EXAMINING THE IMPACT OF NURSE PRACTITIONER-LED GROUP MEDICAL VISITS FOR PATIENTS WITH CHRONIC CONDITIONS IN PRIMARY CARE

by

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Abstract

The aging Canadian population, increasing incidence of chronic conditions, and rising healthcare costs have contributed to concerns that the current healthcare system may not meet healthcare needs. Canada has sought innovative ways to meet patients’ healthcare needs through reforms such as group medical visits (GMVs) and care by nurse practitioners (NPs). While studies have shown that care with NPs and GMVs is effective, there is limited evidence examining how NPs engage in innovative care delivery. The purpose of this study was to examine the impact of NP-led GMVs for patients with chronic conditions in primary care.

This study used multiple methods, including a systematic review and meta-analysis and a multisite case study (N=3). The systematic review and meta-analysis included studies published between 1947 and 2012 for patients with type 1 or 2 diabetes who attended GMVs. Of the 94 studies identified, 13 met final inclusion criteria. Group medical visits had a positive effect on clinical and patient-reported outcomes, with significant reductions in glycated hemoglobin (HbA1c reduction $-0.46\%$, 95% confidence interval $-0.80\%$ to $-0.31\%$).

The case study consisted of two cases where NPs were using GMVs and one where NPs were not using GMVs. Open-ended interviews with patients (N=12), providers (N=14) and 10 hours of direct observation were completed. Analysis of the data suggests that GMVs facilitated an environment that was patient centered, interprofessional and increased patients’ confidence managing chronic conditions. Furthermore, the processes of care within the GMVs disrupted power differentials in primary care, between patients and providers and amongst healthcare providers.
Yet, these same power differentials constrained NPs’ ability to adopt GMVs, with NPs indicating that they had limited agency to diffuse healthcare innovations.

Unique contributions of this study were a systematic review and meta-analysis of GMVs among those with diabetes and new knowledge on how power differentials influence the diffusion of innovations in primary care. These findings demonstrate that GMVs provide opportunities to meet clinical, team-based, and patient-centered healthcare objectives. Ongoing research that considers the context of practice environments, power differentials, and conditions that limit NPs ability to diffuse healthcare innovative is needed.
Preface

This dissertation is the original work of Laura Housden, the author. This study was approved by the UBC Behavioural Research Ethics Board (Approval Number H12-02137), Vancouver Coastal Health Ethics Board (V12-02137) and Northern Health Ethics Board (RRC-2013-0013).
Table of Contents

Abstract ........................................................................................................................................ ii
Preface ........................................................................................................................................ iv
Table of Contents .................................................................................................................... v
List of Tables ........................................................................................................................... ix
List of Figures .......................................................................................................................... x
List of Abbreviations ............................................................................................................. xi
Acknowledgements .................................................................................................................... xii

CHAPTER 1: INTRODUCING THE STUDY ................................................................................. 1
  1.1 Introduction ......................................................................................................................... 1
  1.2 Study Purpose ..................................................................................................................... 3
  1.3 Significance ......................................................................................................................... 5
      1.3.1 Health human resources ......................................................................................... 6
      1.3.2 Burden of chronic conditions on individuals and their families ................. 9
      1.3.3 Novel approaches to delivering primary care to people with chronic conditions .... 11
  1.4 Structure of the Thesis ....................................................................................................... 13

CHAPTER 2: LITERATURE REVIEW ................................................................................... 16
  2.1 Introduction ......................................................................................................................... 16
  2.2 PHC Reform ...................................................................................................................... 19
  2.3 Nurse Practitioners .......................................................................................................... 20
      2.3.1 Complementary and value added attributes of NPs .................................. 21
      2.3.2 Paying attention to the power dynamic between the NP and patients .... 22
      2.3.3 Valuing relational practice .................................................................................. 23
      2.3.4 Care of vulnerable populations ......................................................................... 25
  2.4 Self-Management in Relation to Chronic Conditions .................................................. 26
  2.5 Group Medical Visits ........................................................................................................ 28
      2.5.1 The historical evolution of GMVs ................................................................. 28
      2.5.2 Structural aspects of GMVs ............................................................................. 30
          2.5.2.1 Systems perspective of GMVs ................................................................. 30
          2.5.2.2 Practice context ....................................................................................... 31
          2.5.2.3 Organization of the practice ................................................................. 31
          2.5.2.4 Interprofessional care ........................................................................... 33
      2.5.3 Performance of GMVs ......................................................................................... 34
      2.5.4 Healthcare service delivery ................................................................................. 35
      2.5.5 Patient reported experiences with GMVs ....................................................... 36
      2.5.6 Provider reported experiences with GMVs ...................................................... 37
      2.5.7 Technical quality of patient care ........................................................................ 38
4.3.3.1 Study design ......................................................... 100
4.3.3.2 Eligibility criteria and procedures for case 1 and case 2 ...... 102
4.3.3.3 Eligibility criteria and procedures for case 3 .................... 103
4.3.3.4 Data analysis .......................................................... 104
4.3.3.4.1 Theoretical perspectives informing the data analysis ...... 104
4.3.4 Results ........................................................................ 105
4.3.4.1 Acquisition of knowledge ........................................... 105
4.3.4.1.2 Increased knowledge about the context of individuals’ lives
......................................................................................... 106
4.3.4.1.3 More knowledge equals more power ......................... 107
4.3.4.2 GMV helps shift relationships between patients and healthcare
providers ............................................................................. 109
4.3.4.2.1 Increasing personal agency ...................................... 110
4.3.4.3 GMVs help shift power relations between healthcare providers
......................................................................................... 111
4.3.5 Discussion ..................................................................... 112
4.4 Complexities of Introducing Group Medical Visits with Nurse
Practitioners in British Columbia .............................................. 117
4.4.1 Summary ........................................................................ 117
4.4.2 Introduction ..................................................................... 117
4.4.3 Background ...................................................................... 119
4.4.4 Group medical visits ......................................................... 119
4.4.5 Diffusion of innovation ....................................................... 120
4.4.5.1 Steps and characteristics of innovation ......................... 121
4.4.6 Methods ......................................................................... 122
4.4.6.1 Study design ............................................................... 122
4.4.6.2 Eligibility and procedures ........................................... 122
4.4.6.3 Analysis ....................................................................... 124
4.4.7 Results ......................................................................... 124
4.4.7.1 Advantages of GMVs .................................................. 125
4.4.7.2 Questioning the fit of GMVs in NP practice .................... 127
4.4.7.3 Navigating scope of practice and role constraints ............ 129
4.4.8 Discussion ....................................................................... 131
4.4.8.2 Implications for practice .............................................. 132
4.4.8.3 Implications for policy ................................................ 134
4.4.8.4 Implications for research ............................................. 135
4.4.9 Limitations and recommendations ..................................... 135
4.4.10 Conclusion ...................................................................... 135

CHAPTER 5: DISCUSSION AND IMPLICATIONS ............................. 137
5.1 Summary of Findings ............................................................ 137
5.1.1 GMVs and the performance domain ................................... 139
5.1.1.1 Healthcare service delivery .......................................... 139
5.1.1.2 Technical quality of patient care .................................. 140
5.1.2 GMVs and the structural domain ...................................... 141
5.1.3 GMVs influence relational practice .................................... 141
5.2 Theoretical Contributions ..................................................... 143
5.3 Role of the NP in the GMV .................................................. 146
5.4 Limitations .............................................................................. 147
5.5 Overall Recommendations ...................................................... 147
  5.5.1 Implications for practice .................................................. 148
  5.5.2 Implications for research .................................................. 149
  5.5.3 Implications for education ............................................... 150
  5.5.4 Implications for policy ..................................................... 151
5.6 Conclusion .............................................................................. 151
References .................................................................................... 153

Appendix A: Systematic Review and Meta-Analysis Search Strategy .... 207
  Appendix B: Data Extraction Form for Systematic Review and Meta-
  Analysis ...................................................................................... 211

Appendix C: Meta-Analysis Sensitivity Analysis .................................. 213
Appendix D: Case Study Introduction Letters ..................................... 214
  Appendix D1: Introduction Letter Clinical Practice ......................... 215
  Appendix D2: Introduction Letter Patients ..................................... 216

Appendix E: Consent Form ............................................................ 218
  Appendix E1: Patient Consent Forms ........................................... 219
  Appendix E2: NPs not using GMVs Consent Forms ....................... 221
  Appendix E3: Healthcare providers Consent Forms ....................... 223

Appendix F: Interview Questions .................................................... 225
  Appendix F1: Patient Interview Questions .................................... 226
  Appendix F2: Interview Questions NPs not using GMVs ................ 229
  Appendix F3: Interview Questions Healthcare Providers ................. 231

Appendix G: Telephone Script ........................................................ 233
Appendix H: Coding Schema .......................................................... 235
  Appendix I: Systematic Review and Meta-Analysis: Characteristics of 26
  studies ....................................................................................... 237

Appendix J: Recruitment Poster ....................................................... 243
Appendix I: Demographics Form ..................................................... 244
List of Tables

Table 1: Characteristics of 13 randomized controlled trials included in meta-analysis ................................................................. 82

Table 2: Risk-of-bias assessment of the randomized controlled trials .......... 89

Table 3: Pooled analysis of the effect of group medical visits on clinical outcomes reported in randomized controlled trials................................. 90

Table 4: Case study characteristics ................................................................................. 116
List of Figures

Figure 1: Visual depiction of research questions and analytic approaches...15
Figure 2: Framework for primary care organizations ..................................18
Figure 3: Multi-site case study overview ......................................................57
Figure 4: Schematic representation of case-study research design..............59
Figure 5: Rogers Diffusion of innovation theory ........................................61
Figure 6: Selection of studies ........................................................................80
Figure 7: Pooled analysis of the effect of group medical visits versus usual care for patients with diabetes on glycated hemoglobin reported in randomized controlled trials.........................................................91
Figure 8: Pooled analysis of the effect of group medical visits on systolic blood pressure .................................................................................................92
Figure 9: Pooled analysis of the effect of group medical visits on diastolic blood pressure .................................................................................................92
Figure 10: Pooled analysis of the effect of group medical visits on weight and BMI.........................................................................................................93
Figure 11: Power in Rogers diffusion of innovation process ......................145
## List of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>APN</td>
<td>Advanced Practice Nurse</td>
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<tr>
<td>BC</td>
<td>British Columbia</td>
</tr>
<tr>
<td>CDM</td>
<td>Chronic Disease Management</td>
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<tr>
<td>CHC</td>
<td>Cooperative healthcare clinic</td>
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<tr>
<td>CNS</td>
<td>Clinical Nurse Specialist</td>
</tr>
<tr>
<td>COPD</td>
<td>Chronic Obstructive Pulmonary Disease</td>
</tr>
<tr>
<td>CRNBC</td>
<td>College of Registered Nurses of BC</td>
</tr>
<tr>
<td>GMV</td>
<td>Group Medical Visit</td>
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<tr>
<td>GT</td>
<td>Grounded Theory</td>
</tr>
<tr>
<td>HCP</td>
<td>Healthcare provider</td>
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<tr>
<td>HHR</td>
<td>Health Human Resources</td>
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<tr>
<td>MD</td>
<td>Medical Doctor</td>
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<tr>
<td>MOH</td>
<td>Ministry of Health</td>
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<tr>
<td>MSP</td>
<td>Medical Services Plan</td>
</tr>
<tr>
<td>MW</td>
<td>Minute walking</td>
</tr>
<tr>
<td>Non-RCT</td>
<td>Non Randomized Study</td>
</tr>
<tr>
<td>NP</td>
<td>Nurse Practitioner</td>
</tr>
<tr>
<td>PHC</td>
<td>Primary Healthcare</td>
</tr>
<tr>
<td>RCT</td>
<td>Randomized Control Trial</td>
</tr>
<tr>
<td>RN</td>
<td>Registered Nurse</td>
</tr>
<tr>
<td>SMA</td>
<td>Shared Medical Appointment</td>
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<tr>
<td>TB</td>
<td>Tuberculosis</td>
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<tr>
<td>WHO</td>
<td>World Health Organization</td>
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patience and smiles were continual sunshine throughout my dissertation. I couldn’t have achieved this without you.
CHAPTER 1: INTRODUCING THE STUDY

1.1 Introduction

In Canada, there are increasing numbers of people who are living longer with one or more chronic conditions (PHAC, 2014; Smith, 2012). Because of this demographic shift, there are increasing healthcare costs and potential shortages of healthcare providers. Canada has turned increasing attention to re-examining primary healthcare (PHC) service delivery, looking for new or innovative methods, such as group medical visits (GMVs), to meet patients’ healthcare needs.

PHC is understood as both a philosophy and an approach to healthcare, and includes services beyond the secondary and other healthcare systems (Health Canada, 2006). PHC is the first contact with the healthcare system for individuals, families, and communities. The world health organization (WHO) describes PHC as:

Essential healthcare based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain at every stage of their development in the spirit of self-reliance and self-determination. (WHO, 1978)

The terms primary healthcare and primary care are often used interchangeably, however, they have distinctly different meanings (Barnes et al., 1995; CNA, 2005). Primary medical care (primary care) services fit within the broader context of PHC in Canada (Martin-Misener et al., 2012). Primary care is understood as the “first line of care that provides entry into the healthcare system” (CNA, 2005, p. 1) and is considered one of the core components of PHC (Martin-Misener et al., 2012; Starfield, 1998). Starfield (1998) also
describes primary care as person focused, not disease oriented, and as a part of the broader health system that coordinates care. Evidence has indicated that countries with “strong primary care infrastructures have healthier populations, fewer health-related disparities and lower overall costs for healthcare” (Starfield, 2009, p. 1091).

Group medical visits (GMVs) are becoming increasingly commonplace. Furthermore, different classes of healthcare provider, such as NPs, are being implemented in primary care and PHC settings across Canada (DiCenso et al., 2007). Increasingly, NPs work with specialized populations of patients who have one or more chronic conditions. Using more GMVs in primary care may be appealing since there is recognition that more attention needs to be paid to empowering and engaging those with chronic conditions to help them manage their health effectively (Rathert, Wyrwich, & Boren, 2013; J. Smith, 2012).

Moreover, many decision- and policy-makers have projected that the current healthcare system is financially unsustainable in its current form (MacKinnon, 2004; Robson, 2001; Skinner & Rovere, 2009). Provincial health spending has grown at a rate of 7.4% annually, with government health spending growing faster than the GDP. This is resulting in the “rationing” of healthcare services, including longer wait times for patients (Skinner & Rovere, 2009). Health projections often do not account for the growth of the population, inflation, aging, or costs which are outside of Canada’s funded Medicare—such as prescription medications (Canadian Foundation for Healthcare Improvement, 2007). Increased attention to disease prevention, health promotion, and effective management of chronic health conditions has been a large focus of health reform, specifically primary healthcare (PHC) renewal (Willison, Williams et al. 2007).
This multiple-methods study examined the impact of GMVs, and NP-led GMVs for patients with chronic conditions. Using innovation theory, this study examined how GMVs impact patients with chronic conditions and explored the knowledge and skills NPs bring to delivering care using GMVs.

1.2 Study Purpose

The purpose of this study was to examine the impact of GMVs for patients with chronic conditions in a primary care practices with NPs. The specific research questions were:

1. Based on a systematic review of the literature, how do GMVs impact the quality of care for people living with type I and type II diabetes?

2. Based on case study design:
   a. How might GMVs influence the primary care experiences of patients’ living with other chronic conditions?
   b. What is the role of the NP in the delivery of GMVs?
   c. What are the barriers and facilitators to implementing NP-led GMVs in British Columbia (BC)?

This dissertation examined the role of NP-led GMVs and explored the impact that GMVs had on patients and healthcare providers—particularly for patients with diabetes. GMVs with people who have diabetes was the largest area of GMV research, but a systematic review and meta-analysis had not been completed at the time of this study.

An important premise of this study is that NP care for patients through GMVs could meet the five principles of primary healthcare: accessibility, public participation, health promotion, use of technology, and intersectoral cooperation (CNA, 2005). I hypothesized
that NPs would be well-suited to delivering GMVs because NP’s nursing approaches encourage a broad focus on patients’ individual and social contexts, and the social determinants of health (Browne & Tarlier, 2008). The literature illustrates that GMVs have a focus on patient education, health promotion, support, and group engagement (Lavoie et al., 2013; Thompson, Meeuwisse, Dahlke, & Drummond, 2014). I hypothesized that NPs would be well positioned and suited to deliver care through GMVs. This study provided the opportunity to examine the role of the NP in the delivery of GMVs.

Most of the research to date has examined GMVs led by physicians. Some studies have examined the effect of GMVs on patient processes and clinical outcomes, such as self-management skills (Berry, Williams, Hall, Heroux, & Bennett-Lewis, 2016; Bodenheimer, 2002; Boegner, Fontbonne, Gras Vidal, Mouls, & Monnier, 2008; Dontje & Forrest, 2015; Lavoie et al., 2013; Liu et al., 2012; Rygg, Rise, Gronning, & Steinsbekk, 2012; Schillinger, Handley, Wang, & Hammer, 2009; Watts et al., 2009), empowerment (Raballo et al., 2012), impact on HbA1c (Clancy, Huang, Okonofua, Yeager, & Magruder, 2003; Edelman et al., 2010; Trento et al., 2005; Trento et al., 2004; Wagner et al., 2001) and blood pressure (Edelman, Gierisch, McDuffie, Oddone, & Williams, 2015; Loney-Hutchinson et al., 2009; Taveira, Dooley, Cohen, Khatana, & Wu, 2011), however little has been done examining GMVs from a provider perspective. Examining the implementation of GMVs by NPs in BC provided a rich opportunity to explore why the uptake of GMVs in primary care has been relatively slow as well as to consider more broadly, the diffusion of innovations in primary care with NPs.
1.3 Significance

In this section, I discuss multiple factors influencing the need for PHC reform in Canada. Chronic conditions affect one-third of all Canadians (Mirolla, 2004), and up to 85% of Canadians over the age of 65 have one or more chronic conditions (Public Health Agency of Canada, 2014a). Treatment for people with chronic conditions accounts for 67% of direct healthcare costs, or $190 billion annually (Public Health Agency of Canada, 2012).

The Canadian population continues to grow older and live longer with one or more chronic conditions (CNA, 2011; Smith, 2012), and there has been an increased focus on disease prevention, health promotion, and management within primary healthcare (Hanusaik et al., 2014). As a way to prevent complications associated with chronic conditions, healthcare providers are seeking ways to concurrently improve patients’ self-management of their health, increase timely access to care, and increase the quality of care for patients with complex management issues (Wagner et al., 2001; Willison, Williams, & Andrews, 2007) within the context of PHC.

Chronic conditions are diseases with an insidious onset, having multiple risk factors, and, typically, a long latency period (Bartley & Haney, 2010). The most prevalent types of chronic conditions in Canada are cardiovascular disease, chronic obstructive pulmonary disease (COPD), diabetes, and mental illness (Mirolla, 2004; Smith, 2012). Importantly, these four conditions account for 1,530,000 deaths in Canadians each year (Mirolla 2004).

The costs associated with the management of chronic conditions are staggering, accounting for 42% of the total government expenditures on healthcare (Mirolla 2004). The total cost of chronic conditions annually, including illness, disability, and death, is estimated at over $90 billion, while the total burden, including lost productivity, is upwards of $190
billion (Smith, 2012). Some of the complications associated with chronic conditions are heart failure, myocardial infarcts, stroke, peripheral artery disease, hypertension, kidney failure, peripheral vascular disease, and atherosclerosis (Smith, 2012).

Additionally, patients who are experiencing complications of chronic conditions are spending less time in hospital and are managed more in the community, which may add additional stress to the PHC system. Between 1986 and 2003, the average length of time patients spent in hospital decreased from 10.7 days to 9.0 days and the overall reduction in length of stay between 1976 and 2003 was 15.9% (CIHR, 2005). This reduction in time spent in hospital caused increased need for follow-up from healthcare providers in the community.

Continuing to strengthen primary healthcare is necessary, since it has the potential to be more cost-effective than hospitalization. But there is a move toward increased self-management of chronic conditions. This move toward self-management of chronic conditions has specific implications for the PHC system. The focus on individual responsibility associated with the self-management of chronic conditions may be challenging for some patients (Barr et al., 2003) and the ability for patients to manage their chronic conditions is influenced by various social determinants of health—including income, social support, and education levels (Hill, Nielsen, & Fox, 2013; Michael Vallis, 2015).

1.3.1 Health human resources

This study is important given the changing nature of the Canadian healthcare system. A brief examination of the context of Canadian healthcare is an important first step in describing how the system may affect both GMVs and NPs.

In Canada, the majority of primary care services have been provided by physicians (Hutchison, Abelson, & Lavis, 2001). However, in recent years, there is wide recognition
that care provided by a single primary care provider will not likely meet the healthcare needs of all patients (Willison et al., 2007). Additionally, research in other areas of health delivery, such as mental health and primary care, provides evidence that the model of receiving healthcare through a single-patient-to-single-healthcare-provider visit may not be the best healthcare delivery model for many patients (Kirsh & Aron, 2008).

The Canadian healthcare system is in a state of turmoil for several reasons. Aging is associated with an increased likelihood of having one or more chronic conditions (Gerbeding, 2006; PHAC, 2014; Smith, 2012), and the average age of Canadians is rising. This increases the overall financial burden of healthcare services due to increased use of expensive health services (e.g., acute care, emergency services) and the need for more health human resources. There are concerns about access to healthcare for Canadians (Wellstood, Wilson, & Eyles, 2006), particularly for individuals with complex or chronic health conditions who require intensive primary care services. These individuals often require longer and more in-depth medical appointments (Hogg, Rowan, Russell, Geneau, & Muldoon, 2007).

Past work has estimated that an additional 5,000 family-practice physicians are needed for delivery of primary care services across Canada, particularly in rural communities (Busing, 2009; Laurent, 2002). Although there are similar ratios of physicians and registered nurses (RNs) per 10,000 population today compared to 10 years ago, there is increasing public perception of a healthcare-provider shortage, particularly in primary care (Canadian Foundation for Healthcare Improvement, 2012). One reason for this perception may be because physicians are working differently and working with more complex patients than 10 years ago. Additionally, the number of family physicians practicing comprehensive primary
care in Canada is decreasing, with many new graduates choosing to enter focused areas instead of family practice (MacKean & Gutkin, 2003).

Another aspect of the changing primary care landscape is that the family physician workforce is aging (Watson, Reid, Roos, & Heppner, 2005), with many family physicians retiring or moving to acute-care hospitalist roles (Maskey, 2008), thus contributing to increasing difficulty for patients with chronic conditions to access primary care services. Furthermore, while the majority of physicians in Canada prefer alternatives to the fee-for-service payment model (Canadian Foundation for Healthcare Improvement, 2010a), fee-for-service payments continue to represent the largest portion of physician payment in Canada (CIHI, 2012). The structure of the fee-for-service model encourages providers to bill for as many encounters as possible and can lead to the policy of one patient concern per visit (Muldoon, Rowan, Geneau, Hogg, & Coulson, 2006). As a result, the fee-for-service model can make it more challenging for patients with complex chronic conditions to find a regular primary care provider.

Both RNs and NPs are employed in primary care settings across Canada (Wong & Farrally, 2013). RNs and NPs in BC work in a variety of primary care settings, including rural and remote locations and within First Nations Communities (Banner et al., 2010; Browne & Tarlier, 2008; Forchuk & Kohr, 2009; Wong, Watson, Young, & Mooney, 2009), yet the use of nurses in primary care is still not widespread (Wong et al., 2009).

While current data on numbers of RNs working in BC primary care are not known, as of 2000, approximately 12% of RNs in the province were employed in the primary care workforce (Wong et al., 2009). Primary healthcare RN roles include public health nurses, home-health-care nurses, and nurses working in primary care practices (Banner et al., 2010).
Research shows that the role of RNs vary and include chronic disease management, health assessment (CNA, 2014), health promotion and education (CNA, 2014; Moaveni et al., 2010), interdisciplinary care of patients, case management, patient advocacy, and administration (CNA, 2014).

As of July 2015, there were 251 practicing NPs and 273 registered NPs (including practicing, non-practicing, and working on provisional licenses) working in BC (CRNBC, 2015). This includes NPs working in both primary care and in more specialized areas, such as hospital-based practices.

1.3.2 Burden of chronic conditions on individuals and their families

Chronic conditions play an increasingly significant role in the quality of life for both patients and their families. Chronic conditions have a significant personal and financial cost to patients, their families, and their caregivers (Jerant, von Friederichs-Fitzwater, & Moore, 2005). Patients with chronic conditions may experience loss of work and income, increased personal and relationship stressors, and the financial burdens associated with additional support or care needed within the home.

Additionally, there are rising costs to prescription medications (Schoen, Osborn, How, Doty, & Peugh, 2009). For example, some of the newer medications indicated to treat chronic conditions such as dyslipidemia may not have cheaper generics options available. This contributes to challenges in medication adherence for some patients (Ellis et al., 2004).

There may also be other financial costs associated with chronic conditions, including recommended supportive therapy, such as nutritional guidance. Due to continued cuts in healthcare budgets, many patients are facing decreasing levels of formal social support, such
as the loss of various funded programs and cuts to some extended healthcare programs (Bryant, Raphael, Schrecker, & Labonte, 2011).

In Canada, approximately 76% of Canadian seniors over 65 years of age reported having one or more chronic conditions (CIHI, 2011), and the proportion of the Canadian population greater than 65 years is expected to grow (Smith, 2012). Moreover, older adults may also face decreased financial support available to them upon retirement, such as decreased pensions and reduction in family benefit programs (Bryant, Raphael, Schrecker, & Labonte, 2011). These financial stressors may in turn, may decrease patients’ ability to effectively manage some aspects of their health conditions.

Chronic conditions are also more prevalent in certain populations. In Canada, Aboriginal people have increased rates of diabetes and are more likely to be diagnosed with a chronic condition as compared to other Canadian adults (Earle, 2011; Macmillan, Macmillan, Offord, & Dingle, 1996). In part, Aboriginal people are more likely to have multiple intersecting factors that predispose individuals for having a chronic condition. Some of these factors include: lower socioeconomic status (Feinstein, 1993; Macmillan et al., 1996; Reading, 2009) and living in poverty (Anand et al., 2001).

Racism is experienced by Aboriginal peoples on a more frequent basis compared to the general population (Tang & Browne, 2008). These experiences of racism are harmful both to physical and mental health through a number of pathways—including internalization of racialization and external discrimination (Krieger & Smith, 2004; Stuber, Meyer, & Link, 2008). Racism interacts with socioeconomic status and gender to predispose individuals to the increased likelihood of having a chronic condition; in particular, women face increased
stress given historically gendered roles of caregiving and acting as “family health managers” for their loved ones (Deeks, Lombard, Michelmore, & Teede, 2009).

1.3.3 Novel approaches to delivering primary care to people with chronic conditions

People with chronic conditions, such as diabetes and heart disease, have a higher level of associated premature morbidity. The complexity associated with these illnesses may not be served with conventional, one-on-one primary care delivery models (Bartley & Haney, 2010; Lavoie et al., 2013). The challenges facing patients with chronic conditions are not strictly related to the inadequate numbers of primary care providers.

In many communities across Canada, patients are without a primary care provider (Laurent 2002). The number of Canadians without a primary care provider is estimated to be five million (Esmail, 2011). Some of the innovations to try and manage the care of patients with chronic conditions include broadening the scope of practice for some healthcare providers (e.g., pharmacists providing prescription renewals), supporting the development of advanced-practice nurses (APN), including NPs (Health Canada 2006), and, finally, the implementation of different models of care delivery, such as GMVs.

In Canada, the term APN is used to describe nurses who are engaged in an advanced level of nursing practice; usually this includes the completion of graduate level education (MacDonald, Schreiber, & Davis, 2005). The term APN includes NPs and Clinical Nurse Specialists (CNSs). Given the substantial overlap in scopes of practice between NPs and physicians (Beardwood, 1999; Donald et al., 2009; Way, Jones, Baskerville, & Busing, 2001), NPs were, in part, introduced to address the physician shortage while improving access to services for patients (Browne & Tarlier, 2008; Dicenzo et al., 2007; Dicenzo &
NPs can act as substitutes for the family physician, especially in rural areas (Laurant et al., 2009). The NP role has been established in the US for many years (Cockerham & Keeling, 2014). However, in BC, the introduction and regulation of NPs occurred with the first graduating class of NPs in 2005 in response to the *Health Professions Amendment Act*—which legislated that additional health professionals work and be regulated in the province of BC (Government of British Columbia, n.d.). In BC, NPs are RNs who have received advanced training at the postgraduate level and are able to work autonomously to diagnose illnesses, order lab work, prescribe medications, and refer patients to specialists (CRNBC, 2015a). According to the competencies as outlined by the College of Registered Nurses of BC (CRNBC), NP practice in BC is based upon the five principles of primary healthcare as outlined by the WHO: accessibility, public participation, health promotion, appropriate technology, and intersectoral collaboration (CRNBC, 2015a). Providing primary care for individuals with acute and/or chronic conditions has been a focus of the NP role.

Often, NPs work collaboratively in interdisciplinary clinics with physicians and other healthcare providers such as dieticians, counsellors, and physical therapists. In some areas of Canada, NPs are mandated to work with physicians in order to practice (Dicenso et al., 2007).

There has been ample research to support that NPs are safe and effective healthcare providers (Horrocks, Anderson, & Salisbury, 2002; Mundinger, Kane, Lenz, & Trial, 2009; Sackett et al., 1974; Sangster-Gormley, Frisch, & Schreiber, 2013). However, most of the previous work has focused on comparing NPs to physicians (Dicenso et al., 2007; Sackett et al., 1974).
Another innovation that has been introduced in primary care, in part to support those with chronic conditions, is GMVs. In BC, GMVs are a model of care delivery where primary care is offered in a group format, instead of the conventional single-patient-to-single provider format (Bodenheimer & Grumbach, 2007). Patients meet with their primary care provider in a group, inclusive of other patients (Bodenheimer & Grumbach, 2007).

Group Medical Visits in primary care can be considered innovative because they include a medical component, the patient appointment, and often serve to increase interprofessional collaboration between physicians, nurses, NPs, and other allied health professionals (Kirsh & Aron, 2008).

Group medical visits have also been shown to be a more patient-centered way of delivering primary care (Lavoie et al., 2013). Research on GMVs has indicated that both the patients and the providers of GMV care are satisfied with the care-delivery format (Bartley & Haney, 2010; Beck et al., 1997; Bronson & Maxwell, 2004; J. Scott & Robertson, 1996). Yet, there is limited research on the impact of GMVs or the role of NPs in the delivery of them.

1.4 Structure of the Thesis

This dissertation consists of a literature review of relevant material, three manuscripts (one published, one accepted for publication, and one under review), followed by a summary and synthesis of the findings, recommendations, and implications. This dissertation uses multiple methods, including: (a) a systematic review and meta-analysis in order to address research question #1; and, (b) a multisite case study to address research questions #2a, #2b, and #2c (Figure 1).
The first manuscript reports findings from a systematic review and meta-analysis of GMVs in the area of diabetes. This manuscript synthesizes previous research on GMVs with careful attention to effectiveness claims regarding this method of care delivery. The results of this review are an important step in assisting primary care providers and policy-makers in making informed decisions regarding implementation of GMVS for patients with diabetes.

The second and third manuscripts report on the findings from the case studies. This case study included three cases. Two cases consisted of established primary care practices with NPs offering GMVs and one case consisted of NPs who were not using GMVs. The second manuscript reports on the findings from the overall case study, examining the influences of NP-led GMVs for clients with chronic conditions. The third manuscript, based on the case study of NPs in BC not using GMVs, highlights the factors impacting GMV implementation and answers research question #4.
1) Based on a systematic review of the literature, how do GMVs impact the quality of care for people living with type I and type II diabetes?

Analytic Approach: Systematic review & meta-analysis

2) Based on case-study design:

   a) How might GMVs influence patients’ experiences in primary care?
   b) What is the role of the NP in the delivery of GMVs?
   c) What are the barriers and facilitators to implementing NP-led GMVs in British Columbia (BC)?

Analytic Approach: Multi-site, instrumental case study design

Interpretive descriptive analysis

Figure 1: Visual depiction of research questions and analytic approaches
CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Understanding the broader context of the primary care practice where GMVs are occurring is important to better understand the role of the NP and the impact of GMVs. Unlike physician providers, in BC, NPs are limited in the location and types of patients with whom they work. Funding for NPs is allocated through the health authorities (Wong & Farrally, 2013) and, therefore, NPs generally work in different practices compared to the majority of primary care physicians in BC, who mainly work in private, fee-for-service practices (Wong & Farrally, 2013).

Some NPs in BC work in fee-for-service practices for private physicians, but how many is unknown. Other NPs work in private medical clinics, or in travel medicine, which do not bill the BC Medical Services Plan (MSP); however, how many NPs who do so is also unknown. NPs are also often placed in clinical areas where there is a high patient need or where patients experience difficulties in accessing primary care services, such as patients who may experience lower socioeconomic status, patients who have chronic conditions, or patients who for various reasons have been unable to “attach” to one primary care provider.

To ensure that relevant studies were included in this review, I completed a search of MEDLINE/Pubmed, and CINAHL. Keywords were searched under each topic. For Nurse Practitioners, keywords included NPs, Nurse Practitioners, Advance Practice Nursing, unique, complimentary, chronic conditions, and combinations of these words. For the review of Group Medical Visits, keywords included: group medical visits, GMVs group medical appointments, GMAs, shared medical appointments (SMAs), chronic disease, diabetes, group
appointments, primary care, and combinations of these words. Reference lists from relevant articles were also used to ensure key pieces of literature were not missed.

The Framework for Primary Care Organizations (Hogg et al., 2007) was used to organize the review of the literature and orient my thinking to the way primary care is organized in Canada (See Figure 2). Primary care frameworks have attempted to outline organizational and structural features of primary care but have not addressed all primary care environments (Hogg et al., 2007).

