsorship-program>
- Government of Prince Edward Island. (2016). *Chief public health office report 2016: Health for all Islanders*. Retrieved from https://www.princeedwardisland.ca/sites/default/files/publications/cphorpt16_linkd.pdf
- Government of Prince Edward Island. (2017). *Family medicine opportunities*. Retrieved from <https://www.princeedwardisland.ca/en/topic/family-medicine-opportunities>
- Grover, S., Coupal, L., Kouache, M., Lowensteyn, I., Marchand, S., & Campbell, N. (2011). Estimating the benefits of patient and physician adherence to cardiovascular prevention guidelines: The MyHealthCheckup survey. *Canadian Journal of Cardiology*, 27(2), 159-166. doi:10.1016/j.cjca.2011.01.007
- Harbman, P. (2014). The development and testing of a nurse practitioner secondary prevention intervention for patients after acute myocardial infarction: A prospective cohort study. *International Journal of Nursing Studies*, 51(12), 1542-1556. doi:10.1016/j.ijnurstu.2014.04.004
- Hay Group. (2010). *Physician human resource report*. Retrieved from <http://www.gov.pe.ca/photos/original/DHW-HayGroup.pdf>
- Health PEI. (2006). *Prince Edward Island physician recruitment/retention & medical education strategy*. Retrieved from http://www.gov.pe.ca/photos/original/Health_Phy_RR06.pdf
- Health PEI. (2013a). *Stemming the tide: Health PEI chronic disease prevention and management framework 2013-2018*. Retrieved from http://www.gov.pe.ca/photos/original/hpei_stem_tide.pdf

- Health PEI. (2013b). *Quality and access to timely stroke care services improving*. Retrieved from <http://www.healthpei.ca/index.php3?number=news&dept=&newsnumber=9075&lang=diugitaqnoflsaa>
- Health PEI. (2014). *PEI diabetes strategy 2014-2017*. Retrieved from https://www.princeedwardisland.ca/sites/default/files/publications/pei_diabetes_strategy_2014-2017.pdf
- Health PEI. (2017a). *Chronic disease prevention and management*. Retrieved from <https://www.princeedwardisland.ca/en/information/health-pei/chronic-disease-prevention-and-management>
- Health PEI. (2017b). *Health PEI strategic plan 2017-2020*. Retrieved from https://www.princeedwardisland.ca/sites/default/files/publications/health_pei_strategic_plan_2017-2020.pdf
- Health Quality Ontario. (2013). Specialized nursing practice for chronic disease management in the primary care setting: An evidence-based analysis. *Ontario Health Technology Assessment Series, 13*(10), 1-66. Retrieved from <http://www.hqontario.ca/Portals/0/Documents/evidence/reports/full-report-specialized-nursing-practice-cdm-130906-en.pdf>
- Horrocks, S., Anderson, E., & Salisbury, C. (2002). Systematic review of whether nurse practitioners working in primary care can provide equivalent care to doctors. *BMJ (Clinical Research Ed.)*, *324*(7341), 819-823. doi:10.1136/bmj.324.7341.819

