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Exploring Quality Improvement for Diabetes Care: A Multiple Case Study of Primary Care Teams in First Nations Communities in Canada

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Abstract

Clinical quality improvement (QI) teams from First Nations communities across Canada participated in an 18-month QI collaborative program called the TransFORmation of IndiGEnous Primary HEAlthcare Delivery (FORGE AHEAD) clinical QI initiative. Community-based participatory research and multiple case study methodologies were utilized to explore the experience of two clinical QI teams from diverse primary care settings in First Nations communities as they engaged in developing and implementing changes in practice to improve the quality of diabetes care. This study provides insight into how clinical QI teams drew upon multiple sources of knowledge and information to inform their QI activities, the importance of strengthening relationships and building partnerships with the community, and the factors that support or hinder QI within First Nations communities in Canada. The knowledge generated may help inform community action and future development and implementation of QI programs in First Nations communities in Canada.

Keywords: First Nations, Indigenous health, diabetes, primary care, quality improvement, team-based learning, community-based participatory research, knowledge translation, implementation science, case study methodology

Dedication

     I dedicate this thesis to my late mother, Nancy Fournie, who passed away during this research. She was my first teacher – she taught me to be kind, to read, and to write. I will forever be grateful for the opportunities she provided me in life and always supporting my curiosity. Everything I am, she helped me to be. Without her unwavering support and understanding, I would not be where I am today. Love you, Mom.

To little miss Leigha, we now have all the time in the world to work on the scrapbook. I cannot wait to get creative together.

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List of Abbreviations

Abbreviation	Full Name
CBPR	Community-based participatory research
CPGs	Clinical practice guidelines
CRCT	Clinical readiness consultation tool
EMR	Electronic medical record
FNDSS	First Nations Diabetes Registry and Surveillance System
FNIHB	First Nations and Inuit Health Branch
FORGE AHEAD (FA)	TransFORmation of IndiGEnous Primary HEAlthcare Delivery
KT	Knowledge translation
PARIHS	Promoting Action on Research Implementation in Health Services
PDSA	Plan-Do-Study-Act
OCAP	Ownership, Control, Access, and Possession
QI	Quality improvement
QIC	Quality improvement collaborative

Chapter 1: Introduction

1.1. **Diabetes Health Outcomes in Indigenous Populations**

In Canada, large disparities in health exist between Indigenous and non-Indigenous peoples. Indigenous peoples (First Nations, Inuit, or Métis) in Canada experience worse health outcomes compared to non-Indigenous people, including lower life expectancy and higher rates of chronic disease and mental illness (Frohlich, Ross, & Richmond, 2006). Disparities in health outcomes in Indigenous populations are particularly evident when examining health indicators for chronic diseases such as diabetes. Prevalence rates for diabetes among Indigenous populations have increased rapidly in Canada over the last 30 years (Young, Reading, Elias, & O'Neil, 2000). Current estimates show an age-standardized prevalence of diabetes of 17.2% among First Nations people living on-reserve, compared to 5.0% among the non-Indigenous population (Public Health Agency of Canada, 2011). Moreover, research has indicated higher prevalence rates for mortality and health complications associated with diabetes in Indigenous populations, including one study which showed an over 50% prevalence rate for chronic kidney disease among First Nations peoples with diabetes (Hanley et al., 2005; Harris et al., 2011).

While reasons for these disparities have been attributed to a number of factors, the social determinants of health are recognized as having greatly influenced the poorer health outcomes observed in Indigenous populations in Canada (Adelson, 2005; King, Smith, & Gracey, 2009; C. Reading & Wien, 2013). In particular, inequities in access to care and the structure of health care services in Indigenous communities in Canada have been associated with worse health outcomes for Indigenous peoples, including those living with diabetes (Martens, Martin, O'Neil, & MacKinnon, 2007; C. Reading & Wien,

2013). To improve the health and wellness of Indigenous peoples living with diabetes in Canada, strategies are needed that have the potential to address underlying health inequities and access to quality diabetes care and services (Harris, Tompkins, & TeHiwi, 2017; King et al., 2009).

1.2. Efforts to Enhance the Quality of Diabetes Care in Primary Care

In Canada, the primary care system focuses on the delivery of health care services such as health promotion and the prevention, diagnosis, and treatment of illness and injury (Government of Canada, 2012). The primary care system plays a key role in improving health outcomes for people living with diabetes as it is in this setting where the vast majority of services for the prevention and management of diabetes and diabetes-related complications are provided (Jaakkimainen, Shah, & Kopp, 2003). Healthcare professionals such as family physicians, nurses, dietitians, and pharmacists provide primary care services in coordination with other specialized services. Diabetes clinical practice guidelines (CPGs) have been developed to help support primary care healthcare professionals who care for people with diabetes and improve the quality of care and diabetes health outcomes (Canadian Diabetes Association, 2013). Diabetes CPGs synthesize current research on effective clinical practices for improving diabetes-related health outcomes in an effort to help facilitate the use of research evidence in clinical decision-making.

Even with the availability of CPGs to support quality diabetes care in practice, healthcare professionals in primary care settings in Canada continue to face challenges in providing optimal diabetes care (Leiter et al., 2013). While there have been a variety of strategies, such as audit and feedback and clinical reminder systems, implemented to

support healthcare professionals' use of guidelines in practice (Grimshaw et al., 2006), recent studies have demonstrated gaps in clinical care for people with diabetes in Indigenous communities in Canada (Harris et al., 2011; Naqshbandi Hayward et al., 2012). A national study including 19 First Nations communities in Canada showed that less than 40% of people were achieving guideline-recommended target blood glucose levels to help to delay or prevent diabetes-related complications (Harris et al., 2011). Research has identified several challenges to diabetes care and the use of diabetes CPGs in practice, including a lack of education and training on diabetes management and opportunities for team collaboration (Holt et al., 2013; Nam, Chesla, Stotts, Kroon, & Janson, 2011). To help address some of these challenges, organizational team-based strategies, such as quality improvement collaborative (QIC) programs, have been developed to enhance learning and facilitate changes in practice that can enhance the quality of care and lead to better health outcomes (Ovretveit et al., 2002).

QIC programs have been commonly implemented in primary care and interprofessional health care settings worldwide and in Canada to support interprofessional team collaboration and improve the quality of chronic disease care (Harris et al., 2015; Hutchison, Levesque, Strumpf, & Coyle, 2011; Verma, Amar, Sibbald, & Rocker, 2017). QIC programs incorporate a series of team-based workshops to provide teams with education on best care practices from research and training on quality improvement (QI) methods such as the Model for Improvement (Institute for Healthcare Improvement, 2003).

QIC programs have the potential to improve access to quality diabetes care and improve diabetes health outcomes for Indigenous populations in Canada when they

integrate approaches to enhance and re-design primary care delivery that are driven by communities (Ellison, 2014; Gardner et al., 2011; Morton Ninomiya et al., 2017). In Indigenous health care settings in Australia, QIC programs have shown potential to improve diabetes health outcomes (Bailie et al., 2007; Knight, Ford, Audehm, Colagiuri, & Best, 2012). In Canada, one example of a QIC program currently being piloted in primary care settings in First Nations communities is the TransFORmation of IndiGEnous PrimAry HEAlthcare Delivery (FORGE AHEAD) clinical quality improvement (QI) initiative. The FORGE AHEAD clinical QI initiative is a QIC program aimed at enhancing primary care delivery for diabetes and access to available resources in First Nations communities in Canada by supporting the development of community-driven QI strategies (Naqshbandi Hayward, Paquette-Warren, Harris, & FORGE AHEAD Program Team, 2016). The FORGE AHEAD clinical QI initiative is one component of the national FORGE AHEAD Research Program, which is described further in the following section.

1.3. Overview of the FORGE AHEAD Research Program

The FORGE AHEAD Research Program is housed at Western University (London, Ontario) and funded by the Canadian Institutes of Health Research (CIHR), AstraZeneca Canada Inc., and The Lawson Foundation (#MCO 117675, #297910, and #PME-133824). The FORGE AHEAD Research Program is based on community-based participatory research (CBPR) principles where communities are involved as equal partners in developing, implementing and evaluating program activities. Community participation throughout the research program is described in Chapter 3. Eleven First Nations communities from across Canada partnered in the research program. The

research program team includes a large interdisciplinary steering committee of community representatives from each partnering community, Indigenous and non-Indigenous organizations, and academic clinicians and researchers from across Canada. The principal investigator, Dr. Stewart Harris, and the research team at Western University (herein referred to as the Western research team) were primarily responsible for engaging with community partners throughout the research program and supporting communities' QI activities.

As described by Naqshbandi Hayward et al. (2016), the FORGE AHEAD Research Program is a five-year initiative (2013-2018) consisting of series of program components and activities. Intervention activities included two separate 18-month QI initiatives – a *clinical* QI initiative and a *community* QI initiative – consisting of a series of similar program activities and QI tools. In each community, two QI teams (clinical and community) participated in the QI initiatives. A clinical QI team participated in the FORGE AHEAD clinical QI initiative with a focus on improving diabetes prevention and management within the health centre in the community. A community QI team participated in the FORGE AHEAD community QI initiative with a focus on QI within community-based diabetes programs. Program activities within the clinical and community QI initiatives occurred at the same time with the goal for the two QI teams in each community to work together near the end of the 18-month QI initiatives. The primary program evaluation of the clinical and community QI initiatives within the FORGE AHEAD Research Program consists of a comprehensive, mixed-methods process and outcome evaluation.

1.4. Research Purpose and Questions

This research resides within the clinical QI initiative component of the FORGE

AHEAD Research Program and is a sub-study that has been carried out ahead of the

primary program evaluation. For brevity, the FORGE AHEAD clinical QI initiative will

herein be referred to as the *FA-Clinical QI Program*. Eleven clinical QI teams from First

Nations communities across Canada participated in the 18-month FA-Clinical QI

Program. Clinical QI teams consisted of a small group of healthcare professionals

working within primary care settings in First Nations communities. A detailed description

of program activities and QI tools within the FA-Clinical QI Program are provided in

Chapter 3.

This sub-study includes two of the eleven clinical QI teams that participated in the

FA-Clinical QI Program. The purpose of this research was to explore QI activities for

improving diabetes care as experienced by clinical QI teams from diverse primary care

settings in First Nations communities in Canada. Diabetes QI activities are the

phenomenon of interest in this study, defined as the clinical QI teams' process of

developing and implementing changes in practice to improve the quality of diabetes care

in First Nations communities in Canada through an iterative QI process. This iterative QI

process is based on the Model for Improvement, where teams first identify areas for

improvement, develop goals for QI, identify and develop QI strategies, and then plan,

implement, evaluate and adapt QI strategies in practice using Plan-Do-Study-Act (PDSA)

cycles.

This research utilized CBPR and multiple case study methodologies to answer the

following central research question: What are the experiences of clinical QI teams as they

engage in diabetes QI activities in First Nations communities in Canada? To answer the central research question, this sub-study focused on the following three sub-research questions:

1) How are various types of knowledge used by clinical QI teams to inform their diabetes QI activities?

2) How are diabetes QI activities shaped by the context of primary care services within First Nations communities in Canada?

3) What factors support or hinder clinical QI teams' diabetes QI activities?

Context is defined as the environment or setting in which the proposed change to improve the quality of diabetes care is implemented and carried out. It does not refer to one particular place or location within the community. It can include social, organizational, political and historical contexts. In this sub-study and aligning with CBPR principles, community representatives from each partnering community were involved in conversations around the scope of this research and were involved in discussing the initial research findings. This study included a secondary analysis of existing qualitative data sources collected as part of the primary program evaluation for the FA-Clinical QI Program.

1.5. Significance

Closing gaps in health outcomes between Indigenous and non-Indigenous populations and improving health care delivery in First Nations communities in Canada is on the national, political agenda (Truth and Reconcilliation Commision, 2015). Research is needed on the strategies that can improve the quality of care provided to First Nations peoples with diabetes in Canada and address the inequities in access to culturally

appropriate and optimal care (Bhattacharyya, Estey, et al., 2011). By utilizing case study methodology informed by an implementation science framework, this study contributes to the research base on QIC programs by generating an in-depth understanding of QI activities occurring across diverse primary care settings in First Nations communities in Canada, the underlying knowledge exchange process, and how QI can be supported and facilitated. This study generates knowledge for community partners that may help inform action for the sustainability of QI activities in their communities and possible efforts to advocate for supportive structures for QI and diabetes or chronic disease care. Understanding QI activities across diverse contexts for primary care delivery in First Nations communities in Canada can help inform policy and future development, implementation and scale-up of QIC programs (Edwards & Barker, 2014; Hall, 2011; Milat, King, Bauman, & Redman, 2012).

1.6. Structure of Thesis

This chapter provided a background on the topics informing this research and an overview of this sub-study and the program in which it resides. The following chapter, Chapter 2, expands on these topics and provides a literature review of areas relevant to this sub-study, including background on the provision of primary care services in First Nations communities in Canada, background and current research on QIC programs, and knowledge translation and implementation science. Next, Chapter 3 describes the methodologies and methods used throughout this research. In Chapter 4, I present the findings and interpretations including case descriptions and emerging themes. These findings are then discussed in Chapter 5 along with this study's strengths and limitations, recommendations for future research and QI programs, and conclusion. A list of conceptual and operational definitions is provided in Appendix A.

Chapter 2: Literature Review

This chapter provides a literature review on key topics and areas informing this study. To situate the setting of this research, the social determinants of health in relation to the provision of health services and primary care within First Nations communities in Canada is provided. The second section provides background on quality improvement collaborative (QIC) programs and research on the effectiveness of these programs for the prevention and management of diabetes in primary care. The third and fourth sections of this chapter describe the knowledge translation (KT) and implementation science literature with a focus on the theoretical positions and concepts that informed this research.

2.1. The Social Determinants of Health and Primary Care Services in First Nations Communities in Canada

The social determinants of health influence health outcomes and are responsible for many of the health inequities observed across the globe (World Health Organization, 2017). The history of colonization, racism, and social exclusion are recognized as key social determinants of health affecting the health and wellness of Indigenous peoples in Canada – they have threatened Indigenous peoples' land rights and undermined their rights to self-determination, culture practices, language, and traditional lifestyles and views of health (Commission on Social Determinants of Health, 2007; C. Reading & Wien, 2013). These determinants of health in turn create inequities in other determinants of health, such as access to health care services (C. Reading & Wien, 2013).

Access to health care services refers to the ability of individuals to obtain services they seek, not just in the physical sense but also access to quality and culturally appropriate services (National Collaborating Centre for Aboriginal Health, 2011a).