The Framework for Primary Care Organizations was designed to assist in the examination of primary care services, including chronic disease and team-based contemporary approaches to care (Hogg et al., 2007). This framework can also be used in primary-care research as it can assist in ensuring attention is paid to the broader context and structures in which organizations delivery primary care.
Figure 2: Framework for primary-care organizations (Hogg et al., 2007, p. 311)
Hogg et. al (2007) identified two overarching domains of importance in primary-care research and practice: the structural domain and the performance domain. This dissertation focuses on two structural aspects based on PHC reform strategies aimed at increasing access to primary care: the implementation of NPs and GMVs in BC. The structural domain refers to larger environmental and organizational factors that influence the delivery of primary care services (Hogg et al., 2008), including the context and the organization of the primary care practice. Within this structural domain, Hogg et. al (2007) outlines the importance of the policy environment in which primary care is delivered, provider remuneration, broader community characteristics, and the infrastructure of the primary care practice.

Within the performance domain, two features are identified: healthcare-service delivery and technical quality of patient care (Hogg et al., 2007). The healthcare-service delivery element focuses on broad performance indicators of primary care, such as access to care, and encompasses patient experiences of their care, including patient–provider relationships and coordination of care (Hogg et al., 2007). The technical quality of care element focuses on health promotion, prevention, and care of acute and chronic conditions (Hogg et al., 2007).

2.2 PHC Reform

For more than a decade, PHC redesign has been discussed by policy-makers, researchers, and government agencies in Canada (Hutchison et al., 2011; Hutchison et al., 2001; Romanow, 2002; Russell, Hogg, & Lemelin, 2010; Strumpf et al., 2012). Increasingly, individuals with chronic conditions require complex and costly medication regimens, and the management of their conditions may require frequent appointments. Individuals with chronic conditions also face difficulties in a Canadian healthcare system that is designed to treat or
respond to acute illnesses and not to manage long-standing health issues, such as chronic conditions (Morgan, Zamora, & Hindmarsh, 2007).

Most of the previous PHC redesign efforts have focused on organization and delivery of primary care (Hutchison et al., 2001). Government commissions, including the Kirby (2002) and Romanow (2002) reports, have examined the Canadian healthcare system. The Romanow report (2002) focused on the sustainability of the Canadian healthcare system and recommended a series of changes to ensure that the system continued to meet the needs of Canadians.

In BC, the focus of PHC reforms were aimed at addressing chronic disease prevention and appropriate management of long-standing conditions within PHC and primary care. Primary healthcare reform in BC consisted of seven priority areas: regional practice support teams, local learning sessions, health network teams, improvements to secondary and tertiary services, initiatives that support patients as healthcare partners, improved technology to support PHC, and supportive policy environments (British Columbia Ministry of Health, 2014). Within these areas, NPs were introduced, the practice support program was created, as were new collaborative healthcare funding models. The practice support program includes modules and support aimed at assisting general practitioners in providing care to patients as well as improving job satisfaction (General Practice Services Committee, 2009). One of the learning modules included in the practice support program is the provision of GMVs for patients with shared medical conditions (General Practice Services Committee, 2009).

2.3 Nurse Practitioners

The implementation of NPs can be considered one of the outcomes of a changed structural environment in which PHC is delivered. The Canadian Nurses Association
describes NPs as RNs with “advanced educational preparation and experience who possess and demonstrate the competencies to autonomously diagnose, order and interpret diagnostic tests, prescribe pharmaceuticals and perform specific procedures within their legislated scope of practice” (CNA, 2009). Nurse practitioner practice combines aspects of both nursing and medicine, enabling the NP to prescribe medications, diagnose illness, refer to specialists, and order lab tests for their patients (Archibald & Fraser, 2013).

What is unique about NPs as primary care providers is that they bring knowledge from their nursing education. While many areas of focus in nursing education are not unique to nursing, specific skills emphasized include critical reflective practice (Leppa & Terry, 2004; Nelson, 2012), attention to communication with patients, and the ability to facilitate and coordinate care for patients, taking into account broader social determinants of health (Wong & Farrally, 2013), and, in some places, an explicit attention to power relations between providers and patients (Manojlovich, 2007). Nurse practitioner care is both safe and effective, and shown to improve health outcomes and satisfaction for patients and families (Canadian Foundation for Healthcare Improvement, 2010b; Kaasalainen et al., 2010; Prescott & Driscoll, 1979; Sackett et al., 1974).

2.3.1 Complementary and value-added attributes of NPs

The Hogg, et. al framework (2007) is useful in drawing one’s attention to the structural characteristics of practice, including Health and Human Resources (HHR) that might affect the performance of PHC. In many situations, NPs can be used as substitutes for physicians, often being placed into primary care practices or other settings where there is a shortage of primary care providers (Dicenso et al., 2007). For this reason, much of the previous work regarding NPs has focused on determining if they provide equivalent care to
physicians, or determining if they can provide adequate care as physician substitutes (Horrocks et al., 2002; Quinlan & Robertson, 2013).

While it is important to understand the safety and efficacy of care provided by NPs, this approach sets up an unnecessary dichotomy of NPs versus physicians, and fails to recognize NPs as contributing a complementary or value-added approach to patient care. This comparative approach also fails to recognize the emphasis that the nursing discipline places on the social determinants of health and how this might impact the NPs approach to patient care.

Research has indicated that NPs describe their role as being complementary to physicians rather than as physician substitutes (Burgess & Purkis, 2010). However, concerns with role delineation and scope of practice are ongoing (Bryant-Lukosius, DiCenso, Browne, & Pinelli, 2004; Burgess & Purkis, 2010; Kilpatrick, 2013) and this confusion extends beyond the experience of Canadian NPs (Aleshire, Wheeler, & Prevost, 2012).

Finally, shifting to more patient-focused research, such as how care is delivered, may provide further insight into the value that NPs have to offer patients (Sangster-Gormley et al., 2013). For these reasons, careful attention to how NPs practice is key to the long-term sustainability of the role and has been recognized as a gap in research concerning NPs.

2.3.2 Paying attention to the power dynamic between the NP and patients

There is a paucity of research on the power dynamic between NPs and patients. However, there is research on trust and power within the nurse–patient relationship (Henderson, 1994; Hewison, Ctered, & Ma, 1995; Kettunen, Poskiparta, & Gerlander, 2002) and within the physician–patient relationship (Ackerman, Auer, & Gonzales, 2013; Koeck, 2014; Lieber, Kim, & Volk, 2011; McCullough, 2009; Nimmon & Stenfors-Hayes, 2016;
Quill & Brody, 1996). This evidence suggests that a power imbalance exists between patients and healthcare providers that may contribute to an environment where patients may be reluctant to ask questions, request additional information, or express concerns and opinions about their healthcare (Kettunen et al., 2002).

Much of the power dynamic between patients and healthcare providers is influenced by ways in which healthcare providers communicate with patients (Hewison et al., 1995). Use of jargon, interrupting, questioning, and focusing on diagnostic interventions has been shown to be ways in which nurses and physicians exercise their power in the patient–healthcare provider interaction (Hewison et al., 1995; Kettunen et al., 2002; Koeck, 2014). Through nursing experience and education, many NPs have been inherently socialized in this communication style.

However, NPs have also been cited by patients as preferred over physicians and nurses for discussions about their care, receiving information, and support (Laurant et al., 2008). Due the complexity of the concept of power, more attention must be paid to how power is operationalized in the NP–patient interaction and the implications of this power dynamic on patient outcomes.

2.3.3 Valuing relational practice

Relational approaches are increasingly used in health literature to analyze patient–provider relationships and provider practice (Sherwin, 1998). Yet understandings of what this concept means have varied between nursing and other professions in healthcare. Medicine has described relational practice as the need for a more personalized approach to care—specifically, one that takes into consideration the broader social determinants of health (Raia & Deng, 2015). Relational practice in medicine has been proposed as a way to improve
patient compliance with physician recommendations (Hausman, 2001) and to help prepare physicians to deliver difficult news (Peterson, Porter, & Calhoun, 2012). Relational practice in medicine has also been described as an important way to create meaningful relationships with patients in complex technical environments where the healthcare provider and patient interactions occur amidst advancing technology (Raia & Deng, 2015).

Nursing scholars have argued that these types of conceptualizations of relational practice and interpersonal processes of care are too mechanistic. Instead, nursing scholars suggest that these processes should include a relational model where the values of caring and responsiveness are emphasized (Doane & Varcoe, 2015; Hartrick, 1997). Relational practice is founded on relational epistemology, a way of knowing constructed through the relationships that individuals have with one another and what is known (Thayer-Bacon, 1997, 2003). A relational epistemology approaches “knowing as something that is socially constructed by embedded, embodied people who are in relation with each other” (Thayer-Bacon, 2010, p. 3).

Studies have indicated that the nurse–patient relationship includes mutual participation and patient-centered decision-making, in which the patient is able to control many of the topics being discussed (Kettunen et al., 2002). Relational practice has been described as the “essential core of nursing practice” (Doane, 2002, p. 400) and is “the process of respectful, compassionate and authentically interested inquiry into another’s (and one’s own) experiences” (Doane, 2002, p. 401). As APNs, NPs have a role to play in creating and engaging relational practice with their patients. NPs should understand that relational practice extends beyond interpersonal communication skills and includes the ways in which nurses and NPs are with and relate to patients, colleagues and the contexts in which they work.
Relational practice situates communication between nurses and patients in a “moral space” (Bergum, 2013) in which the nurse acts not only in a responsive way, but also with responsibility grounded in nursing ethics. In this sense, relational practice contributes to patient-centered care through the fostering of relationships in which the nursing interactions cannot be separated from nursing ethics.

2.3.4 Care of vulnerable populations

Nurse practitioners may be deployed because of their abilities to successfully work with patients who are made vulnerable by intersecting determinants of health (Browne & Tarlier, 2008), who do not have a regular primary care provider, or who have multiple chronic conditions. Nurse Practitioners work with patients across the lifespan and there is evidence that NPs provide high quality and effective care for patients with chronic diseases through health promotion and maintenance activities (Conlon, 2010; Lowery et al., 2012). Patients who are vulnerable or who suffer from multiple chronic conditions require additional time and health management that many primary care physicians find challenging to manage within the context of a busy fee-for-service practice using conventional one-on-one appointments (Bodenheimer, 2006; Pimlott, 2008). Special billing fees for these patients have been established in recognition of this challenge.

It has been hypothesized that NPs have a role to play in advocating for social justice for patients and their families through recognition of the larger social and political contexts of patients’ health and illnesses, and also by working to advocate for aspects of social justice to improve patients’ health (Browne & Tarlier, 2008). Examining alternative models of primary care delivery may also provide opportunities to meet the healthcare needs of vulnerable patients.
2.4 Self-Management in Relation to Chronic Conditions

In an attempt to contain steadily increasing healthcare costs and to decrease pressure facing primary-care providers (Gately, Rogers, & Sanders, 2007), governments have tried to either prevent chronic conditions (Public Health Agency of Canada, 2010) or create more responsive models of PHC for chronic condition management, including increasing focus on patient self-management and homecare (Bayliss, Steiner, Fernald, Crane, & Main, 2003). The Hogg et. al framework draws attention to the performance of primary care organizations in the areas of service delivery and technical quality of care. However, this framework does not provide guidance as to how to assess (or evaluate) what impact a primary care organization ought to have on patient outcomes, nor does it provide guidance on how to engage patients in self-management.

Self-management has been described as a complex phenomenon, consisting of a variety of activities that patients with chronic conditions engage in in order to manage their health, healthcare, and related decisions (Jerant et al., 2005). Past evidence suggests that self-management is related to positive health outcomes. Encouraging patients to engage with or manage their conditions can provide patients with an increased sense of control over their health; self-management can improve patients’ self-esteem as well as their problem-solving abilities related to that condition (Bodenheimer, Lorig, Holman, & Grumbach, 2002; Vallis, 2009).

While the idea of engaging patients in their health and healthcare decisions is a laudable process and theoretically ought to lead to better outcomes, the concept of self-management is largely driven by ideas of individualism and fiscal restraint (Anderson, 1990). Individualism refers to the idea of liberal individualism—or the idea that individuals are
“separate rational agents who can be abstracted from their social, economic, political or historical context” (Browne, 2001, p. 121). Self-management discourses, therefore, often fail to acknowledge the complex factors that could contribute to the patient’s inability to manage their own health and well-being (Kendall, Ehrlich, Sunderland, Muenchberger, & Rushton, 2011). For example, individuals who have lower incomes experience an increased incidence of chronic conditions such as diabetes and cardiovascular disease (Labonte, 1992; Raphael, 2000; WHO, 2015), and the financial burden of chronic disease subsequently causes further poverty and disadvantage (WHO, 2015). There are also a significant costs associated with some self-management strategies, such as attending a gym or health club to exercise (Jerant et al., 2005).

The movement to have patients self-manage their chronic condition or manage aspects of their condition more independently can also create feelings of anxiety and feelings of being alone (Anderson, 1990; Bayliss et al., 2003). The strategies that are required to manage illness at home may be complex, may involve a level of technical expertise that some patients are uncomfortable with (such as the monitoring of blood glucose), or may require extensive knowledge and expertise (such as complex nutritional planning) (Anderson, 1991). If the individual is unable to meet the self-management goals, the act of managing the condition may fall upon other family members, thereby extending some of the stressors of the chronic condition to caregivers outside of the medical system. The need to engage additional family members in the individual’s care can contribute to increased anxiety and guilt for the patient (Jerant et al., 2005; M Vallis, 2009).

There are also challenging logistics to consider for patients with chronic conditions, such as the ability to manage multiple appointments. For example, a person with
cardiovascular disease may be required to see a cardiologist, their regular primary care provider, and a nutritionist, and may also need to go for regular laboratory testing (including imaging, blood tests and special diagnostic tests). The ability to manage all the required appointments, including transportation to and from the appointments, can almost be a full-time job for some patients (Jerant et al., 2005).

2.5 Group Medical Visits

Group Medical Visits may be one way to address the complexity of factors that are barriers to patients self-managing their chronic condition(s). As PHC reform continues, and providers look for new and innovative ways to deliver healthcare to clients with increasing rates of chronic diseases and multi-morbidities, GMVs are becoming increasingly popular, particularly across the BC primary care landscape (McKendry et al., 2006). Group medical visits may change the structure of how primary care is typically delivered, where patients are seen in a group format rather than the conventional single patient–single provider format (Bodenheimer & Grumbach, 2007). After briefly reviewing the historical aspect of the GMV, I will use the theoretical framework outlined by Hogg et al., (2007) as an approach to guide and organize the literature review on GMVs.

2.5.1 The historical evolution of GMVs

The concept of providing healthcare visits to patients in a group format rather than the one-on-one, patient-and-provider visit typically seen in the conventional primary-care appointment, has been a method of care delivery in the mental health environment for many years (Noffsinger, 2009; Yalom, 1995). Today’s idea of GMVs was designed based on the principles of group psychotherapy during which it is common for patients to receive care in a group setting (Bartley & Haney, 2010; Noffsinger, 2009). One of the key features that
differentiates GMVs from support groups (e.g., walking groups) or group psychotherapy is that they must contain a medical component such as medical evaluations, prescriptions, and referrals (Jaber, Braksmajer, & Trilling, 2006). Therefore, in order for the group appointment to qualify as a GMV, a physician or an NP must be present to provide the medical aspect of the care to the patients.

GMVs have also been used historically with tuberculosis (TB) patients in the United States. In a 1907 article, Dr. Joseph Pratt refers to the treatment difficulties faced by patients with TB (Pratt, 1907). Dr. Pratt identified that for many patients with TB, the social and financial stressors placed on their families by the sanatorium, or hospital, made treatment of their condition an impossibility. He found that, because of these barriers, many patients with TB were unable to or chose not to receive healthcare services for their condition. Patients would often die from what would have been a treatable illness if they had received medical care early on in the course of their TB disease (Pratt, 1907).

Dr. Pratt (1907) documented the use of a “tuberculosis class,” during which a physician and an assistant worked with the patients to address some of the more complex social needs that many TB patients faced. During the TB classes, the patients received medical care, physical assessments, and referrals while in the group setting (Pratt, 1907). Patients were taught self-management skills, including ways to modify TB treatments in their home environment, sleeping outdoors, and the importance of attending the weekly medical appointments (Pratt, 1907). This process resulted in significant cost savings, but Dr. Pratt also found that the patients had positive health outcomes (Pratt, 1907). Many of the TB patients treated in the group appointment recovered from TB, and an important aspect of the group was the additional social support for the patients that the group provided (Pratt 1907).
The recent reintroduction of the group-style medical appointment as a care-delivery model in North America was initiated in the 1990s in Colorado (Bartley & Haney, 2010; Bodenheimer & Grumbach, 2007; Noffsinger & Scott, 2000). The GMV implementation was directed by Dr. John Scott at Kaiser Permanente, in part due to the demand for a new health-service delivery model related to the increasing workload in primary care (Noffsinger & Scott, 2000; Noffsinger & Scott, 2000). Physicians had been finding that the conventional one patient/one provider appointments did not allow time for the in-depth care that many patients needed and physicians were facing pressure to see more patients in a limited amount of time (Bodenheimer & Grumbach, 2007).

2.5.2 Structural aspects of GMVs

In the framework for primary care organizations, the structural domain refers to the “organizational and environmental features likely to influence primary-care service delivery” (Hogg et al., 2007). The structural domain is divided into three different components: the healthcare system, the practice context, and the organization of the practice (Hogg et al., 2007).

2.5.2.1 Systems perspective of GMVs

The healthcare system within the framework for primary care organizations refers to the larger system, including government and professional associations, and the way that these systems and associations affect healthcare delivery within primary care (Hogg et al., 2007). A systems perspective on GMVs has not yet been explored in the literature, including how the larger organizational structures influence the diffusion of the group appointments, or how the larger system impacts healthcare providers and patients who are involved with group appointments.
2.5.2.2 Practice context

There is limited literature that explores the practice context of GMVs as outlined by the framework for primary care organizations. According to the framework, practice context refers to the “characteristics of surrounding communities, availability of other medical resources and whether or not the practice organization is part of another network with other services in the area” (Hogg et al., 2007, p. 310). This contextual piece has not yet been explored in the current GMV literature but can have a strong effect on the delivery of the primary care practice and models that are implemented within the practice.

2.5.2.3 Organization of the practice

There are a variety of types of GMVs and different ways that individual primary care practices can offer group appointments. These different ways include drop-in group medical appointments (DIGMAs), cooperative healthcare clinics (CHCs) designed for high-acuity patients, and specialty group medical appointments, which are also referred to as disease-specific medical appointments. Overall, the different types of GMVs can be divided into two categories. These categories are: (1) patient-focused GMVs and (2) provider-focused GMVs (Noffsinger, 2001). Noffsinger (2001) describes patient-focused GMV as usually being disease-focused, or focusing on a specific patient population. The patient-focused GMVs often gather patients who experience common illnesses (often a chronic condition) which require treatment and follow-up. A common example of a disease-focused GMV is group care for patients with diabetes. Patient-focused GMVs may also gather patients of a similar population who may experience similar health issues, such as pregnancy, chronic pain, or smoking, but not necessarily a common demographic characteristic such as gender or age.
Provider-focused GMVs are designed to assist the healthcare provider with some of the more challenging administrative aspects of their practice. Provider-focused GMVs are often called DIGMAs. The DIGMA allows the provider to provide care for a variety of patients all with different presentations or illnesses (Noffsinger, 2001). The DIGMA is a novel way to provide an advanced-access care model. Advanced access refers to a model of care in which the provider has open slots available to see patients on the same day they call in need of an appointment (Murray & Berwick, 2003). Using the DIGMA, the provider is able to offer patients who call in for same day appointments a drop-in group appointment at a predetermined time. This allows healthcare providers to see more patients in a preset time schedule and may help meet the demands currently facing primary care (Noffsinger, 1999; Noffsinger, 2009).

The structure of the GMV usually depends on the type of group appointment and the specific needs of the patients within the group. Most group appointments include an educational component as well as the medical-care-based portion (Bodenheimer & Grumbach, 2007). The educational component is patient focused and is often based on a topic that the patients have determined would be beneficial, such as nutritional information for diabetes (Bodenheimer & Grumbach, 2007; Noffsinger, 2001).

Group medical appointments usually have approximately 12–20 patients in each session (Bodenheimer & Grumbach, 2007; Noffsinger, 2001). During the GMV, patients will have their health and medication histories taken, receive a renewal of any necessary prescriptions, and be given the opportunity to interact with other patients. The primary care provider, usually a physician, may meet with each patient individually for any private or more sensitive components of the appointment, such as various physical examinations (Jaber
et al., 2006; Noffsinger, 2002). The provider will also visit with patients within the group, often interacting individually with patients while other patients are present and listening. This allows for increased information sharing between group members and additional questions to be answered within a group setting (Bodenheimer & Grumbach, 2007; E. Noffsinger, 2002). The GMV therefore can result in patients accumulating knowledge and understanding around health conditions for patients throughout the medical appointment, or series of GMV appointments.

While GMVs can be implemented for a wide range of health conditions, they are often used to provide care to patients with chronic illnesses (Kirsh et al., 2007). This may be because the format of the group appointment works well for patients who require additional education on self-management and for patients who might benefit from the social support network provided by the group environment (Jaber et al., 2006). From an administrative perspective, appointments for patients with chronic conditions are often more complex and take more time than medical appointments for acute conditions. Indeed, patients with chronic diseases may not be able to have all their concerns addressed in a one-on-one appointment (Kirsh et al., 2007).

2.5.2.4 Interprofessional care

Another aspect of the practice organization category outlined in the Framework for Primary Care Organizations is the “job descriptions and team functioning” (Hogg et al., 2007). It has been proposed that GMVs may contribute to a more interdisciplinary and interprofessional approach to healthcare within the context of primary care (Bray, Thompson, Wynn, Cummings, & Whetstone, 2005). As recognized by Noffsinger (2001), it is difficult for primary-care providers to have all the necessary knowledge and information needed to
address the complex concerns of today’s patients. Group medical visits may engage a variety of healthcare providers to address the questions and concerns of patients. This interdisciplinary and interprofessional approach is an important aspect of the GMV and patients are often able to determine their educational needs and the types of healthcare providers that will best meet their needs, such as dieticians or physical therapists (Langford, Sawyer, Gioimo, Brownson, & O’Toole, 2007).

2.5.3 Performance of GMVs

The performance domain of the Hogg et al. framework contains two categories: healthcare-service delivery and technical quality of patient care (Hogg et al., 2007). Healthcare-service delivery refers to how healthcare services are delivered and the “technical quality” of care refers to the fit between clinical care or procedures and current evidence for practice (Hogg et al., 2007). Within the category of healthcare-service delivery is access to care, patient–provider relationship, continuity of care, service integration, comprehensiveness of care, and provider satisfaction (Hogg et al., 2007).

Much of the research on GMVs has examined aspects of the performance domain within the healthcare-service delivery category, such as the benefits to primary-care providers and patients, including patient and provider satisfaction (Bartley & Haney, 2010; Beck et al., 1997; Bronson & Maxwell, 2004; Ickovics et al., 2007) and administrative outcomes such as patients needing to access emergency room care (Miller, Zantop, Hammer, Faust, & Grumbach, 2004). Although GMVs have occurred for many years in the United States and Canada, research on their effectiveness or on the technical quality of clinical care remains limited, and is largely focused on specific chronic conditions such as diabetes and cardiovascular conditions.
2.5.4 Healthcare service delivery

GMVs in the United States have been shown to increase in healthcare-provider responsiveness to patients and improved provider productivity (Bronson & Maxwell, 2004). In this study, productivity was defined as “efficiency” and understood as the number of patients seen by the care provider over a one-month period (Bronson & Maxwell, 2004). Because some of the time-based pressures healthcare providers experience in the conventional one-on-one medical appointments have been removed in the group setting, providers report having more time to spend with patients and feeling more satisfied with the depth of care they are able to provide their patients (Bronson & Maxwell, 2004). Additionally, GMVs allow the provider to see a number of complex patients in a single time slot, and, from an administrative perspective, the GMV has been shown to successfully relieve some of the intense scheduling pressures primary care providers face (Bronson & Maxwell, 2004).

A recent study found that healthcare providers in BC have reported they feel the introduction of a group medical appointment has reduced their scheduling load and allowed them to have increased time to spend with more complex patients (Lavoie et al., 2013). What remains unknown is the impact on the administrative or other office staff in coordination of the GMVs, and the best methods to organize them.

The GMV care-delivery model may also decrease the patient’s needs to access urgent or emergency care services, which has significant financial implications for health-service delivery. A randomized controlled trial of older adults who attended group medical visits found that patients who attended GMVs were less likely to access primary care services, had fewer emergency room visits, and had fewer overall hospitalizations (Beck et al., 1997;
Coleman, 2001). GMVs for low-income women with chronic conditions in a large urban setting also found that there was a reduction in emergency room visits for patients who attended the group appointments (Miller et al., 2004).

2.5.5 Patient-reported experiences with GMVs

Patients attending GMVs report more positive experiences with the care they receive and with the healthcare providers who administer the GMV as compared to those attending conventional one-on-one appointments (Bartley & Haney, 2010; Beck et. al., 1997; Bronson & Maxwell, 2004; Ickovics et al., 2007; J. Scott & Robertson, 1996). In primary care, more positive experiences with care has been correlated with improved patient outcomes, including emotional health, symptom resolution, blood pressure, blood sugar levels, and pain control (Hibbard & Greene, 2013; Jesmin, Thind, & Sarma, 2012; Stewart, 1995). These findings have been attributed to the increase in time patients are able to spend with their providers during their medical appointment and the patients’ ability to interact with the providers over a longer period of time (Barud, Marcy, Armor, Chonlahan, & Beach, 2006).

Group medical visits provide patients with an environment that allows for peer observation and interaction throughout the medical appointment. Patients report that the sharing of information, stories, and the social exchange that occurs between patients and providers during the appointment is an additional important aspect of their increased satisfaction with the GMV as a care-delivery model (Miller et al., 2004; Trento et al., 2001). The increased feelings of social and emotional support have been shown to be especially important for patients who are dealing with what are often frustrating conditions, such as chronic conditions and comorbidities (Bartley & Haney, 2010). The additional encouragement and support provided by the GMV also improves the trust patients have in
their care providers (Clancy, Cope, Magruder, Huang, Salter, et al., 2003), which may be related to improved patient experiences in primary care. Further qualitative studies have also reported that patients identified the GMVs as providing them with a support network and contributing to an environment that allows patients to build and increase trust with primary care providers (Pi-Sunyer & Blackburn, 2007).

Group Medical Visits have also been found to be an effective way to provide information to families about raising healthy infants, and about immunizations (Osborn & Wooley, 1981). In this study, families who attended GMVs showed more initiative about their children’s care, were less likely to describe their children as “ill,” and used the other members of the group as resource for support (Osborn & Wooley, 1981). The group appointment was shown to be an effective way of delivering the well-child medical appointment. On the other hand, research on GMVs for postpartum care found that GMVs were not associated with statistically significant different clinical outcomes as compared to conventional one-on-one appointments (Escobar et al., 2001).

Additionally, research has shown that a subset of patients decline to participate in GMVs. While there is limited research on the numbers of patients who have declined, some reports have indicated this could be as high as 40% (NHA, 2007). Why patients choose to decline is unknown, but evidence suggests that concerns about confidentiality surrounding their personal health information has discouraged their participation (Wong, Lavoie, Browne, Macleod, & Chongo, 2015).

2.5.6 Provider-reported experiences with GMVs

A one-year randomized controlled study of GMVs found that healthcare-provider satisfaction with the care they were able to provide their patients also increased (Beck et. al.,
Healthcare providers have reported that GMVs improved productivity, allowing them to see more patients without increasing the overall clinical workload (Carlson, 2003; E.B Noffsinger, 2009). Providers have also mentioned that the group format is helpful in that it prevents them from having to repeat the same information multiple times, which can be tiring and contribute to information being missed in conventional one-on-one medical appointments (Carlson, 2003).

One of the key priorities of PHC reform in Canada is to ensure that Canadians receive a high quality of care, “delivering the best possible care and achieving the best possible outcomes for people every time they deal with the healthcare system or use its services” (Romanow, 2002, p. 150). Clearly, more work is needed to understand the performance of GMVs. There remains a paucity of work that has examined whether GMVs result in increased efficiency of primary care practices or increase productivity of providers. Most past work has examined processes of care as indicators for quality and limited clinical outcomes have been explored for GMVs.

### 2.5.7 Technical quality of patient care

According to the Hogg Framework, *technical quality of care* is the “traditional scope” of primary care, including health promotion, primary and secondary prevention, and the care of acute and chronic conditions (Hogg et al., 2007, p. 312). In this dissertation, impact of GMVs will include patient- and healthcare-provider-reported health outcomes, and observed health outcomes, that may be attributable to the GMV. Based on previous research, I anticipated that these outcomes would include increased patient engagement with healthcare services and improved access to care (Miller et al., 2004; Trento et al., 2001).
2.5.7.1 GMVs for people with diabetes

Most of the work exploring the performance domain using GMV’s, has been done on patients with chronic conditions, particularly focusing on GMVs for patients with diabetes (Bray & Roupe, 2005; Clancy, Cope, Magruder, Huang, Salter, et al., 2003a; Clancy, Dismuke, Magruder, Simpson, & Bradford, 2008; Juliao & Ohri, 2008; Smaldone et al., 2006; Trento et al., 2001; Weinger, 2003). Much of the outcome-based research suggests that the GMV format is a successful way to deliver care to patients with diabetes (Weinger, 2003).

However, there have been varied outcomes reported in the literature for patients with diabetes who attend GMVs. Some studies have pointed to specific positive outcomes associated with group appointments, including tighter glycemic control for patients with type 2 diabetes, better lipid control, higher levels of knowledge about the disease, and lower body mass index (Sadur et al., 2002; Trento et al., 2001). But other studies have illustrated that the outcomes associated with group appointments for diabetes failed to show any statistically significant improvement of Hemoglobin A1c (a measure of long-term blood glucose control), lipid levels, or blood pressure (Clancy, Yeager, Huang, & Magruder, 2007; Edelman et al., 2010; Schillinger et al., 2002; Taveira et al., 2010). This variation between reported outcomes was part of the reason a systematic review is needed.

Research on NPs providing GMVs is limited. During the literature review one study was identified which examined diabetic patients attending GMVs with an advanced-practice nurse in five different practice settings (Bray & Roupe, 2005). This study found that GMVs with NPs resulted in improvements in patients’ personal goals, lower cholesterol levels, and
improved personal care practices (such as use of aspirin to prevent cardiovascular disease and foot examinations to determine diabetic neuropathy) (Bray & Roupe, 2005).

2.5.7.2 GMVs for prenatal and pediatric patients and families

Rice and Slater (1997) found that GMVs were an effective way to provide prenatal education to families. The use of GMVs for families led to a decline in use of healthcare services (Rice & Slater, 1997). Patients and families who attended the GMVs were less likely to make additional primary care appointments (Rice & Slater, 1997). Rice and Slater also found GMVs led a decrease in maternal depression, which was linked to the increased support the group environment provides (1997). A major limitation with this study was that many of the potential findings, such as decreased maternal depression scores, could not be statistically analyzed due to small sample sizes, and it was recommended further studies on the topic be completed (Rice & Slater, 1997).

Patients who attended group antenatal medical visits achieved statistically significant higher rates of breastfeeding and lower incidences of preterm births than patients who did not attend group appointments (Ickovics et al., 2007).

2.5.7.3 GMVs for other chronic conditions

Another chronic condition that some primary care practices offer GMVs for is cardiovascular diseases, such as hypertension and hypercholesteremia, dysrhythmias, stroke, and heart failure. There have been two studies which used experimental design to evaluate GMVs for cardiovascular disease (Griffin, Burkiewicz, Peppers, & Warholak, 2009; Yehle, Sands, Rhynders, & Newton, 2009).

The GMV was also shown to improve patients’ knowledge about cardiovascular illness and led to improved symptom management for patients with heart failure (Yehle et al.,
Kirsh et al. (2007) found that patients with cardiovascular disease who attended group appointments experienced significant decreases in A1C, LDL, and systolic BP; A1c, (1.44 [0.8-2.1], p<0.001), LDL-c (14.8 [2.3-27.4], p<0.02), and lowered systolic blood pressure control (16.0 [9.7-22.3], p <0.001).

One study evaluating outcomes for patients who attended group medical appointments in Kansas reported that patients experienced improvements in their body weights and reductions in cholesterol levels as compared to patients who did not attend group medical appointments (Murray & Everson, 2005); however, this GMV was for all patients with “diseases requiring lifestyle modification” and it is therefore difficult to apply the reported outcomes to any specific population or condition. Additionally, this population consisted of all females and only included a sample size of five patients.

Group medical visits have also been reported to have positive impacts on patients with COPD. Group medical visits were reported to improve patients’ exercise tolerance levels compared to regular one-on-one appointments for patients with COPD. In this study, patients had a clinically significant difference in 6 minute walking (MW) distance (pre-GMV 6MW 745.2 feet [SD = 146.2], post GMV 1204.3ft [SD = 268.45] p<0.001) (De Vries, Darling-Fisher, Thomas, & Belanger-Shugart, 2008). However, this study also found that the GMV did not result in a statistically significant reduction in the utilization of other healthcare services (such as emergency room visits) for patients with COPD (De Vries et al., 2008). De Vries et al. (2008) also reported that patients who attended GMVs were screened for depression as a result of participating in the group appointment and that the GMV led to increased preventative health screenings and referrals.
The model of the group appointment has also been reported to be beneficial for elderly patients experiencing dementia and also for their extended families (Lessig et al., 2006). While the study on GMVs and dementia did not assess specific patient outcomes, it did evaluate patient and provider comments regarding the care-delivery model. Both patients and providers in this study indicated that the GMV format allows for increased support and collaboration between patients and families, resulting in the reduction of fear associated with dementia and increased support to both families and patients, improving self-management of the condition (Lessig et al., 2006).

2.5.8 Gaps in knowledge about GMVs and NPs

A review of the literature has illustrated some clear gaps in knowledge about GMVs and NPs. One of the largest challenges is that there is a wide variation on the effect of GMVs in the area of technical quality of care. Some studies have shown that GMVs are associated with lowering blood glucose levels while other studies suggest the opposite. In part, this could be due to differences in the sample sizes, response rates, and methods used. There is also a paucity of research done on GMVs for chronic conditions other than diabetes, such as heart disease, COPD, or chronic pain. Chronic conditions such as metabolic syndrome have not been examined within the GMV research, yet experiences in BC have indicated that GMVs for other chronic conditions are occurring.