- Housholder-Hughes, S. D., Ranella, M. J., Dele-Michael, A., & Rubenfire, M. (2015). Evaluation of a postdischarge coronary artery disease management program. *Journal of the American Association of Nurse Practitioners*, 27(7), 371-378. doi:10.1002/2327-6924.12201
- Hypertension Canada. (2016). *Hypertension in Canada*. Retrieved from https://www.hypertension.ca/images/whatsnew/HTN-Fact-Sheet-2016_FINAL.pdf
- Jackson, G. L., Lee, S. Y., Edelman, D., Weinberger, M., & Yano, E. M. (2011). Employment of mid-level providers in primary care and control of diabetes. *Primary Care Diabetes*, 5(1), 25-31. doi:10.1016/j.pcd.2010.09.005
- Joffres, M., Shields, M., Tremblay, M. S., & Connor Gorber, S. (2013). Dyslipidemia prevalence, treatment, control, and awareness in the Canadian Health Measures Survey. *Canadian Journal of Public Health*, 104(3), 252-257. doi:10.17269/cjph.104.3783
- Kreatsoulas, C., & Anand, S. S. (2010). The impact of social determinants of cardiovascular disease. *Canadian Journal of Cardiology*, 26, 8-13. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2949987/pdf/cjc26008c.pdf>
- Larrabee, J. H., Ferri, J. A., & Hartig, M. T. (1997). Patient satisfaction with nurse practitioner care in primary care. *Journal of Nursing Care Quality*, 11(5), 9-14. Retrieved from https://www.researchgate.net/publication/14006000_Patient_Satisfaction_with_Nurse_Practitioner_Care_in_Primary_Care
- Lee, D. S., Chiu, M., Manuel, D. G., Tu, K., Wang, X., Austin, P. C.,... Tu, J. V. (2009). Trends in risk factors for cardiovascular disease in Canada: temporal, socio-demographic and geographic factors. *Canadian Medical Association Journal*, 181(3-4), E55–E66. doi:10.1503/cmaj.081629

- Leung, A. A., Daskalopoulou, S. S., Dasgupta, K., McBrien, K., Butalia, S., Zarnke, K. B.,...Rabi, D. M. (2016). Hypertension Canada's 2016 Canadian hypertension education program guidelines for blood pressure measurement, diagnosis, assessment of risk, prevention, and treatment of hypertension. *Canadian Journal of Cardiology*, 32(5), 569-588. Retrieved from: <http://guidelines.hypertension.ca/prevention-treatment/hypertension-with-diabetes/>
- Lorig, K. R., Sobel, D. S., Ritter, P. L., Laurent, D., & Hobbs, M. (2001). Effect of a self-management program on patients with chronic disease. *Effective Clinical Practice*, 4(6), 256-252. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/11769298>
- Liberal Party of Prince Edward Island. (2015). *People, prosperity, engagement: Liberal Party of Prince Edward Island policy platform 2015*. Retrieved from <http://www.liberalpei.ca/wp-content/uploads/Liberal-Party-Platform-2015.pdf>
- Liddy, C., Singh, J., Hogg, W., Dahrouge, S., Deri-Armstrong, C., Russell, G.,...Wells, G. (2012). Quality of cardiovascular disease care in Ontario, Canada: Missed opportunities for prevention-a cross sectional study. *BioMed Central*, 12(74), 1-9. doi:10.1186/1471-2261-12-74
- MacColl Institute for Healthcare Innovation. (2010). *Improving chronic illness care. The chronic care model: Model elements: Self-management support*. Retrieved from www.improvingchroniccare.org.

- MacDonald, D. (2017, April 5). PEI has record number of physicians: Close to 7,000 names still on Patient Registry List. *The Eastern Graphic*. Retrieved from http://www.peicanada.com/eastern_graphic/article_83066cd6-196d-11e7-8c27-0b578760d87f.html
- MacSwain, M., Patterson, M., Kephart, G., & Krause, J. (2016). *Examining the drivers of high-cost healthcare usage in Prince Edward Island*. Retrieved from <http://chcresearch.ca/assets/images/Drivers%20of%20High%20Cost%20Healthcare%20Usage%20Final%20with%20Authors.pdf>
- Martin-Misener, R., Donald, F., Kilpatrick, K., Bryant-Lukosius, D., Rayner, J., Landry, V.,... McKinlay, R. J. (2015). *Benchmarking for nurse practitioner panel size and comparative analysis of nurse practitioner pay scales: Update of a scoping review*. McMaster University. Retrieved from https://fhs.mcmaster.ca/ccapnr/documents/np_panel_size_study_updated_scoping_review_report.pdf
- Mason, C. M. (2003). Managing the spectrum of dyslipidemia in primary care. *Journal of Vascular Nursing*, 21(3), 81-9; quiz 90-1. doi:aS1062030303000517
- McKenzie, J. F., Neiger, B. L., & Thackeray, R. (2013). *Planning, implementing & evaluating health promotion programs a primer*. Boston, MA: Pearson.
- Medical Society of Prince Edward Island. (2015). *Master agreement between the Medical Society of Prince Edward Island and the Government of Prince Edward Island and Health PEI*. Retrieved from http://www.gov.pe.ca/photos/original/doh_masteragree.pdf