Healthcare policies tied to Canada's history of colonization have created several health system challenges and inequities in access to care for Indigenous peoples – including jurisdictional barriers, geographic barriers, and barriers to culturally safe and appropriate care (Lavoie, Forget, & Browne, 2010; National Collaborating Centre for Aboriginal Health, 2011a; C. Reading & Wien, 2013). Policies around the provision of health care tied to the Indian Act of 1867 have had harmful effects on the health and wellness of First Nations people and access to primary care services (Lavoie & Forget, 2008, 2011; Lavoie, O'Neil, & Reading, 2008). Research has shown that challenges in accessing health care services are associated with a higher risk of developing diabetes and poorer diabetes-related health outcomes for Indigenous peoples (Martens et al., 2007; J. Reading, 2009).

The provision of health care services in the approximate 630 First Nations communities in Canada is diverse, with a complex mix of federal, provincial, territorial, and First Nations funded services and programs, that often depends on the community's geographic location, remoteness level (urban, rural, remote), and degree of self-governance (Indigenous and Northern Affairs Canada, 2016a; Lavoie, Forget, Prakash, et al., 2010; J. Reading, Kmetic, & Gideon, 2007). Jurisdictional and constitutional disputes between federal, provincial, and First Nations governments over the provision of health services has resulted in fragmented access to care and has limited the effectiveness of the health care system in addressing health concerns (Lavoie et al., 2008; Lemchuk-Favel & Jock, 2004).

Federally, the First Nations and Inuit Health Branch (FNIHB) of Health Canada is primarily responsible for the delivery of public health, health promotion, and disease

prevention services in First Nations and Inuit communities, as well as providing non-insured health benefits coverage for all registered First Nations (Health Canada, 2014). Additionally, FNIHB funds the Aboriginal Diabetes Initiative, which supports diabetes health promotion and preventions activities, diabetes screening and education programs, and training for community-based diabetes prevention workers (Health Canada, 2011). FNIHB also operates primary care health centres and nursing stations in approximately 200 remote and isolate First Nations communities where provincial services are not easily accessible (First Nations Inuit Health Branch, 2008; Health Canada, 2014). Under the Canada Health Act, the provincial government is responsible for primary care services for all other First Nations communities, which typically includes visiting family physicians and other primary care healthcare professionals (Lemchuk-Favel & Jock, 2004). However, the degree of provincial government involvement in providing other primary care services and programs for First Nations people living on-reserve has varied across communities and the country (Lemchuk-Favel & Jock, 2004; National Collaborating Centre for Aboriginal Health, 2011c).

First Nations people living in remote communites face several barriers to accessing primary care services because of resource constraints and the complexity of providing care in geographically remote settings (Marrone, 2007; National Aboriginal Health Organization, 2003; Shah, Gunraj, & Hux, 2003). Primary care in remote communities is typically provided by nurses rather than family physicians, with available physician services more than 90 km for 35% of remote communities (Health Canada, 2014; Lemchuk-Favel & Jock, 2004). In many remote communities, First Nations people have poor access to other healthcare professionals because they tend to only visit or fly into

communities for short durations to provide care (National Collaborating Centre for Aboriginal Health, 2011a). Many healthcare professionals working in remote northern communities are recruited from outside of the community, causing major issues with staff retention and turnover (Lemchuk-Favel & Jock, 2004). The authors of one study found that the lack of physician support and adequate staffing caused challenges for nurses in remote communities in providing quality chronic disease management (Minore, Boone, Katt, Kinch, & Birch, 2004). Due to these resource constraints and lack of adequate staffing, current health care services in remote communities tend to remain focused on acute or communicable disease, rather than focusing on approaches to address the growing rate of chronic disease in First Nations communities (Health Council of Canada, 2012; C. Reading & Wien, 2013).

In the path to self-determination, First Nations communities' governance and control of the delivery and management of health care services is cited as the most important factor in improving access to health care services and quality and culturally appropriate primary care (Davy, Harfield, McArthur, Munn, & Brown, 2016; J. Reading et al., 2007). Indigenous concepts of health and wellness are often holistic, reflecting physical, spiritual, emotional and mental dimensions, and harmony between individuals, their families, culture, and community (J. Reading et al., 2007). Many healthcare professionals working in communities are non-Indigenous and trained in Western medical models and concepts of health that focus on pathology and the health of the individual, creating the potential for cross-cultural misunderstandings and lack of culturally safe and appropriate health care (Browne, 2005; J. Reading et al., 2007). First Nations control and administration of health services can contribute to improved access

to services and health outcomes through the creation of a culturally appropriate approaches to care based on the community's traditional health practice and views of health (Lavoie, Forget, Prakash, et al., 2010; Lemchuk-Favel & Jock, 2004; National Collaborating Centre for Aboriginal Health, 2011a). Access to culturally appropriate services has important implications for improving diabetes health outcomes as the history of colonization in Canada and Indigenous peoples' loss of cultural traditions and language have contributed to the growing prevalence of diabetes among First Nations communities (Ghosh, 2012).

Self-governance and community control over health services has been initiated by the federal government through various models including contribution, integrated, health transfer, and self-government models (Kulig, MacLeod, & Lavoie, 2007; National Collaborating Centre for Aboriginal Health, 2013). Through health transfer agreements, many First Nations communities have control over the design of their community health programs and employ the majority of their healthcare staff (National Collaborating Centre for Aboriginal Health, 2011c). Early in the health transfer agreement process, FNIHB transferred the role of community health representatives over to community control (Lavoie et al., 2008). Community health representatives are essential community-based healthcare professionals – they are typically from the local community and work with other healthcare professionals to provide care to individuals and families based on Indigenous approaches to health and healing (Native Education and Training College of Business, 2017).

Canada has signed approximately 22 self-government agreements which are considered the highest level of local management and gives communities greater control

and authority over land and resources and a more comprehensive range of services (Indigenous and Northern Affairs Canada, 2015; Kulig et al., 2007). Most self-government agreements have been signed with communities in the Yukon and British Columbia, with some community governments and intergovernmental health authority boards created in other parts of the country including Quebec and Saskatchewan (National Collaborating Centre for Aboriginal Health, 2011b).

2.2. Quality Improvement

Quality improvement (QI) has been defined as "the combined and unceasing efforts of everyone—healthcare professionals, patients and their families, researchers, payers, planners and educators—to make the changes that will lead to better patient outcomes (health), better system performance (care) and better professional development (learning)" (Batalden & Davidoff, 2007, p.2).

There are several types of QI interventions that aim to improve the quality of care and close the gap between what is known from research and what is done in clinical practice (Shojania & Grimshaw, 2005). QI interventions can range from single interventions to complex, multi-faceted programs. These include healthcare professional education programs, organizational change programs, audit and feedback systems, and clinical reminder systems (Bravata et al., 2007; Glasziou, Ogrinc, & Goodman, 2011). Organizational change interventions such as QIC programs can be complex and multifaceted, employing several different methods to promote QI in practice (Glasziou et al., 2011). While there is debate in literature on whether multifaceted interventions are more effective than single interventions at improving the quality of care, the authors of a recent review article found that multifaceted, collaborative team-based strategies were the

most effective at facilitating QI for chronic disease care in primary care settings

(Chauhan et al., 2017)

The Institute for Healthcare Improvement's Breakthrough Series model is a

common QIC program model that has been implemented internationally and across a

variety of health care settings (Schouten, Hulscher, Everdingen, Huijsman, & Grol,

2008). In the Breakthrough Series model, multidisciplinary teams (called "QI teams")

from various health care organizations come together for a series of learning workshops

over a 6- to 15-month timeframe to learn from experts on topics relevant to the area they

want to target for QI and to learn from each other (Institute for Healthcare Improvement,

2003). QI teams usually consist of a subset of three to five people from the healthcare

organization. During the workshops, QI teams are taught QI methods, such as the Model

for Improvement, and are provided dedicated time to discuss and plan practice changes as

a team. Between the workshops – called "action periods" – QI teams continue to plan,

implement, and test QI strategies within their local healthcare organizations. QIC

programs based on the Breakthrough Series model also frequently include external

facilitators or practice coaches that help guide teams throughout the program (Kotecha,

Han, et al., 2015).

The Model for Improvement is an organization-based learning model that enhances

innovation and learning by doing (Hulscher, Schouten, Grol, & Buchan, 2012; Langley,

Nolan, Nolan, Norman, & Provost, 2009). In this model, QI teams identify problems

perceived to be affecting the quality of care and health outcomes in their practice and

then develop, implement and test changes in practices using Plan-Do-Study-Act (PDSA)

cycles. QI teams set aim or goal statements on what they want to accomplish, establish

measures for determining if a specific change led to an improvement, develop ideas for QI strategies that can result in improvement, and then test their QI strategies using the PDSA cycle method (Langley et al., 2009). The PDSA cycle method involves small-scale, iterative and adaptive learning cycles where teams plan their QI strategies (*plan*), implement their QI strategies in practice (*do*), evaluate the success of their QI strategies (*study*), and adapt their QI strategies based on lessons learned to inform the next cycle (*act*) (Institute for Healthcare Improvement, 2003; Langley et al., 2009). Teams are encouraged to collect data from within their practice to evaluate the success of their QI strategies, such as clinical processes (e.g., the percentage of clients with recent foot exam) or clinical outcomes (average blood glucose). The small-scale nature of the PDSA cycle method encourages teams to test their QI strategies on a small number of clients. This process facilitates learning and action, minimizes risk to clients and organizational resources, and provides opportunities to build evidence for QI (Taylor et al., 2014).

2.2.1. *Research on Quality Improvement Programs*

Research has demonstrated the potential for QIC programs to improve access to quality care and health outcomes in practice (Schouten et al., 2010). In Canada, research on the effectiveness of QIC programs in primary care settings in Ontario and Alberta have shown improvements in diabetes care processes, including increased rate of primary care visits and screening for diabetes-related complications (eye exams, foot exams), with some studies demonstrating improvements in diabetes health outcomes (Harris et al., 2013; Harris et al., 2015; Johnson et al., 2014; Reichert et al., 2017). However, QIC programs implemented in primary care settings in Canada, thus far, do not exclusively service people living in Indigenous communities. In Australia, QIC programs have shown

the potential to facilitate improvements in diabetes care in primary care settings in Indigenous communities (Bailie et al., 2007; Knight, Ford, et al., 2012).

The Australian Primary Care Collaborative, a large-scale QIC program including 743 health services in Australia, demonstrated improvements in diabetes health outcomes including an increase in the number of people with diabetes achieving target blood glucose (25% baseline, 38% post 18-months), blood pressure (20% to 33%), and cholesterol (11% to 22%) levels (Knight, Caesar, Ford, Coughlin, & Frick, 2012; Knight, Ford, et al., 2012). A similar program in Australia, called the Audit and Best Practice for Chronic Disease (ABCD) program, utilized PDSA cycles, action planning, and feedback workshops with 12 Indigenous community health centres. Research on the effectiveness of the ABCD program showed significant improvements in the delivery of care processes in accordance with Australian diabetes clinical practice guidelines (CPGs), including an increase in 6-month blood glucose testing from 41% to 74% and an increase from 20% to 58% for 3-month foot examinations (Bailie et al., 2007). QIC programs have also been implemented in the United States. The Indian Health Service launched the Improving Patient Care program based on Breakthrough Series model and the Model for Improvement which aimed to address the high rates of chronic disease in communities in the United States (Alaska Department of Health and Social Services, 2011; Indian Health Service, n.d.). However, there is no known published research assessing the impact of this program.

While these studies have demonstrated effectiveness in improving the quality of care and health outcomes, multiple systematic reviews on the effectiveness of QIC programs have shown mixed results (Hulscher et al., 2012; Nadeem, Olin, Campbell Hill,

Hoagwood, & Horwitz, 2013; Schouten et al., 2008). This has been attributed to the

multi-faceted nature and diversity of QIC programs, the need to tailor programs to

different settings and contexts, and to the highly context-dependent nature of QI where

multiple, interacting contextual factors may influence the success of changes in practice

(Dixon-Woods & Martin, 2016; Hulscher et al., 2012; Nadeem et al., 2013; Ovretveit,

2011; Schouten et al., 2008). The majority of research studies on QI programs have

focused on evaluating their impact on anticipated outcomes (e.g., care processes or

clinical outcomes) and have used controlled or before-after study designs that do not

capture the dynamic nature of QI, how outcomes were achieved, and the contexts that

lead to success or failure (Hulscher et al., 2012; Portela, Pronovost, Woodcock, Carter, &

Dixon-Woods, 2015; Schouten et al., 2008; van Leijen-Zeelenberg et al., 2016). There

are increasing calls for research on contextual factors that influence QI, including the use

of theory and conceptual models to guide QI research (Dixon-Woods, 2014; Kaplan et

al., 2010; Ovretveit, 2011; Robert & Fulop, 2014). Studies have started to develop

conceptual models identifying potential factors across all levels of the health care system

that influence the success of QI and QIC programs, including various team,

organizational, and external policy factors (Kaplan, Provost, Froehle, & Margolis, 2012;

Schouten, Grol, & Hulscher, 2010).

In QI research, more naturalistic and qualitative research methods are needed to

understand how healthcare teams' improvement efforts evolve, the underlying knowledge

exchange and implementation processes, and how contextual factors may influence the

ability of teams to make improvements to care (Baker, 2011; Dückers, Spreeuwenberg,

Wagner, & Groenewegen, 2009; Larkins et al., 2016; Ovretveit, 2011; Portela et al.,

2015). Understanding how knowledge is used and exchanged by teams helps to provide a

deeper understanding on how to facilitate QI in health care settings (Harvey, Jas, &

Walshe, 2015). To inform the implementation of healthcare improvement strategies, this

type of research is needed before examining the effectiveness of the programs in more

controlled designs such as randomized control trials (Shojania, 2013).

There has been a limited number of intervention studies and, to our knowledge, no

QIC programs targeting diabetes care in primary care settings in Indigenous communities

in Canada (Gibson & Segal, 2015; Rice et al., 2016). Research is needed to understand QI

within primary care settings in Indigenous communities in Canada.

2.3. Knowledge Translation

Knowledge translation (KT) is a broad field – it is both a practice and a science

with multiple synonymous terms including knowledge mobilization, knowledge

utilization, knowledge exchange, and implementation science (McKibbon et al., 2010).

The Canadian Institutes of Health Research (2009) defines KT as the process of

synthesizing, exchanging and translating meaningful and relevant knowledge into

practice to transform care delivery and improve population health. It is commonly

described as the process of moving knowledge into action with the goal of closing the gap

between what is known from research and what is used in practice and decision-making

(Straus, Tetroe, & Graham, 2013). QIC programs are described as an organization-based

KT strategy for supporting the implementation of knowledge from research on best care

practices to improve the quality of care and health outcomes (Ferlie, 2013).

Scholars in the KT field argue that most KT strategies have been dominated by

linear, objectivist approaches that emphasize research evidence in decision-making and

isolate knowledge from practice (Dopson & Fitzgerald, 2005; Greenhalgh & Wieringa, 2011; Kitson, 2009). They call for the advancement of alternative paradigms within KT, where the process of translating and implementing knowledge into practice is viewed as context-sensitive and dependent, acknowledges that various forms of knowledge are used in decision-making, not just research evidence, and that knowledge cannot be separated from practice and the context in which it is located.