While a small systematic review of group medical visits studying quantitative research of GMV for diabetes had been completed, a review focusing on quantitative and qualitative research with a meta-analysis had not been completed. While past research has illustrated that GMVs allow for more dialogue between patients and providers and that both patients and providers feel increased support with this model, why or how this happens
remains unknown. Additionally, little is known about the process of the GMV as it relates to the knowledge and skillset of the healthcare provider. Uncertainties continue to exist in the areas of performance and technical quality of care domains. To date, no evidence in the peer-reviewed literature exists about the skills or knowledge that healthcare providers need in order to facilitate GMVs.

Most of the literature on GMVs has examined the “how-to” process of GMV implementation, or examined GMVs for specific patient populations (such as those with diabetes). Yet, within these populations, there has been little work done examining for which configurations of patients the GMV might be more beneficial. For example, GMVs may work better for one sex or gender more than the other, or one specific age group (such as elderly or young persons) or for patients who are experiencing one type of chronic illness or for patients with multi-morbidities.

There is ample evidence supporting that NP care is safe and effective (DiCenso, 2008; Horrocks et al., 2002; Sackett et al., 1974) and it is known that NPs provide care to patients through GMVs. Previous studies on the role of the NP in GMVs have been mainly descriptive, focusing on clinical tasks of NPs engaged in GMVs (Bray & Roupe, 2005; S. Kirsh et al., 2007). There has been no research examining the patient perspectives of impact of the GMV with NPs. In additional to the lack of studies examining GMVs with NPs, there was no research found examining how NPs diffuse or engage in primary care innovations.

Nurse practitioners and GMVs are both viewed as new and innovative ways to address the primary care access problems facing patients. Nurse practitioners and GMVs have also been shown to be linked to positive patient health outcomes. As primary care reform continues in Canada, examining how innovative approaches to primary care intersect,
including how NPs engage in innovation, and what impact this might have for patients and families, is a necessary step in health services evaluation. This study addresses these gaps by examining both the health system structural domain (e.g., NP scope of practice, remuneration, and the ways in which the healthcare system is organized) and performance (e.g., the process of the group appointment, the knowledge and skillset of the healthcare providers, access to care, and outcomes) of GMVs.

2.6 Summary

This chapter has presented the background of GMVs and introduced the conceptual framework used to inform this study. Using this framework, I summarized what is known about NPs, chronic condition self-management, and GMVs within the context of primary care. The Framework for Primary Care Organizations draws attention to the context of the HHR within primary-care organizations and outlines the structural and performance aspects of primary-care organizations from this HHR perspective. The Framework for Primary Care Organizations does not provide guidance on why or how certain types of healthcare providers should be implemented or who should be made part of the primary care team.

While the organizational framework provides perspective on how to approach primary care research from a larger health system perspective, it doesn’t provide specific directions for primary care organization. And while the performance domain attunes us to specific characteristics in health-service delivery, it does not examine specific patient indicators, or what effect a high performing primary-care practice site might have on patients’ self-management or quality of life. Additionally, the structural aspects of a primary healthcare organization are not static, and yet the framework doesn’t address how one might examine the changes that are occurring within a primary care practice (such as the
implementation of new healthcare providers or newer ways to deliver care services),
neglecting some of the complexity of the primary care environment.

This study contributes to a broader understanding of the delivery of PHC and
provides information on the process of implementing and offering GMVs in primary care in
BC. The results of this study contribute to the growing body of advanced-practice nursing
research in Canada and the evidence produced in this study can further help decision-makers
and NPs to optimize primary care delivery for patients and families who experience chronic
conditions.
CHAPTER 3: METHODS

3.1 Introduction

In chapter three, I introduce the methodology used for the overall study and provide background information on the theoretical approaches and analytic method.

This dissertation proposal was defended on September 14, 2011. The project received approval by the UBC ethics committee December 11, 2012, approval from Vancouver Coastal Health on December 11, 2012, and approval from the Northern Health Research Review Committee on June 11, 2013. The systematic review/meta-analysis was completed March 2013. Data collection for the case studies commenced in July 2013, and analysis was ongoing throughout the data collection period of July 2013–March 2014.

3.1.1 Overall study design

This dissertation used multiple methods to explore the use of GMVs with NPs by patients with chronic conditions. Multiple methods are studies in which more than one method is used to gather data (Melia, 2010). This is different from mixed methods, which seek to incorporate data from both quantitative and qualitative studies through a process of data integration (Creswell, Fetters, & Ivankova, 2004; Giacomini, 2010; Melia, 2010). The multiple methods used for this study included meta-analysis and case study, where data were gathered through in-depth interviews and GMV observation.

3.2 Meta-Analysis

To answer research question one (Based on a systematic review of the literature, how do GMVs impact the quality of care for people living with type I and type II diabetes?), I conducted a systematic review and meta-analysis. A “systematic review” is a process of gathering and synthesizing the available evidence regarding a particular research question (J
Meta-analysis is a statistical method in which results from multiple studies are combined and synthesized (Ankem, 2005; Haidich, 2010; Higgins & Green, 2011). Meta-analysis of data is useful because it provides more accurate results and increases power, or reduces the chance of a type II error (Ankem, 2005, p. 165). Meta-analysis allows for a comparison of differences across studies and consideration of how consistent the evidence is between studies (Higgins & Green, 2011).

Within each meta-analysis, different statistical measures and models can be used; each researcher must make specific statistical choices based on the type of data being synthesized (Ankem, 2005). For example, the researcher may want to synthesize the data from a first and second study, and then compare it to the data from a third study. This method is known as cumulative meta-analysis and allows the researcher to examine how the data shifts over time (Clarke, Brice, & Chalmers, 2014). Another approach is the network meta-analysis or multiple treatment meta-analysis. A network meta-analysis compares data that were not initially compared in the original studies by combining two data sets and comparing the overall pooled effect against the subsequent data sets (Brignardello-Petersen, Rochwerg, & Guyatt, 2014). This allows the researcher to compare various interventions during the analysis process. An additional method of meta-analysis is the prospective meta-analysis, where researchers agree on how to pool or aggregate the data prior to commencing the original studies (Gelijns, 1990). Other methods include the hierarchical model, which uses a multilevel statistical framework, or multilevel models, to analyze the data (Higgins & Green, 2011). The hierarchical method ranks studies at higher and lower levels based on the rigor of the study, and can help to explain significant differences between studies when using a random-effects model (Higgins & Green, 2011). The Bayesian method for meta-analysis is
another approach. This method allows for the incorporation of prior knowledge of the data set being examined (Sutton & Abrams, 2001). Using the Bayesian method, the researcher is able to calculate the probability that the odds ratio has a range of possible values (Sutton & Abrams, 2001).

In medicine RCTs are considered the best way to provide evidence of healthcare interventions (Altman et al., 2001). Therefore, to change practice and influence guidelines for primary care, researchers should seek opportunities to assess clinical interventions using RCTs whenever possible. However, careful consideration of the rigor in the design and execution of the RCT must also be considered (Altman et al., 2001, p. 663). The Cochrane Collaboration provide a clear and rigorous method on how to perform a systematic review and meta-analysis (Alper, Fedorowicz, & van Zuuren, 2015; Chandler & Hopewell, 2013). Using the methods outlined by the Cochrane Collaboration, researchers are instructed to try and include only randomized controlled trials (RCTs) in the meta-analysis, while non-RCTs may be used to inform the discussion and background (Higgins & Green, 2011). These guidelines have been created to ensure that the analysis is pooling results from studies in which the intervention and control groups are not substantially different at baseline measurements (Higgins & Green, 2011). Meta-analysis which include non-randomized studies may have challenges with potential confounders, increasing the risk of bias (Higgins & Green, 2011). The Cochrane Collaboration also recommends the exclusion of unpublished findings (Higgins & Green, 2011). While there are guidelines on the types of studies to include in the analysis, the researcher has flexibility to determine the appropriate statistical analysis for the data set.
These guidelines do create some limitations for Cochrane reviews. The exclusion of unpublished data (Jadad & Haynes, 1998) and the inclusion of only RCTs have been cited as a significant limitation to Cochrane meta-analysis (Cundiff, 2007), as many non-RCTs could include outcome data which could influence the meta-analysis results. Despite those limitations, the Cochrane method is a rigorous and widely recognized way of conducting systematic reviews and meta-analysis within healthcare (Alper, Fedorowicz & van Zuuren, 2015). For these reasons, I used Cochrane’s methods for systematic review and meta-analysis. Non-RCT data were used to inform the background and discussion of the systematic review, and only RCT data were pooled in the analysis. Statistical decisions were made based on recommendations for Cochrane Collaboration reviews and the available published data on GMVs.

3.2.1 Systematic review and meta-analysis procedures

I conducted a comprehensive search of the literature, from database inception to February 2012. The databases included were: MEDLINE (PubMed), CINAHL, Biosis, ProQuest Dissertations and Theses, Embase, Web of Science, Psych Info, and the Cochrane Database of Systematic Reviews. I also conducted a search of gray literature and a hand search of bibliographies of selected articles. I consulted with a librarian three times during the search procedures to review search strategies and discuss search terms (Appendix A).

Inclusion of each study was determined using a three-step process. First, I and two of my committee members (SW and MD) independently screened the titles of relevant studies. Second, if titles were deemed relevant, abstracts were independently reviewed by two of us. Finally, if abstracts were deemed relevant, full-text articles were independently

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1 The information presented in section: 3.3.1 Systematic review and meta-analysis procedures, has been adapted from the first publication, and can also be found in Chapter 4: Presentation of the Manuscripts.
reviewed by two of us (as described above). Decisions regarding inclusion and exclusion of studies were made by consensus between the two reviewers; disagreements were resolved by the third reviewer as required.

I included RCTs published in English or translated into English that included patients aged 16–80 years with type 1 or 2 diabetes and had GMVs as the intervention. I excluded studies in which the intervention was for educational purposes only, or did not include a healthcare provider who could diagnose, prescribe, make referrals, and order laboratory tests. Multiple articles from the same study or group of patients were classified as “kinned” articles. I grouped kinned articles together and counted them as one study.

I collected data on study characteristics, participant demographics, and clinical and patient-reported outcomes. Where possible, sample size and post-intervention means and standard deviations (SDs) were extracted for both the intervention and usual-care groups. I extracted data from observational studies to inform the discussion. I initially extracted the data and these extractions were checked by my supervisory committee (Appendix B).

I assessed RCTs for risk of bias using the Cochrane Risk of Bias Tool (Higgins & Altman, 2008). I completed the full quality assessment of each of the articles. Congruency of the assessment was ensured by having a second reviewer independently assess quality of 5% of the included studies. A sensitivity analysis was performed in which I excluded studies that had two or more items with a high risk of bias. Because some articles included patients with either type 1 or type 2 diabetes, I conducted an additional sensitivity analysis for glycated hemoglobin (HbA1c); I excluded studies that included only patients with type 1 diabetes and studies in which the type of diabetes was unclear.
Overall effect size, significance, and funnel plots were examined for HbA1c. Results from the sensitivity analysis can be found in Appendix C.

3.2.2 Meta-analysis plan

I analyzed the data from RCTs using Review Manager software (RevMan, version 5.1, Nordic Cochrane Centre). For each RCT, I calculated the effect size to determine the mean differences between the intervention and control groups at the longest reported time after the intervention.

When conducting a meta-analysis, either a fixed or random-effects model can be used. A fixed-effects model assumes that the data are homogenous; it includes the population, sampling, and intervention (Haidich, 2010). A random-effects model assumes there is heterogeneity within and between the studies and the results obtained are considered a more conservative estimate of the pooled effect (Haidich, 2010; Sutton & Abrams, 2001). To examine study heterogeneity, I first pooled mean differences into a fixed-effects model and tested for heterogeneity using $I^2$. $I^2$ is a measure that examines the variation across the studies in the meta-analysis that is due to heterogeneity, rather than due to chance alone (Higgins, Thompson, Deeks, & Altman, 2003). When I found significant heterogeneity ($I^2 > 25\%$), the analysis was recalculated with a random-effects model. I weighted and pooled the mean differences following the Hedges method for calculating standardized mean differences (Higgins & Green, 2011).

When measures of dispersion were not reported for outcome data, I used baseline SDs or calculated SDs from reported $p$ values. When no baseline SD or $p$ values were reported, I estimated SDs from the baseline range data. When examining these estimated SDs, I found that they were conservative estimates of the value; after performing a
sensitivity analysis, I removed studies with uncertain SDs yielded improved HbA1c outcomes with a decrease in effect size.

I performed a meta-regression analysis to determine (a) if the length of time patients spent attending GMVs was related to effect size and (b) if the number of group visits a patient attended in a year was related to effect size. A meta-regression can be used to examine if a study characteristic (length or time and number of GMVs attended/ year) is associated with an intervention effect (Higgins & Green, 2011). To examine the number of group visits attended per year, I created an “intensity” value by dividing the number of appointments by the number of years of the intervention. For the meta-regression analysis, I used Stata software, version 12.1 (StataCorp LP).

3.3 Reflexive Consideration of Study Design

A multisite instrumental case-study design was used to examine the following questions: “How might GMVs influence patients’ experiences in primary care?”, “What is the role of the NP in the delivery of GMVs?”, and “Based on the findings from this study, what are implications for implementation of GMVs in the BC context?”. There are numerous study designs that were considered for the qualitative portion of this study, including grounded theory and ethnography. In this section I reflect on some of the benefits and limitations of these study designs and introduce why a case-study design was the most appropriate choice for this study.

Grounded theory (GT) can be considered both a type of qualitative study design and an analytic method. Grounded theory was developed in the social sciences by researchers Glaser & Strauss (1967). It provides specific directions on data collection and analysis and has been described as “concrete and structured” (Hussein, Hirst, Salyers, & Osuji, 2014, p.
1. These directions include constant comparison, where data collection and analysis occur simultaneously and theoretical sampling where decisions on data collection are determined by examining the theory being constructed (Glaser & Strauss, 1967; Suddaby, 2006). Unlike case-study research, which seeks to understand a phenomenon (Yin, 1981) the goal of GT is to develop theory through the analysis of the data (Glaser & Strauss, 1967). Both Glaser & Strauss (1967) and later Strauss and Corbin (1990), provide specific directions on data-collection coding and on the analysis of words or groups of words within the data (Allan, 2003, p. 1). In contrast, a case-study design provides flexibility in data collection and analysis (Rosenberg & Yates, 2007).

“Ethnography,” as a study design, is a form of qualitative inquiry that stems from anthropology (Hammersley, 2006; Munhall, 2001). Case-study and ethnographic research are similar in that they seek to understand a phenomenon within its context and provide broad and rich descriptions and understandings of the phenomena (White, Drew, & Hay, 2009). The goal of ethnography is to study the subject within the social environment (Hammersley, 2006). While focused ethnography can be done in a shorter time frame, such as a period of months (Knoblauch, 2005; Munhall, 2001), traditional ethnography has involved immersion within the subject being studied for lengthy periods of time, up to years (Hammersley, 2006). Criticisms of shorter ethnographic studies have included the risk of an “ahistorical perspective,” (Hammersley, 2006, p. 5) and it can be difficult to know if the phenomenon being observed is truly representing normal behavior in the environment. Because I initially sought to examine an NP implement a GMV, and observe GMVs for patients with chronic conditions, the timeline I had for data collection was 12 months, which may have limited the richness of ethnographic data.
A key difference between ethnography and case-study methods is the direction of perspective of the researcher. A case study seeks to look outward, providing a better understanding of the phenomena of interest (NPs and GMVs), whereas an ethnographic study looks inward, to examine the knowledge, culture and context of the participants within their environments (Cohen & Court, 2003; Spencer, 2010). A consideration of the benefits of limitations of GT, ethnography led me to choose case-study methodology as the method most suited for examining NPs in primary care practices in BC.

A multisite case-study design was used due to the complex and contextualized nature of the various primary care practices where GMVs were occurring. *Case-study design* can be described as “an in-depth investigation of a single entity or a small number of entities” (Profetto-McGrath, Polit, & Beck, 2010, p. 195). Case studies can include a single case, or can include multiple sites depending on the phenomenon of interest (Flyvbjerg, 2006). Case studies often use multiple methods, including quantitative methods, employing a number of different ways to gather data and to create a rich, in-depth understanding of the phenomenon (Yin, 1981).

Anthony and Jack (2009) describe case study research as a “practical approach to study[ing] complex subjects within their context” (p. 1172). A case-study design is appropriate when the study phenomenon is complex, because it provides flexibility in its data-collection approach; this allows the researcher to choose the best data-collection methods to examine the phenomenon (Rosenberg & Yates, 2007). Case studies can also be used to generate hypothesis and theories and explain complex situations (Fisher & Ziviani, 2004; Flyvbjerg, 2006). They answer the “how” and “why” of research questions, while providing information on the contextual conditions and how these are relevant to the case
(Baxter & Jack, 2008). When examining healthcare interventions that are process based or involving many different factors, a case study can help understand the system and how this might affect the research phenomenon (Fisher & Ziviani, 2004).

There are numerous types of case study designs that can be used. These case-study designs have been described as exploratory, explanatory, descriptive, intrinsic, instrumental and collective (Baxter & Jack, 2008; Stake, 2000; Yin, 2009). An exploratory case-study design is used to explore a phenomena with no clear outcome and is often used in preliminary research (Mills, 2010; Yin, 2009). An explanatory case-study design seeks to answer casual links between complex interventions (Yin, 2009). A descriptive case-study design describes a phenomena in a real-life context (Yin, 2009). An intrinsic design is suggested for researchers who want to better understand one particular case without the intention to develop theory or make generalizations (Stake, 2000).

In this study I used an instrumental case study design. An instrumental design is an in-depth study which seeks to provide insight to a phenomenon in order to better understand an issue, and to draw generalizations from the case or refine a theory (Baxter & Jack, 2008; Stake, 2000); it also supports the understanding of different phenomena (Baxter & Jack, 2008).

Instrumental designs allow the researcher to look at more than just a particular situation, but to add to, or refine, a theoretical idea about a phenomenon. In this dissertation, the case studies are aimed at generating new knowledge concerning NPs and GMVs, the GMV for patients with chronic conditions, and the impacts of GMVs as an innovation. Unlike many other forms of research designs, the case-study approach situates the research
and the research question within its context, recognizing that context is a key factor in the research outcomes and process (Bergen & While, 2000; R.E Stake, 2000).

Yin (2009) also acknowledges that personal knowledge of the subject is an essential element of case-study methodology. This personal knowledge contributes to the ability of the researcher to develop prepositions that guide the case (Yin, 2009). As a primary care NP, my experiences as a clinician guided my formulation of the study questions and the underlying propositions to be examined “within the scope of the study” (Yin, 2009, p. 28).

**3.4 Overview of Case-Study**

Between July 2013 and March 2014, data were collected from three cases. Case one involved a primary-care practice in rural BC where an NP was offering GMVs focused on healthy living and nutrition for clients with chronic conditions such as diabetes, obesity, heart disease, and arthritis (N=6). Case two included a primary care practice in a large urban center where the NP worked with a team of healthcare providers to offer GMVs targeting people who have diabetes (N=11).

At the onset of this study, the goal was to include a third case where an NP implemented a new GMV and to observe the diffusion of the GMV into the practice. However, after six months of recruitment I was unable to find an NP who was willing and able to implement a GMV. Therefore, in August 2013, the third case was altered to include NPs in BC who were not using GMVs in their practice (N=7). The case study included 10 hours of direct observation and in-depth interviews with patients and healthcare providers. It is important to note that this study did attempt to include interviews with patients who had been invited to attend GMVs but had declined to participate. However, neither clinic kept records of patients who had declined to attend GMVs, nor did any patients respond to
recruitment posters (Appendix J) placed at visible locations in each clinic throughout the data-collection process.

Figure 3: Multisite case study overview

My experience working with GMVs, knowledge of GMV research and my theoretical framework of Diffusion of Innovation guided the development of the following propositions:

1. GMVs are an innovation with opportunities to improve patient outcomes
2. GMVs are within the scope of practice of NPs
3. NPs have a role to play in the delivery of GMVs
As the study progressed, an additional proposition was added, which developed during the recruitment process, and guided the development of the questions for the third case.

4. NPs face challenges in diffusing healthcare innovations such as GMVs

It is important to clearly define the boundaries, or the unit of analysis of the case, prior to starting the research (Baxter & Jack, 2008). Two cases in this study were primary-care practices in which GMVs were delivered by NPs in both urban and rural BC. The boundaries of these two cases case were the primary-care practice and the immediate surrounding context in which care was delivered. For example, in one case the NP provided the GMV care at a location outside of the clinic.

The boundaries of the emerging, or conceptual case, were more theoretical and include NPs in BC who were working in primary care practices with adults and who were not using GMVs in their practice. This case also included an examination of the immediate context in which NPs provide primary care services to their patients. To provide further information on the scope of this project and the boundaries of the cases, I designed a schematic diagram (Figure 4). This visual representation in case-study research is meant to provide further understanding of the research elements and how they relate to one another (Rosenberg & Yates, 2007). A case study schematic can also help to “maintain the rigour and methodological integrity of the case study” (Rosenberg & Yates, 2007, p. 448). A schematic diagram helps the researcher set the conceptual boundaries of the case and is used throughout the research process to guide data collection (Rosenberg & Yates, 2007).
Figure 4: Schematic representation of case-study research design
3.4.1 Theoretical approaches

Initially, I was drawn to complexity theory because it provides a lens from which to examine the various interconnected parts that contribute to the delivery and management of patients in primary care. Complexity theory recognizes that the healthcare system is more like a living organism than it is like a machine due to the human component within the system (Begun & Zimmerman, 2003). However, after discussion with the healthcare providers offering GMVs and the challenges I encountered in recruiting an NP to implement a GMV, it became apparent that change theory, specifically, Rogers Diffusion of Innovation theory (2003), was a more appropriate theoretical lens to apply in this dissertation. Furthermore, as the analysis progressed, the concept of power was identified as an area of key importance in the data. To better understand this concept, I drew upon elements of Foucault’s perspectives on power. In this section I will discuss these theories and how they were used to inform the data analysis.

3.4.1.1 Diffusion of innovation theory

Diffusion of Innovation theory was first introduced by Rogers to explain how innovations, either new ideas or practices, are diffused over time among a social system (1963). In Diffusion of Innovation theory, Rogers (2003) described the communication channels that the adopter goes through prior to and during the adoption of an innovation:
knowledge, persuasion, decision, implementation, and confirmation.

Knowledge refers to the adopter’s understanding or awareness of the innovation (Rogers, 2003; Sanni, Ngah, Karim, Abdullah, & Waheed, 2013). Persuasion refers to the interest in the innovation, including actively seeking information related to the innovation (Rogers, 2003). It is the process of persuasion that helps the innovator determine whether or not to diffuse the innovation, and it also informs their decision to accept or reject the innovation (Rogers, 2003). During the implementation phase, the adopter implements the innovation, and during the confirmation phase the adopter determines if the innovation, or the use of the innovation, will continue or stop (Rogers, 2003). The decision to adopt or reject an innovation is directly related to the five characteristics of an innovation. These include relative advantage, compatibility, complexity, trialability, and observability (Rogers, 1995).

*Relative advantage* is the perception that the innovation is an improvement over the current practice or idea. To diffuse an innovation, the adopter needs to perceive that there are
advantages over the current system. The term “relative advantage” relies on the adopter’s perception of the diffusion rather than the known advantages. Rogers (2003) demonstrated that the more advantageous the innovation was perceived to be, the faster and more likely it was to be adopted.

Compatibility refers to how “compatible” the adopter feels the innovation is. This includes how the innovation fits with the perceived needs of the adopter, and if it’s compatible with the values of the adopter (Rogers, 2003).

Complexity refers to how complex the adopter feels the innovation is. The more complex the innovation is perceived to be, the less likely it is to be adopted (Rogers, 2003).

Trialability refers to the ability for the adopter to “try” or “trial” the innovation, often in smaller incremental steps. This characteristic may be challenging in healthcare since many healthcare innovations are complex and involve multiple individuals and organizational factors.

Lastly, Rogers (2003) outlines the characteristic of observability. This refers to the ability of the adopter to observe the innovation in action. Rogers (2003) proposed that if an innovation was readily observable, then it would be more likely to be adopted.

Rogers (2003) acknowledges that the adoption of innovation is complicated, and even when the innovation has recognized advantages, its adoption is not always successful. Diffusion theory points to the innovation (GMVs) as the specific “change agent” that is taken up within a social system, and rate of adoption of diffusion of this is dependent upon on a number of factors, including the process by which the individuals interact with the innovation and whether they understand the innovation (Rogers, 1995). Due to their relatively limited uptake in BC, both NPs and GMVs may be considered innovative. Diffusion of Innovation
theory provides direction on examining the intersection of two innovations, both GMVs and NPs in BC. Diffusion of Innovation theory calls for recognition that the diffusion of GMVs with NPs in primary care is directly related to how the innovation is understood. With NPs as the “agent” of behavior change, and GMVs as the subject of the behavior change (Rogers 2003).

Much of the use of DOI theory in healthcare has involved the adoption of healthcare technologies (Antwi, Antwi, Yiranbon, Lulin, & Maxwell, 2014; Rajagopalan, Deshmukh, & Deshmukh, 2010; Ward & Ward, 2013; Zhou, Zhou, Shi, Mao, Tang, & Zeng 2014), although it has been used in other areas of healthcare research including the dissemination of clinical knowledge (Kovach, Morgan, Noonan, & Brondino, 2008; Sanson-Fisher, 2004) and dissemination of knowledge in nursing (Archibald & Clark, 2014; Doyle, Garrett, & Currie, 2014; Torre & Crowley, 2011). Diffusion of innovation theory is less often applied to the diffusion of health-service innovations, such as GMVs.

3.4.1.2 Power theory

During data analysis, an important concept that developed was that of “power:” that is, how healthcare providers, with different levels of agency, or personal power and authority (Davies, 1991) face challenges with diffusion of innovation. Therefore, this study also drew on Foucault’s understanding of power as “the ways in which human beings are ‘made subject’, or who they understand themselves to be, and ‘made subject to’, or subjected to control and dependence”, in the analysis.” (Foucault, 1982, p. 212).

Knowledge and power are concepts that are intertwined (Foucault, 1982); the acquisition of knowledge intensifies the acquisition of power (Roberts, 2005, p. 35). These ideas supported an examination of power structures and hierarchies in healthcare. These
hierarchies have traditionally attributed “less authority” and knowledge to nurses than physicians (Zelek & Phillips, 2003) and have potentially served as an oppressive force to the diffusion of healthcare innovations. Through advanced clinical knowledge, NPs have the opportunity to exercise additional power than when they worked as RNs. This additional power includes prescriptive and diagnostic authority, the ability to make referrals, to interpret laboratory tests, and to work autonomously in primary care (CRNBC, 2015a).

Yet, there remains historical hierarchical power dynamics that exist between nursing and medicine (Arcangelo, 1994; Henneman, 1995; L. Housden, Wong, Browne, & Dawes, 2015a; Lockhart-Wood, 2000; Manojlovich, 2007; McKay & Narasimhan, 2012; Radcliffe, 2000; Zelek & Phillips, 2003). The ways of working together are influenced by the way power has traditionally been distributed between nursing and medicine and developed for a number of reasons, including the gendered role of nurses (Fletcher & Con, 2006; Zelek & Phillips, 2003) and the ways in which orders have traditionally flowed vertically from medicine to nursing (Fisher, 2010). Nurse practitioners “subjective identity” (Foucault, 1982) remains that of nursing, so while NPs are able to exercise additional power, the NPs subjective identity may influence how they exercise power and interact within the healthcare system.

3.4.3 Establishing credibility

Yin’s approaches to determining credibility and quality in case-study research has been challenged in qualitative research due to positivist origins (Angen, 2000; Creswell & Miller, 2000; Cutcliffe & McKenna, 1999) and the underlying idea that the world can be objectively measured and understood. Quality of data collected is assessed in Yin’s case-study research through four criteria in the research design: construct validity, internal
validity, external validity, and reliability (Yin, 2009; Yin, 1981). Yin (2009) defines *construct validity* as “identifying correct operational measures for the concepts being studied” and recommends that the researcher use multiple sources of evidence, establish evidence chains, and work with key informants to review the information collected (p. 40).

Yin describes *internal validity* as the attempt to establish a causal relationship within the case. He recommends pattern matching, explanation building, exploring rival explanations, and logic modeling (Yin, 2009).

*External validity* is described as the ability for the study to be generalizable. To ensure external validity, Yin (2009) recommends ensuring theory is present in case-study research and that the researcher pay attention to replication in multicase sites. Finally, to ensure reliability, or that the operations of the study can be repeated, Yin (2009) recommends that a strict case-study protocol and database be maintained.

Yin (1981) states that adhering to these criteria helps to ensure credibility, and that the information obtained through the research is accurate and represents the phenomena under investigation. Many of the approaches that Yin describes as ways to ensure credibility in case-study research can be applied to ensure validation or trustworthiness in the human context (Angen, 2000), including member-checking and reflexivity.

For this case study, I determined the credibility or accuracy of the data collected based on a combination of Yin’s criteria for establishing credibility and qualitative criteria for establishing credibility in interpretive research. Additionally, this study included multiple sources of evidence and careful consideration of patterns emerging within and between the cases.
A key feature in ensuring validation in interpretive research is that the researcher must illustrate the value of the research, ensuring that the audience knows the work is a “worthwhile interpretation” (Angen, 2000, p. 391). The value of this research is that it is directly relevant to NPs and other healthcare providers working with patients who have chronic conditions and also to policy-makers engaged in primary-care redesign.

This study also has specific and important implications for patients who live with chronic conditions. Moreover, this research has the opportunity to contribute to a broader understanding of NP care for patients with chronic conditions and may help to articulate some of the complex factors affecting NP practice in the current BC context. NP respondents were also consulted after the data analysis to discuss and verify the findings. Only NP respondents were contacted to discuss the findings given budgetary limitations and because what patients told us was similar to what had already been reported in the literature.

Another key feature of research that ensures validation of the interpretive results is the importance of the researcher articulating their own position (Yin, 2009). I therefore documented self-reflections throughout data collection and analysis of qualitative data, in separate documents. The self-reflection process is recommended in interpretive descriptive research as a way for the researcher to attempt to trace the thought and conceptual development of the data analysis (Thorne, 2008). Through this reflective process, I considered my own role in the project and my own biases before, during, and after data collection.

For example, I noted that knowledge on the positive impacts of the GMV obtained through the systematic review and meta-analysis could influence my understanding of patient perceptions of GMVs, portraying them in a more positive light. Therefore, I considered how
I was asking participants about GMVs and carefully considered aspects of GMVs that patients noted they didn’t like. These self-reflections assisted me in understanding how the cases had been constructed and how I had interpreted the data throughout the qualitative data collection (Sandelowski & Barroso, 2003).

A third feature outlined by Angen (2000) to ensure validation in interpretive research is making work “visible”. The result of this dissertation is presented in three manuscripts (two published, one accepted for publication), helping to ensure that the findings from this study are available to a wider audience.

Finally, conclusions made at the completion of the project remain open to new interpretations of the data (Angen, 2000). This is further supported through the use of an instrumental case-study design in which the case study informs our understanding of a phenomenon and provides insights into issues or situations (Baxter & Jack, 2008; Stake, 2000; Yin, 2009). It is implicit within the use of the term “informs” that some understanding of the situation or “case” must exist already. In this way, the final results of this case study and the systematic review/meta-analysis were integrated and discussed and will remain open to further understanding and dialogue regarding NPs and chronic condition management in primary care.

3.4.3.1 Eligibility and procedures

3.4.3.1.1 Inclusion criteria case 1 and 2: NP-led GMVs

Inclusion criteria for patients in cases one and two, the NP-led GMVs, were: adults aged 18–80 years old who were English-speaking and attending GMVs for one or more

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2 The information presented in 3.5.4.1 Eligibility and procedures has been adapted from the second and third publication and can also be found in Chapter 4: Presentation of the Manuscripts.
chronic condition. Patients were required to have attended a GMV with an NP at least twice in the past 12 months. Inclusion criteria for providers were involvement in at least two GMVs in the past 12 months.

Healthcare providers offering GMVs were asked if a research team member could attend and observe the medical appointment. Patients were then notified of the study in writing and were provided with study information in advance of our researcher attending their GMV (Appendix D). Consent was obtained from all participants prior to direct observation (Appendix E). During direct observation, data were gathered to better understand how the GMV functioned including data on the physical space, format of the GMV, interpersonal interactions, body language, roles, participation, and presentation styles.

After attendance at the GMV, I remained at the clinic to discuss the project and gather contact information for patients and healthcare providers interested in participating in in-depth interviews to share their experiences. Interview questions were open-ended and designed to examine patient and healthcare-provider perspectives on how GMVs with NPs could impact both patient’s health and the broader clinical environment (Appendix F). Participants were given the opportunity to participate via phone or in person, depending on geographic location (Appendix G). Individuals who expressed interest were contacted a maximum of three times to participate.

3.4.3.1.2 Inclusion criteria case 3: NPs not offering GMVs

The third case included primary care NPs working in two British Columbian health authorities. Eligibility of NPs was: working in a primary care setting and not currently using GMVs. Nurse practitioners who had previously participated in GMVs but were no longer using GMVs were eligible to participate. Sampling for the case was purposeful and
theoretical (Coyne, 1997; Thorne, 2008). Sampling for the case was purposeful in that I selected NPs who were not using GMVs, and theoretical because it was based on the earlier analysis that barriers to NPs diffusing GMVs were an important area to explore. I created a list of NPs working in primary care in two health authorities using publicly available information. I sent initial email inquiries to 15 NPs introducing the project and establishing whether or not the NPs were using GMVs to deliver care to their patients. Fourteen NPs were also contacted through their health authorities communities of practice to invite them to participate.

Nurse practitioners (N = 7) who identified that they were not utilizing GMVs were invited to participate in an in-depth interview either in person or over the telephone depending on geographic location. Open-ended questions were designed to examine participant’s knowledge and experiences with GMVs as well as examine perspectives on what NPs could contribute to the care of patients through GMVs (Appendix F).

Once NPs agreed to participate, I emailed consent forms for review and consent, either signed or verbal, was obtained before interviews were conducted (Appendix E). I contacted NPs a maximum of three times to invite them to participate in the interviews.