- Mercuri, M., Sherbino, J., Sedran, R. J., Frank, J. R., Gafni, A., & Norman, G. (2014). When guidelines don't guide: The effect of patient context on management decisions based on clinical practice guidelines. *Academic Medicine*, *90*(2), 191-196. doi: 10.1097/ACM.0000000000000542.
- Mosca, L., Linfante, A. H., Benjamin, E. J., Berra, K., Hayes, S. N., Walsh, B. W.,...Simpson, S. L. (2005). National study of physician awareness and adherence to cardiovascular disease prevention guidelines. *Circulation*, *111*(4), 499-510. doi: 10.1161/01.CIR.0000154568.43333.82
- Nelson, R. H. (2013). Hyperlipidemia as a risk factor for cardiovascular disease. *Primary Care*, *40*(1), 195-211. doi:10.1016/j.pop.2012.11.003
- New Brunswick Medical Society. (2018). *Recruitment and retention incentives*. Retrieved from <https://www.nbms.nb.ca/students-and-residents/residents/recruitment-and-retention-incentives/>
- Nova Scotia Health. (2011). *Cardiovascular health Nova Scotia strategic plan*. Retrieved from <http://www.cdha.nshealth.ca/cardiovascular-health-nova-scotia-2>
- Nova Scotia Health. (2017). *Nurse practitioner access clinics: Heart health/cardiovascular health*. Retrieved from <https://www.nshealth.ca/service-details/Nurse%20Practitioner%20Access%20Clinic>
- Ohman-Strickland, P. A., Orzano, A. J., Hudson, S. V., Solberg, L. I., DiCiccio-Bloom, B., O'Malley, D., . . . Crabtree, B. F. (2008). Quality of diabetes care in family medicine practices: Influence of nurse-practitioners and physician assistants. *Annals of Family Medicine*, *6*(1), 14-22. doi:10.1370/afm.758

- Ostbye, T., Yarnall, K. S. H., Krause, K. M., Pollak, K. I., Gradison, M., & Michener, J. L. (2005). Is there time for management of patients with chronic diseases in primary care? *Annals of Family Medicine*, 3(3), 209-214. doi:10.1370/afm.310
- Pong, R. W., Lemire, F., & Tepper, J. (2007). *Physician retirement in Canada: What is known and what needs to be done*. Retrieved from http://rcpsc.medical.org/publicpolicy/imwc/10_ret&retCAN.pdf
- Prevention and Population Health Branch. (2010). *Evaluation framework for health promotion and disease prevention programs*. Retrieved from <https://www2.health.vic.gov.au/about/publications/policiesandguidelines/Evaluation-framework-for-health-promotion-and-disease-prevention-programs>
- Prince Edward Island Statistics Bureau. (2017). *Prince Edward Island population report 2017*. Retrieved from https://www.princeedwardisland.ca/sites/default/files/publications/pt_pop_rep_1.pdf
- Public Health Agency of Canada. (2008). *Economic burden of illness in Canada, 2005-2008*. Retrieved from <http://www.phac-aspc.gc.ca/publicat/ebic-femc/2005-2008/assets/pdf/ebic-femc-2005-2008-eng.pdf>
- Public Health Agency of Canada. (2009). *2009 Tracking heart disease and stroke in Canada*. Retrieved from <http://www.phac-aspc.gc.ca/publicat/2009/cvd-avc/pdf/Cvd-avs-2009-eng.pdf>
- Public Health Agency of Canada. (2013). *Implementing the population health approach*. Retrieved from <https://www.canada.ca/en/public-health/services/health-promotion/population-health/implementing-population-health-approach/implementing-population-health-approach.html#prevention>