Similarly, Indigenous scholars have criticized mainstream concepts of KT that separate knowledge from action for not reflecting Indigenous worldviews and ways of knowing (Estey, Smylie, & Macaulay, 2009; Morton Ninomiya et al., 2017). Indigenous ways of knowing intrinsically connect knowledge with action – "for an individual to hold knowledge and not apply it in their life or share it for the benefit of the collective could be seen as foolish and selfish from an Indigenous perspective" (Smylie, Olding, & Ziegler, 2014, p.3). This has led to the development of a definition for KT involving Indigenous communities: "Indigenously led sharing of culturally relevant and useful health information, and practices to improve Indigenous health status, policy, services, and programs, or more simply as, sharing what we know about living a good life" (Smylie et al., 2014, p.4). Within Indigenous settings, research is needed that acknowledges multiple conceptualizations of knowledge and practice and where learning and knowledge use is seen as connected to the larger cultural, social, and political contexts (Leadbeater, Banister, & Marshall, 2011).

2.3.1. Conceptualizations of Knowledge

Knowledge has been defined in various ways including a state of knowing, specific information, and familiarity and understanding gained through experience or study

(Hanson & Smylie, 2006). Nonaka (1994) defines knowledge as "justified true belief" (p.15) and considers knowledge a process of justifying personal beliefs in the aspiration of truth. Knowledge can be held by individuals, groups, cultures, communities, and nations, and shared through written form, pictures, stories, and oral traditions (Little Bear, 2009). Landry, Amara, Pablos-Mendes, Shademani, & Gold (2006) suggest that knowledge is a result of three successive transformations: 1) from reality to data; 2) from data to information (messages, the know-what); and 3) from information to knowledge (interpretation of information, the know-how).

Knowledge can encompass many different forms which have been broadly categorized into explicit and tacit knowledge (Landry et al., 2006; Nonaka, 1994). Explicit knowledge is formal and codified and can be consciously understood and articulated (e.g., research, theories). Tacit knowledge is knowledge gained through practice and experience and is considered informal, not easily articulated, and shared orally. Nonaka (1994) argues that tacit knowledge involves both a person's images of reality and context-specific knowledge and skills. Roy & Campbell (2015) described Indigenous knowledge as a form of tacit knowledge that is gained through observation and experience. There is no one definition of Indigenous knowledge as Indigenous peoples have diverse knowledge systems (Ellison, 2014). That said, Indigenous knowledge is commonly said to be local, contextually-specific knowledge that is relational, holistic, and intergenerational, and shared through oral and visual traditions (Smylie et al., 2014).

2.3.2. The Use of Knowledge in Decision-Making and Context

In the era of evidence-based practice, the use of research evidence in clinical decision-making has been emphasized (Naylor, 2002). In the prevention and management of diabetes and diabetes-related complications, evidence-based practice is usually emphasized within regards to the use of diabetes CPGs. The Canadian Diabetes Association's diabetes CPGs suggest that the optimal structure and organization of primary care for diabetes includes the use of chronic care models to facilitate the implementation of evidence-based chronic disease care approaches in practice (Clement, Harvey, Rabi, Roscoe, & Sherifali, 2013). Due to the complex and multifactorial nature of diabetes, the Canadian Diabetes Association's diabetes CPGs recommend several other best care practices for the prevention and management of diabetes and diabetes-related complications in primary care (Appendix B). These include: regular follow-up for screening and management of blood glucose and other complications or co-morbidities (e.g., hypertension/blood pressure, dyslipidemia/cholesterol, chronic kidney disease, neuropathy, and cardiovascular disease); use of multiple treatment efforts to achieve target glycemic, blood pressure, and cholesterol control; and providing patient-centered case management, care coordination, and self-management education (Canadian Diabetes Association, 2013). For Indigenous populations in Canada, the CPGs recommend earlier and more frequent screening for diabetes and associated complications, a greater focus on gestational diabetes screening programs, and ensuring care is respectful of and adaptable to Indigenous peoples' language, culture, and traditional values and medicines (Harris, Bhattacharyya, Dyck, Naqshbandi Hayward, & Toth, 2013).

With the vast amount of research on the prevention and management of diabetes, CPGs provide healthcare professionals with synthesized current knowledge on effective clinical practices for caring for their clients with diabetes. However, it is now well argued in the literature that both explicit (in the form of research evidence or guidelines) and tacit knowledge (in the form of experiential and context-specific evidence of the broader environment) play a role in decision-making and have a mutual and supporting role with each other (Greenhalgh & Wieringa, 2011). The concept of mindlines, first described by Gabbay and le May (2004), acknowledges that multiple forms of knowledge are used in clinical decision-making. In their foundational ethnographic study, Gabbay and le May discovered how healthcare professionals rarely referred to explicit codified knowledge such as guidelines but instead drew upon mindlines or "collectively reinforced, internalized, tacit guidelines" (p.3). Mindlines are iteratively developed, shared, and negotiated in conversation with colleagues and with brief references to written sources.

The conventional notion of evidence-based practice is that research reveals universal truths and context-free guidance on what we generally know works in practice (Lomas et al., 2005). On the other hand, knowledge and context are considered mutually inclusive, where context is recognized as an important mediator in the implementation and use of knowledge in practice (Dopson & Fitzgerald, 2005; Lomas et al., 2005). In this sense, knowledge is described less by its quality and more by its relevance and applicability to the situation, and that knowledge cannot be separated from what we do (Dobrow, Goel, & Upshur, 2004). This has led to the use of the term "evidence-informed practice" rather than "evidence-based practice" that respects that decision-making involves multiple forms of evidence, including clinical experience and patient

preferences, and is influenced by a variety of contextual factors (Woodbury & Kuhnke, 2014). Contextual factors that influence the use and implementation of knowledge are commonly categorized in the literature into micro, meso, and macro levels of the health care system (Bate, 2014). These levels refer to the patient interaction level (micro), the healthcare organization and community level (meso), and the policy level (macro) (World Health Organization, 2002).

2.4. Implementation Science

Implementation science – also referred to as the science of KT – seeks to understand the many factors that can influence the use of research evidence in decision-making and practice, including how interventions work in real-world settings, factors affecting implementation, processes of implementation, and sustainability (Curran, Grimshaw, Hayden, & Campbell, 2011; Khalil, 2016). Researchers in this field study questions regarding implementation – the process of carrying an intention into effect, which in health research can be policies, programs, or new practices (Peters, Adam, Alonge, Agyepong, & Tran, 2013). A central part of implementation science is examining the influence of context in implementation and decision-making (Edwards & Barker, 2014; Peters et al., 2013). Globally, there has been limited research on the implementation of health services, programs, and services within Indigenous communities (McCalman et al., 2012; McCalman, Bainbridge, Percival, & Tsey, 2016)

With the growth of a theoretical basis in implementation science, there are now multiple theories, models, and conceptual and theoretical frameworks available to help guide and evaluate implementation (Estabrooks, Thompson, Lovely, & Hofmeyer, 2006). In a recent systematic review of implementation frameworks, the authors identified 49

frameworks for implementation within health care settings, making framework selection an onerous task for health service researchers (Moullin, Sabater-Hernández, Fernandez-Llimos, & Benrimoj, 2015).

To help facilitate the selection and application of various theoretical approaches in implementation science, Nilsen (2015) conducted a narrative review of theories, models, and frameworks used in the field and created a taxonomy for researchers to understand the similarities and differences among them. Nilsen describes five categories of theories, models, and frameworks used in implementation science: process models, determinant frameworks, classic theories, implementation theories, and evaluation frameworks. Table 1 summarizes the descriptions and commonly used frameworks for each of the five categories. The Promoting Action on Research Implementation in Health Services (PARIHS) Framework is an example of a determinant framework that describes multiple factors that may influence implementation outcomes. The PARIHS Framework was used to inform the analysis of this study.

Table 1. Five categories of models, theories, and frameworks used in implementation science

Category	Description	Commonly Used Examples
Process models	- Specifies stages in the process of translating research into practice (e.g., action models) - Describe and/or guide the process of translating research into practice	Knowledge-to-Action Model (Graham et al., 2006)

Category	Description	Commonly Used Examples
Determinant frameworks	• Specify determinants, which act as barriers and enablers that influence implementation outcomes • Understand and/or explain influences on implementation outcomes	• Promoting Action on Research Implementation in Health Services (PARIHS) (Rycroft-Malone, 2011) • Consolidated Framework for Implementation Research (CFIR) (Damschroder et al., 2009)
Classic theories	• Originate from fields external to implementation science, which can be applied to provide understanding and/or explanation of aspects of implementation	• Theory of Diffusion (Rogers, 2003).
Implementation theories	• Theories that have been developed by implementation researchers to provide understanding and/or explanation of aspects of implementation	• Organizational readiness (Weiner, 2009)
Evaluation frameworks	• Specify aspects of implementation that could be evaluated to determine implementation success	• Reach, Effectiveness, Adoption, Implementation, Maintenance (RE-AIM) : (Glasgow, Vogt, & Boles, 1999)
Source: Nilsen, 2015		

2.4.1. The Promoting Action on Research Implementation in Health Services

(PARIHS) Framework

The PARIHS Framework is a widely used implementation science framework and has undergone substantial development work since it was first published in 1998 (Kitson, Harvey, & McCormack, 1998; Kitson et al., 2008; Rycroft-Malone et al., 2013). It is a conceptual framework that organizes various factors that combine or interact in a pattern that is dependent on the implementation context (Nilsen, 2015; Rycroft-Malone et al., 2013). The framework represents *successful implementation* of evidence into practice as a dynamic, complex interaction between three core elements – the nature and type of

evidence, the *context* in which implementation takes place, and the way in which implementation is *facilitated* (Rycroft-Malone, 2011). Each core element is divided into multiple sub-elements. The most recent definition of successful implementation by its developers acknowledges successful implementation as a process rather than outcome, whereby organizations, teams or individuals conduct active and planned efforts to implement changes in practice (Rycroft-Malone et al., 2013).

The first core element, *evidence*, is a broad concept including both explicit and tacit knowledge forms. The sub-elements include evidence from research, clinical experience, patient preferences, and local practice information. While research evidence is often heavily weighted over other forms of evidence within other KT paradigms, fundamental to the PARIHS framework is that each of these four sources of evidence, or knowledge, are meaningful and considered evidence in decision-making. The framework posits that these four sources of evidence are integrated and implemented by individuals and teams through a process of reflecting upon and drawing conclusions about their usefulness for implementing changes in practice (Kitson et al., 2008).

The second core element of *context* is defined as characteristics of the environment or the setting in which the proposed change is to be implemented and is comprised of the sub-elements of culture, leadership, and evaluation (Rycroft-Malone, 2011). Context is seen as an important mediator to successful implementation, with the sub-elements of context interacting in a dynamic and multi-level way. The framework proposes that contexts most conducive to change are organizations that: a) embrace a culture of learning that acknowledge individuals, groups, and organizational systems; b) have clear

roles, effective teamwork, and transformational leadership; and c) embed measures to collect information that feedbacks to individuals, teams, and systems.

Facilitation, the third core element in PARIHS, is defined as the process of enabling the implementation of evidence into practice (Rycroft-Malone et al., 2011). Facilitation is achieved by a person who is either internal or external to the healthcare organization and is specifically assigned the role of working with individuals and teams to apply knowledge in practice. Facilitation is seen as a critical factor to successful implementation with the premise that the integration of multiple sources of knowledge entails "an interactive, participatory process guided by skilled facilitation" (Rycroft-Malone, 2011, p. 118). Facilitation is divided into two sub-elements: purpose, and skills and attributes. The purpose of facilitation can vary along a continuum from helping to achieve a specific goal to enabling individual and team change. The skills and attributes of the facilitator can include communication and interpersonal skills but vary depending on the situation and context (Kitson et al., 2008).

The PARIHS Framework has been utilized in implementation research examining QIC programs within primary care settings (Harvey, Oliver, Humphreys, Rothwell, & Hegarty, 2015; Roberge et al., 2013). However, a review of the literature did not find any articles using the PARIHS Framework in empirical research to understand implementation within Indigenous health care settings. This is not surprising given that very little implementation science research has been conducted in Indigenous health services research (McCalman et al., 2012, 2016). Nonetheless, with the recognition of multiple conceptualizations of knowledge and the importance of context in implementing change, the PARIHS Framework has been identified as a potentially useful framework

for health services research with Indigenous communities and for identifying factors critical to implementation success in Indigenous health care settings (Davison, Ndumbe-Eyoh, & Clement, 2015; McCalman et al., 2016).

2.5. Conclusions

This chapter provides background on the provision of primary care services in First Nations communities in Canada to inform the research methods used and situate the research findings. A review of the literature showed the promising nature of QIC programs for facilitating QI for diabetes care in primary care settings. However, whether this type of QIC program can support QI and enhance the quality of care for First Nations peoples living with diabetes in Canada is not clear. Research on the impact of QIC programs have shown mixed results, with a limited understanding of healthcare teams' QI activities and the process translating and implementing knowledge in practice to improve the quality of care. By acknowledging multiple forms of knowledge and contextual factors influencing decision-making, the KT and implementation science literature offers a useful starting point to expand knowledge on the nature of QI activities occurring within QIC programs and how healthcare teams' QI efforts evolve. From this position, the process of developing and implementing changes in practice to improve the quality of care is seen as context-sensitive and dependent, and that various forms of knowledge are used to inform decision-making. This study explores the experiences of clinical QI teams as they engage in diabetes QI activities, with a focus on understanding how various types of knowledge are used by clinical QI teams to inform their diabetes QI activities, how QI activities are shaped within the context of primary care services in First Nations communities in Canada, and the factors that support or hinder QI.

Chapter 3: Methodology and Methods

This chapter first describes the positioning of this sub-study within the larger

FORGE AHEAD Research Program and the paradigm guiding this research. Next, the

methodologies utilized are described, followed by a description of the theoretical and

conceptual framework that informed this research, program activities within the FA-

Clinical QI Program, data collection and analysis procedures, the researcher's self-

reflectivity, and ethical considerations.

3.1. Positioning Research within the FORGE AHEAD Research Program

It is important to note that this research is a sub-study within the larger FORGE

AHEAD Research Program, specifically this study is embedded within and conducted

ahead of the primary program evaluation of FA-Clinical QI Program. The primary

program evaluation consists of a comprehensive, mixed-methods process and outcomes

evaluation to assess the implementation of program activities, participants' experiences in

the program, and the impact of the program on diabetes-related health outcomes. This

sub-study emerged as an interest in conducting a more in-depth analysis and

understanding of clinical QI teams' diabetes QI activities by drawing upon a knowledge

translation (KT) and implementation science lens. This sub-study included a secondary

analysis of existing qualitative data collected as part of the primary program evaluation to

answer the research questions. The data collection methods used were designed before

the development of this sub-study.