3.4.4. Data quality management

Case one and two included interviews and direct observation with patients and healthcare providers, and case three included interviews with healthcare providers. All interviews were recorded, transcribed verbatim, and de-identified. Interviews were assigned a unique study identification. Detailed field notes during the recruitment, interview, and direct observation process were also transcribed and used to inform the analysis. Ethics approval was obtained from the Ethics Boards of the University of British Columbia and from the two
health authorities where the NPs practiced. Yin (2009) also recommends a clear case study protocol and database to ensure reliability; therefore clear audit trail was maintained throughout the study. This audit trail consisted of all documents created for the purposes of the project, as well as any changes to these documents.

3.4.5 Analytic method: Interpretive description

While case-study research does provide some direction on analytic methods, it also allows for flexibility in study design and analysis (Rosenberg & Yates, 2007). Since the qualitative portion of this study uses nursing knowledge and practice as its foundation, I also sought an analytic approach derived from a nursing epistemology to guide the analysis.

Both interpretive description and case study seek to describe a phenomenon (the case) and generate possible explanations (Darke, Shanks, & Broadbent, 1998). Interpretive description, as described by Thorne (2008), is a method of qualitative inquiry in which the researcher recognizes that the human experience of health and or illness consists of complex interactions between psychosocial and biological phenomena. Interpretive descriptive methods seek to explore the contextual aspects of the phenomenon with health and illness (Thorne, 2008). Interpretive description draws on a number of other disciplines, including sociology, anthropology and philosophy (Thorne, Kirkham, & MacDonald-Emes, 1997; Thorne, Reimer Kirkham, & O’Flynn-Magee, 2008; Thorne, 2008).

Interpretive descriptive methods allow the researcher to develop complex conceptualizations about the clinically relevant phenomenon and explore meaning and explanations that may have implications for nursing practice (Thorne et al., 1997, 2008). Interpretive descriptive methodology supports the exploration of complex clinical systems and allows the researcher to expand the clinical knowledge about a particular situation.
In this study, I sought to explore the complex, contextualized environment of the GMV and the ways in which NPs provide care through the GMV. Therefore, the combination of case study and interpretive descriptive methods provided a rich, detailed, and nursing-focused exploration of the impact of NP-led GMVs for patients with chronic conditions in BC, both within and between cases.

Case-study designs often require multiple methods of data collection from multiple sources. Analyzing case study data to examine data within each case as well as across cases (Creswell et al., 2004). I explored the data within each case and compared the data between cases.

A between- and within-case examination allowed for examination of the different practice environments, the population, the health systems structural domain, and organization of the community. In this study, the data integration was done both during the data-collection process and at the end of the data collection. Data integration included an analysis of the thematic similarities within the case as well as the differences, with careful attention given to the different subcategories that I analyzed within each case and the various complex relationships within each case. I completed the qualitative data collection in sequential steps so that I was able to build upon the data-collection process and reflect on the concepts that were developing. These between and within-case results are presented in manuscripts two and three.

Data were initially read and reread and themes were developed from a process of constant comparative analysis (Thorne et al., 2008; Thorne, 2008). Data were first organized into broad conceptual categories using an open coding procedure, which included deductive and inductive approaches. I met with my supervisory committee members to discuss the data
and the initial broad conceptual categories. As more data were read, conceptual categories and the initial codes were refined. My supervisory committee members participated by reviewing transcripts, engaging in some of the coding, and reviewing and discussing the logic of the coding categories, and the themes reflected in the data. The third step in the coding process included the development of more thematic codes and subcodes (Appendix H).

These broad categories were explored in-depth, taking into account similarities and differences emerging in the data, both between and within cases. Data were then aggregated further into descriptive themes, and patterns and relationships between the data and each case were examined through the use of visual mapping.

Yin (2009) calls upon case-study research to include pattern matching and explanation building as part of ensuring internal validity. “Pattern matching” and “explanation building” can be linked through the idea of concept mapping (Thorne, Reimer Kirkham, & O’Flynn-Magee, 2008), where ideas and concepts were explored for their meaning and relationship to one another.

Concept mapping, using the program XMind Pro (XMind Ltd, 2012) was done throughout the analysis. Each case was mapped by outlining descriptive themes, and considering the patterns and relationships between the cases, including similarities and differences between cases. Common themes were visually connected on the concept maps. To further clarify the logic and patterns in the concept map, I met with my supervisory committee to discuss the visual representation of the data, which helped to further refine the framing the findings.
CHAPTER 4: PRESENTATION OF THE MANUSCRIPTS

4.1 Introduction

This dissertation used multiple-methods inquiry to explore the impact of GMVs for patients with chronic conditions including a systematic review and meta-analysis, and case study, providing an overall rich description of the impact of GMVs for patients with chronic conditions in primary care. In this chapter I present the three manuscripts developed based on this study.

Manuscript one presents the results from the systematic review and meta-analysis of group medical visits for people who have diabetes. Manuscripts two and three report on the findings of the case study. Yin’s case study methodology was used to guide and frame the inquiry on the impact of GMVs for patients with chronic conditions and their healthcare providers, including interviews and direct observation. Manuscript two is the presentation of the findings from the third case, which included NPs in BC who were not using GMVs in their primary-care practices. Manuscript three is the findings from the cross-case analysis, where findings from both patients and providers who were involved in GMVs as well as the findings from the NPs who were not using GMVs were analyzed using cross-case methods.

4.2 Effectiveness of Group Medical Visits for Improving Diabetes Care: A Systematic Review and Meta-analysis

4.2.1 Summary

Background: Group medical visits, whereby health care professionals meet with groups of patients who have the same disease, have been introduced in primary care as a way to

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meet the increasing demand for health care delivery to patients with chronic diseases. We performed a systematic review and meta-analysis of the evidence on the effectiveness of such visits for patients with diabetes.

**Methods:** We conducted a systematic review of all relevant studies published from 1947 to February 2012 identified in a search of electronic databases and grey literature. We included RCTs and observational studies published in English that included patients aged 16–80 years with type 1 or 2 diabetes and that had group medical visits as the intervention. These studies were assessed for methodologic quality. We included data only from the RCTs in the meta-analysis.

**Results:** Of the 94 studies identified, we selected 26 that met our inclusion criteria, 13 of which were RCTs. Group medical visits had a positive effect on clinical and patient-reported outcomes, with significant reductions in glycated hemoglobin (HbA1c reduction $-0.46\%$, 95% confidence interval $-0.80\%$ to $-0.31\%$). We were unable to assess the effect of group medical visits on processes of care because of an insufficient number of RCTs that reported on this outcome.

**Interpretation:** Group medical visits for patients with diabetes were found to be effective in terms of reducing HbA1c. The results of our meta-analysis suggest that wider implementation of group medical visits for patients with diabetes will have a positive effect on patient outcomes.

**4.2.2 Introduction**

Increasing evidence shows that strengthening the foundation of primary health care will lead to improved health and provide better management for people with one or
more chronic conditions (Epping-Jordan, Pruitt, Bengoa, & Wagner, 2004). In Canada, increased attention on the primary health care system is particularly important given the growing number of people living with one or more chronic conditions (Fortin, Bravo, Hudon, Vanasse, & Lapointe, 2005). The move to renew and redesign primary care has led to a number of innovations, including group medical visits (General Practice Services Committee, 2009).

Group medical visits (GMVs) are a format for health care delivery whereby medical appointments are offered to a group of patients with the same disease instead of the conventional one-to-one patient–provider format (Bodenheimer & Grumbach, 2007). During the group visit, patients receive a health evaluation and educational information about their condition and about the prevention of complications and disease progression, and they may have prescriptions, referrals, and laboratory tests ordered. The visit is usually facilitated by a physician or a NPs and may involve other interdisciplinary team members such as a registered nurse, nutritionist and pharmacist (Kirsh et al., 2007).

Group medical visits offer an ideal format for patients with chronic diseases because they allow health care providers to provide care to 12–15 patients in one appointment and enable patients to interact with people who share their condition. In Canada, group medical visits are increasingly being used to provide primary health care to patients with diabetes (General Practice Services Committee, 2009). Type 1 and type 2 diabetes affect about 6.8% of the Canadian population (Public Health Agency of Canada, 2011). Social support from peers with diabetes has been shown to improve some clinical outcomes (Smith et al., 2011; van Dam et al., 2005).
Although health care providers have reported this care model to be an effective way to deliver care (Bartley & Haney, 2010; Beck et al., 1997; Bronson & Maxwell, 2004; J. Scott & Robertson, 1996), data are limited and differ on the impact of group medical visits on patient outcomes. We conducted a systematic review and meta-analysis to measure the effect of group medical visits on biophysical, process-of-care, and patient-reported outcomes among patients with type 1 and 2 diabetes.

4.2.3 Methods

We used the PICO (population, intervention, comparison and outcome) approach to develop the research question for our systematic review — population: patients with type 1 or 2 diabetes; intervention: group medical visits; comparison: usual care; outcomes: biophysical, patient-reported, and process-of-care outcomes.

4.2.3.1 Literature search

We conducted a comprehensive search of the following electronic databases from inception through February 2012: MEDLINE (PubMed), CINAHL, Biosis, ProQuest Dissertations and Theses, Embase, Web of Science, Psych Info, and the Cochrane Database of Systematic Reviews. We also searched various sources of grey literature. Bibliographies of selected articles were manually searched for additional studies. Details of our search strategies are available in Appendix A. A librarian was consulted to review the search strategy.

4.2.3.2 Study selection

A 3-step process was used to determine the eligibility of studies for our review. First, the title of relevant articles were independently screened by each of us. Second, if titles were deemed relevant, abstracts were independently reviewed by two of us (LH and either S.T.W. or MD). Finally, if abstracts were deemed relevant, full-text articles were
independently reviewed by two of us (as described above). Decisions regarding inclusion and exclusion of studies were made by consensus between the two reviewers; disagreements were resolved by the third reviewer as required.

We included RCTs and observational studies published in English or translated into English that included patients aged 16–80 years with type 1 or 2 diabetes and had group medical visits as the intervention. We excluded studies in which the intervention was for educational purposes or did not include a health care provider who could diagnose, prescribe, make referrals, and order laboratory tests. Multiple articles from the same study or group of patients were classified as “kinned” articles. We grouped kinned articles together and counted them as one study.

4.2.3.3 Data extraction

We collected data on study characteristics, participant demographics, and clinical, and patient-reported outcomes. Where possible, sample size and post-intervention means and SDs were extracted for both the intervention and usual-care groups. We extracted data from the observational studies to inform the discussion. Data were initially extracted by one of us (LH) and checked by the others (S.T.W., MD) to ensure accuracy (Appendix B).

4.2.3.4 Assessment of bias

We assessed RCTs for risk of bias using the Cochrane Risk of Bias Tool (Higgins & Altman, 2008). One of us (LH) completed the full quality assessment. Congruency of the assessment was ensured by having a second reviewer (S.T.W.) independently assess quality of 5% of the included studies. A sensitivity analysis was performed in which we excluded studies that had two or more items with a high risk of bias. Because some articles included patients with either type 1 or type 2 diabetes, we conducted an additional
sensitivity analysis for glycated hemoglobin (HbA1c) in which we excluded studies that included only patients with type 1 diabetes as well as studies in which the type of diabetes was unclear. Overall effect size, significance, and funnel plots were examined for HbA1c.

4.2.3.5 Data synthesis

We included only RCTs in the meta-analysis. We analyzed the data from RCTs using Review Manager software (RevMan, version 5.1, Nordic Cochrane Centre). For each RCT, the effect size was calculated to determine the mean differences between the intervention and control groups at the longest reported time after the intervention.

Mean differences were first pooled into a fixed-effects model. A $\chi^2$ test for heterogeneity was performed; when significant heterogeneity was found ($I^2 > 25\%$), the analysis was recalculated with a random-effects model. The mean differences were weighted and pooled following Hedges’ method for calculating standardized mean differences (Higgins & Green, 2011).

When measures of dispersion were not reported for outcome data, we used baseline SDs or calculated SDs from reported $p$ values. When no baseline SD or $p$ values were reported, we estimated SDs from the baseline range data. When examining these estimated SDs, we found that they were conservative estimates of the value; a sensitivity analysis in which we removed studies with uncertain SDs yielded improved HbA1c outcomes with a decrease in effect size.

We performed a meta-regression analysis to determine (a) if the length of time patients spent attending GMVs was related to effect size and (b) if the number of group visits a patient attended in a year was related to effect size. To examine the number of group visits attended per year, we created an “intensity” value by dividing the number of
appointments by the number of years of the intervention. For the meta-regression analysis, we used Stata software, version 12.1 (StataCorp LP).

4.2.4 Results

We identified 92 potentially eligible articles. The most common reasons for exclusion were that the intervention did not involve a health care provider who could prescribe, diagnose, assess, and refer patients; the article was a narrative or commentary based on other research studies; the study did not include a group medical visit as the intervention; and the article was not in English. A total of 26 studies met our inclusion criteria (Figure 3) (Benedetti, Flock, Pedersen, & Ahern, 2004; Boegner, Fontbonne, Gras Vidal, Mouls, & Monnier, 2008; Bray et al., 2005; Clancy, Brown, Magruder, & Huang, 2003; Clancy, Cope, Magruder, Huang, & Wolfman, 2003; Clancy, Huang, Okonofua, Yeager, & Magruder, 2007; Clancy, Yeager, et al., 2007; Clancy, Cope, Magruder, Huang, Salter, et al., 2003; Cohen et al., 2011; Culhane-Pera et al., 2005; Desouza, Rentschler, & Haynatzki, 2010; Dickman, Pintz, Gold, & Kivlahan, 2012; Dontje & Forrest, 2015; Edelman et al., 2010; Gutierrez, Gimple, Dallo, Foster, & Ohagi, 2011; Kirsh et al., 2007; Loney-Hutchinson et al., 2009; Mallow, 2011; Naik et al., 2011; Pieber et al., 1995; Raballo et al., 2012; Rygg, Rise, Gronning, & Steinsbekk, 2012; Sadur et al., 2002; Schillinger, Handley, Wang, & Hammer, 2009; Taveira, Dooley, Cohen, Khatana, & Wu, 2011; Taveira et al., 2010; Trento et al., 2001, 2002, 2005; Trento et al., 2004; Wagner et al., 2001).
Figure 6: Selection of studies. \((RCT = \text{randomized controlled trial})\)
4.2.4.1 Study characteristics

The characteristics of the 13 RCTs included in the meta-analysis are summarized in Table 1 (Clancy, Brown, et al., 2003; Clancy, Cope, Magruder, Huang, & Wolfman, 2003; Clancy et al., 2008; Clancy, Huang, et al., 2007; Clancy, Yeager, et al., 2007; Clancy, Cope, Magruder, Huang, Salter, et al., 2003; Cohen et al., 2011; Edelman et al., 2010; Naik et al., 2011; Rygg et al., 2012; Sadur et al., 2002; Schillinger et al., 2009; Taveira et al., 2011; Taveira et al., 2010; Trento et al., 2002, 2005, 2001; Trento et al., 2004; Wagner et al., 2001) For characteristics of all 26 studies see Appendix I. The number of studies published after 2002 increased substantially (4 studies before 2002, 12 between 2002 and 2007, and 16 between 2008 and 2012). One document was a doctoral dissertation, completed in 2011 (Mallow, 2011). Most of the studies (n = 20) were conducted in the United States (Bray et al., 2005; Clancy, Brown, et al., 2003; Culhane-Pera et al., 2005; Desouza et al., 2010; Dickman et al., 2012; Dontje & Forrest, 2011; Gutierrez et al., 2011; Kirsh et al., 2007; Loney-Hutchinson et al., 2009; Mallow, 2011; Naik et al., 2011; Sadur et al., 2002; Schillinger et al., 2009; Taveira et al., 2011; Wagner et al., 2001), with the remainder conducted in Europe (Austria n = 1 (Pieber et al., 1995), France n = 1 (Boegner et al., 2008), Italy n = 3 (Raballo et al., 2012; Trento et al., 2001, 2002, 2005; Trento et al., 2004) Norway n = 1 (Rygg et al., 2012). Samples ranged in size from 37 to 707 participants. Three studies included fewer than 50 patients, and 6 had more than 200; the remainder had between 50 and 100 patients (n = 7 studies) or between 100 and 200 patients (n = 10).

Of the total 4652 patients, 3112 received group care or attended GMVs as an intervention. The mean age of participants in the studies that reported this information was 59.3 years, and 56% of participants attending GMVs were men.
<table>
<thead>
<tr>
<th>Study</th>
<th>Study Duration</th>
<th>Duration and Frequency of GMVs</th>
<th>No. of Patients</th>
<th>Study Population</th>
<th>% Male</th>
<th>Outcomes Measured</th>
<th>HbA1C Outcome</th>
<th>BP Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clancy et al., 2003</td>
<td>6mo</td>
<td>2-h sessions; monthly over 6mo</td>
<td>Intervention: 59 Control: 61</td>
<td>Age &gt; 18yr; type 2 diabetes with HbA1c &gt;8.5% at most recent evaluation</td>
<td>21.7</td>
<td>Trust in physician (scale), ADA process-of-care indicators, patient care assessment tool, HbA1c, lipid profiles</td>
<td>At 6mo: 9.513% in intervention and 9.714% in control; difference not significant</td>
<td>Not measured</td>
</tr>
<tr>
<td>Clancy et al., 2007 and 2008</td>
<td>12mo</td>
<td>2-h sessions; monthly over 12mo</td>
<td>Intervention: 96 Control: 90</td>
<td>Age &gt;18yr; poorly controlled type 2 diabetes (HbA1c &gt;8%)</td>
<td>28</td>
<td>Emergency department visits, inpatient stays, primary and specialty outpatient visits, total charges, HbA1c testing, lipid profiles, adherence to ADA guidelines, cancer screens</td>
<td>Not measured; instead study looked at no. of patients who received HbA1c testing</td>
<td>Not measured</td>
</tr>
<tr>
<td>Cohen et al., 2011</td>
<td>6mo</td>
<td>2-h sessions over 6mo; weekly for 4wk, then monthly for 5mo</td>
<td>Intervention: 50 Control: 49</td>
<td>Veterans with type 2 diabetes; HbA1c &gt;7.0%, LDL cholesterol &gt;100 mg/dL (or &gt; 70 mg/dL if coronary artery disease present); BP &gt; 130/80 mm Hg</td>
<td>Target goals reached by 40.5% in intervention v. 20.4% in control (p = 0.03); patients in intervention group had higher odds of attaining HbA1c goals</td>
<td>Target systolic BP (&lt; 130 mm Hg) reached by 50% in intervention and 32.7% in control (p = 0.015); patients in intervention group had higher odds of attaining systolic BP goals</td>
<td></td>
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</tr>
<tr>
<td>Study</td>
<td>Study Duration</td>
<td>Duration and Frequency of GMVs</td>
<td>No. of Patients</td>
<td>Study Population</td>
<td>% Male</td>
<td>Outcomes Measured</td>
<td>HbA1C Outcome</td>
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<tr>
<td>Edelman et al., 2010</td>
<td>12.8mo</td>
<td>90-120 min per session; every 2mo over 12mo; total seven sessions</td>
<td>Intervention: 133 Control: 106</td>
<td>Veterans with poorly controlled diabetes (HbA1c ≥ 7.5%) and hypertension (systolic BP &gt; 140 mm Hg, diastolic BP &gt; 90 mm Hg); type of diabetes not specified</td>
<td>Intervention: 95.5 Control: 96.2</td>
<td>Systolic and diastolic BP, HbA1c, self-reported medication adherence</td>
<td>Mean decrease 0.8% in intervention and 0.5% in control; difference not significant (p = 0.159)</td>
<td>Mean decrease in systolic BP was 13.7 mm Hg in intervention v. 6.4 mm Hg in control (p = 0.011)</td>
</tr>
<tr>
<td>Naik et al., 2011</td>
<td>12mo</td>
<td>60-min sessions; four sessions; every 3wk over 3mo</td>
<td>Intervention: 45 Control: 42</td>
<td>Veterans aged 50–90yr with a primary-care provider; type 2 diabetes; mean HbA1c 7.5% 6mo before study</td>
<td>Unknown</td>
<td>HbA1c, diabetes self-efficacy scale, diabetes specific knowledge and understanding scale</td>
<td>At 1yr: 8.05% +/- 1.40% in intervention v. 8.64% ± 1.39% in control (p = 0.05)</td>
<td>Not measured</td>
</tr>
<tr>
<td>Study</td>
<td>Study Duration</td>
<td>Duration and Frequency of GMVs</td>
<td>No. of Patients</td>
<td>Study Population</td>
<td>% Male</td>
<td>Outcomes Measured</td>
<td>HbA1C Outcome</td>
<td>BP Outcome</td>
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<tr>
<td>Rygg et al., 2012</td>
<td>12mo</td>
<td>5-h sessions; every 2 wk over 6 wk, or every 3 wk over 9 wk, depending on site</td>
<td>Intervention: 73</td>
<td>Age &gt; 18 yr; type 2 diabetes; consultation with general practitioner in past 3 yr</td>
<td>Approximately 50%”</td>
<td>HbA1c, patient activation, diabetes knowledge, BP, weight, BMI, total and HDL cholesterol, triglycerides, creatinine, oral glucose- lowering medication, visits with health care personnel in past 3 mo, satisfaction with diabetes treatment, problem areas in diabetes, EQ-VAS, SF-36 (physical and mental health domains), self-management (diet, foot care, and blood glucose)</td>
<td>At 12 mo: no significant difference (p = 0.432), except in subgroup analysis of patients with highest HbA1c (&gt; 7.7%) at baseline (8.2% ± 1.4% in intervention group v. 8.8% ± 1.4% in control group; p = 0.012)</td>
<td>Systolic BP intervention: 140.6 (17.1), control: 143.7 (20.8), diastolic BP intervention: 82.6 (10.3), control 83.3 (10.3)</td>
</tr>
<tr>
<td>Study</td>
<td>Study Duration</td>
<td>Duration and Frequency of GMVs</td>
<td>No. of Patients</td>
<td>Study Population</td>
<td>% Male</td>
<td>Outcomes Measured</td>
<td>HbA1C Outcome</td>
<td>BP Outcome</td>
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<tr>
<td>Sadur et al., 1999</td>
<td>12mo</td>
<td>2-h sessions; monthly over 6mo</td>
<td>Intervention: 82</td>
<td>Age 16–75yr; type 1 and 2 diabetes; HbA1c &gt; 8.5%, or no HbA1c test performed in previous yr</td>
<td>Intervention: 58.8 Control: 55.7</td>
<td>HbA1c, self-reported changes in self-care practices, self-efficacy, satisfaction, utilization of inpatient and outpatient health care</td>
<td>5mo after randomization: 8.18% in intervention and 9.33% in control (p &lt; 0.0001)</td>
<td>Not measured</td>
</tr>
<tr>
<td>Schillinger et al., 2009</td>
<td>1mo</td>
<td>90-min sessions; monthly over 9mo</td>
<td>Intervention: 104</td>
<td>Adult patients with type 2 diabetes; uninsured with high school education or less; 1 primary-care visit in past yr; recent HbA1c 8.0%</td>
<td>Intervention: 36.3 Control: 44.7</td>
<td>1-yr changes in structure (patient assessment of chronic Illness care), communication processes (interpersonal processes of care) and outcomes (behavioral, functional, and metabolic)</td>
<td>No difference between groups (9.0% ± 2.0% in both groups; p = 0.3)</td>
<td>Systolic BP 138.9 ± 20.3 mm Hg in intervention and 141.5 ± 23.9 mm Hg in usual-care group (p = 0.1); diastolic BP 75.5 ± 11.3 mm Hg in intervention and 78.5 ± 18.5 mm Hg in usual-care group (p = 0.08)</td>
</tr>
<tr>
<td>Study</td>
<td>Study Duration</td>
<td>Duration and Frequency of GMVs</td>
<td>No. of Patients</td>
<td>Study Population</td>
<td>% Male</td>
<td>Outcomes Measured</td>
<td>HbA1C Outcome</td>
<td>BP Outcome</td>
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</tr>
<tr>
<td>Taveira et al., 2010</td>
<td>4mo</td>
<td>2-h sessions; weekly over 4wk</td>
<td>Intervention: 58</td>
<td>Veterans aged &gt;18yr with type 2 diabetes; HbA1c 7%–9% in previous 6mo</td>
<td>Intervention: 91.4</td>
<td>HbA1c, BP (systolic &lt; 130 mm Hg, diastolic &lt; 80 mm Hg), lipids, tobacco use</td>
<td>Target reached by 40.4% in intervention and 21.6% in control; absolute mean change – 0.9 ± 1.6 in intervention and 0.0 ± 1.5 in control</td>
<td>Target systolic BP reached by 65.5% in intervention and 39.9% in control; absolute mean change – 7.3 ± 20.3 mm Hg in intervention and – 1.7 ± 19.6 mm Hg in control. Target diastolic BP reached by 65.5% in intervention and 68.6% in control; absolute mean change – 6.5 ± 10.0 mm Hg in intervention and 1.0 ± 10.8 mm Hg in control</td>
</tr>
<tr>
<td>Study</td>
<td>Study Duration</td>
<td>Duration and Frequency of GMVs</td>
<td>No. of Patients</td>
<td>Study Population</td>
<td>% Male</td>
<td>Outcomes Measured</td>
<td>HbA1C Outcome</td>
<td>BP Outcome</td>
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<tr>
<td>Taveira et al., 2011</td>
<td>6mo</td>
<td>90-min sessions; weekly for 4wk, then monthly for 5mo</td>
<td>Intervention: 44 Control: 44</td>
<td>Veterans with depression and type 1 or 2 diabetes; HbA1c &gt; 6.5% in previous 6mo</td>
<td>Intervention: 100 Control: 95.5</td>
<td>HbA1c &lt;7%at6mo, adherence to ADA guidelines (systolic BP &lt; 130 mm Hg, diastolic BP &lt; 80 mm Hg), total, LDL and HDL cholesterol, tobacco cessation, change in 10-yr coronary event risk at 6mo, depression symptoms</td>
<td>7.4% ± 1.2% in intervention v. 8.4% ± 2.0% in control group (p &lt; 0.05)</td>
<td>Systolic BP 123.4 ± 12.3 mm Hg in intervention and 127.0 ± 17.3 mm Hg in control (p &lt; 0.05 from baseline)</td>
</tr>
<tr>
<td>Trento et al., 2002, 2001, and 2004</td>
<td>4yr</td>
<td>Duration of session not stated; session every 3mo</td>
<td>Intervention: 56 Control: 56 (42 in each group at yr 5)</td>
<td>Type 2 diabetes, treated with diet alone or diet and oral hypoglycemic agents; attended diabetes clinic</td>
<td>Intervention: 51.1 Control: 60.7</td>
<td>Weight, fasting blood glucose level, HbA1c, serum creatinine, total and HDL cholesterol, triglycerides, microalbumine: creatinine ratio, diabetes-related quality of life, knowledge of diabetes, health behaviors, BP, BMI</td>
<td>At 5yr after randomization: 7.3% ± 1.0% in intervention and 9.0% ± 1.6% in control (p &lt; 0.001)</td>
<td>Not measured</td>
</tr>
<tr>
<td>Study</td>
<td>Study Duration</td>
<td>Duration and Frequency of GMVs</td>
<td>No. of Patients</td>
<td>Study Population</td>
<td>% Male</td>
<td>Outcomes Measured</td>
<td>HbA1c Outcome</td>
<td>BP Outcome</td>
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</tr>
<tr>
<td>Trento et al., 2005</td>
<td>3yr</td>
<td>Duration of session unclear; every 2–3mo; total 15 sessions over 36mo</td>
<td>Intervention: 30 Control: 28</td>
<td>Age &lt; 70yr; type 1 diabetes with onset before 30yr; insulin started within 1yr of diagnosis; ≥ 1yr previous attendance in clinic</td>
<td>Intervention: 61.3 Control: 58.1</td>
<td>Diabetes-related quality of life, knowledge of type 1 diabetes, health behaviors, HbA1c, total and HDL cholesterol, microalbumine: creatinine ratio, complications (hypoglycemic episodes [retrospective]), economic analysis</td>
<td>At 3yr: 7.88% ± 0.20% in intervention and 8.79% ± 1.38% in control (p = NS)</td>
<td>Not measured</td>
</tr>
<tr>
<td>Wagner et al., 2001</td>
<td>2yr</td>
<td>Half-day sessions; “periodic” (intervals of 3mo and 6mo)</td>
<td>Intervention: 278 Control: 429</td>
<td>Age &gt; 30yr; patients with diabetes (type not specified) using insulin or oral hypoglycemic therapy were “preferentially selected”</td>
<td>Intervention: 56 Control: 51.8</td>
<td>Subscales of SF-36 (general health, physical function, emotional role function, social function and pain), bed disability, restricted-activity days</td>
<td>At 24mo: no difference between groups (7.9% in both groups; p = 0.9)</td>
<td>Not measures</td>
</tr>
</tbody>
</table>

Note: ADA = American Diabetes Association, BMI = body mass index, BP = blood pressure, EQ-VAS = Euro Qol 5-d measure of health outcome, HDL = high-density lipoprotein, LDL = Low-density lipoprotein, NS = not significant, SF-36 = Medical Outcomes Study 36-item Short Form.
A summary of the risk-of-bias assessment of the 13 RCTs can be found in Table 2. The amount of bias varied across the trials. Only one had a low risk of bias in most areas (Edelman et al., 2010). The other RCTs either did not report enough information for bias to be assessed or had two or more areas assessed as a high source of bias.

<table>
<thead>
<tr>
<th>Study</th>
<th>Random sequence generation (selection bias)</th>
<th>Allocation concealment (selection bias)</th>
<th>Blinding of participants and personnel (performance bias)</th>
<th>Blinding of outcome assessment (detection bias)</th>
<th>Incomplete outcome data (attrition bias)</th>
<th>Selective reporting (reporting bias)</th>
<th>Other Bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clancy et al.</td>
<td>High</td>
<td>Unclear</td>
<td>High</td>
<td>Unclear</td>
<td>Unclear</td>
<td>Unclear</td>
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</tr>
<tr>
<td>Clancy et al.</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>High</td>
<td>Unclear</td>
<td>Unclear</td>
<td>Unclear</td>
</tr>
<tr>
<td>Cohen et al.</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Unclear</td>
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<tr>
<td>Edelman et al.</td>
<td>Low</td>
<td>Low</td>
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<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Unclear</td>
</tr>
<tr>
<td>Naik et al.</td>
<td>Low</td>
<td>Low</td>
<td>Unclear</td>
<td>High</td>
<td>Low</td>
<td>Unclear</td>
<td>Unclear</td>
</tr>
<tr>
<td>Rygg et al.</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Unclear</td>
<td>Low</td>
<td>Unclear</td>
<td>Unclear</td>
</tr>
<tr>
<td>Sadur et al.</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Unclear</td>
<td>Unclear</td>
<td>Unclear</td>
<td>Unclear</td>
</tr>
<tr>
<td>Schillinger et al.</td>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>Unclear</td>
<td>Low</td>
<td>Unclear</td>
<td>Unclear</td>
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<tr>
<td>Taveira et al.</td>
<td>High</td>
<td>Unclear</td>
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<td>Unclear</td>
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<tr>
<td>Taveira et al.</td>
<td>High</td>
<td>High</td>
<td>Unclear</td>
<td>High</td>
<td>Low</td>
<td>Unclear</td>
<td>Unclear</td>
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<tr>
<td>Trento et al.</td>
<td>Low</td>
<td>Unclear</td>
<td>Low</td>
<td>Unclear</td>
<td>Low</td>
<td>Unclear</td>
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<tr>
<td>Trento et al.</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Unclear</td>
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<tr>
<td>Wagner et al.</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Unclear</td>
<td>High</td>
<td>Unclear</td>
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</tr>
</tbody>
</table>
4.2.4.2 Clinical outcomes

Eleven of the RCTs reported HbA1c data at baseline. The baseline values did not differ significantly between the studies (weighted mean difference −0.09, 95% confidence interval [CI] 0.29 to 0.11). Only 10 studies reported HbA1c data that could be included in our meta-analysis. Pooled analysis of HbA1c values after the intervention period showed significantly lower values among the patients attending group medical visits (weighted mean difference −0.46, 95% CI −0.80 to −0.13) (Table 3, Figure 4).

<table>
<thead>
<tr>
<th>Outcome</th>
<th>No. of trials</th>
<th>Weighted mean difference (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HbA1c</td>
<td>10</td>
<td>−0.46 (−0.80 to −0.13)</td>
</tr>
<tr>
<td>Systolic BP</td>
<td>5</td>
<td>−2.81 (−6.84 to 1.21)</td>
</tr>
<tr>
<td>Diastolic BP</td>
<td>4</td>
<td>−1.02 (−2.71 to 0.67)</td>
</tr>
<tr>
<td>Total cholesterol</td>
<td>3</td>
<td>0.04 (−0.21 to 0.30)</td>
</tr>
<tr>
<td>HDL cholesterol</td>
<td>3</td>
<td>0.01 (−0.07 to 0.10)</td>
</tr>
<tr>
<td>Triglycerides</td>
<td>3</td>
<td>−0.01 (−0.41 to 0.38)</td>
</tr>
<tr>
<td>Weight</td>
<td>3</td>
<td>−0.50 (−3.87 to 2.88)</td>
</tr>
<tr>
<td>BMI</td>
<td>4</td>
<td>0.05 (−0.90 to 1.00)</td>
</tr>
</tbody>
</table>

Note: BMI = body mass index, BP = blood pressure, CI = confidence interval, HDL = high-density lipoprotein.
Figure 7: Pooled analysis of the effect of group medical visits versus usual care for patients with diabetes on glyated hemoglobin (HbA1c) reported in randomized controlled trials. A weighted mean difference of less than zero indicates a positive effect of group medical visits. CI = confidence interval, SD = standard deviation.

In the meta-regression analysis, we found that duration of treatment directly affected patients’ HbA1c values. Patients who attended group medical visits for longer periods had better HbA1c outcomes. For every year increase in the duration of treatment, there was a decrease in effect size of 0.25, which indicated a drop in HbA1c of one quarter of 1%. When we examined whether the frequency of group visits had an effect on HbA1c outcomes, it did not explain the difference in the effect size, which indicated that the duration of treatment had a greater effect on HbA1c outcomes than the number of appointments attended per year. We did not analyze other attributes of group visits using meta-regression techniques because the data were not consistently reported in the RCTs.