- Public Health Agency of Canada. (2015). *The Canadian diabetes strategy: History, evolution, moving forward*. Retrieved from <https://www.canada.ca/en/public-health/services/chronic-diseases/diabetes/canadian-diabetes-strategy-history-evolution-moving-forward.html>
- Public Health Agency of Canada. (2016a). *Cardiovascular disease*. Retrieved from <http://cbpp-pcpe.phac-aspc.gc.ca/chronic-diseases/cardiovascular-diseases/>
- Public Health Agency of Canada. (2016b). *Health status of Canadians 2016: Report of the chief public health officer-how are we unhealthy?- cardiovascular disease*. Retrieved from <https://www.canada.ca/en/public-health/corporate/publications/chief-public-health-officer-reports-state-public-health-canada/2016-health-status-canadians/page-17-how-are-we-unhealthy-cardiovascular-disease.html>
- Public Health Agency of Canada. (2017). *Heart disease in Canada: Highlights from the Canadian chronic disease surveillance system*. Retrieved from <https://www.canada.ca/content/dam/phac-aspc/documents/services/publications/diseases-conditions/heart-disease-fact-sheet/heart-disease-factsheet-eng.pdf>
- Rajan, D., Barroy, H., & Stenberg, K. (2016). *Strategizing national health in the 21st century: A handbook*. Retrieved from <http://apps.who.int/iris/bitstream/10665/250221/1/9789241549745-chapter8-eng.pdf>
- Robson, J., Dostal, I., Sheikh, A., Eldridge, S., Madurasinghe, V., Griffiths, C.,...Hippisley-Cox, J. (2013). The NHS Health Check in England: An evaluation of the first 4 years. *British Medical Journal*, 6(1), 1-10. doi:10.1136/bmjopen-2015-008840

- Round, R., Marshall, B., & Horton, K. (2005). *Planning for effective health promotion evaluation*. Retrieved from http://www.health.vic.gov.au/healthpromotion/evidence_res/integrated.html
- Russell, G. M., Dabrouge, S., Hogg, W., Geneau, R., Muldoon, L., & Tuna, M. (2009). Managing chronic disease in Ontario primary care: The impact of organizational factors. *Annals of Family Medicine*, 7 (4), 309-318. doi:10.1370/afm.982
- Sanchez, M., Vellanky, S., Herring, J., Liang, J., & Joa, H. (2008). Variations in Canadian rates of hospitalization for ambulatory care sensitive conditions. *Health Care Quarterly*, 11(4), 20-22. doi:10.12927/hcq.2008.20087
- Sanmartin, C., & Khan, S. (2011). *Hospitalizations for ambulatory care sensitive conditions (ACSC): The factors that matter*. Retrieved from <http://www.statcan.gc.ca/pub/82-622-x/82-622-x2011007-eng.pdf>
- Song, X., Quek, R. G. W., Gandra, S. R., Cappell, K. A., Fowler, R., & Cong, Z. (2015). Productivity loss and indirect costs associated with cardiovascular events and related clinical procedures. *BMC Health Services Research*, 15, 245. doi:10.1186/s12913-015-0925-x
- Statistics Canada. (2013). *Health profile, December 2013*. Retrieved on February 17, 2016 from <https://www12.statcan.gc.ca/health-sante/82-28/details/page.cfm?Lang=E&Tab=1&Geo1=PR&Code1=11&Geo2=PR&Code2=01&Data=Rate&SearchText=prince%20edward%20island&SearchType=Contains&SearchPR=01&B1=All&Custom=&B2=All&B3=All>
- Statistics Canada. (2015). *Ten leading causes of death, by sex and geography, 2009-Prince Edward Island*. Retrieved on November 27, 2017 from <https://www.statcan.gc.ca/pub/84-215-x/2012001/tbl/t015-eng.htm>