3.2. Paradigmatic Position

It is important for researchers to locate their research within a paradigm and to

reflect on the underlying philosophical systems (ontological, epistemological

assumptions) that guide their approaches to research (Holloway & Todres, 2003). Constructivist paradigmatic viewpoints of relativism and subjectivism guided this sub-study (Guba & Lincoln, 1994; Ponterotto, 2005).

Relativism, is the viewpoint there is no one true reality, but rather there are multiple, equally valid views of reality that are constructed by those perceiving it and the context of the situation (Guba & Lincoln, 1994). In this sub-study, diabetes QI activities are seen as socially constructed phenomenon that are influenced by the local context, including the interaction between clinical QI team members, the organizations in which they are work, and the social, cultural, and historical contexts within First Nations communities. The meanings and understanding of clinical QI team members' experiences in engaging in diabetes QI activities in this study were seen as multiple and varied subjective perceptions of reality that were created and interpreted through a dialogical interaction between the researcher and participants as well as the researcher and the case (Guba & Lincoln, 1994; Ponterotto, 2005; Stake, 1995).

The subjectivist assumptions of this paradigm acknowledge that the researcher cannot completely separate themselves from the research or try to control or bracket potential biases (Finlay, 2002). This stance values researcher reflexivity and transparency, acknowledging that the researchers' experiences and disciplinary lens influence their assumptions and beliefs about the nature of the phenomenon they are studying and the development of the research findings. Researchers within this paradigm explicitly locate themselves within the research process. Thus, I have described my experiences and theoretical lens within this chapter and have incorporated both my voice and participants' voices into the findings.

3.3. Community-Based Participatory Research

Community-based participatory research (CBPR) includes a set of fundamental

principles that integrate knowledge and action to improve health and reduce health

disparities (Wallerstein & Duran, 2006). These principles embody conducting research

with rather than *on* Indigenous populations, with the goal of breaking down the

colonizing nature of past research by providing a space for community voices and

knowledge to be heard and respected throughout the research process (Macaulay et al.,

2007; Minkler, 2004). For research to be effective at improving health outcomes in

Indigenous populations, it requires respecting Indigenous knowledge and oral traditions

for creating knowledge, and the synthesis of both Indigenous and Western knowledge

systems (Roy & Campbell, 2015; Smylie et al., 2004).

While keeping in mind the similarities between the two knowledge systems and the

problematic nature of dichotomous frameworks, Smylie et al. (2004) found fundamental

differences in the epistemologies underlying Western and Indigenous knowledge

systems. In the Western system of scientific inquiry, information is condensed into

knowledge using a reductionist approach and seen as linear and hierarchical. Whereas in

Indigenous knowledge systems, the creation of knowledge starts with narratives and then

proceeds to the cultivation of knowledge through experience. The synthesis of Indigenous

and Western knowledge systems and the creation of new knowledge are facilitated

through dynamic interactions and the creation of an ethical space, which means when two

separate worldviews interact space must be created to allow for respectful dialogue

(Smylie et al., 2004; Vukic, Gregory, & Martin-Misener, 2012).

CBPR emphasizes the creation of trusting and respectful partnerships between researchers and Indigenous communities that facilitates a space for the synthesis of Indigenous and Western knowledge (Israel, Schulz, Parker, & Becker, 1998). In CBPR, all partners are considered equal contributors of knowledge and expertise throughout the research process, from identifying community strengths, needs and resources through to interpreting and disseminating the research findings. The creation of partnerships facilitates a co-learning process where researchers learn from the local knowledge of the community and where communities strengthen practices and skills for conducting research (Israel et al., 1998; Jagosh et al., 2012). Knowledge translation is built into the research process because those most affected by the issue being studied are involved in identifying issues and solutions most important to the community and in the creation of knowledge, thus, increasing the relevance of the research for informing health service delivery and the likelihood for action (Cargo & Mercer, 2008; Rikhy, Jack, Campbell, & Tough, 2007; Salsberg et al., 2015).

How communities participate in CBPR projects varies depending on the topic and the context of the research, including the amount of resources (e.g., time, staff) available in the community to dedicate to the research process (Cargo & Mercer, 2008; Minkler, 2004). As a sub-study within the larger FORGE Research Program, how communities were involved in the larger FORGE AHEAD Research Program and this sub-study are further described.

All components of the FORGE AHEAD Research Program were based on the principles of CBPR. Communities from across Canada expressed interest in addressing diabetes within their community and heard about the development of this program either

through investigators with whom they had prior partnerships with or by information shared on public and regional websites. Communities were considered full partners in the program. Community representatives from all partnering communities attended research team meetings to discuss the development of program activities and research objectives, which aimed to build on the strengths and resources within each community. This included a two-day in-person meeting in June 2013 attended by community representatives from all interested communities. Community research and financial agreements were developed and signed between community advisory boards (i.e., chief and council, health boards) and the principal investigator, Dr. Stewart Harris. The research agreements outlined the Ownership, Control, Access, and Possession (OCAP®) principles (First Nations Information Governance Centre, 2017), where each community individually decided how they would be involved throughout each stage of the research, as well as how data would be collected, stored and shared, and how the research findings would be disseminated.

Over the course of the FORGE AHEAD Research Program, the Western research team and other investigators continually developed trusting and respectful relationships with all community representatives, based on the foundation of open, honest and sincere communication. These relationships were developed through continual conversations around the program and aimed to ensure all program and research activities were discussed with community representatives. Community representatives from each partnering community were key partners on the research program team and were involved throughout the research. Community leadership identified all community representatives. Community representatives in each community included a key contact, a

community facilitator, a community data coordinator, and a community evaluation liaison. Key contacts were responsible for overall administration, identifying members of the clinical QI team, and liaising with the community advisory board. Community facilitators and community data coordinators were people either working in or from the community and supported program and research activities within the community. Community evaluation liaisons worked with the Western research team in developing research questions and outcomes of interest to the community, as well as to discuss data analysis and interpretation. Both partnering communities involved in this sub-study identified the key contact as the community evaluation liaison.

As a sub-study within the larger FORGE Research Program, this research ensured collaboration with community partners throughout the research process. Over multiple teleconference meetings, I shared and discussed the scope of this research (research questions and design) and the findings from this research with the key contacts/ community evaluation liaisons from the two partnering communities involved in this sub-study. These meetings ensured that the findings generated from this study would be relevant and meaningful to the community and that community representatives were involved in the interpretation of the findings. More details on how the findings from this sub-study were shared and discussed with the community evaluation liaison from each community are provided in the data analysis section 3.8. While this study did not integrate a direct action component, the findings from this research may help inform community's sustainability plans for QI or community-led efforts to advocate for structures to support QI and diabetes care.

3.4. Case Study Methodology

Since CBPR does not outline specific research methods, researchers may also utilize other qualitative methodologies within a CBPR project (Minkler, 2004). This sub-study embeds qualitative, constructivist multiple case study methodology to guide data collection and analysis. Qualitative approaches to case study methodology focus on studying a phenomenon within the context of a case or multiple cases through an in-depth analysis of multiple sources of information (Creswell & Poth, 2017; Stake, 1995). Case study methodology is considered appropriate for a CBPR study because case study methodology generates local community knowledge and greater attention detail on activities occurring within diverse community contexts (Johnston, 2013; Stake, 1995).

Case study methodology fits well with the purpose of this research in exploring QI activities for improving diabetes care because diabetes QI activities were considered to be contextually bounded and because the researcher had no control over the phenomenon (Baxter & Jack, 2008). Case study methodology was ideally positioned to give new insights into the process of implementing changes in practice to improve the quality of care and "unpack the dynamics of change" (Baker, 2011, p.i32). Compared to other methodologies, case study allows for an in-depth, holistic exploration of QI within a complex setting, detailed contextual and cross-case analysis using multiple perspectives and methods, and the use of theoretical frameworks to inform analysis (Creswell & Poth, 2017; Meyer, 2001). Also, using case study methodology can help to generate knowledge on how multiple forms of knowledge come together to inform decision-making and their use within context (Greenhalgh & Wieringa, 2011).

While there are several approaches to case study methodology proposed by authors such as Yin (2014), Stake (1995; 2006), and Merriam (2009), this study draws upon case study design as described by Stake because his approach is consistent with a constructivist paradigmatic position (Hyett, Kenny, & Dickson-Swift, 2014; Yazan, 2015). Stake classifies case studies into three categories: intrinsic, instrumental, and collective/multiple. Intrinsic case study designs focus on gaining a better understanding of the case, whereas in instrumental case study designs, the case plays only a supportive role in gaining a better understanding of a phenomenon of interest in the study. Multiple case study designs are instrumental, with a focus on the inclusion of multiple cases to gain an in-depth understanding of the complexity and particularity of a phenomenon as it is situated across diverse contexts (Stake, 1995, 2006).

Specifically, this study employs a multiple case study design to explore QI activities for improving diabetes care by carefully examining the activity and experiences of two clinical QI teams from diverse primary care contexts that participated in FA-Clinical QI Program. As will be discussed in the data collection and analysis methods sections below, case study methodology favours the use and triangulation of multiple perspectives and data sources (Stake, 1995, 2006). The knowledge generated through this approach aims to transform the reader's understanding of the phenomenon and whether or not they can apply the findings to their own situation (Baxter & Jack, 2008; Stake, 1995).

3.4.1. Case Definition

Stake defines a case as an object (a noun or entity) occurring within a bounded system, located in its own situational, historical, social, and political contexts (Stake,

1995, 2006). The definition of the case for this study was built off Stake's (2006)

suggestion for specifying the case by its "boundedness, contexts, and experiences" (p. 3).

In this study, each case is defined as a clinical QI team consisting of a small group of

healthcare professionals working within a primary care setting in a First Nation

community and that participated in the FA-Clinical QI Program. The phenomenon and

the cases are bounded within the 18-month timeframe of the FA-Clinical QI Program.

3.4.2. *Case Selection*

Cases were selected based on non-probability sampling, where the aim is not

generalization or achieving a representative sample of the population, but rather is largely

based on the researcher's discretion in achieving the stated purpose of the research and

diversity in the findings (Stake, 2006). The rationale for case selection was based on

several considerations. First, two cases were sampled because, compared to a single case,

two cases: 1) allowed for cross-case analysis; 2) allowed for the inclusion of clinical QI

teams across diverse First Nations primary care contexts; and 3) enhanced the

transferability of the findings to other contexts (Creswell & Poth, 2017; Stake, 2006).

Also, compared to selecting more or all clinical QI teams that participated in the FA-

Clinical QI program, selecting two cases was considered feasible for conducting an in-

depth case study analyses within the timeline of this sub-study. Second, due to feasibility

and timeline restrictions, case selection was limited to clinical QI teams that had

completed the 18-month FA-Clinical QI Program at the time that case selection was

conducted. Five of the eleven clinical QI teams met this criteria.

Based on Stake's recommendations for case selection, case selection allowed for

examining the complexity of diabetes QI activities occurring across diverse primary care

settings in First Nations communities and ensured that the existing data sources would provide multiple team member perspectives and experiences. Two of the five eligible clinical QI teams were selected for maximum variation based on diversity in the characteristics of the community as they related to the structure of primary care services in First Nations communities in Canada. This case selection strategy was chosen because the situation or contexts of the case is expected to shape diabetes QI activities (the phenomenon) and those experiencing it (Stake, 2006). Moreover, Edwards and Barker (2014) argue that choosing diverse contextual settings is important to implementation science questions and developing a deeper understanding of how context shapes implementation.

To select cases, I reviewed and compiled information on community characteristics for each of the five eligible cases from several sources, including publicly available information on government and community websites and information collected on the community profile survey (Naqshbandi Hayward et al., 2016, Additional file 1) at the beginning of the FORGE AHEAD Research Program. This information was compiled into two large tables and included: community geographic area, local community language, community remoteness level, community size, governance structure, percentage of population with diabetes, health service organization (e.g., nursing station, health centre), availability of a family physician, availability of specialists and allied healthcare professionals (e.g., nurses, dietitians, pharmacists, social workers, community health representatives), funding structure, and access to diabetes services (e.g., labs, dialysis). For brevity, Table 2 provides a summary of key characteristics, not all information collected for each of the five cases. After collecting this information, I then

conducted a review of the literature to provide insight and understanding into the structure of primary care services in First Nations communities in Canada. The literature review helped to identify the most salient and relevant characteristics to consider for case selection.

I reviewed the information collected for each case, my proposed sampling strategy, and a summary of the literature review with my supervisors. While several characteristics were considered, we agreed on selecting cases based on characteristics of the community that exhibited the most importance in the literature review and relevance to the phenomenon and research questions. As Stake (1996) suggests, when selecting cases only a few of the relevant characteristics can be included. Each case may be considered unique in many different ways so it was important to choose only the most relevant characteristics that we believed may influence primary care and QI activities in First Nations communities.

The two cases selected are indicated with an asterisk (*) in Table 2. The two clinical QI teams were selected based on diversity in characteristics of the community's remoteness level, governance, and geographical location. This information was collected from the Indigenous and Northern Affairs Canada's (2016b) First Nations Profiles online database. As described in Chapter 2, these characteristics affect primary care services, diabetes health outcomes, and community control over health care services in First Nations communities in Canada. In addition, cases were selected based on the amount of data available within existing data sources. Compared to other cases, these two cases provided had a larger number of team member interviews which ensured that a diversity

of team members' perspectives and experiences were included. Herein, the two clinical

QI team are identified by the pseudonyms of Team West and Team East.

It is important to note that while characteristics such as health service organization,

availability of healthcare professionals, funding, and access to diabetes services were

considered relevant, the variability of these characteristics within the cases transcended

from the community's remoteness level, and thus, were captured within it. Additionally,

although community size was considered an important factor to the type and amount of

government health services and program funding, it was difficult to obtain an accurate

reflection of the community's funding. For example, while a community may be small,

there is the potential the community can receive additional or other types of funding

through external grants or local business revenue. Other characteristics were not

considered because they were not relevant to the purpose of this research or phenomenon

of interest (i.e., local QI activities).