When we excluded studies with two or more methodologic features assessed as a high source of bias, the overall effect of group medical visits on HbA1c improved (weighted mean difference−0.62, 95% CI −1.23 to −0.01). When we excluded studies with
three or more features assessed as a high source of bias, the effect size did not change significantly (−0.47, 95% CI−0.94 to 0.00). When we excluded studies that had only patients with type 1 diabetes, the effect size increased (−0.58, 95% CI −1.12 to −0.04). Five of the RCTs evaluated the effects of group medical visits on systolic blood pressure, and four assessed the effects on diastolic pressure. No statistically significant effect on either type of blood pressure was found in the meta-analysis (Figure 5, Figure 6).

### Systolic blood pressure

<table>
<thead>
<tr>
<th>Study</th>
<th>Group medical visit</th>
<th>Usual care</th>
<th>Mean difference (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edelman et al.</td>
<td>139 ± 14.8, 133</td>
<td>146.5 ± 13.4, 106</td>
<td>−7.30 (−10.88 to −3.72)</td>
</tr>
<tr>
<td>Rygg et al.</td>
<td>140.6 ± 17.1, 73</td>
<td>142.7 ± 20.8, 73</td>
<td>−2.10 (−9.28 to 2.08)</td>
</tr>
<tr>
<td>Schillinger et al.</td>
<td>138.9 ± 20.3, 104</td>
<td>141.5 ± 23.9, 108</td>
<td>−2.60 (−8.56 to 3.36)</td>
</tr>
<tr>
<td>Taveira et al.</td>
<td>122.4 ± 12.3, 44</td>
<td>127 ± 17.3, 44</td>
<td>−5.60 (−8.87 to 2.67)</td>
</tr>
<tr>
<td>Trento et al.</td>
<td>154 ± 21, 56</td>
<td>149 ± 15, 56</td>
<td>5.00 (−1.76 to 11.76)</td>
</tr>
<tr>
<td>Overall</td>
<td>410</td>
<td>387</td>
<td>−2.81 (−6.84 to 1.21)</td>
</tr>
</tbody>
</table>

**Figure 8:** Pooled analysis of the effect of group medical visits on systolic blood pressure

### Diastolic blood pressure

<table>
<thead>
<tr>
<th>Study</th>
<th>Group medical visit</th>
<th>Usual care</th>
<th>Mean difference (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edelman et al.</td>
<td>78.3 ± 12.1, 133</td>
<td>82.1 ± 13.4, 106</td>
<td>−3.80 (−7.14 to −0.46)</td>
</tr>
<tr>
<td>Rygg et al.</td>
<td>82.6 ± 10.3, 73</td>
<td>83.3 ± 10.3, 73</td>
<td>−0.70 (−4.04 to 2.64)</td>
</tr>
<tr>
<td>Schillinger et al.</td>
<td>75.5 ± 11.3, 104</td>
<td>78.5 ± 18.5, 108</td>
<td>−3.00 (−7.11 to 1.11)</td>
</tr>
<tr>
<td>Trento et al.</td>
<td>88 ± 7, 56</td>
<td>86 ± 9, 56</td>
<td>2.00 (−0.99 to 4.99)</td>
</tr>
<tr>
<td>Overall</td>
<td>366</td>
<td>243</td>
<td>−1.02 (−2.71 to 0.67)</td>
</tr>
</tbody>
</table>

**Figure 9:** Pooled analysis of the effect of group medical visits on diastolic blood pressure
Group medical visits had a slightly positive effect on patients’ weight, but no effect on body mass index (Figure 7); the effect on weight was not statistically significant. A negative effect of group medical visits on total and high-density lipoprotein cholesterol levels was noted; however, the effects were minimal (Figure X).

4.2.4.3 Other outcomes

Patients who attended group medical visits reported improvements in quality of life, as measured by the “Diabetes Quality of Life Questionnaire” (DCCT, 1988) weighted mean difference $-29.30$, 95% CI $-60.64$ to 2.05); however, the results were limited to 2 RCTs and were not statistically significant.

Data on process-of-care outcomes in the RCTs were insufficient to include them in the meta-analysis. In our synthesis of findings from all 26 studies, we noted reports on aspects of patients’ engagement in their health care, including positive outcomes in the
domain of self-care (Sadur et al., 2002; Taveira et al., 2011), physical activity (Dickman et al., 2012), the setting and achievement of measurable goals (Benedetti et al., 2004; Dickman et al., 2012; Rygg et al., 2012), patient knowledge (Gutierrez et al., 2011; Pieber et al., 1995; Rygg et al., 2012; Trento et al., 2005; Trento et al., 2004), self-efficacy (Naik et al., 2011; Sadur et al., 2002) and self-management (Benedetti et al., 2004; Bray et al., 2005; Dontje & Forrest, 2015; Pieber et al., 1995; Rygg et al., 2012; Schillinger et al., 2009).

### 4.2.5 Interpretation

Our meta-analysis showed that GMVs for patients with diabetes led to significant reductions in HbA1c. Small decreases have been shown to have substantial clinical impacts: a 1.0% reduction in HbA1c may be associated with a 37% decrease in microvascular complications, up to a 14% reduction in the incidence of myocardial infarction and a 21% decrease in the risk of death from diabetes (Stratton et al., 2000).

Patients with diabetes are known to be at increased risk of cardiovascular disease and cardiovascular-related death (CDA, 2008; Kannel, 2000). Although not statistically significant, the reductions in systolic and diastolic blood pressure among patients attending group medical visits are of interest. Many lifestyle modifications such as weight reduction, dietary changes, physical activity and alcohol consumption have been found to reduce systolic blood pressure by 2–8 mm Hg (U.S. Department of Health and Human Services, 2003). A reduction of 2 mm Hg in diastolic blood pressure has been associated with a 6% decrease in the risk of coronary heart disease and a 15% reduction in stroke and transient ischemic attacks (Cook, Cohen, Hebert, Taylor, & Hennekens, 1995).

An additional factor to consider when caring for patients with diabetes is their
quality of life. Although only two of the RCTs measured this outcome using the Diabetes Quality of Life Questionnaire, the aspects of patients’ quality of life examined in many of the other studies were similar to the domains covered in the questionnaire.

Only two of the RCTs examined the risk of hypoglycemic events associated with group medical visits (Edelman et al., 2010; Trento et al., 2005). Studies have shown that intensive glucose-lowering therapy among patients with diabetes may increase the risk of morbidity and mortality owing to hypoglycemic events (Gerstein et al., 2008; Patel et al., 2008).

4.2.6 Limitations

There were few long-term studies examining the effectiveness of group medical visits for diabetes care. Fifteen of the 26 studies were 12 months or less in duration, and six studies were up to 2 years in duration. The study with the longest duration followed patients for 5 years after the intervention. Therefore, the long-term or sustainable outcomes of group medical visits are unclear, and it is difficult to know if the outcomes were maintained for a substantial length of time after the intervention.

Another limitation was that we restricted our search to include only published studies. We realize that studies showing a lack of effect may not have been published. We also included only articles written in English or translated into English, thereby excluding two studies not published in English.

Many of the studies involved specific populations of patients, such as those with low incomes, those with different ethnic backgrounds and veterans. Although group medical visits may work for populations with specific characteristics, the mixed results indicate that further examination of the types of populations and types of delivery models is needed.
4.2.7 Conclusion

Group medical visits for patients with diabetes were found to be effective in terms of reducing HbA1c. The results of our meta-analysis, combined with the other benefits reported by patients and providers, suggest that wider implementation of group medical visits for patients with diabetes will have a positive effect on patient outcomes.

4.3 Attending to Power Differentials: How NP-led Group Medical Visits Can Influence the Management of Chronic Conditions

4.3.1 Summary

Objective: In Canada, primary care reform has encouraged innovations, including nurse practitioners (NPs) and group medical visits (GMVs). NP-led GMVs provide an opportunity to examine barriers and enablers to implementing this innovation in primary care.

Design: An instrumental case-study design (n=3): two cases where NPs were using GMVs and one case where NPs were not using GMVs, was completed. In-depth interviews with patients and providers (N=24) and 10 hours of direct observation were completed. Interpretive descriptive methods were used to analyze data.

Results/ Findings: Two main themes were identified: 1) Acquisition of knowledge and 2) GMVs help shift relationships between patients and healthcare providers. Participants discussed how patients and providers learn from one another to facilitate self-management of chronic conditions. They also discussed how the GMV shifts inherent power differentials between providers and between patients and providers.

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4 A version of this manuscript has been accepted for publication: Housden, L., Wong, S. T., Browne, A. J., & Dawes, M. (2015). Attending to power differentials: How NP-led group medical visits can influence the management of chronic conditions. Manuscript Accepted for Publication.
Discussion: NP-led GMVs are a method of care delivery that harness NPs’ professional agency through increased leadership and interprofessional collaboration. GMVs also facilitate an environment that is more patient centered and interprofessional, providing patients with increased confidence to manage their chronic conditions. The GMV provides the opportunity to meet both team-based and patient-centered healthcare objectives and may disrupt inherent power differentials that exist in primary care.

4.3.2 Introduction

Primary-care reform is aimed at strengthening the healthcare system (Strumpf et al., 2012); growing evidence suggests that stronger primary care contributes to healthier populations (Kringos, Boerma, Van Der Zee, & Groenewegen, 2013; Starfield, 2009). Innovative approaches to primary care reform in Canada can include changing the ways in which patients interact with their providers and each other such, as in the case of group medical visits (GMVs) or shared medical appointments between patients (Lavoie et al., 2013). Other innovations are aimed at broadening the healthcare team to include various providers such as nurse practitioners (NPs) (Archibald & Fraser, 2013).

Group medical visits enable healthcare providers to work together to deliver services to patients in a group format, rather than the conventional single patient, single provider format (Bodenheimer & Grumbach, 2007). While different types of GMVs exist (e.g. drop-in, groups based on a common issue such as pain or women’s wellness) (Bodenheimer & Grumbach, 2007; E. Noffsinger, 1999; Noffsinger, 2009; Scott & Robertson, 1996), the most common type of GMV are appointments for patients with a shared medical condition. During the GMV patients meet for their primary care appointment(s) together and receive services in a group environment (Bodenheimer & Grumbach, 2007). The GMV includes a review of
recent laboratory results, an education piece that often focuses on aspects of a shared chronic condition, an interactive discussion (Boegner et al., 2008; Liu et al., 2012; Pieber et al., 1995; Rygg et al., 2012; Trento et al., 2001, 2002, 2004, 2005) and the delivery of preventative or health promotion health services (Bodenheimer & Grumbach, 2007; Bronson & Maxwell, 2004). Past work has shown that confidentiality is not a major concern for patients attending GMVs; rather, GMVs increase patient and provider trust (Wong et al., 2015). Group medical visits have been used with success in Canada (Lavoie et al., 2013; Remick & Remick, 2014), the United States (Bodenheimer, Wagner, & Grumbach, 2002; Clancy et al., 2008; Geller, Orkaby, & Cleghorn, 2011; Housden, Wong, & Dawes, 2013; Lavoie et al., 2013), Europe (Boegner et al., 2008; Pieber et al., 1995; Rygg et al., 2012; Trento et al., 2001, 2002, 2004) and China (Liu et al., 2012).

In North America, NPs are advanced-practice nurses who have completed postgraduate level training and function in an expanded scope of nursing practice (CRNBC, 2015a; Hamric, 2014; Hass, 2006). The scope of NP practice includes the ability to diagnose diseases, prescribe medications, order and interpret laboratory tests and refer patients to specialists (CRNBC, 2015a). In Canada, NPs often work as part of interprofessional teams (Heale, Dickieson, Carter, & Wenghofer, 2014)

Unfortunately, the combined use of NP-led GMVs in primary care remains limited in Canada. This has been hampered by a number of factors, some of which are structural such as the dominant remuneration model of fee-for-service (Burgess & Purkis, 2010; Dicenso et al., 2007) and the availability of an appropriately large clinical space. Some of the barriers to the implementation of NP-led GMVs are interpersonal such as individual provider capabilities (Barnett, Vasileiou, Djemil, Brooks, & Young, 2011). Whether innovations are
implemented or not can be influenced by power differentials (Sturm & Antonakis, 2015). In the case of NP-led GMVs power differentials exist between patients and providers and between different health professions (e.g. medicine, nursing, pharmacy). While there is substantial research on the area of NP practice, there is scant research on NPs led GMVs (Trotter, 2013; Watts et al., 2009) and no published research on NP-led GMVs in Canada.

The existence of power differentials contributes to complexity in any given work environment, healthcare notwithstanding. Power differentials between healthcare professionals are accentuated by “organizational constraints” (e.g. policies and procedures, healthcare budgets, staff privileges) (D’Amour, Ferrada-Videla, San Martin Rodriguez, & Beaulieu, 2005, p. 117) and the fact that individuals have varying levels of “agency” or individual power and authority (Davies, 1991). Physicians typically have more power and authority than nurses given their scope of practice and because most are considered independent contractors who bill the public insurer (provincial government) for their services (Zelek & Phillips, 2003). In most conventional practice settings, physicians provide the diagnosis, medical treatment and course of treatment for care (Bajnok, 2010; Rothstein & Hannum, 2007; Zelek & Phillips, 2003). Nurses, while responsible for the care they deliver, are typically employees of organizations, which in some situations include private physician practices. With the adoption of NPs, the role and scope of nurses’ practice in primary care has shifted such that NPs have an overlapping scope of practice with their family physician colleagues (Archibald & Fraser, 2013; Donald et al., 2010; MacDonald et al., 2005; Poghosyan et al., 2013). While the scope of practice for nurses and NPs has changed, the ways in which health professions work together has been slower to change (Wong & Farrally, 2013). Little is known as to how power differentials influence the diffusion of
innovations in primary care. The purpose of this paper is to examine NP-led GMVs for patients with chronic conditions and consider the barriers and enablers to implementing GMVs in one Canadian province, British Columbia.

4.3.3 Methods

4.3.3.1 Study design

The results reported are part of a larger study that used a case-study design consisting of three cases based in both urban and rural British Columbia. The instrumental case-study design was used to provide broader understanding of the phenomenon (NP-led GMVs) (Baxter & Jack, 2008). Case study approaches are appropriate when studying “complex subjects within their context” (Anthony & Jack, 2009) and allow a rich, in-depth understanding of the study phenomenon to develop (R.Yin, 2009; R.K. Yin, 1981). Recruitment of participants occurred over 12 months between January 2013- January 2014. After one year of recruitment, a total of 24 patients and healthcare providers participated in in-depth interviews and 10 hours of direct observation was completed for a total of three case studies.

Cases one and two included primary-care practices where NPs led GMVs. The first case included a primary-care practice where the NP organized and administered a GMV focused on healthy nutrition for patients with various chronic conditions, including obesity, diabetes and heart disease. The second case involved a primary care practice where the NP with support from an interdisciplinary healthcare team offered GMVs about diabetes management. In case two other healthcare providers also attended the answer patients’ questions and assist with prescriptions.
The primary researcher (LH) observed seven GMVs, totaling 10 hours of direct observation. Two GMVs were observed in case one, and five GMVs were observed in case two. The number of patients attending each GMV varied, from 12 to 28 patients in attendance. For case one and two both patients who attended the GMVs (n=12) and healthcare providers (n=5) were interviewed. We also sought to interview patients who had been invited to attend GMVs but declined to participate. However, information on who had been invited was not available, and patients did not respond to the recruitment poster placed at the clinics. The boundaries of case one and two (Rosenberg & Yates, 2007) were the primary care clinics.

In case one and two patients received healthcare assessments at the beginning of the GMV. This included blood pressure, weight and foot checks as necessary. When all participants arrived, the NP reviewed procedures for keeping information confidential and introduced the topics for discussion. In both cases, the NP guided the discussion with participants, clarifying misconceptions and encouraging patients to share goals and health challenges in the day-to-day management of their chronic condition(s). In case two, one of the other healthcare providers would also provide additional information or clarity as needed. At the completion of the group, goals and discussion topics for the next session were determined. The healthcare provider(s) remained in the group to answer any remaining questions at the end of each session. In case one, patients could choose to individually discuss their laboratory results, but overall laboratory result as well as weight trends of the group were discussed. In case two, patient’s laboratory results were shared on a large white board at the front of the room.
Case three included NPs (n=7) who were not leading GMVs but were willing to discuss their ideas about GMVs. Nurse Practitioners in the third case self-identified as being primary care providers, although their clinical practices and target populations varied including refugee health, mental health and addictions, and student health.

We had initially sought to follow an NP who was implementing a GMV. After six months of recruitment we were unable to find an NP available or supported to implement a GMV. This third case examined factors shaping decisions related to NPs not being able to offer GMVs in primary care. The boundary for the third case was defined by the geographic boundaries of two BC health authorities.

The research team created an initial list of NP-led GMVs in British Columbia, Canada. Sampling for the cases were purposeful and theoretical (Coyne, 1997; Thorne et al., 1997; Thorne, 2008). We purposely sought practices where NPs were offering GMVs and theoretical in that an early analysis indicated NPs had challenges diffusing innovations such as GMVs in primary care, thus the need for adding a third case of NPs who were not implementing GMVs. A clear audit trail was maintained throughout the study, including a case study protocol and database of case study documents (Table 4).

4.3.3.2 Eligibility criteria and procedures for case 1 and case 2

Inclusion criteria for interviewing patients in cases one and two were: adults aged 18-80 years old who were, English-speaking, and had attended GMVs for one or more chronic conditions. Patients were required to have attended an NP-led GMV at least twice in the past 12 months. Inclusion criteria for providers were involvement in at least two GMVs in the past 12 months. Healthcare providers offering GMVs were asked if a research team member could attend and observe the medical appointment.
All patients who were attending upcoming GMVs were mailed information about the study by the clinic prior to one of the research team attending their GMV. Consent to observe the GMV was obtained from all patients immediately prior to direct observation. During direct observation, data were gathered via detailed field notes to better understand how the GMV functioned including data on the physical space, format of the GMV, interpersonal interactions amongst patients and between patients and healthcare providers, body language, roles, participation, and presentation and discussion styles.

After attendance at the GMV the primary researcher remained at the clinic to discuss the project and gather contact information for patients and healthcare providers interested in participating in in-depth interviews to share their experiences. Interested participants were screened for eligibility and given the opportunity to participate via phone or in person, depending on geographic location. Interested participants were contacted a maximum of three times to complete an interview. Interview questions were open-ended and designed to examine patient and healthcare-provider perspectives on how GMVs with NPs could impact both patient’s health and the broader clinical environment.

### 4.3.3.3 Eligibility criteria and procedures for case 3

Inclusion criteria for the third case were NPs practicing in primary care; living in one of two BC health authorities (one urban, one rural) and not currently facilitating GMVs. Email inquiries were sent to NPs in two health authorities through publically available contact information. The study was introduced and NPs were asked whether or not they were facilitating GMVs to deliver care to patients. Nurse practitioners were contacted a maximum of three times to participate in the study if they were not using GMVs. The Ethics Boards of the University of British Columbia and the two health authorities where the NPs worked
approved all procedures. A description of the cases and patient participants can be found in Table 4.

4.3.3.4 Data analysis

All interviews were audio-recorded and both interviews and field notes from the direct observation were transcribed. These transcript data were organized using NVivo (QSR International Pty LTD., 2014). Interpretive descriptive methods were used to analyze the data (Thorne, 2008). Data were first organized into broad conceptual categories, using deductive and inductive approaches. These broad categories were discussed in-depth and validated among the research team. Similarities and differences in the data, both between and within cases, were considered. Data were aggregated into themes and patterns and relationships between the data and each case were examined through the use of concept mapping (Thorne, 2008). Each case was mapped by outlining the themes and considering patterns and relationships between and within the cases. Concept maps were discussed amongst the research team members. Nurse practitioner respondents were consulted after the data analysis to discuss and verify the findings.

4.3.3.4.1 Theoretical perspectives informing the data analysis

This study used both diffusion of innovation (Rogers, 2003), and theoretical perspectives on power (Foucault, 1982) as lenses from which to analyze the data. Diffusion of innovation theory has been applied in many healthcare situations (Alkhateeb, Khanfar, & Loudon, 2009; Fuks Nielsen & Moldrup, 2007; Giddens & Walsh, 2010; Miller, Saigal, Banerjee, Hanley, & Litwin, 2008). Diffusion of innovation theory generally seeks to examine how a particular innovation is diffused over time within a social system (Rogers, 2003). In this study, diffusion of innovation theory was used to examine NP-led GMVs in
primary care. Our initial analysis led to the recognition of power as a central concept influencing GMVs. To further examine these results we drew upon Foucaultian understandings of power as, the ways in which human beings are ‘made subject’, or who they understand themselves to be, and ‘made subject to’, or subjected to control and dependence, in our analysis (Foucault, 1982, p. 212). Foucault’s suggestion that the acquisition of knowledge serves to “intensify the exercise of power” (Roberts, 2005, p. 35), supported an examination of the power differentials in healthcare and GMVs in particular. These power differentials have traditionally situated nurses as having less authority and knowledge than physicians (Zelek & Phillips, 2003) and have potentially served as an oppressive force to the diffusion of healthcare innovations.

### 4.3.4 Results

The analysis of the data resulted in the identification of two main themes relating to the following: 1) acquisition of knowledge and 2) GMVs help shift relationships between patients and healthcare providers. Participants discussed how patients and providers learn from one another to facilitate the self-management of chronic conditions. They also discussed how the GMV shifts inherent power differentials between providers and between patients and providers.

#### 4.3.4.1 Acquisition of knowledge

Both patients and healthcare providers described how GMVs allowed for the acquisition of knowledge. This knowledge was acquired through increased understanding of how experiences are shaped by environment, geography, community, and other social determinants of health. Foucault describes a process by which individuals become subjects through a process of control and dependency as well as the process of who the individual
“understand themselves to be” (Springer & Clinton, 2015, p. 90). This process is deeply connected to the concept of knowledge and power (Roberts, 2005). Through the acquisition of health and interpersonal knowledge, patients attending GMVs in case one and two were able to harness more agency; that is, personal power and authority. For example, patients described how they gained more insight into the disease management process. This quote by a patient reflects how the GMV improved their knowledge and subsequently their ability to engage in self-management. “… I’m actually managing. Even though its 10 years and things are supposed to get more difficult or get worse, I’m actually managing better. [I’m] more intelligent in managing things instead of acting out of fear” (Patient Interview #2).

4.3.4.1.2 Increased knowledge about the context of individuals’ lives

A sub-theme was that GMVs provided a space where providers and patients felt more connected to one another as there was increased sharing of knowledge about each other’s lives. The building of relationships through GMVs contributed to a more in-depth understanding of patients’ lives and healthcare providers’ daily work realities. This patient describes how the GMV moved beyond a medical appointment to become a space where individuals feel accepted and supported. “The group, it’s a community. People aren’t selected; they’re just there and we, we just have to help each other as best as we can as a community and nobody wants to be alone with diabetes. They don’t have to be alone” (Patient Interview #2). As this healthcare provider points out, GMVs were valuable in understanding the context of their patients. Moreover, GMVs encourage providers to learn how each provider interacts with each other. “…I feel like I know [patients] a little bit more. You might learn more about their life, or their family or their pastimes and hobbies…you
know their social determinants of health; it’s something that comes out a bit more….”
(Healthcare Provider Interview #10).

This environment of shared understanding and a sense of community contributed to a shift in the traditional power dynamics. In many conventional primary care settings healthcare providers are viewed as the “expert” and patients are supposed to “follow the [healthcare provider’s] orders” (Cook, 2001; Emanuel & Emanuel, 1992; Lerner, 1997). However, the acquisition of contextual knowledge gave GMV participant’s additional agency and provided opportunities for patients to support each other and better self-manage their chronic conditions.

4.3.4.1.3 More knowledge equals more power

Another sub-theme was that GMVs could broaden patient’s perspectives of their chronic conditions. Not only were patients obtaining information from other patients on their health and chronic condition(s), but the group provided them with first-hand accounts of how their disease could progress. Patients described these first-hand accounts as helpful and motivating and new ways of learning developed through a process of observation and engagement with other patients. Patients recognized they were able to support each other to better self-manage their chronic condition(s): “You get moral support from people who are also going through what you’re going through, or even people who have it worse off than you, you know they have diabetes…you can look and go ‘Oh my God, I’m heading there..I gotta smarten up’” (Patient Interview #5). Both this quote and the one below from a healthcare provider indicate a realization of how each person has the opportunity to acquire more knowledge through the GMV. It also demonstrates how the group can encourage and motivate each other. The quote above also suggests that some patients might experience
heightened anxiety with more knowledge about the disease progression. However, the GMV also provided a space for participants to see their contributions to the care of others and to hold each other accountable for improving their self-care abilities.

I think because they are hearing it from more than just one source, I think that when they see other people who are struggling with the same things that they are struggling with, it makes the situation [come] alive..and then when they see the great success that comes with everyone sharing the success, I think there’s more of a buy-in to make those changes. (Healthcare Provider Interview #8)

The interpersonal interactions in the GMV also contributed to increased learning about the day-to-day management of chronic conditions, including a more in-depth understanding of lab values and the potential complications of their condition(s):

“I pay more attention to my chart now, more often since starting this group. Like my A1C was this number last month, now it’s a different number this month and, like your kidney, your A1C, your HDL.. I’m paying more attention to that more.” (Patient Interview #7)

Patients also noted how being with other patients in the group and observing the interaction between patients and healthcare providers often provided answers to questions they had regarding their health conditions. Observing this discussion allowed patients who may not have wanted to ask questions the opportunity to listen and receive answers.

…if you have a question about something you can bring it up they will discuss it. Someone will research it and bring the evidence. Generally if someone brings up a question other people will have the same question, only they haven’t brought it
up….You find out that some people, someone else brings something up and they say

“oh yah, that’s right.” (Patient Interview #8)

**4.3.4.2 GMV helps shift relationships between patients and healthcare providers**

Patients acknowledged that in most conventional healthcare settings, healthcare providers were in a position of power relative to the “average” person. “They [GMVs] are great. Especially for people in my age group or even older, sort of the relationship between medical professionals and myself, who is sort of an average Joe…they [Healthcare providers] are on a different level” (Patient Interview #8). Healthcare providers also discussed power differentials in primary care and noted how the GMV transformed the clinical encounter into a more patient-centered approach. As this healthcare provider described:

…often the personality of a [healthcare provider] is they want to be in charge and they know best and they kind of want to be directing what happens, in most groups, that doesn’t happen. The [healthcare provider] sits down and they’re a member of the group and the discussion, but it’s not the same level, [with] the patient and the other healthcare providers below, which was the old system. It really is the patient in the middle surrounded by all the healthcare professionals that are looking after the patients…(Healthcare Provider Interview #9)

The environment of the GMV provided increased opportunities for patients and healthcare providers to engage with one another. Group medical visit participants shared their personal challenges, successes, and goals. This sharing fostered an environment in which patients felt as though their healthcare providers were also gaining valuable knowledge from the GMV. The two quotes below show that this change from the conventional healthcare provider/patient relationship served to humanize healthcare
providers as individual’s with their own challenges, burdens, and healthcare goals. “You know, she’s in our shoes, she’s been in our shoes, she lives by the way she is teaching us” (Patient Interview #5).

They [healthcare providers] learn from us too, surprisingly. They learn quite a bit from us. The [doctor] wasn’t eating lunch for a long time. We had a side bet, I’d stop some of my sugar intake and drink more water, she’d try to eat healthier lunches or veggies.. each time we’d check in with each other… (Patient Interview #6)

Through this changed communication process, patients, and healthcare providers described new ways of engaging in ways that acknowledged each person’s particular contexts.

4.3.4.2.1 Increasing personal agency

Group medical visits also enabled patients to be more in control of access to primary care. Patients acknowledged that their healthcare providers were busy and working constrained environments (e.g. 15 minute visits to discuss only one problem). Yet, they described how attending the GMV relieved some of their perceived need to access traditionally delivered primary-care services. This excerpt from a patient interview describes the discomfort at the number of times she previously accessed primary care and how the GMV provided confidence that she could go to the GMV as often as she wanted and that someone was monitoring her health on an ongoing basis:

“My doctor is awesome, but I almost feel embarrassed about the number of times I kept going, and so, this sort of alleviates that a little bit, you see that it is okay, somebody is watching out for me in a general way as well” (Patient Interview #1).

This patient’s experience below also illustrates how GMVs can both increase power and authority by providing a group of patients (and providers) sufficient time to encourage self-
management and by engaging with patients in problem solving regarding the day-to-day management of a chronic condition:

The health system is not capable of managing so many people and the best way to do it is to have groups with support staff…so you got a team of about five people supporting everybody. If [patients] are intelligent they can figure out how to get the most out of these kinds of groups. They don’t have to be pestering their doctor every 10 minutes about some minor thing, [he’s] a very busy man. (Patient Interview #7)

The of the above mentioned-excerpts describe a shift occurring where GMVs provided a safe space for patients to increase their own agency, thereby increasing their confidence in managing their chronic conditions.

4.3.4.3 GMVs help shift power relations between healthcare providers

The analysis of the data also showed that GMVs can shift relationships between providers. Some NPs in the third case were concerned with their role not being visible or valued. Nurse practitioners in the third case described wanting recognition for their work (L. Housden et al., 2016a). Yet, through the process of delivering GMVs in case one and two the relationship between the physician and NP shifted. The physician recognized it was the NP who engaged in the main leadership role. This quote by a physician captures a perspective that runs counter to the notion of doctors having overall authority in the GMV. “The physician is just, just a friendly face in the room…..The nurse practitioner actually takes the main leadership role in our clinic, where she does all the teaching”. (Healthcare Provider Interview #12) Additionally, in the GMV where the NP was the only healthcare provider present, the skills and contributions of the NP were recognized by the broader medical community. As this NP stated:
…the outcomes [of the group] became so incredibly successful that the clinics, and then another clinic came on board and just said ‘you know what, however you need to work this, it doesn’t really matter what it costs, we’re willing to just pay for it’.

(Healthcare Provider Interview #8)

Through the GMV the understanding of the knowledge and ability of the NP changed amongst the physicians in the community. This same NP described an experience with a diabetic patient who was referred to her. “And so the physician, having no idea what to do with this man next, because he wouldn’t do as he was told, sent him to me” (Healthcare provider Interview #8). This interaction represents a shift in the conventional NP/physician relationship, challenging the traditional view of the NP as having less expertise or knowledge than the physician.

4.3.5 Discussion

This study is unique in its examination of NP-led GMVs in Canada. Our results suggest an acquisition of knowledge and a disruption of the power differentials between patients and healthcare providers and amongst healthcare providers. Our analysis adds depth to the Diffusion of Innovation Theory (2003) since there has been little consideration of how innovations could serve to disrupt existing power differentials.

Patients who attended GMVs described a more engaged sense of communication and increased confidence in managing their condition(s). Group medical visits also contributed to an environment where the relationships between patients and healthcare providers and among healthcare providers become more collaborative and centered around patient needs. Patients attending GMVs had the opportunity to draw on the expertise and care of an NP in addition to harnessing more of their own personal agency to ask questions. Through the GMV,
patients also became aware that there were benefits to learning from other patients and listening to healthcare providers interact with other patients.

Past work has shown that GMVs are not necessarily suitable for all patients (Wong et al., 2015), with some indicating that up to 40% of patients approached to attend GMVs decline (NHA, 2007). The reasons cited for declining are for legitimate concerns such as being hard of hearing and cognitive deficits. Our work also suggests that gaining more knowledge about a disease trajectory might possibly increase anxiety levels amongst some patients. More work is needed to examine who has attended GMVs, reasons why they may choose to discontinue and whether the GMV has resulted in any unexpected harms to them in terms of gaining more knowledge.

As we described in a previous paper (Housden et al., 2016a), NPs in case three were working in contexts where they were reluctant to implement GMVs. These non-adopters of GMVs described aspects of the historical power dynamics that exist between nursing and medicine (Arcangelo, 1994; Henneman, 1995; Housden et al., 2016a; Lockhart-Wood, 2000; Manojlovich, 2007; McKay & Narasimhan, 2012; Radcliffe, 2000; Zelek & Phillips, 2003) as barriers to innovation. While NP practice is different from many aspects of registered nursing (CRNBC, 2015a), having a nursing background is integral to the professional-identity of the NP. Nurse practitioners may encounter many of same challenges associated with power differentials that nurses face (Arcangelo, 1994; DiCenso et al., 2007; DiCenso et al., 2010; Wong & Farrally, 2013), such as perceptions of NPs as having less knowledge, skills, and abilities than physicians. Yet, NPs who were using GMVs described a reconfiguration of these power differentials resulting in NPs having more personal power and authority. In this study, the GMV emerged as a method of care delivery that allowed NPs to
harness their professional agency through increased leadership and interdisciplinary collaboration.

This study is not without limitations. We only spoke with patients who had agreed to attend GMVs and were unable to obtain information on the number of patients who had declined to participate. We also only examined two cases of NP-led GMVs and one case of NPs not using GMVs in BC. More work is needed to examine the use of NP-led GMVs in other Canadian provinces and jurisdictions. While this study examines the interprofessional processes that can unfold within a GMV, other work has shown that GMVs can positively affect clinical outcomes such as HbA1c and blood pressure, for patients with diabetes (Housden & Wong, 2016). Although some studies have examined GMVs for heart disease (Cohen et al., 2011; Yehle et al., 2009), COPD (De Vries et al., 2008) dementia (Lessig et al., 2006; Scott et al., 2004) and mental illness (Remick & Remick, 2014; Scott et al., 2004), much of the current work has focused on GMVs targeting people who have diabetes. Finally, we were not able to video or audio-record the direct observation so we were unable to complete a more in-depth analysis of patient-patient, provider-patient, or provider-provider interactions. Future work could further examine the impact of NP-led GMVs and include patients who did not attend or stopped attending GMVS and have other chronic conditions. Costs associated with GMVs compared to typical consultation visits should also be examined.