- Stephens, L. (2012). Family nurse practitioners; “Value Add” in outpatient chronic disease management. *Primary Care: Clinics in Office Practice*, 39, 595-603. doi: 10.1016/j.pop.2012.08.008
- Stone, J. A., Austford, L., Parker, J. H., Gledhill, N., Tremblay, G., & Arthur, H. M. (2008). AGREEing on Canadian cardiovascular clinical practice guidelines. *Canadian Journal of Cardiology*, 24(10), 753-757. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2643154/pdf/cjc24753.pdf>
- Straus, S., & Leung, E. (2010). *The action cycle*. Retrieved from <http://www.cihr-irsc.gc.ca/e/41929.html>
- Tanner, L. (2017, November 13). Is your own MD best in the hospital? Study eyes hospitalist. *Canadian Press*. Retrieved from <http://www.theguardian.pe.ca/living/None/is-your-own-md-best-in-the-hospital-study-eyes-hospitalists-161394/>
- Toeh, H., Home, P., & Leiter, L. A. (2011). Should A1c targets be individualized for all people with diabetes? *Diabetes Care*, 34(2), 191–196. doi:10.2337/dc11-s217
- Tu, J. V., MacLagan, L. C., Ko, D. T., Atzema, C. L., Booth, G. L., Johnston, S.,...Chu, A. (2017). The Cardiovascular Health in Ambulatory Care Research Team performance indicators for the primary prevention of cardiovascular disease: A modified Delphi panel study. *Canadian Medical Association Journal*, 5(2), 315-321. doi: 10.9778/cmajo.20160139
- Turcotte, M. (2015). *Family caregiving: What are the consequences*. Retrieved from <https://www.statcan.gc.ca/pub/75-006-x/2013001/article/11858-eng.htm#a7>

- Viscomi, M., Larkins, S., & Gupta, T. S. (2013). Recruitment and retention of general practitioners in rural Canada and Australia: A review of the literature. *Canadian Journal of Rural Medicine, 18*(1), 13-23. Retrieved from <https://www.srpc.ca/PDF/cjrm/vol18n1/pg13.pdf>
- Wagner, E. H. (1998). Chronic disease management: What will it take to improve care for chronic illness? *Effective Clinical Practice, 1*(1), 2-4. Retrieved from <https://ecp.acponline.org/augsep98/cdm.pdf>
- Watts, S. A., Gee, J., O'Day, M. E., Schaub, K., Lawrence, R., Aron, D., & Kirsh, S. (2009). Nurse practitioner-led multidisciplinary teams to improve chronic illness care: The unique strengths of nurse practitioners applied to shared medical appointments/group visits. *Journal of the American Academy of Nurse Practitioners, 21*, 167-172. doi: 10.1111/j.1745-7599.2008.00379.x
- Wong, S. T., & Farrally, V. (2012). *The utilization of nurse practitioners and physician assistants: A research synthesis*. Retrieved from https://www.msfnr.org/sites/default/files/Utilization_of_Nurse_Practitioners_and_Physician_Assistants.pdf
- World Health Organization. (2007). *Prevention of cardiovascular disease: Guidelines for assessment and management of cardiovascular risk*. Retrieved from http://www.who.int/cardiovascular_diseases/guidelines/Full%20text.pdf
- Wright, T. (2017, September 30). Three P.E.I. family doctors retire; recruitment ongoing to replace Ken Coady. *The Guardian*. Retrieved from <http://www.theguardian.pe.ca/news/local/three-pei-family-doctors-retire-recruitment-ongoing-to-replace-ken-coady-104683/>