Table 2. Case Selection Table

| | Community Characteristics | | | | | |
| | Used for Case Selection | | | | Other Key Characteristics | |
Cases/ Clinical QI Teams	Community Remoteness Level[1]	Governance[1]	Province[2]	Available data	Community Size[2]	Family Physician Access[2]
1	Urban	Indian Act	Alberta	Low	15,223	Visiting
2* *Team West*	Urban	Indian Act	Alberta	High	2,073	Visiting (usually on-site)
3	Rural	Indian Act	Manitoba	Low	1,767	Available in neighbouring town
4	Urban	Indian Act	Quebec	High	10,514	On-site
5* *Team East*	Remote-special access	Self-Governing/ Local agreement	Quebec	Low	2,238	On-site (rotational)

1. Collected from Indigenous and Northern Affairs Canada's (2016b) First Nation Profiles online database. *Urban*: A geographic zone located within 50 km of the nearest service centre with year-round road access; *Rural*: A geographic zone located between 50 and 350 km from the nearest service centre with year-round road access; *Remote*: A geographic zone located over 350 km from the nearest service centre with year-round road access; *Remote-special access*: A geographic zone which has no year-round road access to a service centre and, as a result, experiences a higher cost of transportation. *Service Center*: the nearest town/city to which a First Nations person can gain access to government services, banks and suppliers, including provincial services (health services, community and social services, environmental services)
2. Collected from the community profile survey (Naqshbandi Hayward et al., 2016, Additional file 1)

3.5. Theoretical and Conceptual Framework

This study is positioned within the field of health information science with the purpose of exploring diabetes QI activities occurring across diverse primary care settings in First Nations community. The focus of this research is on understanding how knowledge is used by clinical QI teams to inform their diabetes QI activities and how QI activities are shaped by context of primary care services in First Nations communities, which embodies concepts within the KT and implementation science literature. This study draws upon key theoretical assumptions from within alternative KT paradigms that align with a constructivist paradigmatic position. Thus, in this study, clinical QI teams' diabetes QI activities are seen as a complex and dynamic process of translating knowledge into practice. It is a context-dependent phenomenon that is socially constructed and interpreted through the values and judgments of individuals and groups. The use of research-based knowledge is not regarded as a linear process, rather diabetes QI activities are shaped by the context in which they are implemented and by various forms of knowledge that are: a) integrated, b) given meaning in context, and c) individually and collectively constructed and negotiated (Greenhalgh & Wieringa, 2011; Kitson, 2009).

As described in Chapter 2, the Promoting Action on Research Implementation in Health Services (PARIHS) Framework, a conceptual framework within implementation

science, was used as a conceptual device during analysis to help think about and make

sense of the complexity of implementation. The framework has been put forth as a useful

conceptual framework to guide a retrospective analysis in understanding how

implementation varies across contexts (Hill et al., 2017). The use of a well-informed

framework enhances the rigor and consistency of case study research (Meyer, 2001).

The PARIHS Framework was chosen for several reasons. First, the PARIHS

framework is consistent with the constructivist paradigmatic location and theoretical

assumptions underlying this research (Kitson et al., 2008; Rycroft-Malone, 2007). The

framework was developed to represent the implementation of knowledge as a non-linear

process and acknowledges the use of various sources of knowledge and the influence of

context in decision-making (Estabrooks et al., 2006). Second, while the FA-Clinical QI

Program was not developed prospectively using the PARIHS Framework, the core

strategies employed in the program aligned with the framework's sub-elements of

knowledge and facilitation. The elements of the framework provided greater conceptual

depth for analysis of the knowledge and facilitation elements compared to other

implementation science frameworks. Third, it is considered a conceptually robust

framework that has undergone substantial developmental work and has been widely

applied allowing for insights into its strengths and weaknesses and enhancing the

transferability of this study's findings to other settings (Helfrich et al., 2010; Kitson et al.,

2008; Nilsen, 2015).

However, it is important to acknowledge that a single framework will not

illuminate the entire picture of implementation; while they are useful for helping to

analyze emerging themes, it is important that the research does not become too driven by

the framework (Moullin et al., 2015; Nilsen, 2015). The underlying premise of the framework and the construct flexibility allows for inductive analysis (Rycroft-Malone et al., 2013; Tabak, Khoong, Chambers, & Brownson, 2012). Using theory with an inductive approach maintains the contextual relevance and nature of the data (Rycroft-Malone, 2007). Moreover, given the constructivist position of this research, using the framework in a deductive approach was considered incongruent with the underlying paradigmatic assumptions, where knowledge is generated from the meanings that people attribute to their experiences (Carpenter & Suto, 2008). Using an inductive approach was also important because the framework was not developed nor has it been widely tested within Indigenous health care settings.

3.6. The FORGE AHEAD Clinical Quality Improvement Program

The FA-Clinical QI Program is a multi-component, quality improvement collaborative (QIC) program based on the Institute for Healthcare Improvement's Breakthrough Series Model and the Model for Improvement (Institute for Healthcare Improvement, 2003; Langley et al., 2009). Over the course of 18 months, clinical QI teams participated in three phases of program activities (Figure 1). The preparatory phase (3 months) included initial team formation and the completion of the first clinical readiness consultation tool. The second core activities phase (12 months) included a series of three team-based learning workshops, separated by three-month action periods, and the completion of a second clinical readiness consultation tool. The wrap-up activities phase (3 months) included the development of sustainability plans and the completion of a third clinical readiness consultation tool. Program activities were supported by various program roles including program facilitators (community facilitator,

Western research team facilitator) and a community data coordinator. The FA-Clinical QI Program integrated two tools that could be utilized by clinical QI teams to inform their diabetes QI activities. This included a First Nations Diabetes Registry and Surveillance System (FNDSS), housing clinical information for people living with diabetes in the community, and a clinical readiness consultation report that could be used during a team-based clinical readiness consultation process.

The workshops and QI tools developed for the program were aligned with key components of chronic disease prevention and management outlined in the Expanded Chronic Care Model. The Expanded Chronic Care Model is designed to facilitate improvements in practice by identifying evidence-based and modifiable elements of the health care system that promote population-based and patient-centered chronic disease care (Barr et al., 2003; Wagner et al., 2001). The core elements of this model include: delivery systems design, self-management, decision support, information systems, build healthy public policy, create supportive environments, and strengthen community action. Research has indicated that chronic care models are effective at guiding practice improvements in primary care settings and improving diabetes-related outcomes (Coleman, Austin, Brach, & Wagner, 2009; Davy et al., 2015; Grossman et al., 2008).

FORGE AHEAD Clinical QI Program Timeline		2014			2015												2016		
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Preparatory Phase		▓	▓	CRCT*															
Core Activities	Workshop #1				CRC*														
	Action period #1					░	░	░											
	Workshop #2								▓										
	Action period #2									CRCT*	░	░							
	Workshop #3												▓						
	Action period #3													░	░	░			
Wrap-Up activities																	▓	▓	CRCT*
*CRCT - Clinical Readiness Consultation Tool																			
*CRC - Clinical readiness consultation																			

Figure 1: FORGE AHEAD-Clinical QI Program Activities Timeline

3.6.1. *Program Roles*

Community facilitators, community data coordinators, and Western research team facilitators supported program activities throughout the FA-Clinical QI Program. As previously described, the community facilitator and the community data coordinator in each community supported both program and research activities and were working in or from the community. The community facilitator's role in each community was to lead and guide the clinical QI team throughout the program including at workshops and during action periods in the community. The community data coordinator's role was to help populate FNDSS with clinical charting information and generate reports from the system when requested by the clinical QI team. Community facilitators and community data coordinators could also play a dual role as a clinical QI team member, as many of them were healthcare professionals working in the community (e.g., nurses, diabetes educators, community health representatives). In Team West, the community facilitator and data coordinator were both members of the team. There were two turnovers within the community facilitator role for Team West over the course of the FA-Clinical QI Program. However, there was overlap and training with the facilitators to reduce the impact on program and QI activities. In Team East, the community facilitator was a member of the team, but not the community data coordinator. There was no turnover within program roles for Team East.

Western research team facilitators included program coordinators and research assistants from the Western research team, whose roles were to moderate and help facilitate team breakout sessions at the workshop, as well as support community

facilitators, community data coordinators and clinical QI teams' during action periods between workshops.

3.6.2. Clinical QI Team Member Recruitment

Working with the community advisory board, the key contact identified up to six people who were part of the circle of diabetes care in the community. The community facilitator then asked each person to participate in the FA-Clinical QI Program as a member of the clinical QI team and before the first workshop provided them with a letter of information and consent form. The letter of information outlined both program and research activities and objectives. Written consent forms were returned to the Western research team. A separate letter of information and consent form was provided to team members for other research activities occurring later in the program including end-of-program interviews. Clinical QI team members could also be members of the community QI team participating in the parallel FORGE AHEAD community QI initiative (see Section 1.3).

3.6.3. Diabetes Quality Improvement Activities and Quality Improvement Process

Throughout the FA-Clinical QI Program, clinical QI teams engaged in diabetes QI activities, defined as a process of developing and implementing changes in practice to improve the quality of diabetes care in First Nations communities. In this QI process based on the Model for Improvement, teams identify priority areas to target for QI, develop goals for QI, identity and develop QI strategies, and then plan, implement, evaluate, and adapt QI strategies in practice using Plan-Do-Study-Act (PDSA) cycles (Figure 2). QI strategies are specific changes developed and implemented in practice to improve the quality of diabetes care. Teams were encouraged to first test their QI

strategies with a small number of people and then over continuous cycles move to include more people and implement successful strategies fully in practice. Diabetes QI activities were entirely driven by the clinical QI team, meaning the program did not prescribe what areas of care teams would target for QI or what strategies they would implement to improve care. The Western research team provided clinical QI teams with a PDSA cycle template (Appendix C) as a way to document and keep track of their QI strategies and each step in the PDSA cycle.

Figure 2: Quality Improvement Process

3.6.4. Workshops

Clinical QI team members participated in a series of three team-based learning workshops. All workshops followed common traditions of Indigenous communities, including opening and closing prayers and offering tobacco to Elders in appreciation and respect for their participation and guidance in the program. The workshops were designed to provide: 1) knowledge from research on best practices for diabetes care, diabetes

clinical practice (CPGs), and elements of the Expanded Chronic Care Model; 2) knowledge on successful health interventions in Indigenous communities, and other topics identified by communities as priority areas; 3) training on the Model for Improvement; and 4) allocated time at breakout sessions for teams to discuss strategies for improving diabetes care in their community. Workshop plenary and breakout session topics are provided in Appendix D.

The first workshop occurred in-person in London, Ontario over two days. Plenary sessions at the first workshop included presentations on the Model for Improvement and applying PDSA cycles. Breakout sessions at the first workshop were designed to take the teams through the stages of their QI process from first identifying priority areas for improvement through to developing and planning their QI strategies. The second and third workshops were both one-day in length and occurred over video-conference. To help facilitate cross-community learning and support, at the start of both the second and third workshops each team presented to the group the QI strategies they had worked since the last workshop and successes and challenges they encountered.

Over the three workshops, each team participated in a total of 8 breakout sessions (workshop 1, four sessions; workshop 2 & 3, two sessions each). The community facilitator led the team's breakout sessions with the support of Western research team facilitators. Western research team facilitators moderated the breakout sessions and were there to answer any questions about the program. There was one Western research team facilitator in each breakout session as well as more experienced Western research team facilitators that entered and exited the rooms throughout the breakout sessions.

After the second workshop, additional learning opportunities were offered to clinical QI teams including Diabetes Boot Camp. The Diabetes Boot Camp program is organized and run by a nurse practitioner and a certified diabetes educator employed at the Primary Care Diabetes Support Program at St. Joseph's Health Care, in London, Ontario. The program addresses key concepts for diabetes management and provides knowledge on current medications for diabetes and strategies to support medication adjustments. The Diabetes Boot Camp program has been run across Canada, including many remote communities. The program was offered by webinar and was open to all healthcare professionals in the community to attend, not just those on the clinical QI team. The program was delivered individually to each team in November 2015 and tailored to meet the learning objectives and needs of the team.

3.6.5. *Action Periods*

During the three-month action periods between workshops, teams were encouraged to continue to meet regularly to continue to develop and plan strategies for improving diabetes care. Western research team facilitators conducted weekly support calls with community facilitators and community data coordinators. Community representatives were able to email or phone a member of the Western research team at any time if they had any questions regarding any aspect of the FA-Clinical QI Program or larger research program. At the request of the teams, Western research team facilitators would also attend clinical QI team meetings via teleconference. The support calls provided an opportunity to discuss how QI activities were progressing, any challenges encountered, and to help teams with applying the Model for Improvement and PDSA cycles.

3.6.6. *First Nations Diabetes Registry and Surveillance System*

FNDSS is a web-based diabetes registry and surveillance system designed to help inform clinical QI teams' diabetes QI activities. FNDSS was previously developed as part of another national research project with First Nations communities across Canada (Naqshbandi Hayward, Harris, et al., 2012). It could be used by clinical QI teams to identify clients with diabetes, identify gaps in care to target for QI, and to evaluate the success of their QI strategies by tracking clients' health outcomes. The diabetes registry identifies all adults 18 years of age and older diagnosed with diabetes in each community, including name, gender, year of birth, and year of diagnosis. The surveillance system houses clinical information (risk factors, clinical values, screening, medications, complications, visits, and referrals) for all clients listed on the diabetes registry and includes built-in clinical reports for tracking clients' clinical processes and health outcomes. For each community, access to the registry and surveillance system was determined by the community advisory board. Communities with pre-existing registries and surveillance systems could choose to use their own systems in the program. For communities with an existing surveillance system or electronic medical record (EMR), the Western research team supported the collection of all clinical outcome information related to diabetes.

Community members with diabetes had the option to opt-out of the registry and surveillance system. Posters describing FNDSS and its purpose were posted in the community to inform community members and make them aware of the opt-out process. However, for Team West, the community decided to have an opt-in consent process, where each community member with diabetes was provided a letter of information and

consent form. Clinical information for only people who consented was included in FNDSS.

3.6.7. Clinical Readiness Consultations

The clinical readiness consultation is both a tool and a consultation process. In collaboration with community partners, the Clinical Readiness Consultation Tool (CRCT) was developed to identify health system factors for chronic disease prevention and management within First Nations communities in Canada (Naqshbandi Hayward et al., 2017). The tool was adapted from an existing tool developed for Indigenous communities in Australia. The tool included 74 items designed to collect information on existing health care delivery systems and available resources as they aligned to the components of the Expanded Chronic Care Model.

The community facilitator distributed the CRCT to each clinical QI team member. Team members were asked to complete the CRCT three times throughout the FA-Clinical QI Program – once before the first workshop, once during the program, and once after the third workshop (Figure 1, p.45). Team members completed two parts for each item. First, team members marked a number along an 11-point Likert scale that best reflected their views and practices at the health center. Second, team members explained in the open-ended section why they scored the item the way they did.

After each team member had returned the completed CRCT, the Western research team developed an aggregated *clinical readiness consultation report* that summarizes team members' responses on the CRCT. Aligning to the elements on the Expanded Chronic Care Model, the report included averaged scores for five components and 21 sub-components and a summary of team members' open-ended responses (Appendix E).