Despite study limitations this study adds new knowledge on how diffusing new innovations in primary care can disrupt power differentials between patients and providers and amongst providers. Implementing GMVs with the goal of increasing quality of care, particularly for those with chronic conditions, requires attention to power differentials. While
there are challenges in diffusing innovations in the complex environment of healthcare, GMVs create community, encourages interprofessional practice, are patient centered, and serve to deconstruct some of the traditional hierarchies that exist in primary care.
Table 4: Case study characteristics

<table>
<thead>
<tr>
<th>Description of Case</th>
<th>Case #1: NP-Led GMV</th>
<th>Case #2: Interdisciplinary GMV</th>
<th>Case #3: No GMV Case</th>
</tr>
</thead>
<tbody>
<tr>
<td>A primary-care practice in a rural BC community where the NP provides healthy living and nutrition focused GMVs. Clients attend GMV with a variety of chronic conditions including diabetes, obesity, heart disease, and arthritis.</td>
<td>A primary-care practice in a large urban center where the NP works with a team of healthcare providers to offer GMVs, including a pharmacist, physician, and patient volunteers. Clients attend GMVs for diabetes.</td>
<td>A case consisting of NPs from BC, working in primary care with patients who have chronic conditions and who are not offering GMVs in their practice.</td>
<td></td>
</tr>
<tr>
<td>Direct Observations: 2 GMVs, 3 hours total.</td>
<td>Total Participants N =6 1 = Healthcare provider</td>
<td>Direct Observations: 5 GMVs, 7 hours total.</td>
<td>Total Participants N =11 4 = Healthcare providers</td>
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Patient Demographics

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<td>5</td>
</tr>
<tr>
<td>Female</td>
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Age (yrs)

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Patient Ethnicity

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<tr>
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Family Context

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<th>Married lives with partner</th>
<th>Never Married</th>
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</thead>
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<td></td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Married lives with Partner</td>
<td>Divorced</td>
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<td>1</td>
</tr>
<tr>
<td></td>
<td>Separated</td>
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Highest Education

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<th>Diploma/Degree</th>
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Income

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<th>$30,000-$39,000</th>
<th>$40,000-$49,000</th>
<th>$70,000-$79,000</th>
<th>$20,000-$29,000</th>
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Employment

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<tr>
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<th>Working Part-Time</th>
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<th>Retired</th>
<th>Unemployed</th>
<th>Receiving Disability Payments</th>
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<td>2</td>
<td>1</td>
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</table>

5 The NP defined this as a GMV focused on exercise and nutrition to help address patients chronic conditions, often related to diet and obesity.
4.4 Complexities of Introducing Group Medical Visits with Nurse Practitioners in British Columbia

4.4.1 Summary

In Canada, increasing numbers of people with chronic conditions have prompted calls for innovative approaches to delivering primary care. These approaches may include group medical visits (GMVs) and the introduction of nurse practitioners (NPs). We examined why NPs in the province of British Columbia were not using GMVs. This case study is part of a larger research project that examined the impact of GMVs with NPs for patients with chronic conditions. We completed open-ended interviews with seven NPs working in primary care. Interviews were audiotaped and transcribed. Data were analyzed using interpretive descriptive approaches. Three major themes emerged: (a) advantages of GMVs, (b) questioning the fit of GMVs in current practice contexts, and (c) navigating scope of practice and role constraints that affect NPs’ ability to use GMVs. Power dynamics and hierarchies may influence NPs’ ability to adapt to GMVs. Consideration of practice environments and structures that enable the NPs ability to diffuse and utilize healthcare innovative care-delivery methods is needed.

4.4.2 Introduction

In Canada, the aging population and increasing numbers of people living with chronic conditions have contributed to a significant shift in demographics (Public Health Agency of Canada, 2014b). People over the age of 65 are the fastest growing age group in Canada (Public Health Agency of Canada, 2014a; J. Smith, 2012) and up to 85% of Canadians over...
65 years of age reported living with a chronic condition (Public Health Agency of Canada, 2014a). Individuals with chronic conditions have a higher level of premature morbidity and mortality compared to individuals without chronic conditions (Mirolla, 2004; J. Smith, 2012). In Canada, the most common chronic conditions include cardiovascular disease, cancers, COPD, diabetes and mental illness (Haydon, Roerecke, Giesbrecht, Rehm, & Kobus-matthews, 2006; Mirolla, 2004)

Research has shown that conventional one-to-one primary care delivery models may not be a good fit for patients with complex health management needs (Bartley & Haney, 2010). The challenges in managing the increasing health needs of those who have one or more chronic condition have prompted calls in Canada (Brian Hutchinson, Levesque, Strumpf, & Coyle, 2011) and elsewhere (Dadich & Hosseinzadeh, 2013; Starfield, 2009) for innovative approaches to deliver primary care. Changing the structure of primary care could improve the management of chronic conditions (Hogg et al., 2007; Russell et al., 2009).

Some of the provinces have adopted multi-faceted innovations to address the primary-care needs of the changing population (Canadian Foundation for Healthcare Improvement, 2010). These innovations include changing how healthcare is delivered, such as using GMVs and interprofessional team-based care with the addition of nurse practitioners (NPs) (Canadian Foundation for Healthcare Improvement, 2010; Brian Hutchinson et al., 2001).

The purpose of this study was to explore GMVs with NPs and describe why some NPs are not using GMVs to deliver primary care. We sought to answer the following question: What are the implications of the diffusion of GMVs with NPs in British Columbia? We used Rogers (2003) diffusion of innovation theory to examine why some NPs have
considered using GMVs but for a variety of reasons have not implemented or are not using them in their practices. The results discussed in this paper are part of a larger multisite case study that examined the impact of GMVs with NPs for patients with chronic conditions. The results of the overall case-study and cross-case analysis have been accepted for publication (L. Housden, Wong, Browne, & Dawes, 2015b).

4.4.3 Background

In Canada, many of the innovations noted take place within the publicly funded healthcare system, where each province or territory acts as the insurer and delivers health services (Health Canada, 2011). The province of British Columbia is divided into distinct health regions called “health authorities,” which are the largest employers of NPs in the province. Although NPs have been delivering health care in Canada since 1967 (Dicenso et al., 2007), until the 1990s, their role mainly involved the care of clients in rural and remote or outpost areas (Browne & Tarlier, 2008; Dicenso et al., 2007). Nurse practitioners are considered advanced-practice registered nurses and a masters of nursing degree is the educational standard in Canada (Donald et al., 2010). Across Canada, primary-care NPs may work with specific populations of patients, such as low-income patients, patients with chronic conditions, or patients who for various reasons have been unable to “attach” to one primary-care provider (Donald et al., 2010).

4.4.4 Group medical visits

Group medical visits are a model of care delivery in which primary care is offered to a group of patients, instead of the conventional single patient and single provider format (Bodenheimer & Grumbach, 2007; Noffsinger & Scott, 2000). During the group appointment patients receive primary care services including health assessments, care planning, education,
prescriptions, and referrals (Housden, Wong, & Dawes, 2013; Noffsinger & Scott, 2000). Group medical visits in primary care are innovative because they include some aspects of the single patient–single healthcare professional appointment delivered in a group format. Group medical visits also enhance interprofessional collaboration among physicians, NPs, and other healthcare professionals (Kirsh & Aron, 2008; Victorian, 2009). Both patients and healthcare professionals are satisfied with GMVs (Bartley & Haney, 2010; Beck et al., 1997; Bronson & Maxwell, 2004; Scott & Robertson, 1996; Wong et al., 2011), clinical outcomes for patients attending GMVs are generally positive (Housden et al., 2013), and GMVs provide a patient-centered way of delivering care (Lavoie et al., 2013). We define GMVs as a primary care medical appointment occurring between a healthcare professional and patients in a group setting. Unlike group-based education, GMVs included a medical component, such as health assessment, provision of prescription, laboratory testing, or referrals.

4.4.5 Diffusion of innovation

In 1963, Rogers developed the diffusion of innovation theory to explain how innovations are diffused over time in a social system (Rogers, 2003). Rogers (2003) asserted that the individual or “adopter” moves through a series of distinct processes before the adoption of an innovation and that the innovation possesses a series of characteristics that influence its diffusion into practice. Since the development of the diffusion of innovation theory, researchers have applied it to the examination of a variety of different healthcare innovations, including primary care innovations (Alkhateeb, Khanfar, & Loudon, 2009; Fuks Nielsen & Moldrup, 2007; Giddens & Walsh, 2010; Miller, Saigal, Banerjee, Hanley, & Litwin, 2008).
An innovation does not have to be a newly conceived idea; rather, it can be an idea that is not readily taken up or adopted by the social group for which it was intended (Rogers, 2002, 2003). Diffusion of innovation theory encourages a broad examination of the role of context, acknowledging that varying environments and viewpoints affect the rate of diffusion of innovations (Rogers, 1995).

4.4.5.1 Steps and characteristics of innovation

Individuals move through five steps when adopting an innovation: knowledge, persuasion, decision, implementation, and confirmation (Rogers, 2003). Five characteristics of an innovation affect how rapidly the innovation is diffused or adopted within a society, including relative advantage, compatibility, complexity, trialability, and observability (Rogers, 2003).

Relative advantage refers to the perception of the innovation and accepts that the adoption of any innovation depends on how the adopter views the benefit(s) of the innovation over the previous option (Rogers, 2002, 2003). Compatibility refers to how the innovation “fits” or is compatible to the needs of the healthcare professional, including how it fits with individual or group values, and past experiences (Rogers, 2003). Complexity refers to how complicated the innovation is perceived to be (Alkhateeb et al., 2009; Rogers, 2003) whereas trialability is the ability of the adopter to “try” or “experiment” with an innovation before full adoption (Rogers, 2003). The final characteristic of an innovation that impacts its diffusion is observability (2003). “The more observable the innovation is to others, the more rapid the possible spread of the innovation” (Alkhateeb et al., 2009, p. 124). Diffusion of innovation theory frames the analysis of GMVs as innovation while examining their diffusion in primary care settings with NPs. This lens encourages the examination of the practice context.
surrounding the NP as “adopter” of the innovation, as well as providing a lens for considering particular characteristics of GMVs that may serve as barriers or facilitators to diffusion.

4.4.6 Methods

4.4.6.1 Study design

The analysis reported here developed from a multisite, instrumental case study that examined the impact of GMVs with NPs for patients with chronic conditions in urban and rural British Columbian contexts. Case study design gives the researcher the opportunity to examine a phenomenon within its context (R.K Yin, 2009). It is appropriate when examining complex and contextualized phenomenon (Rosenberg & Yates, 2007).

In the overall study design we initially included two cases where NPs were offering GMVs and envisioned a third case where an NP would implement a GMV. However, during recruitment for our study we encountered significant challenges finding an NP who was willing or able to adopt a GMV. Therefore, the conceptual boundaries of our third “emerging” case shifted to include NPs in British Columbia who were not using GMVs in their primary care practices. This shift provided the opportunity to explore NPs’ experiences with and understanding of GMVs. Additionally, we were able to explore possible reasons why GMVs were not diffused widely among NPs practice environments. It is important to note that even with educational support for the delivery of GMVs in British Columbia (General Practice Services Committee, 2009), their use in primary care remains limited.

4.4.6.2 Eligibility and procedures

The boundaries for the emerging case included primary care NPs working in two of British Columbia’s five regional health authorities. NP eligibility entailed working in a
primary care setting and not currently using GMVs. NPs who had previously used or participated in GMVs but were no longer using them were also eligible to participate. Sampling for the case was purposeful and theoretical (Coyne, 1997; Thorne, 2008). It was purposeful in that we selected NPs who were not using GMVs, and theoretical because it was based on our early analysis that barriers to NPs diffusing GMVS were an important area to explore.

We created a list of 15 NPs working in primary care in two health authorities using publicly available information. We sent initial email inquiries to these 15 NPs introducing the project and establishing whether or not they were using GMVs to deliver care to their patients. Fourteen NPs were also contacted through their health authority communities of practice and invited to participate. In BC, each health authority has a community of practice for NPs where they share information, discuss practice issues, and promote best practices in the region.

Nurse practitioners who indicated that they were not utilizing GMVs were invited to participate in an in-depth face-to-face or telephone interview. Open-ended questions were designed to examine participants’ knowledge of and experiences with GMVs and examine their perspectives on how NPs could contribute to the care of patients through GMVs.

We contacted NPs a maximum of three times to invite them to participate in the interviews. Interviews were recorded. Once NPs agreed to participate, we emailed them consent forms for review and consent. Either signed or verbal consent was obtained before we conducted the interviews. Two professional transcriptionists completed the transcribing of the interviews after signing confidentiality agreements. The research team transcribed detailed field notes during the recruitment and interview process and used these notes to
inform the analysis. Ethics approval was obtained from the Ethics Boards of the University of British Columbia and from the two health authorities in the provinces where the NPs practiced.

4.4.6.3 Analysis

We reviewed and cleaned all interview transcripts to remove any identifying features and loaded into Nvivo, a qualitative data management program (QSR International Pty LTD., 2014). We organized interview data into broad conceptual codes using deductive and inductive approaches (Coyne, 1997). We derived themes from the codes and explored themes throughout the data-collection process. We performed validation by discussing the themes with the research team. After completing seven interviews, we did not identify any new themes in the data. We contacted NPs after the analysis to discuss the findings and ensure the themes and discussion represented practice issues. Throughout the analysis, we developed a series of visual maps to help illustrate and create linkages within the data.

We used interpretive descriptive analytic methods (Thorne, Reimer Kirkham, & O’Flynn-Magee, 2008) and diffusion of innovation theory as a lens through which to analyze the data. We examined the practice contexts surrounding NPs, whom we identified as the innovation “adopters.” This theory also prompted us to consider particular characteristics of GMVs that could be barriers or facilitators to diffusion.

4.4.7 Results

Seven out of the 29 invited NPs participated and became the third case in the larger study. Six of the seven participants were female. Participants had worked as NPs for an average of 5.7 years (SD = 2.4 years). Five NPs were between 35 and 39 years of age, one was 50 to 54 years of age, and one was 60 to 64 years of age. All participants described their
practices as focusing on primary care with a specific population such as individuals with concurrent disorders, refugees, those with addiction or other mental health conditions, young adults, women, and individuals from First Nations.

We identified three major themes: (a) advantages of GMVs as part of primary care; (b) questions about the fit of GMVs with primary, including barriers to their diffusion among practice contexts; and (c) scope of practice and role constraints that affected NPs’ ability to use GMVs.

4.4.7.1 Advantages of GMVs

Nurse practitioners described GMVs as an approach to patient care that incorporated and acknowledged the medical and social backgrounds of patients. Group medical visits were reported to provide opportunities for healthcare professionals to deliver comprehensive primary care. Although NPs in this case were not using GMVs, they had clearly considered the relative advantages GMVs could provide despite significant knowledge variation. One NP illustrated conceptualization of GMVs in a basic operational sense when stating, “If they are diabetic they can come to [a] group visit, maybe at a group [a] GP, NP or nurse can provide ongoing follow-ups and also education” (NP Interview #2).

In contrast, another NP describes a more in-depth understanding of GMVs and how they might impact patients by explaining:

…Group medical visits… an opportunity to get people.. a population together that have like health problems to…encourage self-management and increasing independence with their health condition. It usually has a bit of curriculum associated with it regarding knowledge around the health condition and sometimes different practitioners come in to present. It often includes an MD or an NP visit to each of the
individuals in the group, …to update their scripts and lab requirements (NP Interview #6).

This variation in understanding of GMVs was perhaps related to NPs’ past experiences with GMVs, including experiences as student NPs and colleagues’ or clinics’ reported experiences with GMVs.

GMVs were a way for both health care professionals and patients to reflect on practice and day-to-day care with one another. In the quote below, the NP described the atmosphere created in the GMV as reflective, allowing patients and healthcare professionals the time to discuss the complexities of an individual’s condition.

I think people don’t know where to turn, they’re a little bit afraid. We forget as healthcare providers when we’ve all become so versed in the side effects….the progression of the disease processes and things like that….the group medical visit provides a much more contemplative environment for talking things over (NP Interview #1).

The GMV environment was described as supportive, where patients felt they would have the opportunity to have multiple questions answered in one appointment rather than feeling as though they could only present one question to their healthcare professional. In the words of one NP:

Some people find that going to their doctor can be quite intimidating, and some people have physicians where [sic] you can only have one problem … and a group medical visit is a way to have ten problems, because if you all have diabetes and one person’s worried about hyperglycemia and another person’s worried about nocturia,
and another person’s worried about their vision you get information that can be both preventative and curative all in the same visit (NP Interview #4).

Nurse practitioners explained how their nursing background provided them with the knowledge and ability to enhance their patients’ “holistic care” and described an extensive commitment to these practice values. As one nurse practitioner said:

…nurses are really good at looking at the individual in the context of their own life pulling out the pieces that are of value to the patient, and sharing knowledge in a way that can build rapport….. if you are talking to a diabetic you need to figure out food safety, food security first, before you start talking about the glycemic index (NP Interview #1).

Previous work has acknowledged that NPs are well positioned to address the broad context of patients’ lives (Browne & Tarlier, 2008). The recognition that GMVs with NPs could enhance contextualized patient care demonstrated NPs attention to factors that may serve to empower patients.

4.4.7.2 Questioning the fit of GMVs in NP practice

Most interview participants stated that GMVs were advantageous to some patients. Yet, they were ambivalent about the compatibility of delivering primary care using this group approach instead of the conventional one-on-one primary care delivery model. NPs described their patient caseloads as complex and focused on specific populations stating that GMVs might not work with some populations or that some of their patients’ characteristics were not well suited for a GMV. For example, one NP explained how “…people with mental health conditions and addictions are overloaded with groups, and get tired of group settings” (NP Interview #6). According to another NP, “…people with concurrent disorder[s] can’t keep
the timeline, or they can’t sit long enough…and they often miss appointments….so I think the one-on-one visits work for them” (NP Interview #2).

One NP pointed out that patients are accustomed to receiving primary care in a certain way. Moreover, many NPs are accustomed to delivering care using the single patient and single healthcare professional format. Envisioning the delivery of care in a different format created hesitancy. As one NP said:

Everyone comes to health care encounters with their cultural and historical and traditional ways of receiving health care, if you’re 65 years old, and have always gone to your doctor, it’s going to seem really odd that all of a sudden here you are in front of these people,…it might seem very intimidating (NP Interview #4).

One NP thought that patients’ concerns about confidentiality contributed to GMVs being a short-lived and unsuccessful innovation. As the NP explained, “There were lots of concerns afterward about confidentiality and some degree of suspicion about rumours starting and people talking about things, and the group just was not comfortable talking about those issues” (NP Interview #1).

Another NP expressed personal discomfort with disclosing confidential patient information such as laboratory results within a group context. This quote illustrates how personal values can influence diffusion of the innovation: “I was somewhat concerned about the confidentiality, being a small town I would never, as a patient [go] to one, because…they talked about the lab results….I was a little uncomfortable with that…” (NP Interview #3).

Incompatibility of delivering GMVs may also be due to structural barriers. Nurse practitioners described how physical space, administrative time, and buy-in were major barriers to the diffusion of GMVs. Many NPs described the challenges of lacking regular
office space or having limited administrative time, which required them to engage in clinical organization during personal or unpaid time. According to one NP:

In many places where I see NPs are practicing, quite often it’s ‘You are an NP, you would be great here. Here you can have this room, we’ll clean out this closet, you can practice out of here. You won’t have an office, but you can see patients in this room…’ …you need the space for the GMV but, in how many places is this space adequate for the NP to do all of her job? (NP Interview #4).

NPs identified other structural challenges in accessing appropriate technology, such as electronic medical records that could hinder GMV administration.

4.4.7.3 Navigating scope of practice and role constraints

Most NPs also provided care to patients who were “attached” to a primary care physician. Therefore, they were temporarily the designated healthcare professional for these patients for either a certain period or for a certain condition. This temporary role created a barrier to diffusing GMVs because NPs perceived limited autonomy to fully manage the care of patients without consent of the main healthcare professional, typically a family physician. NPs described navigating relationships with family physicians as walking on a “tight rope” and spoke of sending patients back to their physicians even though treatment for a patient’s health condition was within the NP scope of practice. As one NP explained:

In [order to] survive and be viable without making the practice any money, NPs get slotted into niche practices…So she isn’t really a full service primary care provider because the physician will say ‘your [hemoglobin] A1C’s getting a little high, you better go see the NP.’ So ‘the NP’ will see [the patient], and [the patient states] ‘my toenails all thick, yellow and funky’ and the NP will say ‘that’s right. You probably
have onychomycosis, but you need to go back and see your physician for that’ (NP Interview #4).

These descriptions and the two quotes that follow illustrate how power dynamics inherent in primary care directly influence NPs’ practice and practice environments. NPs in this study generally worked in roles where they felt constrained in specific aspects of their practice and disempowered by the fee-for-service payment models. NPs struggled to understand how they would function with an advanced scope of nursing practice and in a group setting where their role may not be valued or visible. In the words of one nurse practitioner:

There was another NP who was running [a GMV] in a fee-for-service practice, but it was almost like an RN role and she ended up being the organizer, administrator, and manager of [the GMV], and the physician, in order to bill for the GMV, wanted to do the actual care provision (NP Interview #4).

Another NP explained that when she was first doing GMVs it was irritating that a physician would pop in and say, “Great job…everybody’s working on quitting on smoking.” Then the MD would leave and “bill for the ten people that were in the group. “But “the NP” had done all of the work, teaching, counselling and the prescriptions (NP Interview #1).

Two NPs had previous involvement with GMVs and described them as a way of delivering care that did not align with a patient-centered approach. Instead, these NPs described an environment in which the group was healthcare professional-centric, serving to increase the remuneration of the physician rather than meet the needs of the patients.

We [the Clinic] tried a group medical visit for diabetes. It was unsuccessful…. because I think the incentive behind it was to see a bunch of people all at once and
sign off, as opposed to really organizing and design[ing] it in a way that was patient centered (NP Interview #6).

These concerns demonstrated NPs’ ongoing challenges with their desire to be visible and recognized within a healthcare system that only reimburses care offered by certain healthcare professionals for selected activities.

4.4.8 Discussion

This study provided an opportunity to explore NPs’ perspectives regarding factors that constrain widespread diffusion of GMVs into primary care in the Canadian province of British Columbia. We identified three major themes. First, nurse practitioners recognized advantages of delivering GMVs. They also described challenges GMVs presented to their practice and to primary care due to various scope of practice constraints. Second, NPs reported that GMVs could be advantageous to some patients. And, third, NPs described GMVs as being highly compatible with aspects of NP practice and values. Among them are a focus on attention to communication with patients (Wong & Farrally, 2013) and maintaining what Doane and Varcoe (2007) referred to as a “relational practice” p. 200.

These results suggest that NPs’ diffusion of GMVs into their practice is challenging. Rogers’ (1963) diffusion of innovation theory would suggest that the trialability of GMVs was limited due to administrative work and systemic barriers. The limited number of NPs in British Columbia who used GMVs made it difficult to find a GMV for observation. The complexity of diffusing GMVs was also influenced by the power dynamics between physicians and NPs, which limited NPs’ ability to work to their full scope of practice.
The major contribution of our study is the illustration that inherent power dynamics and hierarchies could influence NPs’ ability to adopt GMVs. Although Rogers (2003) acknowledged that individuals with more power might be more successful in diffusing innovations than others, little attention has been paid to the role of power in diffusing innovations in primary care. These results suggest that even with policies for integrating NPs into primary care in British Columbia (British Columbia. Ministry of Health, 2016; Wong & Farrally, 2013), adding a new practitioner to the family-physician-dominated primary care environment creates disruptions to power dynamics.

Nurse practitioners revealed that diffusion of GMVs may be stalled due to concerns about being visible and valued members of the healthcare team. The hierarchy of primary care contributes to an environment in which NPs seek to maintain their power and agency through avoiding situations where the work done by the NP might be credited to the physician. Nurse practitioners who lack their “own” panel of patients might feel uncomfortable navigating their roles and responsibilities in providing primary care.

Past work has shown that GMVs may be a preferred way for patients to receive psychiatric care because GMVs served to “reduced the stigma associated with having a mental illness” (Remick & Remick, 2014, p. 52). Group medical visits have been a successful method of delivering care to other vulnerable and complex patients, such as patients with dementia (Lessig et al., 2006), or low socioeconomic status (Thompson et al., 2014) and chronically ill older adults (Coleman, 2001).

4.4.8.1 Implications for practice

Understanding the power and politics among different health professional roles in the delivery of primary care and collaborative practice is critical for effective diffusion of
innovations into practice. Nurse practitioners are registered nurses with a history (and legacy) of hierarchical relationships with physicians (Lockhart-Wood, 2000; McKay & Narasimhan, 2012; Radcliffe, 2000; Zelek & Phillips, 2003). Nurse practitioners are advanced practice nurses (Bryant-Lukosius et al., 2004) and historically “physicians have been situated at the top of the hierarchy” (Dicenso et al., 2010, p. 247) with more power than nurses. Additionally, structural constraints, such as insufficient physical space for NPs to work and see patients, influence the diffusion of GMVs. Moreover, existing primary care structures have not been developed to physically or administratively accommodate additional health care professionals (Sangster-Gormley, Martin-Misener, Downe-Wamboldt, & Dicenso, 2011). Certain primary care structures, along with pressures that health care professionals face to provide care quickly and efficiently (Pimlott, 2008; Yarnall, Pollak, Ostbye, Krause, & Michener, 2003), do not leave NPs and other clinicians much time to learn about GMVs and diffuse them as an innovative approach.

Finally, although some NPs found aspects of GMVs compatible with their practice, they also had concerns about them in terms of NPs’ roles in providing primary care. These participants had ideas of how they “should” provide care that conflicted with the realities of clinical practice. Moreover, some NPs had concerns about not being able to control potential breaches in patient confidentiality in a group setting. These concerns demonstrate NPs’ desires to engage in care that meets ethical standards including consideration of right to privacy and confidentiality (CNA, 2008). Yet, in our larger cross-case analysis and in previous research, patients attending GMVs and health care professionals delivering GMVs suggest that concerns of confidentiality are largely a non-issue (Eisenstat, Ulman, Siegel, & Carlson, 2013; Noffsinger & Scott, 2000; Wong, Lavoie, Browne, Macleod, & Chongo,
2015). In contrast, GMVs create environments in which trust between patients and healthcare professionals is more likely to develop (Lavoie et al., 2013). This contrast between some NPs’ perceived challenges with GMVs with regard to confidentiality and evidence to the contrary points to the need for NPs to increase their knowledge of evidence when considering diffusing innovations in primary care.

4.4.8.2 Implications for policy

Innovations in primary care policy reform such as NPs and GMVs can improve quality of care and patient outcomes. They also can increase accessibility, responsiveness, and comprehensiveness of primary care by the right healthcare professional at the right time. While evidence points to advantages of GMVs (Bronson & Maxwell, 2004; Clancy et al., 2003; Clancy, Dismuke, Magruder, Simpson, & Bradford, 2008; Housden et al., 2013; Kirsh et al., 2007; Lavoie et al., 2013; Miller, Zantop, Hammer, Faust, & Grumbach, 2004; Trento et al., 2001) supporting evidence or policies are not enough to foster adoption of an innovation (Barnett et al., 2011).

Findings from this study support the understanding that beyond basic knowledge and experience with an innovation, policy-makers hoping to diffuse healthcare innovations should consider the context in which NPs practice. This consideration should include NP roles, structures that that enhance or impede innovation, scope of practice constraints, and interprofessional relationships. As policy-makers and clinicians continue to seek innovative ways to meet the needs of the Canadian population, they need to be mindful of the power dynamics and structural barriers that NPs may face when attempting to diffuse innovations. Attention to these barriers could create practice environments in which NPs are able to diffuse innovative methods of healthcare delivery, including and not limited to GMVs.
4.4.8.3 Implications for research

This study provides evidence about the complex environments in which NPs in BC practice. Further examination of these environments, including what kinds of actionable items may decrease barriers to innovations in primary care and encourage NPs to diffuse innovation, is needed.

4.4.9 Limitations and recommendations

Study participants came from two British Columbian health authorities. Although the sample size of this case study was small the findings provide preliminary evidence of why NPs were not utilizing GMVSs. Studies that explore diffusion of GMVs with NPs in other jurisdictional contexts are needed because these findings are not necessarily applicable to all NPs or practice contexts.

Leaders of professional nursing and medical associations, directors of academic programs in primary care, and experts in primary care practice require preparation in adopting innovations such as GMVs. The education might include completion of modules where health care professionals and students study and deal with power dynamics.

4.4.10 Conclusion

Even though NPs recognize potential advantages of GMVs for their patients, they identified barriers to diffusing GMVs in primary care. These barriers included structural challenges and inherent power dynamics in primary care settings. Diffusion of an innovation such as GMVs in primary care requires that NPs be willing “agents,” working on its adoption.

Further research on diffusing GMVs in other primary care settings and locales is needed to expand knowledge about their diffusion as a primary care innovation. Health care
professionals and students might benefit from education about GMVs, diffusion of innovations in primary care, and related power dynamics.
CHAPTER 5: DISCUSSION AND IMPLICATIONS

This dissertation consisted of a systematic review with meta-analysis on the use of GMVs among those with diabetes, as well as a multisite case study consisting of three cases. The purpose of this study was to examine the impact of GMVs with NPs on patients with chronic conditions in primary care practices. In this study I sought to answer four research questions: 1) “Based on a systematic review of the literature, how do GMVs impact the quality of care for people living with type I and type II diabetes?” 2) “Based on case study design: 2a) how might GMVs influence the primary care experiences of patients’ living with other chronic conditions? 2b) What is the role of the NP in the delivery of GMVs? 2c) What are the barriers and facilitators to implementing NP-led GMVs in British Columbia (BC)?”

In this chapter, I discuss the results of the dissertation organized according to the Hogg Framework for Primary Care Organizations (Hogg et al., 2007). I also discuss the contributions this dissertation makes to nursing scholarship and consider the relevance of Diffusion of Innovation theory in primary care. Finally, I reflect on potential implications of these results for primary-care practice, research, education, and policy.

5.1 Summary of Findings

The results of this multiple-methods study provide evidence that GMVs can improve health outcomes for patients with chronic conditions and change the ways in which healthcare providers work with patients and with other healthcare professionals. Viewed as a whole, the findings demonstrate that GMVs are a useful innovation in primary care with positive impacts on both the structural and performance domains in primary care (Hogg et al., 2007). The use of multiple methods in this study allowed me to examine a number of
aspects of the Framework for Primary Care Organizations and contributed a rich and in-depth understanding of GMVs with NPs for patients with chronic conditions.

The evidence on NP diffusing innovations in BC is limited for a number of reasons. Firstly, there are limited numbers of NPs working in primary care in BC. Movement toward providing more team-based care has been limited, partly due to the dominant fee-for-service funding model (Canadian Foundation for Healthcare Improvement, 2010). Additionally, healthcare providers and patients operate within a system that has a history of hierarchies and complex power dynamics (Stein, Watts, & Howell, 1990; Zelek & Phillips, 2003), making studies focused on innovations in health care, including those involving NPs, complex and context-bound.

Group medical visits have the potential to impact the organizational and environmental features of primary care as well as impact the healthcare-service delivery and the technical quality of patient care (Hogg et al., 2007). Group medical visits also offer an alternative way to deliver primary care by providing GMV patients and NPs with more agency. That is, GMVs increase both patients’ and NPs’ understanding of both their abilities and limitations in exercising personal power or authority (Davies, 1991). The findings from this study suggest that attention to power dynamics is essential in the context of diffusing innovations that change the way in which providers and patients work together. In particular, NPs need to be attuned to issues of power if they are hoping to engage in innovative ways to deliver primary care services.
5.1.1 GMVs and the performance domain

5.1.1.1 Healthcare-service delivery

Healthcare-service delivery includes concepts of access, continuity, integration, and comprehensiveness (Hogg et al., 2007). GMVs increased accessibility to primary care through the provision of long-term, regular appointments and the GMV environment focused on health prevention and self-management of chronic conditions in a collaborative, interdisciplinary atmosphere.

The analyses across the cases suggested that GMVs provide an environment for increased team collaboration; multiple healthcare providers (e.g., NP and medical office assistant or NP, MD, pharmacist and office assistant) were sometimes together in the room with patients. This shared environment provided an opportunity for synchronous collaboration and communication between all GMV participants. Patients and providers communicated about the meaning of patient results (e.g., elevated HbA1c) and next steps in a shared treatment plan. Importantly, each participant gained a greater understanding of the day-to-day complexities of carrying out these treatment plans within each of the contexts of patients’ lives and experiences.

Across all cases, it also became clear that GMVs shifted ways in which accountability was enacted in primary care between patients and providers. Traditionally primary care providers were accountable to patients for their professional competence and practice (Emanuel & Emanuel, 1992). GMVs created a collaborative environment where patients and providers shared their health goals and behaviors, becoming accountable to one another.
5.1.1.2 Technical quality of patient care

The technical quality of care consists of the activities performed in primary care and includes health promotion, primary and secondary preventative services, and the care of acute and chronic conditions (Hogg et al., 2007, p. 312). Aspects of this domain were examined through systematic review and meta-analysis, where I found that GMVs had both a clinically and statistically significant impact on lowering patients HbA1c with a decrease in effect size of 0.25, or ¼ of 1% (L. Housden et al., 2013). The meta-regression revealed that the duration of the GMV was more important than the intensity of the GMV. When GMVs are offered over a set duration of time, such as a 12-week program, they may not have the same impact on physiological outcomes as a long-term GMV offered at less regular intervals.

The results of this systematic review and meta-analysis provided important information for healthcare providers and decision-makers, encouraging the more widespread diffusion of GMVs for patients with diabetes.

After completion of the systematic review and meta-analysis, various questions remained unanswered, including: 1) What impacts do GMVs have on patients’ quality of life and 2) Why are so few healthcare providers offering GMVs? Notably, in BC, GMVs in primary care have remained a more local innovation and are not widely adopted by NPs or physicians.

To explore these questions, a multisite instrumental case study consisting of three cases, two with NPs offering GMVs and one case where NPs were not offering GMVs, was completed.
5.1.2 GMVs and the structural domain

Manuscript three presented the results from the case study where NPs were not providing GMVs. Nurse practitioners described a variety of factors related to the structural contexts of their practices that could contribute to the lack of diffusion of GMV, including the contexts of the BC primary care practices. In BC, primary care services are traditionally offered through solo providers working in private practice. This was identified as a barrier to diffusing GMVs due to the challenges associated with NP integration, including lack of physical space to practice, limited administrative support for coordination of the GMVs, and role constraints.

Another structural barrier to diffusing GMVs is related to how primary care providers in BC are remunerated. NPs in the third case were cognizant of the fact that a mainly fee-for-service system encouraged providers to focus their practice on efficiency and throughputs of primary care. NPs perceived that the goal of delivering GMVs in some physician practices seemed to focus on billing and receiving remuneration for as many patients as possible. Thus, NPs believed that GMVs may not be suitable for some patient populations (e.g. those with complex mental illnesses and/or addictions) given such a focus on throughputs.