- Yang, Q., Zhong, Y., Ritchey, M., Cobain, M., Gillespie, C., Merritt, R.,...Bowman, B. A. (2015). Vital signs: Predicted heart age and racial disparities in heart age among U.S. adults at the state level. *Morbidity and Mortality Weekly Report*, 64(34), 950-958. doi: 10.15585/mmwr.mm6434a6
- Yarnall, K. S., Pollak, K. I., Ostbye, T., Krause, K. M., & Michener, J. L. (2003). Primary care: Is there enough time for prevention? *American Journal of Public Health*, 93, 635–641. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447803/pdf/0930635.pdf>
- Yarnall, K. S., Ostbye, T., Krause, K. M., Pollak, K. I., Gradison, M., & Michener, J. L. (2009). Family physicians as team leaders: “Time” to share the care. *Preventing Chronic Disease*, 6(2), A59. Retrieved from https://www.cdc.gov/pcd/issues/2009/apr/pdf/08_0023.pdf
- Yousefi, V. (2013). Health system drivers of hospital medicine in Canada. *Canadian Family Physician*, 59(7), 762-767. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles>

Appendix A

Triage Criteria

1) Current primary care provider

Yes (1) _____
No (2) _____

2) Current diagnosis of

Type II Diabetes Mellitus (2) _____
Dyslipidemia (2) _____
Hypertension (2) _____

3) Currently at or below target for

Type II Diabetes Mellitus (-1) _____
Dyslipidemia (-1) _____
Hypertension (-1) _____

4) Current use of nicotine products

Yes (1) _____
No (0) _____

5) Family history of premature coronary artery disease?

Yes (1) _____
No (0) _____

Score= /10

Appendix B

Table 1

Planning Activities and Timeline

2018-2019	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Province wide stakeholder meetings	✓								
Program proposal submission		✓							
Funding approval				✓					
Secure physician collaborator				✓					
Develop job description, post position & conduct job interviews					✓	✓	✓		
Secure office space & equipment						✓	✓		
Notify successful Nurse Practitioner & Administrative Assistant candidate							✓		
Development of program policies, protocols & procedures							✓	✓	
Confirmation of evaluation methods, goals and tools							✓		
Revisions of policies, protocols & procedures, & approval by Health PEI								✓	
Arrange computer training & access codes (ISM) for NP								✓	
Nurse Practitioner begins to visit hospitals, community health centres, primary care physicians, NPs and staff								✓	

Contact media-article in local newspaper in regards to emerging role of NP in primary prevention of CVD.								✓	
CVD primary prevention program NP begins									✓

Appendix C

Nurse Practitioner Satisfaction Survey

Please indicate your degree of satisfaction with the following statements:

- 1) Overall I was satisfied with my visit with my the Nurse Practitioner (NP).

Strongly Disagree Disagree Agree Strongly Agree Uncertain

- 2) I am likely to recommend the NP to others.

Strongly Disagree Disagree Agree Strongly Agree Uncertain

- 3) I am likely to schedule appointments with the NP in the future.

Strongly Disagree Disagree Agree Strongly Agree Uncertain

- 4) The NP was not rushed.

Strongly Disagree Disagree Agree Strongly Agree Uncertain

- 5) I was able to schedule a convenient appointment with the NP.

Strongly Disagree Disagree Agree Strongly Agree Uncertain

- 6) When I feel I need to see my NP, I can get an appointment without a problem.

Strongly Disagree Disagree Agree Strongly Agree Uncertain

- 7) My NP is easy to access.

Strongly Disagree Disagree Agree Strongly Agree Uncertain

- 8) My NP is a skilled healthcare provider.

Strongly Disagree Disagree Agree Strongly Agree Uncertain

- 9) My NP discusses methods other than medications to treat my problems.

Strongly Disagree Disagree Agree Strongly Agree Uncertain

10) I am satisfied with how the NP treated me.