Each clinical QI team was provided with a clinical readiness consultation report to use during the team's *clinical readiness consultation.* The first *clinical readiness consultation* was directly embedded in the first workshop and led by the community facilitator during the team's first breakout session. This consultation process provided an opportunity for teams to discuss the information provided in the clinical readiness consultation report, discuss whether the results were reflective of the current context of the community, and identify key factors to target for QI. The report was provided to teams two other times during the program – once halfway through and once at the end of the program. These reports showed scores from the previous reports. The two other consultation processes occurred in the community at the team's discretion.

3.7. Data Collection and Procedures

A secondary analysis of multiple existing qualitative data sources was conducted to generate an in-depth description of the clinical QI teams and primary care services in the community and to capture a holistic understanding of clinical teams' diabetes QI activities. Using multiple methods is a key characteristic of case study methodology, it enhances the credibility of the findings by allowing different facets and views of the phenomenon to be explored (Stake, 2006). Program documentation sources were used to generate an in-depth description of each case. Observation field notes, team member interviews, QI activity documentation, and implementation support notes were used as analytical sources to answer this sub-study's research questions (Table 3). These research activities were designed as part of the primary program evaluation to assess the acceptability and success of the FA-Clinical QI Program and other research program activities. The data collection timeline is provided in Figure 3.

Table 3: Summary of Data Collection Methods

Data Source	Description	Quantity of Data
Observation Field Notes	Observation of workshop breakout sessions • **Workshop 1**: 4 Breakout Sessions (approx. 4 hours) • **Workshop 2**: 2 Breakout Sessions (approx. 2 hours) • **Workshop 3**: 2 Breakout Sessions (approx.. 2 hours)	16 field and reflective notes (16 per team)
Team Member Interviews	End of program interviews (approx. 1 hour) with clinical QI team members	7 interview transcripts (4 interviews Team West, 3 interviews Team East)
QI Activity Documentation	Documentation of diabetes QI activities on PDSA cycle templates.	25 pages (10 pages Team West, 15 pages Team East)
Implementation Support	Documentation of implementation support	44 pages (21 pages case A; 23 pages case B)

Figure 3: Data Collection Timeline

3.7.1. Community and Participant Information

A variety of sources were used to collect background information for this study and to generate an in-depth description of each case. Characteristics of participating

clinical QI team members (profession, whether they identified as Indigenous, team member role, turnover) were collected at the beginning and throughout the FA-Clinical QI Program and documented in a study database. Community characteristics collected as part of the case selection process (section 3.4.2) were used to describe the community and available primary care services (language, geographic location, community size, remoteness level, governance, number of people in the community with diabetes, and availability of healthcare professions). This included information collected on the community profile survey at the beginning of the FORGE AHEAD Research Program (Naqshbandi Hayward et al., 2016, Additional file 1), community websites, and Indigenous and Northern Affairs Canada's First Nations Profile online database.

3.7.2. Observation Field Notes

Observation field notes included two sets of field notes – one as participant observers in the field and a second as a non-participant observer. The first set of field notes were taken in the field by Western team researchers during the clinical QI teams' breakout sessions at the three workshops (Table 3). Due to breakout sessions occurring concurrently, there were different Western team researchers assigned to each team's breakout room to take observation notes. During teams' breakout sessions, the Western team researcher acted as a participant observer and as a facilitator in helping to support team discussion. Field notes were taken to record what took place during these sessions including the descriptions of activities, a summary of what was discussed by the team, individual and group actions, role of program facilitators, and meanings team member's attributed to the process. Team members' salient comments during the breakout sessions were documented, but the team member was not identified. Fields notes also included reflective notes to document thoughts, feelings, and experiences and reflections on program activities and the process, including a reflection on their role as a Western

research team facilitator. Each breakout session was audio-recorded with permission from team members. After each workshop, the Western team researcher listened to audio-recordings to expand on jot notes and created completed field notes. During subsequent team meetings, members of the Western research team met to debrief and discuss the workshop and breakout sessions, including successes and challenges. It is important to note that as a research assistant, I took some of the observation notes during breakout sessions for the two teams included in this sub-study.

Since I did not observe all breakout sessions for the two teams included in this sub-study, a second set of non-participant observation field notes were taken at the end of the program to complement the participant observation field notes taken in the field during breakout sessions. I listened to the audio-recordings from each team's breakout sessions to document my observations and reflexive notes as a non-participant observer. While these notes were not direct observations, it ensured notes captured an understanding of the teams' diabetes QI activities over the course of the FA-Clinical QI Program and provided the opportunity to reflect on the research questions of this research study The two sets of field notes complemented each other and provided multiple and differing perspectives on the teams' diabetes QI activities.

3.7.3. Team Member Interviews

End-of-program telephone interviews were conducted with clinical QI team members at the completion of the 18-month FA-Clinical QI Program and lasted approximately one hour. Team members from all communities were purposefully sampled for maximum variation based on their professional role and community membership. Selected team members were emailed a letter of information and consent form outlining the purpose of the interview. A total of seven team members from the two

clinical QI teams selected for this sub-study consented to participate. All interviews were audio-recorded and conducted by one member of the research team with experience in qualitative interviewing. The purpose of team member interviews was to understand team members' experiences in the FA-Clinical QI Program. Interview questions were open-ended and flexible in order and nature. The interview guide (Appendix F) included questions on the role and experience in program activities, facilitators and barriers to participation, perceptions on the impact of the program, QI activities, and what QI plans the team had for the future. If community facilitators and data coordinators were also team members, the interviewer ensured to gather their perspectives from within both roles to gain a better understanding of program activities and clinical QI teams' experiences in the program. Since the interview guide was designed as part of the larger research program evaluation, some interview questions were not relevant to this sub-study. All audio-recordings were sent to an external transcription company and transcribed verbatim. The transcripts were de-identified and included participants' "ums" and pauses. I listened to audio-recording of interviews and verified transcripts for the seven participating team members from the two teams included in this sub-study.

3.7.4. Quality Improvement Activity Documentation

As part of the program activities, teams were encouraged to keep track of their QI strategies using a PDSA cycle template (Appendix C). Community facilitators were primarily responsible for documenting the teams' QI strategies and sending the PDSA cycle template periodically to a member of the Western research team. At the end of the FA-Clinical QI Program, a final PDSA cycle document was compiled by the Western research team that combined all of the PDSA cycle templates sent throughout the

program. This final document was then forwarded to the team to review for completeness. For research purposes, the information included on the teams' final PDSA cycle document provided details on the team's QI strategies, what information they used to plan and evaluate their QI strategies, and any challenges they encountered.

3.7.5. *Implementation Support Notes*

As previously described, Western research team facilitators supported the community facilitators, community data coordinators, and clinical QI teams during action periods throughout the FA-Clinical QI Program via teleconference. The support calls provided time to discuss how QI activities were progressing, any challenges encountered, and to help teams with applying the Model for Improvement and PDSA cycle. Western research team members documented their discussions and personal observations and reflections in a Microsoft Access© (2013) database. Implementation support notes were exported from the database into Microsoft Excel© 2013 document. The data within the implementation support notes were used to gain insight into the context of the research and QI activities occurring within the community.

3.8. Data Analysis

All data sources were compiled and inserted into NVivo, a qualitative data analysis software, to help organize and analyze the data. I read each data source for each case several times to contextualize and to immerse and re-familiarize myself with the data. I also reviewed plenary session slides from each workshop and the teams' clinical readiness consultation reports to re-orient myself to the information provided to the team and to give context to what team members' discussed during breakout sessions and interviews. I listened to audio-recording of interviews to gain insight into the context and

salient features of the research setting and nature of the interview. During this initial

review of the data sources, I created some initial codes and wrote down my initial

thoughts and impressions of each case in a reflexive journal. For each case, I wrote a

summary and reflection on what I learned from each data source. This assisted with

building a story and triangulating the data sources during analysis. After gaining a grasp

of the data, I was able to refine my analytical strategy and how I would proceed with

analysis.

Throughout data analysis, memo and reflexive notes were taken to record the

meaning of codes, where they come from, how codes interrelate and connect to research

questions, and any emerging thoughts or analytical notes (Charmaz, 2014; Coffey &

Atkinson, 1996). This study followed the within- and cross-case data analysis procedures

for case study research described by Stake (1995, 2006). Throughout analysis, the

research questions were maintained at the forefront. Each case was analyzed individually

(within-case analysis) then followed by cross-case analysis of categories and themes.

Data sources were not analyzed individually but rather triangulated in looking for greater

understanding and interpretations across data sources and for generating a detailed and

holistic perspective of the context, activities, and experiences of each clinical QI team. I

attended to the situatedness of QI activities throughout data analysis, acknowledging that

the context shapes not only QI activities but also those experiencing and interpreting it.

Data sources were analyzed chronologically and iteratively to give insight into the

context of the case and to understand how teams' diabetes QI activities emerged over

time. First, data sources were analyzed to generate a detailed, thick narrative description

of each clinical QI Team and their contexts and activities. Coding first took place

inductively by breaking the data into meaningful chunks (line-by-line, sentences, or paragraphs) (Coffey & Atkinson, 1996). A combination of descriptive, process and in-vivo codes were used (Charmaz, 2014). Descriptive codes were used to capture descriptions of feelings, experiences, and explanations. Process codes were used to preserve teams' actions and activities. In-vivo codes were used to stay true to participants' words or phrases. In initial coding stages, I aimed to stay close to data as possible through line-by-line coding of actions, processes, and the meanings participants attributed to their experiences. By conducting line-by-line coding, I was able to force myself to look at the data in different ways and push myself beyond my theoretical lens, as well as explore emerging links and comparisons between data.

After initial inductive coding, I returned to the data to examine possible theoretical explanations and began to develop interpretative and theoretical codes (Charmaz, 2014; Coffey & Atkinson, 1996). I used the PARIHS framework as a conceptual guide to help make sense of the initial codes and emerging categories and themes. I engaged in multiple rounds of reorganizing and re-contextualizing the data by comparing the initial codes and assessing codes for frequency and analytical strength, how the codes were related or in contradiction to each other, when they happened, and how they are connected to the research purpose and questions. Throughout these multiple rounds, I began to identify categories and themes. Lastly, cross-case analysis proceeded to understand patterns, similarities, and differences across cases (Stake, 2006). This occurred through a "back and forth dialectic" between the case and attention to the phenomenon (i.e., QI activities) as a whole (Stake, 2006, p. 46).

Throughout data analysis and interpretation, I discussed my initial codes and emerging findings with my co-supervisors and the program coordinator on the Western research team. As a result of reviewing the initial codes and emerging findings with my supervisors and the program coordinator, some initial codes were collapsed because we agreed that they were similar in nature. For example, the codes "not feasible" and "out of team's control" were subsumed into one code called "feeling unable to make changes". There were also times where the researchers disagreed on whether some codes were relevant to the research question but through continued discussion and reflection on the data the researchers were able to come to an agreement on the relevancy of the data. The initial within-case findings were also discussed with the community evaluation liaison from each community to provide insight into the findings from the perspectives of those directly involved in the program. A summary of the initial findings were sent to each community representative. Later, we met by teleconference to discuss the initial findings. The community evaluation liaisons provided more insight into their experiences and connections between emerging categories and themes. In particular, the community evaluation liaison gave further insight into the structure of the primary care services and clarity around the QI strategies that they implemented within their health centres. Afterward, I returned to the data and reflected on any new insights into the data as result of these discussions.

3.9. Self-Reflexivity

In keeping with the constructivist paradigmatic underlying this sub-study, it is important to provide background on my prior experiences and disciplinary location and address the multiple perspectives that influenced this research (Carpenter & Suto, 2008;

Finlay, 2002). Since 2007 and prior to starting my Master's degree program at Western, I worked as a full-time research assistant with Dr. Stewart Harris and his research team at the Centre for Studies in Family Medicine. My research experience on this team primarily involved evaluating provincial QIC programs and working on the FORGE AHEAD Research Program. Within my role in the FORGE AHEAD Research Program, I helped to develop and implement program activities and QI tools and supported community facilitators and QI teams during action periods. I was also involved in data collection. Throughout these experiences on the team, I became familiar with many of the recommendations outlined in Canadian Diabetes Association's diabetes CPGs (e.g., quarterly screening of blood glucose, annual foot examinations, and self-management support) and gained experience in conducting both quantitative and qualitative research.

My prior research experiences cultivated my research interest in KT and chronic disease management in primary care settings, which in turn drove me to return to school to complete my Master's degree and expand my knowledge and skills in KT research. My course work during my Master's degree helped to refine and expand my thinking around KT and implementation science, as well as guided me to think critically about notions of evidence-based care and use of evidence in practice. Moreover, this experience expanded my interest in Indigenous health services research and KT within the context of Indigenous community settings. The ideas for this research transpired from my prior involvement in the FORGE AHEAD Research Program and from my learning experiences throughout my Master's degree.

As a researcher with no experience living or working in a First Nations community, I attended multiple learning opportunities including events during Indigenous Health

Awareness Week at Western University and Indigenous cultural safety learning webinars to improve my knowledge and awareness of Indigenous health and culture. These events, as well as reading through various literature, opened up my awareness of the history of colonization in Canada, the structures and systems that impact Indigenous peoples' health, and the importance of being attentive to issues of power and privilege when working with Indigenous communities. These learning opportunities were essential for me when working with community representatives. Additionally, they were integral for analyzing and interpreting the data as I aimed to be critically attentive to the social determinants of health and conditions that may influence primary care delivery and QI in Indigenous communities. However, I do not have the power or the knowledge to fully understand the structures and systems within Indigenous communities that may influence health and primary care. Thus, it was essential for me to involve community representatives in the interpretation of the research findings. Community representatives helped provide greater insight into the structure of primary care services in their community and both the benefits and challenges of working in these settings. Dr. Stewart Harris, my co-supervisor, also had multiple years of experience providing clinical care in First Nations communities in Northern Ontario and across Canada. During initial coding stages, we had conversations around working in remote communities and the challenges providing chronic disease care in these settings. These conversations contributed to the revision and enhanced interpretation of the findings.

Engaging with community representatives, my co-supervisors, and the program coordinator throughout data analysis allowed the exploration of the data through multiple perspectives and lenses. Each of us had different disciplinary backgrounds and

knowledge of the data, some having more knowledge of the clinical context in First Nations communities, and some being more involved than others in the program and data collection. This enhances the rigour and credibility of the findings and provided an opportunity to challenge my biases and assumptions. As a constructivist, I recognize that each of these lenses influenced how the data were interpreted.

Lastly, it is important for me to discuss the partnerships and relationships with community partner representatives. The prior partnerships and relationships that the Western research team, including myself, had built with community representatives in the FORGE AHEAD Research Program were integral to this sub-study. CBPR projects can typically take longer to conduct because of the time needed to build trusting and respectful relationships. I had built relationships with community representatives from all of the partnering communities through my previous involvement in the FORGE AHEAD Research Program. We often discussed topics beyond the program itself, including sharing stories of our families and common life experiences. I believe as a result of having built a prior relationship with the community representatives, I did not encounter any significant delays as this study progressed. This helped to facilitate trust and open communication with community representatives throughout this sub-study.