5.1.3 GMVs influence relational practice

Group medical visits supported a relational practice approach, an approach to care that values the experiences, concerns, social contexts, complexities, and goals of the patients (Doane & Varcoe, 2007; G. Doane & Varcoe, 2015; Hartrick, 1997; Jonsdottir, Litchfield, & Pharris, 2004). Past work indicates that patients also value time and having relationships with their healthcare provider, and prefer primary care providers who consider patients’ social, family economic, and personal contexts when collaborating with them on healthcare.
management plans (Bensing, Rimondini, & Visser, 2013). Patients in this study described valuing patient-centered care and having relationships with their healthcare providers where they felt heard and well cared for.

Hogg et. al. (2008) identifies the patient–provider relationship as an important aspect of the performance domain in primary care. This includes interpersonal communication, respect, trust, whole-person care, cultural sensitivity, family-centered care, and advocacy (Hogg et al., 2007). Both patients and providers described GMVs as a space to develop relationships, resulting in increased connection to one another and an increased sense of agency rooted in mutual trust and cooperation. The reconfiguration of the clinical encounter reduced hierarchical relationships that exist between healthcare providers and patients. Patients sensed a shift in power relations when participating in GMVs. This shift to shared power between provider and patient facilitated relational practice. Providers could improve their approach to care where they were able to better hear and listen to patients’ experiences, social contexts, and daily complexities of self-care. Patients’ increased their knowledge about chronic conditions and their accountability to themselves and each other in the day-to-day management of their health. This shift represents a relational way of knowing, or knowledge that is socially constructed between the individual, others, and the broader environment (Thayer-Bacon, 2003). This reconfiguration resulted in a reduction of the hierarchical relationships that have traditionally existed in primary care, where physicians have been situated at the top of the medical hierarchy (Fisher, 2010; Fletcher & Con, 2006; Zelek & Phillips, 2003).

GMVs may also influence the relational aspects of the structural domain in primary care. Within the structural domain, Hogg et. al identifies team functioning, management and
practice governance, organizational adaptiveness and organizational culture (2008). My analysis suggests that the ways in which GMVs shifted the relationships between healthcare providers directly influenced the organizational structure and dynamics in primary care. NPs who were using GMV described a shift in their personal agency, leading to less hierarchical relationships with physician colleagues and new ways of working together developing. Hogg et. al., suggests that organizational culture can influence the quality of primary care (Hogg et al., 2007, p. 310). My analysis suggests that GMVs resulted in improved relationships between both patients and healthcare providers and among healthcare providers. These relationships became more collaborative and centered around patient needs, while contributing to increased interprofessional understanding of the NPs knowledge, skills, and abilities in primary care.

5.2 Theoretical Contributions

This dissertation contributes new knowledge on how power dynamics and hierarchies may impact the diffusion of innovations in primary care, and that attention to issues of power can increase the utility of Diffusion of Innovation theory. Diffusion of Innovation theory focuses on how the diffusion is adopted within a social system (Rogers, 2003). While there is acknowledgement that individuals with more power have increased opportunities to diffuse innovations (Rogers, 2002), there is little consideration of how adopters are influenced by power or hierarchies (e.g. the traditional hierarchies that exist between nursing and medicine) or how the innovations themselves have the opportunity to disrupt these hierarchies.

As a communication theory, Diffusion of Innovation conceptualizes an almost linear adoption of an innovation (Denis, Hébert, Langley, Lozeau, & Trottier, 2002; Fitzgerald, Ferlie, Martin, & Hawkins, 2002; Wolfe, 1994). The individual apparently moves
through a series of steps in order to successfully adopt an innovation. Moreover, the innovation has a number of characteristics that impact its likelihood of being diffused. Yet, the implementation and delivery of GMVs is not a linear process. How the individual moves through these steps and the factors that influence the likelihood of diffusing the innovation can be impeded or stalled because of the lack of attention to issues of power.

Foucault’s perspectives on power as “the ways in which human beings are ‘made subject’, or who they understand themselves to be, and ‘made subject to’, or subjected to control and dependence” (Foucault, 1982, p. 212) provided additional insight into completing the cross-case analysis. Considering power within Diffusion of Innovation theory in primary care demonstrated that established hierarchies between the health professions may limit or disrupt the diffusion of innovation. That is, power dynamics can disrupt the diffusion of innovation process. Individual agency was an important factor in the implementation of GMVs. This analysis shows that an innovation could have limited uptake due to an individual’s lack of agency of the adopters or the lack of perceived agency. To reflect the influence of power in the diffusion of innovation, Rogers Diffusion of Innovation theory was adapted (See Figure 11)—positioning power as an important background influence in the diffusion of innovation process.
Figure 11: Power in Rogers diffusion of innovation process

The figure should be seen as an heuristic since the steps (e.g. knowledge, persuasion, decision, implementation and confirmation) still appear linear in fashion. More work needs to be done to examine the relationships between the various steps in diffusing an innovation since power dynamics can disrupt these steps as much as an innovation can disrupt power dynamics. Without additional attention to issues of power, specifically process-related challenges such as communication and interpersonal processes, Diffusion of Innovation theory remains limited in its application to the diffusion of healthcare innovations. The further consideration of power and process-related challenges in addition to better known factors such as the physical environments, allows for a greater understanding of the complex environments in which NPs in BC work.
5.3 Role of the NP in the GMV

The third research question on the role of the NP in the GMV raised some important additional questions. When patients were asked about the role of the NP, they were also unable to articulate a specific role or contribution of the NP provider. Instead, patients described the high level of knowledge of the GMV facilitators, the tasks that various healthcare providers performed, and overall positive impressions of GMVs.

Patients focused on the ways in which GMVs addressed their health and social needs and described how the patient-centered environment of the GMV was integral to meeting their healthcare needs. Patients were less concerned with who was offering primary care services and more interested in how primary care services met their needs. Past work indicates that patients value time and relationships with their healthcare providers, preferring healthcare providers who take into consideration patients’ social, family, economic and personal contexts when collaborating (Bensing et al., 2013). Further research should, as an explicit aspect of the design, aim to tease out what, if any, might be the unique contributions of NPs that are most significant to patients.

Non-NP healthcare team members described NPs as integral to the success of the GMV since they had important facilitative skills. Nurse practitioners in this study described themselves as having a “holistic” approach to patient care, one that considered the broader social contexts of patients and families. Holism can be understood as an approach to care that takes into consideration not only the patients physical needs, but also incorporates the individuals psychological, cognitive, and social needs into their care (Erickson, 2007). In this dissertation, NPs spoke of valuing holistic care approaches. Past research has indicated that NPs may bring a broad contextualized understanding of patients’ lives into primary care.
(Sangster-Gormley et al., 2013). Yet, in this study it was difficult to determine if it was the structure of the GMV providing opportunities for holistic, patient-centered care and relational practice to develop or if the NPs were particularly adept at delivering GMVs given their strong nursing foundation, reflective practice, and attention to group dynamics in addition to advanced clinical and technical skills.

5.4 Limitations

There are several limitations to this study. The meta-analysis only included studies where GMVs were implemented with patients who had diabetes. More work is needed to examine whether GMVs are positively associated with clinical and health outcomes in those with other chronic conditions. The case-study work was only conducted in one province and the participants were from two of the seven health authorities in BC. Another limitation is that only patients attending GMVs were interviewed. Future work should include those who have not attended GMVs. An attempt to interview patients who had declined to participate in GMVs was made; however, information about who had been invited and which patients had declined to participate was not kept by the clinics or known by the healthcare providers. We were also unable to video or audio-record the direct observation and were unable to complete a more in-depth analysis of patient-patient, provider-patient, or provider-provider interactions.

5.5 Overall Recommendations

In this section, I present some implications of the findings from this study for practice, research, education, and policy, and offer recommendations based on these findings.
5.5.1 Implications for practice

NPs need to be open to innovations and to implementing innovations in practice. While NPs do and will continue to face challenges with regards to their roles and lack of others’ understanding of their scopes of practice, the needs of patients continue to increase. NPs are well-situated to address patients’ needs through conventional (e.g. one-on-one appointments) and more innovative ways of primary care delivery, such as through GMVs. Delivering care through GMVs can assist NPs in meeting both patient centered healthcare objectives and can change the power dynamics and hierarchies within which they practice. These changes may provide NPs with new opportunities to collaborate with their colleagues and demonstrate, on an ongoing basis, the importance of patient centered, interprofessional care.

Additionally, these findings support the broader implementation of GMVs with people who have diabetes both with NPs and other primary care providers. Primary care providers could also consider GMVs as a long-term method of care delivery rather than a short-term program. While our meta-analysis indicated that both short and long-term GMVs with people who have diabetes statistically significantly improved patients HbA1c, longer-term GMVs showed further statistically significant improvements.

It is also important that NPs pay attention to the power dynamics and hierarchies that exist in healthcare and how these power dynamics might serve to impede or stall innovations. As emphasized in Foucault’s writings, knowledge and power are intertwined (Foucault, 1982; Henderson, 1994). Increased knowledge on why diffusion of innovations might be impeded or stalled may actually provide NPs with more agency, assisting them with new strategies and approaches to successfully diffuse innovations.
Patients benefited from the delivery of care through interdisciplinary teams. NPs and healthcare providers should seek opportunities to work collaboratively with other healthcare providers and with patients. This collaborative process will assist NPs in meeting patient-centered care objectives and facilitate a relational practice approach that recognizes the complexities, concerns, goals, and experiences of the patients.

5.5.2 Implications for research

Some clear areas for further research emerged from this study. The findings from the systematic review and meta-analysis indicated that the duration of GMVs was more important than the intensity. Given this evidence, future research on GMVs should examine these features in more detail to develop a greater understanding on why longer-term GMVs have more impact on, for example, glycate hemoglobin than frequent, shorter duration GMVs. Additionally, examining duration versus intensity for other clinical measurements including blood pressure and lipids would provide more information on how GMVs should be organized for patients with chronic conditions.

In Canada, NPs were introduced, in part, to address the primary care physician shortage (Dicenso et al., 2007; Edwards, Rowan, Marck, & Grinspun, 2011; Kaasalainen et al., 2010) and initial research needed to establish that NPs were safe and effective care providers. Past work over the last 40 years has established NPs as competent primary care providers with a similar scope of practice to family physicians (Horrocks et al., 2002; Mundinger et al., 2009; Sackett et al., 1974). There is ample evidence exploring what NPs can do, yet limited evidence exploring how NPs can be mobilized to provide improved access to care—including care delivered via GMVs. Broadly, there is work to be done exploring how NPs provide care, including the extent to which relational practice is enacted with NP-
led care, and with attention to the complex structures within which NPs practice.

Understanding how NPs engage in relational practice approaches and create meaningful, complex and contextualized connections with patients could shed light on how NPs might add value to patient care delivery – including through GMVs. Shifting the discussion from what to how could help to further solidify NPs as integral members of the healthcare team whose approaches to patient care are valuable and deserving of further research.

In BC, NPs practice in complex environments, many of which are not organized in relation to the typical physician fee-for-service practices. For this reason, NPs encounter different health system structures that influence the possibilities to diffuse innovation as compared to physicians. Further examination of NP practice environments and the kinds of actionable opportunities that NPs can take action within these environments, may decrease barriers to innovation in primary care and encourage NPs to diffuse primary care innovations. Lastly, future GMV research should look for opportunities to video and audio-tape GMV session to further examine GMV dynamics between and amongst patients and healthcare providers.

5.5.3 Implications for education

Additionally, there are some implications for education from this study. The integration of additional nursing theory into NP programs, including innovation and power theory, may help NPs attune to issues of power structures and innovation. Furthermore opportunities for interdisciplinary education outside of nursing should be considered as a way to develop relationships with other healthcare providers, as well as to improve knowledge of NPs roles and scope of practice, issues which were identified in this study as barriers to diffusion of innovation. Lastly, to encourage the use of GMVs more widely in primary care,
NPs and other healthcare providers should receive training on the structure and process related to group dynamics as well as education on group facilitation.

**5.5.4 Implications for policy**

While policy makers should seek opportunities to fund innovations in primary care practices, they should also consider how remuneration might impede or encourage innovation. In this study NPs expressed concerns that their work in GMVs might not be visible or valued, noting that they were not provided with funding or support to diffuse GMVs. Nurse practitioners also discussed how the throughputs of primary care created situations where the focus of the GMV became the volume of patients that could be seen, rather than a way to provide patient-centered care.

**5.6 Conclusion**

In conclusion, this dissertation used a multiple-methods approach to examine the influence of GMVs for patients with diabetes and explore GMVs with NPs for patients with chronic conditions. Through in-depth, open-ended semi-structured interviews with NPs, patients, and other healthcare providers, the findings demonstrate that GMVs provided opportunities for NPs to achieve the five principles of primary healthcare: participation, accessibility, health promotion, and chronic disease management, technology and innovation, and intersectoral collaboration (CNA, 2005).

GMVs in BC and elsewhere also contribute to an environment in which the traditional hierarchies in primary care may be altered. This shift leads to more contextual and less hierarchical relationships between patients and healthcare providers and among healthcare providers. Through our systematic review and meta-analysis, this study also demonstrates that GMVs may have a positive impact on some clinical outcomes for patients.
with diabetes, including improved HbA1c and BP control, and that duration of GMVs has more impact than the intensity of GMVS for clients with diabetes.

This dissertation also broadened the understanding of innovation theory in healthcare. Without additional consideration of power dynamics and hierarchies, Rogers’ Diffusion of Innovation theory may have limited application in healthcare. This is particularly apparent when examining innovations with healthcare providers, such as NPs, who are situated within a complex medical hierarchy and face significant confusion regarding their role and scope of practice. The perception by NPs of having less agency to diffuse innovations has broader implications for policy-makers who are seeking new ways to provide care to an increasingly complex and high-needs population. While NPs face significant challenges implementing GMVs due to these broader constraints, more widespread diffusion of GMVs in primary care should be encouraged as part of improving access to high quality, patient-centered, primary care throughout BC.
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Appendix A: Systematic Review and Meta-Analysis Search Strategy

Source: PubMed (Medline) 1947- Present
Searched on: January 31, 2012 & February 26th, 2012
Results: 21,370
Search:
1. Group + Medical + Visit
2. “Group Medical Visit”
3. GMV
4. Shared Medical Appointments
5. "Group Appointments”
6. Group Visits
7. Diabetic Group Appointment
8. “Diabetes Group Medical”
9. “Group Visit”
10. “Group Medical Clinic”
11. Diabetes + Cluster Visits
12. “Group Processes” + Diabetes

Limits: Human Subjects

Source: CINAHL
Results: 5,175
Search:
1. Group Medical Visits
2. Shared Medical Appointments
3. Diabetic Group Medical
4. “Diabetic Group Medical”
5. Group Visits
6. Diabetic Group
7. Group Medical + Diabetes
8. GMV
9. “Group Medical Clinic”
10. “Diabetic Group Appointment”

Source: Biosis
Searched on: February 4, 2012
Results: 137
Search:
1. “Group Medical”
2. Group Medical Visits
3. Shared Medical Appointment
4. “Diabetic Group Appointment”
5. “Diabetes Group Medical”
6. “Group Appointment”
7. “Group medical Clinic”
8. “Shared Medical”

Source: Proquest Digital Dissertations
Searched on: February 5, 2012
Results: 14
1. “Group Medical Visits” + diabetes
2. “Shared Medical Appointments” + diabetes
3. “Diabetic Group Appointment”
4. “Cluster visit”

Source: Embase
Searched on: February 5, 2012
Results: 3900
1. “Group medical Visit”
2. “Diabetic Group Appointment”
3. “Diabetes Group appointment”
4. “Group Visits”
5. “Group Appointments”
6. “Shared Medical Appointment”
7. “GMV”
8. “Diabetic Group Appointment”
9. “Diabetic Group”
10. “Group Medical Clinic”
11. “Chronic Care Clinics”
12. “Cluster Visit”

Removed “map term to subject heading”

Source: Web of Science
Searched on: February 11, 2012
Results/ Citations: 748
1. Base search: Trento, Passera et al. 2001
2. Base search: Edelman, Fredrickson et al. 2010
5. Base search: Culhane-Pera, Peterson et al. 2005
6. Base search: Deakin, McShane et al. 2005
7. “Group Medical Visit”
8. “Shared Medical Appointment”
9. “Diabetic Group Appointment”

Source: Psych Info (1887-Present)
Search:
1. “Group Medical Visit”
2. “Shared Medical Appointments”
3. “Shared Medical”
4. “Diabetic Group Appointment”
5. “Diabetic Group”
6. “Group Appointment”
7. “Chronic Care Clinic”
8. “Shared Diabetes Visit”
9. “Shared Group”

Source: HSTAT (1977-Present)
Search:
1. “Group Medical Visit”
2. “Shared Medical Appointment:
3. “Shared Medical” + “Diabetes”
4. “Diabetes Group”
5. “Diabetes Clinic”
6. “Chronic Care Clinic”

Limits: Omitted immunology, information science, microbiology, molecular biology, neurosciences, small molecules libraries, viruses

Source: Cochrane CDSR
Search:
1. “Shared Medical”
2. “Group Medical Visits”
3. “Group Visits”
4. “Diabetic Group”
5. “Shared Diabetes Care”
6. “Diabetes Clinic”
7. “Chronic Care Clinic”
8. “GMV”
9. “SMA”
10. “Shared Medical Appointment”

Source: Google Scholar- Grey literature
Search:
1. “Shared Medical”
2. “Group Medical Visits”
3. “Group Visits”
4. “Diabetic Group”
5. “Shared Diabetes Care”
6. “Diabetes Clinic”
7. “Chronic Care Clinic”
8. “GMV”
9. “SMA”
10. “Shared Medical Appointment”
1. “Shared Medical Appointment”
2. “Cooperative healthcare clinic”
3. “Group Medical Visit”
4. “Group Medical Clinic”
5. “Diabetic Group Appointment”
6. “Diabetic Group Visit”
7. “Group Care Diabetes”

Source: Clinical Trials
Searched on: February 19, 2012
Results: 100
Search:
1. “Group Medical Visits”
2. “Diabetic Group”
3. “Group Visit”
4. “Group Appointment”
5. “Shared Medical”
6. “Diabetes Clinic”
7. “Diabetes Group”
8. “Diabetes Visit”
9. “Group Medical Appointment”

Source: PubMed Health
Searched on: February 19, 2012
Results: 336
Search:
1. “Group Medical”
2. “Diabetes Group”
3. “Diabetes Education”
4. “Shared Medical”
5. “Group Appointment”
### Appendix B: Data Extraction Form for Systematic Review and Meta-Analysis

<table>
<thead>
<tr>
<th>Reference: <em>(Will include: authors, journal title, volume and page numbers)</em></th>
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<tr>
<td><strong>Objectives of the Study:</strong></td>
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<tr>
<td><strong>Included:</strong> <em>(Rationale)</em></td>
</tr>
<tr>
<td><strong>Type of Study:</strong></td>
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<tr>
<td>2) Cohort/Longitudinal</td>
</tr>
<tr>
<td>3) Controlled Trial</td>
</tr>
<tr>
<td>4) Unknown</td>
</tr>
<tr>
<td>5) Other</td>
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| **Population:** *Description of participant demographics* | **Intervention:** *GMV*  
*Provide a description of how the GMV was implemented, practitioners etc.* | **Comparison:** | **Outcome:** *Reported results*  
*Reported measures-statistical analysis used* | **Methods:** *How data were gathered for this study* | **Bias:** |
| | | | | | |
Population Characteristics: *Urban, rural, mixed*

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<td>Informed Consent:</td>
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<tr>
<td>Funding:</td>
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<tr>
<td>Any Quality of Life Assessments/ Indicators Completed?:</td>
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# Appendix C: Meta-Analysis Sensitivity Analysis

<table>
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Total (95% CI) 345 349 100.0% -0.57 [-1.12, -0.02]

Heterogeneity: Tau² = 0.38, Chi² = 27.97, df = 5 (P < 0.0001), I² = 82%

Test for overall effect: Z = 2.04 (P = 0.04)
Appendix D: Case Study Introduction Letters
Examining the Impact of Nurse Practitioner-Led Group Medical Visits for Patients with Chronic Conditions in Primary Care: Health Care Providers

Date__________, 2012

Dear Name, [Clinic Name],

We are conducting a study to examine the impacts of group medical visits (GMVs) in primary care. We are interested in those GMVs that are being offered to patients with one or more chronic conditions. We would like to examine how the GMV impacts patients and healthcare providers by examining patient, provider and other office staff reported health outcomes, quality of life indicators and impacts on the clinic environment. This study is part of Laura Housden’s doctoral dissertation project.

Your clinic is being invited to take part because there is a NP in the practice delivering GMVs or the NP is planning to implement a GMV for chronic conditions, or interested in implementing a GMV for chronic conditions. We are hoping to establish partnerships with three clinics and interview patients, healthcare providers and office staff and observe a GMV and set up a video observation session of a GMV. Clinic partners will assist with providing patients with letters of invitation and contacting patients for interviews.

It is our hope that this research can provide information to clinics, NPs and health care providers who are offering GMVs or considering GMVs as a way to manage chronic health conditions. We also hope this research will help illustrate some of the unique impacts NPs are making in the health of British Columbian patients by helping to further understand the unique roles and contributions NPs make to primary care.

If you are interested in participating in this research study, please contact the research co-investigator Laura Housden, [email] or [phone] for more information. Participation is completely voluntary and participants can withdraw at anytime. All practice staff involved in offering GMVs can participate. Taking part in this study is confidential, it will not affect how your practice operates in any way.

Kind Regards
Co-Investigator: Laura Housden, MN-NP(F), PhD(c)
Principal Investigator: Sabrina Wong, RN(c), PhD
Appendix D2: Introduction Letter Patients

THE UNIVERSITY OF BRITISH COLUMBIA
School of Nursing
T201- 2211 Wesbrook Mall
Vancouver, B.C. Canada V6T 2B5
Tel: [redacted]
Fax: [redacted]

Examining the Impact of Nurse Practitioner-Led Group Medical Visits for Patients with Chronic Conditions in Primary Care: Patients

Date__________, 2012

Dear Potential Participant,

We are conducting a study to better understand the impacts of Group Medical Visits (GMVs) on patients with chronic conditions. The intent of this study is to better understand how the GMV impacts you and your healthcare provider.

You are being invited to take part in this study because you come to a primary care office where group medical visits are being delivered. We are looking to talk to you because you attend [for those who have declined-have been invited but declined to attend] GMVs with Nurse Practitioners (or you have been asked to attend GMVs but have decided not to). We value the chance to hear your story about attending [or not attending] GMVs. The interview will take approximately 60 minutes and you will also be asked a few short questions about your health and quality of life. Taking part in this interview will not affect your care in any way. [pending successful funding we will add a sentence: At the end of the interview, we would like to provide you with $10 in appreciation for your time]

If you are interested in participating in this research study, you can contact the research co-investigator Laura Housden, [redacted] or [redacted] for more information. This study is part of Laura’s doctoral dissertation requirement at the University of British Columbia, School of Nursing. Participation is completely voluntary and you are able to withdraw from the project at any time.

Kind Regards
Co-Investigator: Laura Housden, MN-NP(F), PhD(c)
Principal Investigator: Sabrina Wong, RN(c), PhD

216
Examining the Impact of Nurse Practitioner-Led Group Medical Visits for Patients with Chronic Conditions in Primary Care: Health Care Providers

Date_________, 2012

Dear Name,

We are conducting a study to examine the impacts of group medical visits (GMVs) in primary care. We are interested in those GMVs that are being offered to patients with one or more chronic conditions. We would like to examine how the GMV impacts patients and healthcare providers by examining both patient and provider reported health outcomes and quality of life indicators. This study is part of Laura Housden’s doctoral dissertation project.

Your practice is being invited to take part because there is a NP in the practice delivering GMVs or the NP is planning to implement a GMV for chronic conditions, or interested in implementing a GMV for chronic conditions. We are hoping to travel to these practices and interview patients and healthcare providers, observe a GMV and set up a video observation session of a GMV.

It is our hope that this research can provide information to other NPs and health care providers who are offering GMVs or considering GMVs as a way to manage chronic health conditions. We also hope this research will help illustrate some of the unique impacts NPs are making in the health of British Columbian patients by helping to further understand the unique roles and contributions NPs make to primary care.

If you are interested in participating in this research study, please contact the research co-investigator Laura Housden, or for more information. Participation is completely voluntary and participants can withdraw at anytime. All practice staff involved in offering GMVs can participate. Taking part in this study is confidential, it will not affect how your practice operates in any way.

Kind Regards

Co-Investigator: Laura Housden, MN-NP(F), PhD(c)
Principal Investigator: Sabrina Wong, RN(c), PhD
Appendix E: Consent Form
Examining the Impact of Nurse Practitioner-Led Group Medical Visits for Patients with Chronic Conditions in Primary Care: Patient Interviews

Date__________, 2012

Principal Investigator: Laura M Housden, MN-NP(F), PhD(c), UBC School of Nursing,

Co-Principal Investigator: Sabrina Wong, RN, PhD, Associate Professor, UBC School of Nursing,

Purpose of the Study
We are conducting a study examining the impact of Nurse Practitioner (NP) led Group Medical Visits (GMVs) in order to better understand how these types of medical appointments impact the health of patients with chronic conditions, such as diabetes or heart disease.

Study Procedures
In order to better understand these impacts, we will be interviewing patients and healthcare providers who are involved in these group appointments and observing group medical visits. You are being asked to take part in this study because you have received health care from this clinic.

The interviews will take place in a location of your choice and will last approximately 60 minutes. If you agree to participate in an interview you can refuse to answer any question. Taking part in this study is voluntary. You can withdraw at any time.

Risks and Benefits
Taking part in this study you will help us better understand the benefits and challenges of a GMV, as well as how this type of appointment impacts you. You will not personally receive any direct benefits from participating in this study, but no risks are expected from participating. [pending successful funding for this study, we will add: You will receive $10 as a token of appreciation for your time]

Confidentiality
All interviews will be kept confidential. Your health care will not be affected in any way. Interviews will be digitally recorded and the recordings will be transcribed verbatim. The digital records will be stored in a secure location at the University of British Columbia for five years before being destroyed. Transcripts of the electronic format will be stored on a password-protected computer.

The transcripts will not contain any names, or anything that might identify individuals. No identifying information will be included on any written reports, or papers associated with this study.

This research is being completed as part of Laura Housden’s doctoral research. She is a graduate student in the UBC School of Nursing and nurse practitioner. As per UBC policy, graduate theses are public documents once completed. The results of this study will be reported in a graduate thesis. The main findings of this study will be published in academic journal articles. The dissertation will be made available through the University of British Columbia. The final graduate thesis will not include names of individuals or clinics who participated in the project or any identifying features of participants.

For More Information
If you have any questions or desire further information, you may contact the principal investigator for the study Laura Housden at [email] or Dr. Sabrina Wong at [email]. If you have any concerns about your treatment or your rights as a research participant, you may contact the Research Subject Information Line at the UBC Office of Research Services at the University of British Columbia, at [phone number].

Consent
By signing this consent form, you are agreeing to take part in this study, and acknowledge receipt of a copy of this consent form for your records.

☐ I consent to participate.
☐ I have kept a copy of this consent for my files.

__________________________________________
Print Name:

__________________________________________
Signature Date
Appendix E2: NPs not using GMVs Consent Forms

THE UNIVERSITY OF BRITISH COLUMBIA
School of Nursing
T201- 2211 Wesbrook Mall
Vancouver, B.C. Canada V6T 2B5
Tel: [redacted]
Fax: [redacted]

Examining the Impact of Nurse Practitioner-Led Group Medical Visits for Patients with Chronic Conditions in Primary Care: Healthcare Provider and Office Staff Interviews

Date __________, 2013

Principal Investigator: Laura M Housden, MN-NP(F), PhD(c), UBC School of Nursing,

Co-Principal Investigator: Sabrina Wong, RN, PhD, Associate Professor, UBC School of Nursing,

Purpose of the Study
We are conducting a study examining the impact of Nurse Practitioner (NP) led Group Medical Visits (GMVs) in order to better understand how these types of medical appointments impact the health of patients with chronic conditions, such as diabetes or heart disease.

Study Procedures
In order to better understand these impacts, we will be interviewing patients and healthcare providers who are involved in these group appointments, observing group medical visits and speaking with NPs who are not providing care through group appointments. You are being asked to take part in this study because you provide care to patients and do not use group medical visits at this time.

The interview will take place in a location of your choice and will last approximately 60 minutes. If you agree to participate in an interview you can refuse to answer any question. Taking part in this study is voluntary. You can withdraw at any time.

Risks and Benefits
Taking part in this study you will help us better understand the benefits and challenges of a GMV, as well as how this type of appointment may impact you and your work. We are also interested in your perspectives on how the GMV could impacts your patients. You will not personally receive any direct benefits from participating in this study, but no risks are expected from participating.
Confidentiality
All interviews will be kept confidential. Interviews will be digitally recorded and the recordings will be transcribed verbatim. The digital records will be stored in a secure location at the University of British Columbia for five years before being destroyed. Transcripts of the electronic format will be stored on a password-protected computer. The transcripts will not contain any names, or anything that might identify individuals. No identifying information will be included on any written reports, or papers associated with this study.

This research is being completed as part of Laura Housden’s doctoral research. She is a graduate student in the UBC School of Nursing and nurse practitioner. The results of this study will be reported in a graduate thesis. The main findings of this study will be published in academic journal articles. As per UBC policy, graduate theses are public documents once completed. The dissertation will be made available through the University of British Columbia. The final graduate thesis will not include names of individuals or clinics who participated in the project or any identifying features of participants.

For More Information
If you have any questions or desire further information, you may contact the principal investigator for the study Laura Housden at [Contact Information] or Dr. Sabrina Wong at [Contact Information]. If you have any concerns about your treatment or your rights as a research participant, you may contact the Research Subject Information Line at the UBC Office of Research Services at the University of British Columbia, at [Contact Information].

Consent
Taking part in this study is voluntary. You may refuse to take part or withdraw at any time. By signing this consent form, you are agreeing to take part in this study, and acknowledge receipt of a copy of this consent form for your records.

☐ I consent to participate.
☐ I have kept a copy of this consent for my files.

Print Name: __________________________

Signature __________________________ Date ____________
Examining the Impact of Nurse Practitioner-Led Group Medical Visits for Patients with Chronic Conditions in Primary Care: Healthcare Provider and Office Staff Interviews

Date ________, 2012

Principal Investigator: Laura M Housden, MN-NP(F), PhD(c), UBC School of Nursing, 604-839-7520.

Co-Principal Investigator: Sabrina Wong, RN, PhD, Associate Professor, UBC School of Nursing, 604-827-5584.

Purpose of the Study
We are conducting a study examining the impact of Nurse Practitioner (NP) led Group Medical Visits (GMVs) in order to better understand how these types of medical appointments impact the health of patients with chronic conditions, such as diabetes or heart disease.

Study Procedures
In order to better understand these impacts, we will be interviewing patients and healthcare providers who are involved in these group appointments and observing group medical visits. You are being asked to take part in this study because you provide care to patients who use this clinic for primary care.

The interview will take place in a location of your choice and will last approximately 60 minutes. If you agree to participate in an interview you can refuse to answer any question. Taking part in this study is voluntary. You can withdraw at any time.

Risks and Benefits
Taking part in this study you will help us better understand the benefits and challenges of a GMV, as well as how this type of appointment impacts you, your work and your perspectives on how the GMV impacts your patients. You will not personally receive any direct benefits from participating in this study, but no risks are expected from participating.

Confidentiality
All interviews will be kept confidential. Interviews will be digitally recorded and the recordings will be transcribed verbatim. The digital records will be stored in a secure location at the University of British Columbia for five years before being destroyed. Transcripts of the electronic format will be stored on a password-protected computer. The transcripts will not contain any names, or anything that might identify individuals. No identifying information will be included on any written reports, or papers associated with this study.

This research is being completed as part of Laura Housden’s doctoral research. She is a graduate student in the UBC School of Nursing and nurse practitioner. The results of this study will be reported in a graduate thesis. The main findings of this study will be published in academic journal articles. As per UBC policy, graduate theses are public documents once completed. The dissertation will be made available through the University of British Columbia. The final graduate thesis will not include names of individuals or clinics who participated in the project or any identifying features of participants.

For More Information
If you have any questions or desire further information, you may contact the principal investigator for the study Laura Housden at [redacted] or Dr. Sabrina Wong at [redacted]. If you have any concerns about your treatment or your rights as a research participant, you may contact the Research Subject Information Line at the UBC Office of Research Services at the University of British Columbia, at [redacted].

Consent
Taking part in this study is voluntary. You may refuse to take part or withdraw at any time. By signing this consent form, you are agreeing to take part in this study, and acknowledge receipt of a copy of this consent form for your records.

☐ I consent to participate.
☐ I have kept a copy of this consent for my files.

__________________________
Print Name:

__________________________
Signature Date
Appendix F: Interview Questions
Appendix F1: Patient Interview Questions

Questions for Individual Interviews-Patients

Dear Participant,

My name is Laura Housden. I am a nurse practitioner and doctoral candidate at the University of British Columbia and am exploring Group Medical Visits as part of my research.

Thank you to taking the time to speak with me today. This interview will take approximately 45-60 minutes. While there is no scheduled break during this interview, if you require one please let me know.

In order for me to learn from your comments today I will be recording this interview. I will also be writing notes to help me remember as well and to ensure that this research will be as accurate as possible. Our conversation and recording are private and will be kept confidential. The materials that I gather today will be stored safely at the University of British Columbia.

You have received a few pieces of paper today, including an informed consent form. In order to take part in this interview you will need to understand and sign this form. This form goes over the risks and benefits of participating in this research project. I will go over each section with you briefly and then ensure that your questions regarding the study are answered before we begin. At the bottom of the consent form there is a space for your signature.

There is also a small form asking for some personal information.

Please note:

1. There are no right or wrong answers and all your comments are important.
2. Your personal information and identity will be kept confidential in all reports made from this study. The data will be analyzed but no names or personal information will be attached to your comments.
Preamble [for those attending a GMV]:

So I understand you have been attending Group Medical Visits for XX time now, and I was wondering if I could speak to you about your thoughts regarding these visits, and how these visits might have an impact on your health.

1. First, it would be helpful if you could let me know a bit about your general health, your health conditions and why you are attending Group Medical Visits:

2. Can you please describe any other health conditions you receive medical or health related care for?
   a. Do you receive care for (XX condition) through GMVs or through other appointments?
      i. Such as physiotherapy, massage therapy or any alternative therapies
   b. Were any of your health conditions diagnosed after you started attending GMVs?
      i. If so, can you tell me about that?