Strongly Disagree Disagree Agree Strongly Agree Uncertain

11) I was satisfied with the amount of time the NP spent with me.

Strongly Disagree Disagree Agree Strongly Agree Uncertain

12) My NP is caring.

Strongly Disagree Disagree Agree Strongly Agree Uncertain

13) My NP is knowledgeable about health problems.

Strongly Disagree Disagree Agree Strongly Agree Uncertain

14) I trust my NP.

Strongly Disagree Disagree Agree Strongly Agree Uncertain

15) My NP knows when to refer to or consult with other professional.

Strongly Disagree Disagree Agree Strongly Agree Uncertain

16) My NP listened to what I had to say.

Strongly Disagree Disagree Agree Strongly Agree Uncertain

17) My NP was interested in my health concerns.

Strongly Disagree Disagree Agree Strongly Agree Uncertain

18) My NP respected me.

Strongly Disagree Disagree Agree Strongly Agree Uncertain

19) I can easily talk to the NP about my health concerns.

Strongly Disagree Disagree Agree Strongly Agree Uncertain

20) I understood what the NP explained to me.

Strongly Disagree Disagree Agree Strongly Agree Uncertain

21) I understood what the NP taught me.

Strongly Disagree Disagree Agree Strongly Agree Uncertain

22) The NP explained things in an understandable manner.

Strongly Disagree Disagree Agree Strongly Agree Uncertain

23) I feel comfortable asking the NP question.

Strongly Disagree Disagree Agree Strongly Agree Uncertain

24) I left the NP visit with all questions answered.

Strongly Disagree Disagree Agree Strongly Agree Uncertain

25) Number of times in the past year that you have seen you NP.

Strongly Disagree Disagree Agree Strongly Agree Uncertain

26) Gender

- a) ___ Male
- b) ___ Female
- c) ___ Other

27) Highest Education Level

- a) ___ Less than High School Degree
- b) ___ High School/GED
- c) ___ Some Vocational/Technical School
- d) ___ Vocational/Technical School Degree
- e) ___ Some college
- f) ___ Associate Degree
- g) ___ Bachelor's Degree
- h) ___ Master's Degree
- i) ___ Doctoral Degree

28) Age

- a) ___ 18-25
- b) ___ 26-35
- c) ___ 36-45
- d) ___ 46-55
- e) ___ 56-65
- f) ___ 66-75
- g) ___ 76-85
- h) ___ 86 and older

29) Race

- a) ___ African American
- b) ___ Asian
- c) ___ Caucasian (white)
- d) ___ Hispanic
- e) ___ Other (please specify)

30) Marital Status

- a) ___ Single never married
- b) ___ Married/Cohabiting
- c) ___ Separated
- d) ___ Divorced
- e) ___ Widowed

31) Your yearly net (take home) income

- a) \$25,000
- b) \$25,001-50,000
- c) \$50,001-75,000
- d) \$75,001-100,000
- e) >\$100,000

Appendix D

Table 2: Personnel Budget

	Hourly rate	Regular hours	Other costs	Total
Nurse Practitioner	56.38	1950 hours (FTE 1 year)	18% benefits (vacation, sick, pension, disability, etc.)	
		\$109,941	\$19,789.38	129,730.38
Physician consultation fee				5000.00
Administrative Assistant	21.02	1950 hours (FTE 1 year)	18% benefits (vacation, sick, pension, disability, etc.)	
		\$41,000	\$ 7,378.00	48,378.00
				183,108.00

Table 3: Equipment & Material Budget

Expense	Amount Requested
Technology costs (office phone; computers; printer/fax; OSCAR software)	\$5000.00
General office supplies (pens, paper, prescription pads, etc.)	\$2000.00
General health supplies	\$5000.00
Clinic space	In-kind (Health PEI)
Total	\$10, 500.00

Program Total (1 year)	\$193, 608.00
------------------------	---------------