3.10. Ethics and OCAP Principles

The FORGE AHEAD Research Program was approved by Western University's Health Sciences Research Ethics Board (REB#103895), the Health Research Ethics Board of Alberta (CHC-14-0054), the Cree Board of Health and Social Services of James Bay (#2014-DSP-03), and the Mi'kmaw Ethics Watch (Unama'ki College, Cape Breton University, approved March 14, 2014). This study was covered under the FORGE

AHEAD Research Program ethics protocol because the research questions fell under the objectives of the primary program evaluation. A protocol revision was submitted to ethics describing the research questions and methodology (Appendix G)

Ethical principles for research with Indigenous communities were followed including OCAP® principles and the 4 R's (respect, reciprocity, relevance, and responsibility) of research involving Indigenous peoples in Canada (Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, & Social Sciences and Humanities Research Council of Canada, 2014; First Nations Information Governance Centre, 2017). In keeping with the OCAP® principles outlined in the community research agreements, all aspects of this research and findings were continually shared and discussed with community representatives. Any future publication plans beyond this thesis will be shared and discussed with community partners and other members of the research program team.

As stipulated in the community research agreements, community names have been removed to protect the anonymity and confidentiality of the participating team members. This is consistent with ethical requirements in protecting the anonymity of participants within a small team working in the community. Individual team member quotes were not identified within the findings, and direct quotes by participants were withheld if it made participants easily recognizable. Community representatives signed confidentiality agreements outlining their responsibilities to protect and maintain the anonymity and confidentiality of participants and the data they collected. All data files were password protected and kept on a secure server at Western University or secured in a locked filing cabinet.

Chapter 4: Findings

This chapter presents the findings from the analysis of multiple data sources that explored the experiences of clinical QI teams as they engaged in the process of developing and implementing changes in practice to improve the quality of diabetes care in First Nations communities in Canada. This chapter is divided into two sections. The first section provides within-case descriptions, with each case described separately. Within-case descriptions include a description of the clinical QI team (Team West and Team East), participation in research activities relevant to this sub-study, the community and primary care system in which they reside, and a summary of the teams' QI strategies. The second section, following within-case descriptions, presents the four emerging themes from the cross-case analysis.

Chapter 4A – Within-Case Descriptions

4.1. Team West

4.1.1. Description of the Team

Table 4 provides a summary description of Team West including team members' professional role, whether they identify as Indigenous or non-Indigenous, and turnover on the team over the course of the FA-Clinical QI Program. The table also indicates if a team member held a program role as a community facilitator or community data coordinator. Over the course of the 18-month FA-Clinical QI Program, the team consisted of up to six team members from a variety of different healthcare professional roles within the primary care system. Within the first six months of the program, two team members resigned from their role on the team and one person joined the team shortly before the second workshop. Four of the team members were also members of the community QI team.

Table 4. Team West Description

Clinical QI Team Member	Professional Role	Indigenous/ Non-Indigenous	Team Member Turnover	Other Program Roles
1	Family Physician	Non-Indigenous	Remained on team throughout program	None
2	Retinal Photographer	Indigenous	Remained on team throughout program	Community data coordinator
3	Homecare worker	Indigenous	Remained on team throughout program	None
4	Medical office assistant	Non-Indigenous	Remained on team throughout program	None
5	Diabetes educator	Non-Indigenous	Left team prior to first workshop	Community facilitator
6	Health Promoter	Indigenous	Left prior to second workshop	Community facilitator
7	Diabetes educator	Non-Indigenous	Joined team prior to second workshop	Community facilitator

4.1.2. *Participation in Research Activities*

For research activities, all team members consented to participate in observational field notes and program documentation (QI activity documentation, implementation support notes), and four of the team members consented to participate in an interview at the end of the FA-Clinical QI Program. All team members attended each of the three workshops where observational field notes were conducted, unless at that time they were no longer part of the clinical QI team.

4.1.3. *Description of the Community and Primary Care Services*

The community neighbours a large urban centre in Alberta and identifies themselves as a Dene nation. It is considered an urban community with access to

provincial health, community, and social services within 50 kilometres. There are approximately 2,000 community members living on-reserve and 134 members who have been diagnosed with diabetes in the community.

The structure of primary care services and delivery in the community consists four main groups, all residing within a large health centre in the community: 1) a primary care clinic, 2) diabetes and health education programs, 3) homecare, and 4) community and public health programs. The primary care clinic is funded by Alberta's provincial health services, consisting of visiting family physicians, nurses and office assistant staff. The other three groups are primarily governed by the band office and funded federally through Health Canada.

Most healthcare professionals and services are accessible in the community including dietitians, diabetes educators, pharmacists, community health representatives, community health promoters, retinal photographer, and diabetes education and counselling services. Social workers and specialized services such as gestational diabetes programs and dialysis treatment centres are available off-site in the neighbouring city. Medical transportation is available for community members to access services within the neighbouring city.

Prior to participating in the FA-Clinical QI Program, there was an informal diabetes registry being used in the community, but no electronic system for tracking and monitoring client's diabetes clinical information. Shortly before the first workshop, the primary care clinic transitioned from paper charts to an electronic medical record (EMR). The other groups used either paper charts or a separate electronic charting system from the primary care clinic. In addition, shortly before the first workshop, the diabetes

educator had resigned from their position, and there was a four-month delay in hiring their replacement. The new diabetes educator joined the health centre and the clinical QI team shortly before the second workshop.

4.1.4. Team West's Quality Improvement Strategies

Over the 18-month FA-Clinical QI Program, Team West developed and implemented various strategies to improve diabetes care in the community. It is important to note that some of the strategies were only within the planning stages at the time data collection was completed. Many of the QI strategies developed and implemented by the team to improve diabetes care aimed to achieve multiple goals, including improving clients' access to care, enhancing diabetes education, supporting clients' self-management and mental health, and improving follow-up on CPG recommendations. Additionally, the team felt that a priority area for improvement was improving system integration and the sharing of client information among the main groups within the health centre. The diabetes education program, the primary care clinic, and home care services each kept separate charting systems within the health centre, and as a result, the team felt that there was a lack of communication between healthcare professionals and lack knowledge of the care that clients were receiving. However, there were privacy concerns with sharing client information and, specifically, giving healthcare professionals working in the diabetes education program access to the primary care clinic's EMR. One team member described the challenges with multiple charting systems used by the different groups within the health centre.

> Of course the biggest barrier that we encountered was we had a unique situation in that we had diabetes charts through the health centre, through our [diabetes program] and we also had the [primary care clinic] working

in our health centre and they held their charts separately (Team West, Interview)

Below is a summary of the QI strategies developed and implemented by Team West to improve diabetes care within the community throughout their participation in the FA-Clinical QI Program.

➢ Linked registries of clients with diabetes between the primary care clinic and the diabetes education program to identify a shared listed of clients with diabetes.

➢ Shared client lists between the diabetes education program and homecare services.

➢ Shared summary client visit notes between the diabetes educator and family physicians.

➢ Joint, ad-hoc diabetes appointments with the diabetes educator and family physicians, where the diabetes educator would attempt to see the client on the same-day they were in to see their family physician.

➢ Group medical visits consisted of four self-management education sessions over five weeks. The sessions were led by the diabetes educator and the family physician, with other healthcare professionals such as dietitians and exercise specialists providing support.

➢ Weekly clinical notes and electronic reminders for family physicians, such as reminding them to measure clients' blood glucose:

> One of the PDSAs on the clinical side that stood out, was kind of using post-its as a reminder. So their physicians have post-its – they're rotating post-its, and one of them says, on the work station it says, is your client's A1C [blood glucose] up to date? And then that would encourage them to just check, and look for it. And earlier on it said, have you introduced your patients to the diabetes educator?... Yeah, it's a paper post-it. It's a little laminated, bright pink post-it that sits on the desk, and, yeah, so that worked well for me to meet new people, and get the A1Cs [blood glucose] prompted. And now we have – so not really using those post-its anymore – now we're using sub-rows in the EMR. (Team West, Interview)

➢ Provided diabetes screening, awareness and education at local community events (annual diabetes walk and powwows).

➢ Offered a diabetes information and healthy snacks booth at the community's band office.

➢ Assessed and discussed clients' mental health and well-being by using the patient health questionnaire and questions on spirituality for improving coping skills.

➢ Provided education and training to homecare staff and community health workers on how to do foot examinations in the home.

➢ Developing "welcome kits" to support newly diagnosed clients with diabetes, such as providing information on a variety of topics about diabetes and services available in the community and the importance of self-management and frequent follow-up with healthcare professionals.

4.2. Team East

4.2.1. Description of the Team

A summary description of team members from Team East is provided in Table 5. The team consisted of six team members over the course of the program including two family physicians, a health service coordinator, a nurse-in-charge, a nutritionist, and a community health representative. Membership on the team remained fairly consistent with one turnover within the community health representative position.

Table 5. Team East Description

Clinical QI Team Member	Professional Role	Indigenous/ Non-Indigenous	Turnover	Other Program Roles
1	Family Physician	Non-Indigenous	Remained on team throughout program	None

Clinical QI Team Member	Professional Role	Indigenous/ Non-Indigenous	Turnover	Other Program Roles
2	Family Physician	Non-Indigenous	Remained on team throughout program	None
3	Health service coordinator	Indigenous	Remained on team throughout program	None
4	Nurse-in-charge	Non-Indigenous	Remained on team throughout program	Community facilitator
5	Nutritionist	Non-Indigenous	Remained on team throughout program	None
6	Community Health Representative	Indigenous	*Left team prior to second workshop*	None
7	Community Health Representative	Indigenous	*Joined team prior to second workshop*	None

4.2.2. Participation in Research Activities

All team members consented to observation field notes at workshops and program

documentation (QI activity documentation, implementation support notes). Three team

members consented to participate in an end-of-program interview. Observation field

notes during the team's breakout sessions at each of the three workshops were taken.

However, it is important to note that team members' attendance at workshops varied

across the three workshops. At the first workshop, two of the six team members were

unable to attend. All of the team members were able to attend the second workshop. Due

to scheduling issues only two of the six team members were able to attend the third

workshop.

4.2.3. Description of the Community and Primary Care Services

The community identifies themselves as a Cree nation and is located in a remote

area of Quebec, approximately 600 kilometres from the nearest city with provincial

health, community, and social services. The community has approximately 2,200 community members living on-reserve, with an estimated 300 people with diabetes.

All health services within the community are delivered and funded by a regional First Nations governed health board. Federal- and provincial-funded services are filtered through the health board. Within the community, there is a health centre with access to family physicians, nurses, nutritionists, community health representatives, physiotherapists, and social workers. There are also traditional healers and cultural coordinators available in the community. Physicians and nurses are always available in the community but are considered rotational positions. Physicians and nurses work in the community four times a year with thirteen-week rotations (nine weeks in the community, return home for 4 weeks). During the four week return home, replacement physicians and nurses cover their work.

Most diabetes education and care services are accessible in the community including lab services and counselling for nutrition and physical activity. Other healthcare professionals and specialists visit the community periodically throughout the year, such as a regional diabetes educator, a foot care nurse, and an optometrist. The regional diabetes educator comes once a year to the community, including setting up diabetes clinics and teaching staff diabetes care practices. Otherwise, the health centre staff have access to the diabetes educator by telephone. All other specialists or diabetes services such as pharmacists and dialysis treatment are available indirectly by phone or telehealth or are located in urban centre greater than 600 km away.

There was an existing regional diabetes registry and surveillance system being used in the community that provided a list of people with diabetes and clients' recent blood

work. The health centre uses a paper charting system for documenting all other clinical information, such as blood pressure, foot examinations, and medication.

4.2.4. Team East's Quality Improvement Strategies

Team East's QI strategies for improving diabetes care over the course of the FA-Clinical QI Program focused on many goals including: improving continuity of care and consistency in follow-up, integrating community health representatives more within the team, providing training on diabetes care for community health representatives, improving clients' access to care, and enhancing clients' knowledge of diabetes and self-management. Similar to Team West, many of the QI strategies developed by Team East aimed to achieve multiple goals. A summary of Team East's QI strategies for improving diabetes care is provided below.

➢ Provided training for community health representatives on how to take photographs for tele-ophthalmology.

> I've even got my community health representatives even doing tele-ophthalmology now. Where they're taking pictures of eyeballs and sending them off electronically to an ophthalmologist to view. And they're very interested in that stuff. Both the girls studied the eyeball and all of that sort of stuff, like really got into it when they were in their training.

➢ With the support of nurses, implemented a community health representative-led blood pressure program, where community members could come into the health centre to measure their blood pressure.

➢ Offered tele-ophthalmology screening appointments on evenings and weekends, and provided notes for clients to take time off work to attend appointments.

➢ Diabetes clinic days, where a dedicated team of nurses would provide care and follow-up for a small number of clients (2-5 clients each) with the client seeing the same nurse at each visit. The physician, nutritionist, and community health

representative were available for consultation if needed. Using motivational interviewing techniques, the nurse conducted weekly education and self-management support sessions with clients for four visits over one month, where the clients would identify and set their own diabetes self-management goals.

➢ Same-day, joint appointments with the nurse and nutritionist.

➢ Creating and testing diabetes templates for nurses to use when following up with clients with diabetes. Diabetes templates provided a list of clinical measures (e.g., lab tests, blood pressure target, self-management goals) to follow-up with clients on.

➢ Integrated discussion on quality improvement during weekly staff meetings in the health centre. The team invited the community health representative, the community QI team, and members of the health board to the weekly meetings. After a few months of trying this out, one nurse started sending email updates at the end of the week so that staff who were holidays would be aware of what is going on in the clinic that week, such as any new protocols, or any problems that arose.

➢ Added a half-hour educational session on diabetes to the physical workout program offered in the community. Nurses would stay after workout sessions to provide people with information about diabetes, including healthy eating.

➢ Implemented cooking workshops in the community for making healthy meals which included traditional community recipes.