3. Can you tell me a bit about your day-to-day activities?
   a. For example, how do you spend your typical day?
   b. If patient describes work: Can you tell me a bit more about the activities you do in your job?

3. To help me understand your day-to-day experiences, can you tell me a bit about who you share your household with, or who lives with you either full time, or part-time?
   a. If other people in the home: Do you think the GMV has changed any of the way you spend time with your family (personalize), or your families’ health?
   b. Living with and managing (health condition) can be really challenging. Can you tell me about any friends or family who are helping you out at home?
      i. For example, do you have any people coming by to help in your home, or to help drive you places or help with your daily activities?

4. I’ve been reading a lot about GMVs and in some other places some patients have found that what they hear or learn about in the GMV actually changes the way they spend their free time, I’m wondering if you can comment on that?
   a. For example, have you changed any of the day-to-day things you do, or have your started any new activities?

5. I’ve also heard that for some patients, the way they manage their (health conditions) may change after attending GMVs, can you describe if this has happened to you?
   a. What sort of things do you do differently to manage your (conditions) now?

6. Can you tell me how attending the GMV has changed the way your get or take any medications?
   a. For example, are you on any new medications, or do you get your medications from a new place?
7. Many patients have said the GMVs were a good place to learn more about their (conditions), can you tell me about this? do you feel you learned more about your (conditions)?

8. Were you aware that your GMV involves a Nurse Practitioner?

9. Can you describe how the Nurse Practitioner works (facilitates) the GMV and what his/her role is?
   a. Do you feel the Nurse Practitioner has any particular approaches helps them to provide you care through a GMV?
      i. For example: Do you feel that Nurse Practitioners have any specific abilities that they bring to Group Medical Visits?

10. Is there anything else you would like me to know about Group Medical Visits, or your health issues?
Appendix F2: Interview Questions NPs not using GMVs

Questions for Interviews- Nurse Practitioners- Emerging Case Study

Dear Participant,

My name is Laura Housden. I am a nurse practitioner and doctoral candidate at the University of British Columbia and am exploring Group Medical Visits as part of my research.

Thank you to taking the time to speak with me today. This interview will take approximately 45-60 minutes. While there is no scheduled break during this interview, if you require one please let me know.

In order for me to learn from your comments today I will be recording this interview. I will also be writing notes to help me remember as well and to ensure that this research will be as accurate as possible. Our conversation and recording are private and will be kept confidential. The materials that I gather today will be stored safely at the University of British Columbia.

You have received a few pieces of paper today, including an informed consent form. In order to take part in this interview you will need to understand and sign this form. This form goes over the risks and benefits of participating in this research project. I will go over each section with you briefly and then ensure that your questions regarding the study are answered before we begin. At the bottom of the consent form there is a space for your signature.

There is also a small form asking for some personal information.

Please note:

11. There are no right or wrong answers and all your comments are important.
12. Your personal information and identity will be kept confidential in all reports made from this study. The data will be analyzed but no names or personal information will be attached to your comments.
Questions for NPs not using GMVs:

1. Can you please describe your area of clinical practice?

2. What do you know or understand about Group Medical Visits, if anything?

3. What experiences have you or your clinic had with GMVs?
   a. If none: Can you tell me what you understand about GMVs?
   b. If some experience: Can you tell me more about why your clinic no longer offers them?
      i. Prompt: For example: Billing changes, lack of patient interest, administrative challenges (scheduling, space, contacting patients) etc.

4. What do you feel are some of the factors that are precluding the delivery of GMVs?
   a. Prompt: For example, the healthcare system (expand), the organization where you work, inter-professional dynamics/ intra-professional dynamics, lack of support staff, challenges with physical space, concerns regarding confidentiality, unclear how to organize GMVs.
      i. Can you expand?

5. Based on your experiences as a NP, considering both your nursing background and your experience with primary care, what specifically do you believe NPs could bring to delivering care in a group format?
   a. Can you expand?
   b. Prompt: The approach of the NP

6. What conditions would need to be in place if GMVS were to be offered at your site? And what would need to be in place for you as an NP, if you were to LEAD the GMVs?
Appendix F3: Interview Questions Healthcare providers

Questions for Individual Interviews-Healthcare Providers

Preamble:
We are examining the impacts of Group Medical Visits on patients and Healthcare providers. We are interested in learning about your experiences in facilitating, organizing assisting and or participating in GMVs

1. Can you tell me a bit about the Group Medical Visit that you are involved in?

2. Do you feel the GMV has had an impact on your clinic environment?
   a. For example, how have things been running differently, such as bookings, workflow and patient appointments.
   b. Subquestion: Can you describe how the GMV has affected your clinic scheduling?
   c. Subquestion: Do you notice any change in the length of time that individual patients wait for appointments?

3. What are the conditions that need to be in place in order for a GMV to be offered by a clinic?
   a. Can you tell me about any specific programs that support your clinics GMV?
      i. For example: the practice support program?

4. Can you tell me about anything specific or special about your clinic that either supports or creates challenges for offering GMVS to patients?
   a. What are the range of things you need to consider when offering or planning to offer GMVs – ask them for examples.
      i. For example: support staff, who works at the clinic, the physical layout of the clinic environment.

5. Why do you think some healthcare providers or clinics implement GMVs, while others do not? What kinds of factors do you see as influencing their decisions? Can you give me some examples?
   i. For example: as type of healthcare provider, the way healthcare providers are remunerated (fee-for-service vs. salary), physical space etc.

6. Can you describe what type of leadership is needed in order to successfully implement and offer GMVs? Can you give me some examples of leadership that has been particularly helpful, or leadership approaches that haven’t quite worked?
7. I am interested in understanding the approach that Nurse Practitioners take when working with Group Medical Visits. Can you describe any specific contributions or abilities that you feel Nurse Practitioners bring to Group Medical Visits?

8. I am also interested in understanding how a GMV might affect the health of a patient, including their support system, their knowledge of their (condition/s) and how they manage their health. Can you comment on how you feel the GMV affects the health of patients?
   i. For example, do you feel the GMV impacts patients’ knowledge about their health condition?

9. I am interested in understanding how the care provided to patients in Group Medical Visits may extend beyond the group appointment. Since starting GMVS, have you noticed any changes for patients in their access to resources?
   i. For example: have you noticed your patients have any increase in their disability support, or changes in their housing situation?

10. What condition or kinds of health conditions do you feel are particularly suited to GMVs and why?
    i. Such as a chronic condition versus an acute condition, drop in GMVs vs. pre-scheduled GMVs.

11. Can you describe what sort of things would make GMVs better or more effective and what are some of the limitations of GMVs?
Appendix G: Telephone Script

THE UNIVERSITY OF BRITISH COLUMBIA
School of Nursing
T201- 2211 Wesbrook Mall
Vancouver, B.C. Canada V6T 2B5
Tel: (604) 822-7417
Fax: (604) 822-7466

Examining the Impact of Nurse Practitioner-Led Group Medical Visits for Patients with Chronic Conditions in Primary Care: Telephone Script for MOA or NP

Date __________, 2012

MOA/NP: Hello [name]. Recently you were sent a letter inviting you to take part in a study to better understand the impacts of Group Medical Visits (GMVs) on patients with chronic conditions. The intent of this study is to better understand how the GMV impacts you and your healthcare provider.

You are being invited to take part in this study because you come to a primary care office where group medical visits are being delivered.

Laura Housden, for part of her doctoral work at UBC is looking to talk to you because you attend [for those who have declined-have been invited but declined to attend] GMVs with Nurse Practitioners (or you have been asked to attend GMVs but have decided not to). She values the chance to hear your story about attending [or not attending] GMVs.

The interview will take approximately 60 minutes and you will also be asked a few short on your health and quality of life. Taking part in this interview will not affect your care in any way. [pending successful funding we will add a sentence: At the end of the interview, we would like to provide you with $10 in appreciation for your time]

Would you be interested in participating?

Participant: Yes

MOA/NP: That’s great. Would it be o.k. if I were to give her your contact information so she can follow-up and arrange a time that works for you?

Participant: Yes

If Participant says: No, I would prefer to contact her.
MOA/NP: Do you have a paper and pen ready? Here is her contact info: Laura Housden, [redacted] or [redacted]

MOA/NP: Would you be interested in participating?

Participant: No

MOA/NP: o.k., thanks for your time today. We’ll see you the next time you are in. Have a nice day.
Appendix H: Coding Schema

Patient Interviews

1. Activity Level
   a. Day to Day activities
   b. Decreased Physical Functioning
   c. Increased Activity
2. Administration of Group Medical Visits
   a. Creation of Action Plans
   b. Group Composition
   c. Group Rules
3. Comprehensiveness
4. Confidentiality
5. Descriptions of Healthcare Providers
   a. Descriptions of NPs
   b. Descriptions of other healthcare providers
6. Education
7. End of Life Care
8. Improved Continuity
9. Incorporation of Mental Healthcare into groups
10. Lifestyle/ Behaviour Change
    a. Change related to increase self-monitoring
    b. Change related to knowledge
11. Patient Perspectives
    a. Asking other group members questions
    b. Gaining perspectives- seeing more options/ choices
    c. Patient perspectives on personal health
    d. Patient perspectives on Group Medical Visits
    e. What patients don’t like about GMVs
    f. What patients like about GMVs
12. Patient/ provider relationships
    a. Accountability- to each other
    b. Healthcare provider- knows patient
    c. Interpersonal Communication
    d. Reciprocity
       i. Learning from patients
    e. Respectfulness
    f. Trust
    g. Whole-person care
13. Patient Support Systems
    a. Family Support
14. Patient questions or ideas incorporated into the GMV
15. Personal Acceptance
16. Power
a. Decreasing power differential
17. Provider satisfaction
18. Quotable Quotes
19. Relationships within the group
20. Self-Management
Appendix I: Systematic Review and Meta-Analysis: Characteristics of 26 Studies
<table>
<thead>
<tr>
<th>Study</th>
<th>Study design</th>
<th>Study duration</th>
<th>Duration and frequency of group medical visits</th>
<th>No. of patients</th>
<th>Study population</th>
<th>% male</th>
<th>Outcomes measured</th>
<th>HbA1c outcome</th>
<th>BP outcome</th>
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<tbody>
<tr>
<td>Clancy et al., 2003&lt;sup&gt;23-27&lt;/sup&gt;</td>
<td>RCT</td>
<td>6 mo</td>
<td>2-h sessions; monthly over 6 mo</td>
<td>Intervention: 59 Control: 61</td>
<td>Age &gt; 18 yr; type 2 diabetes with HbA1c &gt; 8.5% at most recent evaluation</td>
<td>21.7</td>
<td>Trust in physician (scale), ADA process-of-care indicators, patient care assessment tool, HbA1c, lipid profiles</td>
<td>At 6 mo: 9.51% in intervention and 9.714% in control; difference not significant</td>
<td>Not measured</td>
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<tr>
<td>Clancy et al., 2007&lt;sup&gt;28&lt;/sup&gt; and 2008&lt;sup&gt;29&lt;/sup&gt;</td>
<td>RCT</td>
<td>12 mo</td>
<td>2-h sessions; monthly over 12 mo</td>
<td>Intervention: 96 Control: 90</td>
<td>Age &gt; 18 yr; poorly controlled type 2 diabetes (HbA1c &gt; 8%)</td>
<td>28</td>
<td>Emergency department visits, inpatient stays, primary and specialty outpatient visits, total charges, HbA1c, testing, lipid profiles, adherence to ADA guidelines, cancer screens</td>
<td>Not measured; instead study looked at no. of patients who received HbA1c testing</td>
<td>Not measured</td>
</tr>
<tr>
<td>Cohen et al., 2011&lt;sup&gt;31&lt;/sup&gt;</td>
<td>RCT</td>
<td>6 mo</td>
<td>2-h sessions over 6 mo; weekly for 4 wk, then monthly for 3 mo</td>
<td>Intervention: 50 Control: 49</td>
<td>Veterans with type 2 diabetes; HbA1c &gt; 7.0%, LDL cholesterol &gt; 100 mg/dL (or &gt; 70 mg/dL if coronary artery disease present); BP &gt; 130/80 mm Hg</td>
<td>Intervention: 100 Control: 96</td>
<td>HbA1c, LDL cholesterol, BP, goal attainment of these values, diabetes self-care behaviour, prescribing (medications) between groups, no. of visits with primary care provider</td>
<td>Target goals reached by 40.5% in intervention v. 20.4% in control (p = 0.03); patients in intervention group had higher odds of attaining HbA1c goals</td>
<td>Target systolic BP (≤ 130 mm Hg) reached by 50% in intervention v. 32.7% in control (p = 0.015); patients in intervention group had higher odds of attaining systolic BP goals</td>
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<td>Edelman et al., 2010&lt;sup&gt;32&lt;/sup&gt;</td>
<td>RCT</td>
<td>12.8 mo</td>
<td>90-120 min per session; every 2 mo over 12 mo; total 7 sessions</td>
<td>Intervention: 133 Control: 106</td>
<td>Veterans with poorly controlled diabetes (HbA1c ≥ 7.5%) and hypertension (systolic BP &gt; 140 mm Hg, diastolic BP &gt; 90 mm Hg); type of diabetes not specified</td>
<td>Intervention: 95.5 Control: 96.2</td>
<td>Systolic and diastolic BP, HbA1c, self-reported medication adherence</td>
<td>Mean decrease 0.8% in intervention and 0.5% in control; difference not significant (p = 0.139)</td>
<td>Mean decrease in systolic BP was 13.7 mm Hg in intervention v. 6.4 mm Hg in control (p = 0.011)</td>
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<tr>
<td>Naik et al., 2011&lt;sup&gt;33&lt;/sup&gt;</td>
<td>RCT</td>
<td>12 mo</td>
<td>60-min sessions; 4 sessions; every 3 wk over 3 mo</td>
<td>Intervention: 45 Control: 42</td>
<td>Veterans aged 50–90 yr with a primary care provider; type 2 diabetes; mean HbA1c 7.5% 6 mo before study</td>
<td>Unknown</td>
<td>HbA1c, diabetes self-efficacy scale, diabetes specific knowledge and understanding scale</td>
<td>At 1 yr: 8.05% ± 1.40% in intervention v. 8.64% ± 1.35% in control (p = 0.03)</td>
<td>Not measured</td>
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<td>Study</td>
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<td>Duration and frequency of group medical visits</td>
<td>No. of patients</td>
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<td>Ryeg et al., 2012</td>
<td>RCT</td>
<td>12 mo</td>
<td>5-h sessions; every 2 wk over 6 wk, or every 3 wk over 9 wk, depending on site</td>
<td>Intervention: 73 Control: 73</td>
<td>Age &gt; 18 yr; type 2 diabetes; consultation with general practitioner in past 3 yr</td>
<td>&quot;Approximately 50%&quot;</td>
<td>HbA1c, patient activation, diabetes knowledge, BP, weight, BMI, total and HDL cholesterol, triglycerides, creatinine, oral glucose-lowering medication, visits with health care personnel in past 3 mo, satisfaction with diabetes treatment, problem areas in diabetes, EQ-VAS, SF-36 (physical and mental health domains), self-management (diet, foot care and blood glucose)</td>
<td>At 12 mo: no significant difference (p = 0.432), except in subgroup analysis of patients with highest HbA1c (&gt; 7.7%) at baseline (8.2% ± 1.4% in intervention group v. 8.8% ± 1.4% in control group; p = 0.012)</td>
<td>Systolic BP intervention: 140.6 (17.1), control: 143.7 (20.8), diastolic BP intervention: 82.6 (10.3), control B33.3 (10.3)</td>
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<tr>
<td>Sadur et al., 1999</td>
<td>RCT</td>
<td>12 mo</td>
<td>2-h sessions; monthly over 6 mo</td>
<td>Intervention: 82 Control: 74</td>
<td>Age 16–75 yr; type 1 and 2 diabetes; HbA1c &gt; 8.5%, or no HbA1c, test performed in previous yr</td>
<td></td>
<td>HbA1c, self-reported changes in self-care practices, self-efficacy, satisfaction, utilization of inpatient and outpatient health care</td>
<td>≥ 5 mo after randomization: 8.18% in intervention and 9.33% in control (p &lt; 0.0001)</td>
<td>Not measured</td>
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<tr>
<td>Schillinger et al., 2009</td>
<td>3-arm</td>
<td>RCT</td>
<td>90-min sessions; monthly over 9 mo</td>
<td>Intervention: 104 Control (usual care): 108 3rd arm (weekly automated telephone support with nurse follow-up): 112</td>
<td>Adult patients with type 2 diabetes, uninsured with high school education or less; ≥ 1 primary care visit in past yr, recent HbA1c ≥ 8.0%</td>
<td></td>
<td>1-yr changes in structure (patient assessment of chronic illness care, communication processes (interpersonal processes of care) and outcomes (behavioural, functional and metabolic)</td>
<td>No difference between groups (9.0% ± 2.0% in both groups; p = 0.3)</td>
<td>Systolic BP 138.9 ± 20.3 mm Hg in intervention and 141.5 ± 23.9 mm Hg in usual-care group (p = 0.1); diastolic BP 75.5 ± 11.3 mm Hg in intervention and 78.5 ± 18.5 mm Hg in usual-care group (p = 0.03)</td>
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<td>Taveira et al., 2010</td>
<td>RCT:</td>
<td>feasibility</td>
<td>2-h sessions; weekly over 4 wk</td>
<td>Intervention: 58 Control: 51</td>
<td>Veterans aged ≥ 18 yr with type 2 diabetes; HbA1c 7%–9% in previous 6 mo</td>
<td></td>
<td>HbA1c, BP (systolic &lt; 130 mm Hg, diastolic &lt; 80 mm Hg), lipids, tobacco use</td>
<td>Target reached by 40.4% in intervention and 21.6% in control; absolute mean change −0.9 ± 1.6 in intervention and 0.0 ± −1.5 in control</td>
<td>Target systolic BP reached by 65.5% in intervention and 39.9% in control; absolute mean change −7.3 ± 20.3 mm Hg in intervention and −1.7 ± −19.6 mm Hg in control. Target diastolic BP reached by 65.5% in intervention and 68.6% in control; absolute mean change −6.5 ± 10.0 mm Hg in intervention and 1.0 ± 10.8 mm Hg in control</td>
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<td>Study</td>
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<td>Taveira et al., 2011†</td>
<td>RCT</td>
<td>6 mo</td>
<td>90-min sessions; weekly for 4 wk, then monthly for 5 mo</td>
<td>Intervention: 44 Control: 44</td>
<td></td>
<td>Veterans with depression and type 1 or 2 diabetes; HbA1c &gt; 6.5% in previous 6 mo Intervention: 100 Control: 95.5</td>
<td>HbA1c &lt; 7% at 6 mo, adherence to ADA guidelines (systolic BP &lt; 130 mm Hg, diastolic BP &lt; 80 mm Hg), total, LDL and HDL cholesterol, tobacco cessation, change in 10-yr coronary event risk at 6 mo, depression symptoms</td>
<td>7.4% ± 1.2% in intervention v. 8.4% ± 2.0% in control group (p &lt; 0.05)</td>
<td>Systolic BP 123.4 ± 12.3 mm Hg in intervention and 127.0 ± 17.3 mm Hg in control (p &lt; 0.05 from baseline)</td>
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<td>Trento et al., 2002, 2001† and 2004†</td>
<td>RCT</td>
<td>Duration of session not stated; session every 3 mo</td>
<td>Intervention: 56 Control: 56 (42 in each group at yr 5)</td>
<td>Type 2 diabetes, treated with diet alone or diet and oral hypoglycemic agents; attended diabetes clinic</td>
<td></td>
<td>Weight, fasting blood glucose level, HbA1c, serum creatinine, total and HDL cholesterol, triglycerides, microalbumin: creatinine ratio, diabetes-related quality of life, knowledge of diabetes, health behaviours, BP, BMI</td>
<td>At 5 yr after randomization: 7.3% ± 1.0% in intervention and 9.0% ± 1.6% in control (p &lt; 0.001)</td>
<td>Not measured</td>
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<td>Trento et al., 2005†</td>
<td>RCT</td>
<td>Duration of session unclear; every 2–3 mo; total 15 sessions over 36 mo</td>
<td>Intervention: 30 Control: 28</td>
<td>Age &lt; 70 yr; type 1 diabetes with onset before 30 yr; insulin started within 1 yr of diagnosis ≥ 1 yr previous attendance in clinic</td>
<td></td>
<td>Diabetes-related quality of life, knowledge of type 1 diabetes, health behaviours, HbA1c, total and HDL cholesterol, microalbumin: creatinine ratio, complications (hypoglycemic episodes [retroductive]), economic analysis</td>
<td>At 3 yr: 7.88% ± 0.20% in intervention and 8.79% ± 1.38% in control (p = N5)</td>
<td>Not measured</td>
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<td>Wagner et al., 2001†</td>
<td>RCT</td>
<td>Half-day sessions; &quot;periodic&quot; (intervals of 3 mo and 6 mo)</td>
<td>Intervention: 278 Control: 429</td>
<td>Age &gt; 30 yr; patients with diabetes (type not specified) using insulin or oral hypoglycemic therapy were &quot;preferentially selected&quot;</td>
<td></td>
<td>Subscales of SF-36 (general health, physical function, emotional role function, social function and pain), bed disability, restricted-activity days</td>
<td>At 24 mo: no difference between groups (7.9% in both groups; p = 0.9)</td>
<td>Not measured</td>
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<td>Outcomes measured</td>
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<td>Benedetti et al., 2004&lt;sup&gt;16&lt;/sup&gt;</td>
<td>Cohort</td>
<td>6 mo</td>
<td>2-h sessions; frequency unclear</td>
<td>Intervention: 698</td>
<td>Age &gt; 18 yr; type 2 diabetes for ≥ 1 yr</td>
<td>Not stated</td>
<td>Annual HbA&lt;sub&gt;1c&lt;/sub&gt; test, HbA&lt;sub&gt;1c&lt;/sub&gt; &lt; 8.0%, HbA&lt;sub&gt;1c&lt;/sub&gt; &lt; 9.5%, annual LDL cholesterol test, LDL &lt; 130, annual urine protein test, eye and foot exams; BP &lt; 130/85 mm Hg, BP &lt; 140/90 mm Hg, patients &gt; 40 yr taking ASA, self-management goal</td>
<td>Achievement of HbA&lt;sub&gt;1c&lt;/sub&gt; &lt; 9.5% significantly higher in intervention group than in usual-care group (p &lt; 0.05)</td>
<td>BP &lt; 140/90 mm Hg “approached significance” (p &lt; 0.06); BP &lt; 130/85 significant (p &lt; 0.05)</td>
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<td>Boegner et al., 2008&lt;sup&gt;15&lt;/sup&gt;</td>
<td>Cohort</td>
<td>6 mo</td>
<td>Half-day sessions; mean 3 sessions per practice</td>
<td>427</td>
<td>Age &gt; 18 yr; type 2 diabetes &gt; 1 yr</td>
<td>55.3</td>
<td>Self-reported diabetes knowledge and behaviour; weight, BP, HbA&lt;sub&gt;1c&lt;/sub&gt;, fasting glycemia, % sedentary, dietary compliance, % using insulin, smoking status, antihypertensive treatment, lipid-lowering therapy, medication (tablet/d)</td>
<td>7.57% ± 1.33% at baseline; 7.41% ± 1.26% after intervention (p &lt; 0.01)</td>
<td>BP “remained stable and approached the French recommendations”</td>
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<td>Bray et al., 2005&lt;sup&gt;16&lt;/sup&gt;</td>
<td>Feasibility study; convenience sample</td>
<td>12 mo</td>
<td>2-h sessions over 6 mo, total 4 sessions</td>
<td>Intervention: 112 Control: 48</td>
<td>Type 2 diabetes + ≥ 1 of: HbA&lt;sub&gt;1c&lt;/sub&gt; &gt; 7.0%, BP &gt; 135/85 mm Hg or high risk of end-stage organ disease (including retinopathy, neuropathy, nephropathy)</td>
<td>43</td>
<td>Health care provider productivity, billable encounters, documented self-management goals, documented lipid profile, documented ASA use, documented foot exam, average daily encounter rate</td>
<td>8.2% ± 2.6% at baseline; 7.1% ± 2.3% after intervention (p &lt; 0.05 for difference between groups)</td>
<td>Not measured</td>
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<td>Cuhan-Pera et al., 2005&lt;sup&gt;16&lt;/sup&gt;</td>
<td>Cohort</td>
<td>13 mo</td>
<td>3.5-h sessions; monthly for 3 mo, then quarterly; total 7 sessions</td>
<td>Intervention: 39 Refusers: 22 Nonparticipants = 216</td>
<td>Hmong adults with type 2 diabetes</td>
<td>56</td>
<td>HbA&lt;sub&gt;1c&lt;/sub&gt;, BMI, BP, LDL cholesterol, microalbuminuria, self-reported 24-h diet recall and exercise, mental health, foot exams, eye referrals, flu shots and medication intensification</td>
<td>9.48% before and 9.58% after intervention; difference not significant (p = NS)</td>
<td>No significant difference in systolic BP (132.67 mm Hg before and 127.56 after intervention) or in diastolic BP (78.06 mm Hg before and 78.64 mm Hg after intervention)</td>
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<td>Kinsh et al., 2007</td>
<td>Quasi-experimental with concurrent non-randomized controls</td>
<td>Unclear</td>
<td>60-120 min per session; frequency not specified; patients participated in 1–7 sessions</td>
<td>44</td>
<td>Veterans with type 2 diabetes + ≥ 1 of: HbA1c &gt; 9%; systolic BP &gt; 160 mmHg and LDL cholesterol &gt; 130 mg/dl</td>
<td>97.7</td>
<td>Systolic BP, HbA1c, LDL cholesterol, ASA use</td>
<td>Mean decrease after intervention 1.4% (95% CI 0.8%–2.1%) (p &lt; 0.001)</td>
<td>Mean decrease in systolic BP 16.0 mm Hg (95% CI 9.7–22.3) (p &lt; 0.001)</td>
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<td>Loney-Hutchinson et al., 2009†</td>
<td>Unclear</td>
<td>18 mo</td>
<td>60-min sessions; monthly since July 2007</td>
<td>66</td>
<td>HbA1c, persistently &gt; 10%; type of diabetes not specified; not receiving care in diabetes clinic for ≥ 1 yr</td>
<td>Unknown</td>
<td>BP, HbA1c, LDL cholesterol</td>
<td>Mean decrease from 12.1% to 8.3% at 12 mo</td>
<td>% who achieved BP control increased from 15% at baseline to 36%</td>
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<tr>
<td>Mallow et al., 2011†</td>
<td>Retrospective</td>
<td>27 mo</td>
<td>Not specified</td>
<td>Intervention: 53</td>
<td>Age &gt; 18 yr; uninsured patients with diabetes (type not specified) receiving care at a free clinic</td>
<td>26.1</td>
<td>Depression score, weight, BMI, HbA1c, blood glucose, creatinine, microalbumin, systolic BP, diastolic BP, total, HDL and LDL cholesterol, triglycerides</td>
<td>No significant change</td>
<td>Mean systolic BP 126.83 ± 18.31 mmHg after intervention; mean decrease 5.49 (95% CI 0.443–10.539) mm Hg (p = 0.03)</td>
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<td>Pieber et al., 1995†</td>
<td>Cohort</td>
<td>6 mo</td>
<td>90–120 min per session; every wk over 4 wk</td>
<td>Intervention: 53</td>
<td>Non-insulin dependent, type 2 diabetes</td>
<td>58</td>
<td>Weight, BMI, HbA1c, serum cholesterol, serum triglycerides, systolic BP, diastolic BP, self-monitoring glycosuria, footcare practices, diabetes-related knowledge, medication intensity</td>
<td>Decreased from 8.57% to 8.11% (p &lt; 0.05)</td>
<td>At 6 mo: systolic BP 144 ± 21 mm Hg in intervention vs. 150 ± 24 mm Hg in control (p = 0.05)</td>
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<td>Raballo et al., 2012†</td>
<td>Propositional analysis: RCT cohort</td>
<td>2 yr</td>
<td>40–50 min per session; every 2–3 mo (type 1 diabetes) or 3–4 mo (type 2 diabetes) over 2 yr (program could be repeated ad libitum)</td>
<td>Intervention: 120</td>
<td>Type 1 or type 2 diabetes</td>
<td>51</td>
<td>Patient perceptions of group care v. usual care, patient locus of control, range of concepts regarding diabetes, patient attitudes to group care</td>
<td>No significant difference among patients with type 2 diabetes (7.8% ± 1.0% in intervention and 8.0% ± 1.6% in control)</td>
<td>Not measured</td>
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Note: ADA = American Diabetes Association, ASA = acetylsalicylic acid, BMI = body mass index, BP = blood pressure, CI = confidence interval, EQ-VAS = EuroQol 5-d measure of health outcome, HDL = high-density lipoprotein, LDL = Low-density lipoprotein, NS = not significant, SF-36 = Medical Outcomes Study 36-item Short Form.
Appendix J: Recruitment Poster

THE UNIVERSITY OF BRITISH COLUMBIA

School of Nursing
T201- 2211 Wesbrook Mall
Vancouver, B.C. Canada V6T 2B5
Tel: [redacted]
Fax: [redacted]

RESEARCH PARTICIPANTS NEEDED:
We are looking for people who have attended or been invited and not attended a group medical visit

We are interested in hearing your stories about group medical visits. These are becoming a more popular way to provide health care services. Group medical visits are one of many ways we are trying to make sure the health care system is meeting your needs. We need your help in understanding their benefit (or not) to patients. Please call Laura Housden for more information if:

- You are an adult between 18-80 years of age
- You have one or more chronic health condition (such as diabetes or heart disease)
- You speak and understand English

The total maximum time commitment will be approximately 60-90 minutes.

This study is part of a Laura Housden’s doctoral study at the University of British Columbia, School of Nursing

If you are interested, please contact:
Laura Housden MN-NP(F), Doctoral Candidate
Phone: [redacted]
Email: [redacted]
Appendix I: Demographics Form

Information about you

1. Are you male or female? □₀ Male □₁ Female

2. How old are you?

| □ 1 | 19-24   |
| □ 2 | 25-29   |
| □ 3 | 30-34   |
| □ 4 | 35-39   |
| □ 5 | 40-44   |
| □ 6 | 45-49   |
| □ 7 | 50-54   |
| □ 8 | 55-59   |
| □ 9 | 60-64   |
| □10 | 65-69   |
| □11 | 70-74   |
| □12 | 75-79   |
| □13 | 80-84   |
| □14 | 85-89   |
| □15 | 90+     |

[Note: questions 3-6 will only be asked of primary care providers]

3. How long have you been a primary care provider? ____________ years/months

4. Are you a:

| □ 1 | Family physician |
| □ 2 | Nurse practitioner |
| □ 3 | Medical office assistant |
| □ 4 | Nurse |
| □ 5 | Social Worker |
| □ 6 | Nutritionist |
| □ 7 | Other [please specify] ______________________ |

5. Your role in the group visits is (please check all that apply):

| □ 1 | Facilitate (lead the visit) |
| □ 2 | Diagnose/treat/prescribe |
6. When did you start working offering Group Medical Visits? __________ year/month

[Note: the following section will be used to gather additional demographic data from patient interview participants only]

7. Are you:

- □ 1 Currently Married or living with a partner
- □ 2 Separated
- □ 3 Divorced
- □ 4 Widowed
- □ 5 Never Married

12. Are you an Aboriginal person, including First Nations, Metis (MAY-TEE), or Inuit? IF NECESSARY: Could you tell me if you would consider yourself a First Nations, Metis, or Inuit person?

- □ 1 Yes, First Nations (GO to 14)
- □ 2 Yes, Metis (GO to 14)
- □ 3 Yes, Inuit (GO to 14)
- □ 4 Yes, Would not specify (GO to 14)
- □ 5 No, don’t know, refuse (GO to 13)

IF 12 = YES (ANY) GO TO 14
IF 12 = NO, DK, REFUSE GO TO 13

13. I am going to read you a list of terms used to describe different ethnic groups. Please tell me when I read the one that describes you best. (READ RESPONSES EXCEPT DK AND REFUSE)

- □ White, Caucasian, Or European ☑ GO TO 14
- □ Chinese ☑ GO TO 14
- □ South Asian, including East Indian, Pakistani, Sri Lankan ☑ GO TO 14
- □ Black ☑ GO TO 14
D13A. This question refers to the ethnic or cultural origins of your ancestors, including ancestors from both sides of your family. An ancestor is someone from whom you have descended and is usually more distant than a grandparent. Ethnic or cultural ancestry refers to your “roots” or cultural background and should not be confused with citizenship or nationality. Other than aboriginal persons, most people can trace their origins to their ancestors on first coming to this continent.

In addition to being “Canadian,” what were the other ethnic or cultural origins of your ancestors on first coming to North America? I am going to read you a list of terms used to describe different ethnic groups. Please tell me when I read the one that describes you best. (READ RESPONSES EXCEPT CANADIAN, DO NOT ENTER CANADIAN UNLESS THE RESPONDENT ABSOLUTELY INSISTS.)

14) What is the highest level of education you completed?

☐ 1 Less than grade 12
☐ 2 Grade 12 or GED
☐ 3 Some post-secondary or college
☐ 4 Diploma or degree obtained

15) Could you please tell me how much income you and other members of your household received in the year ending December 31st 2012, before taxes. Please include income from all sources, such as savings, pensions, rent, as well as wages. Was the total household income from all sources:

☐ 1...less than $20,000,
☐ 2...$20,000 to $29,999
☐ 3...$30,000 to $39,999
☐ 4...$40,000 to $49,999
☐ 5...$50,000 to $59,999
☐ 6...$60,000 to $69,999
☐ 7...$70,000 to $79,999
☐ 8...$80,000 to $89,999
☐ 9...$90,000 to $99,999
☐ 10...$100,000 to $119,999
☐ 11...$120,000 to $149,999
☐ 12...$150,000 or more?

16) What is your current occupational status? (select all that apply)
☐ 1 Work full-time ☐ 2 Work part-time
☐ 3 Not employed
☐ 4 Student full-time
☐ 5 Retired
☐ 6 Disability or welfare beneficiary
☐ 7 Homemaker
☐ 8 Other:_______________________