Chapter 4B – Emerging Cross-Case Themes

The following section provides the emerging themes from the cross-case analysis of data sources from the two cases selected for this study. The themes represent emerging findings from both Team West and Team East, thus, illuminating the within-case themes. Unique within-case findings have been highlighted to ensure that diversity of perspectives are heard and highlight how diabetes QI activities transpired across diverse contexts. The case (Team West or Team East) and data source (interview, observation field notes) are listed after each supporting quotation. Summarized and grouped data are representative of all participants from both clinical QI teams and integrate several data sources. The four central themes and associated sub-themes that emerged from the analysis are outlined in Figure 4.
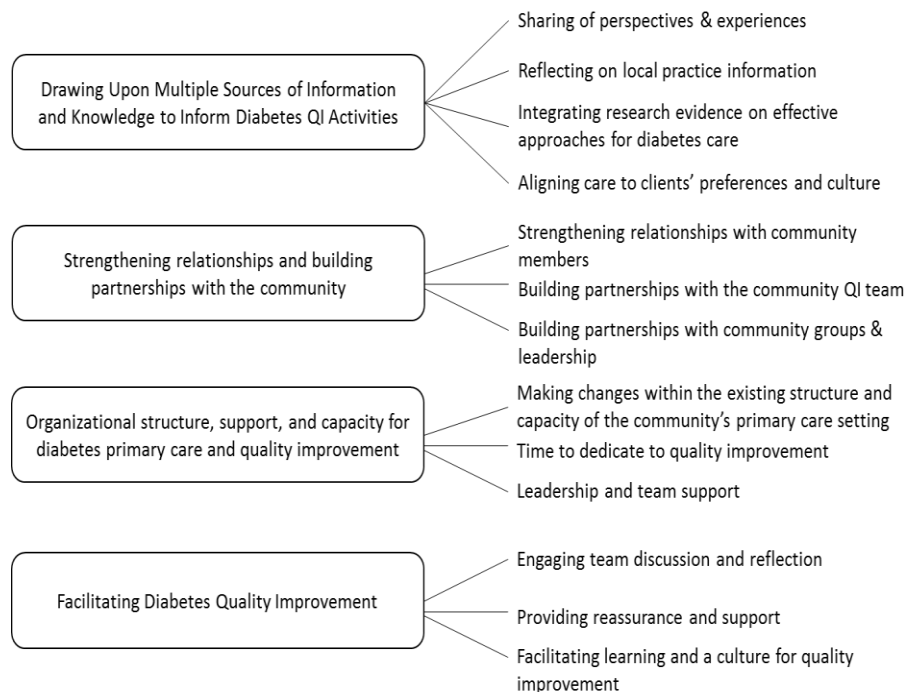
Figure 4: Outline of Emerging Themes and Sub-themes

4.3. Drawing Upon Multiple Sources of Information and Knowledge to Inform Diabetes QI Activities

This theme reflects how clinical QI teams drew upon multiple sources of information and knowledge to inform their diabetes QI activities. This theme is further broken down into four sub-themes: 1) sharing of perspectives and experiences; 2) reflecting on local practice information; 3) integrating research evidence on effective approaches for diabetes care; and 4) aligning care to clients' preferences and culture.

4.3.1. Sharing of Perspectives and Experiences

This sub-theme is comprised of the following three categories: 1) team members' perspectives and experiences; 2) community members' perspectives and experiences; and, 3) experiences of other teams.

Team Members' Perspectives and Experiences

The sharing of perspectives and experiences among members of the clinical QI team was essential to enabling and informing diabetes QI activities. This sharing was facilitated by meeting as a team at the workshops as well as back in the community. When asked what was important to improving diabetes care throughout their participation in the FA-Clinical QI Program, one team member described the importance of meeting as a team:

> I think it's mostly forcing us to think about it… just to force us to meet and to talk about it … when we have to meet together we have to talk about it and we have to talk about it as a team… FORGE AHEAD helped us work more as a team… I think we have to continue to communicate together. It's so easy just to stay in our office and just do our things. We really have to continue to talk together and for the benefit of our clients. (Team East, Interview)

With team members from diverse roles in providing diabetes care in the community, team discussion facilitated the sharing of varying team members'

perspectives and input throughout the teams' QI process, including identifying areas for improvement and ideas for QI strategies. Team members felt that it was helpful to obtain team members' different perspectives to inform the development of strategies to improve diabetes care. As described by one team member: "I think it was helpful to have, you know, all those different inputs from the team members" (Team West, Interview).

In particular, the clinical readiness consultation and information provided on the teams' clinical readiness report informed the development of QI strategies by facilitating team discussion and sharing of individual team members' perspectives on the local organizational context for diabetes care. During the clinical readiness consultation process at the first workshop, team members discussed their results on their clinical readiness report and further shared their experiences and perspectives from within their professional roles on how well the system was doing in providing diabetes care services in the community. Team discussion around components of the clinical readiness report further illuminated how team members' viewpoints sometimes varied depending on their role and location within the system. Reflecting on the individual team members' perspectives facilitated a better understanding of other people's roles in providing diabetes care, clinical and community resources available for people with diabetes, and existing gaps or challenges to providing diabetes care that some team members may not have been previously aware of. As illustrated in the following quote, going through the clinical readiness report as a team and further discussing the perspectives of everyone on the team facilitated a more comprehensive understanding of the context for diabetes care in the community.

> The reports that we got back were helpful. So, it was worth it to go through [as a team] because you don't always see the bigger picture. You

just see what's happening with you and then you get the answers of your team. So yeah, the reports were helpful and worth it. (Team West, Interview)

Throughout the FA-Clinical QI Program, team members would share ideas for QI strategies based on their previous experiences. Team members shared past experiences to identify potential challenges and strategies to overcome barriers to implementing diabetes programs in the community. For instance, team members from Team East discussed past successes with other clinical programs, such as new mother programs, to inform the implementation of QI strategies for improving knowledge of diabetes and self-management. Team members shared how when they offered programs in the community, outside of the health centre, more people attended and felt that community members communicated with them more and asked more questions.

While team discussion facilitated the sharing of different perspectives and experiences to inform the clinical QI teams' QI activities, the level of individual team member involvement in team discussions varied. Some team members dominated a lot of the conversations, which was observed as potentially being indicative of existing professional hierarchies within the teams. Other team members were not consistently involved or engaged in team discussion and tended only to contribute to the discussion if the topic was directly related to their role in diabetes care. However, sometimes team members acknowledged that they were doing most of the talking and would specifically ask other's to provide their ideas and opinions.

Community Members' Perspectives and Experiences

Team discussion also facilitated the sharing of community members' perspectives on diabetes and diabetes care. Community members who were part of the clinical QI teams helped to inform the teams' diabetes QI activities by providing further insight into

the community's culture and health practices, and ideas for how the team could improve diabetes care in the community. When asked to describe their role on the team, a team member from Team West described the benefit of being able to provide a unique perspective as a member of the community when the team was discussing ideas to improve care:

> Just for the clinical team, I guess just having someone who lives in the community, works in the community, and raised in the community, just having that point of view or outlook on the ideas that were thrown around in the clinical team. (Team West, Interview)

Non-Indigenous team members often drew upon the perspectives of community members on the clinical QI team to provide insight into barriers to accessing diabetes care, their opinions on areas needing improvement, and ways the team could improve diabetes care.

Team members from Team East described using information provided by community members on the *community QI team* participating in the parallel FORGE AHEAD community QI initiative to inform their clinical team's diabetes QI activities. Before the clinical QI teams' first workshop, members of the community QI team had shared with the community facilitator their perspectives on diabetes care in the community, including their perspectives on how the community viewed diabetes, healthcare professionals' knowledge and relationship with the community, and areas of diabetes care they felt that the clinical QI team could work on improving. Community members felt the clinical QI team could focus their diabetes QI activities on improving the way information about diabetes is provided, adapting care to their culture and traditions, and improving the clinical staff's knowledge of the community and their culture. During breakout sessions at the first workshop, the community facilitator shared this information with members of the clinical QI team. Members of Team East then

reflected upon this information throughout their breakout sessions as they discussed their QI activities. Team members expressed feeling privileged for the information that was shared by the community QI team members and learning valuable information on what community members thought about their delivery of diabetes care. One team member described the value of the information provided by the community members on the community QI team and using this information to inform their diabetes QI activities:

> We [received] a lot of information from them [the community team], since the very beginning, which was very precious, all the information we gathered. So we used that information into the clinical team. (Team East, Interview)

Experiences of Other Teams

Some team members described liking the opportunity to connect with other teams participating in the FA-Clinical QI Program during workshops to share their experiences, challenges, and ideas for QI: "So just having people at that the workshops, sharing some of the things that they came up with was good" (Team West, Interview). Both teams developed QI strategies based on what other teams had developed and presented at the workshops, such as welcome kits for newly diagnosed patients and community healthy eating programs with traditional healthy recipes. However, not all team members felt these networking sessions at the workshops were necessarily useful because they were too long:

> I'm not too sure that really helped. I thought it was a bit long. Like at first we would listen to everybody what they were doing, try to take some ideas but we didn't focus on everybody. Like it was a bit long and not listening to everybody and yeah. (Team East, Interview)

Others also described not feeling well connected to other participating teams:

> It was nice to feel a part of that bigger thing, but to be honest I'm not sure how useful it was. I wouldn't say I'm connected to any of the other Nations and would call them up and say, hey, how is it going and how is

> your project going, or give me hints or anything like that. (Team West, Interview)

4.3.2. Reflecting on Local Practice Information

Team reflection on information from within their local practice was essential to informing their diabetes QI activities. Team members described how the Model for Improvement and Plan-Do-Study-Act (PDSA) cycles provided a method for teams to identify problems within the system and areas of diabetes care they can focus on improving, and allowed the team to set their own goals.

> It helped us step back and look at where in diabetes care we should be focusing and to help us set our own goals, so it's this whole stepping back and looking at what we now call out here the panel of your patients… We think about it with intent, right, that we are intentional about our diabetes care. So we step back a little bit, look at our-our patient population, and say, how can we do better? (Team West, Interview)

It also provided a method to collect and evaluate information from within their practice to inform their diabetes QI activities. One team member from Team West described the team's improved capacity to evaluate their practice and existing diabetes programs and services:

> I think in the area of making changes, and evaluating them… and how we're going to measure… previous to this, I don't think we'd been doing any kind of evaluating [of] our programs. We would ask for some feedback, but otherwise, we weren't really measuring or monitoring things like that, so I think we have a better capacity in evaluation (Team West, Interview)

QI tools such as the clinical readiness report and the First Nations Diabetes Registry and Surveillance System (FNDSS) were designed to provide information from the team's local organizational context for diabetes care within their primary care settings. Team members shared how they reflected on information provided in their clinical readiness report to identify gaps in care and inform their diabetes QI activities.

Team members described using the clinical readiness report to identify areas for improvement and to generate ideas on areas where the team could focus their diabetes QI activities on.

> It made its differences. It identified what our starting lines are. And that kind of gave us an idea of where we'd like to go. And what would be achievable right now because of our isolation and all that. (Team East, Interview)

One team member from Team West described how the team would look at areas of the report that were scored low or they thought needed improvement to inform their QI activities: "And, if it was super low or needed improving we would maybe discuss like how we could get it higher, maybe a PDSA. That was how we used the reports. It was basically just to generate ideas" (Team West, Interview).

However, during workshop breakout sessions, some team members described feeling like they were getting stuck on the details of the clinical readiness report when discussing priority areas of improvement, rather than discussing others areas potentially not captured in the report. While members of Team West described using the second and third clinical readiness reports to see how areas were improving, one team member from Team East described not using the second and third reports to inform their QI activities:

> It kind of opened up my eyes at first to see that we don't really have a diabetes team… we don't have much, you know? That kind of just opened up my eyes about that. But I didn't really use it after. (Team East, Interview)

Another team member from Team East described how the reports highlighted issues within the health centre but felt they were discouraging to look at:

> For the readiness [report], well, I mean, it's [laughs] kind of … the results were not that great, I guess. We knew we had some issues that we have to face. I think it's just … but now it's down on paper, so now we have to work on it…. But I don't want to look really at those results because it's too big… Well, I mean, at the end you see what the problems are. But the

thing is we … the scores were so low in almost everywhere [laughs] that, you know, at some point it's, kind of, discouraging. You're looking at them and you're like, oh, my God, where do we start, you know…. we knew that it was going to be like this but it's just, like, facing the problem is like, okay, now we have to sit down and, you know, try to improve things. (Team East, Interview)

As part of the FA-Clinical QI Program, teams were encouraged to review diabetes process and outcome information stored within FNDSS or another clinical charting system (e.g., number of clients with recent foot examination, number of clients achieving target blood glucose levels) to identify gaps in care, areas to target for improvement, and to evaluate the success of their QI strategies. However, the findings were mixed on whether the teams used these systems to inform their diabetes QI activities. For Team West, team members found the registry within FNDSS useful for identifying a shared list of clients with diabetes between the primary care clinic and the diabetes education program. However, with issues surrounding multiple charting systems being used in the health centre, some team members from Team West were hesitant to use the surveillance system. One team member described how they may have used surveillance system more to inform their QI activities had the team been able to get more of the clients with diabetes to consent to have their clinical information stored in FNDSS:

We couldn't capture everybody. If we captured more people than we would [have] been more inclined to use it, because I feel like it's not really representative of our community, the information that's in there, because it's only capturing a few people. So I'm not super eager to use it. (Team West, Interview)

When asked about using their EMR, team members from Team West discussed making better use of their EMR to document clients' diabetes clinical information and improve client follow-up. However, team members did not specifically discuss using clinical information within the system to identify areas of care to target for QI or to evaluate the

success of their QI strategies. Team members from Team East did not use FNDSS to inform their diabetes QI activities because they had an existing registry and surveillance system in the community. Their existing system provided the team with a list of clients with diabetes that they used for some QI strategies, such as identifying clients due for tele-ophthalmology screening. Team members also described using their existing system to show patients graphs of their recent blood work during clinical visits, but did not use the system to inform their diabetes QI activities.

4.3.3. *Integrating Research Evidence on Effective Approaches for Diabetes Care*

The workshop plenary sessions were designed to provide clinical QI teams with knowledge of clinical practice guidelines and evidence from research on effective diabetes care practices and strategies for improving the quality of care and health outcomes. During team discussion at workshop breakout sessions, many of the team members expressed the importance of frequent follow-up with clients on CPG recommendations, including quarterly measurement of clients' blood glucose, annual foot examinations, and supporting client's diabetes self-management practices and mental health and well-being. Team West and Team East developed many QI strategies that focused on improving the implementation and follow-up of CPG recommendations. Both teams developed QI strategies based on practices and strategies for diabetes care presented during the workshop plenary sessions (Appendix D), including team-based diabetes care approaches (e.g., group or multidisciplinary medical visits), motivational interview techniques to support clients' diabetes self-management, and integrating discussion on spirituality during mental wellness visits.

While team members did not mention during end-of-program interviews how they used the knowledge provided at the workshops to inform their diabetes QI activities, team members did discuss how the information provided at the workshop informed their overall knowledge of diabetes care. The usefulness of the plenary sessions for improving knowledge of diabetes care varied across the three workshops. Some team members found the workshops very useful: "the training for me was really interesting to make sure that my knowledge was up-to-date. It made me more confident in my ability to help diabetic people" (Team East, Interview). However, some team members did not feel like they learned anything new at the second and third workshops: "The follow-up workshops were just not- I don't think I learned anything new there" (Team West, Interview).

Many of the team members from both teams discussed the value of the Diabetes Boot Camp program in providing knowledge on current medications for diabetes and decision-support strategies for adjusting medication based on client's clinical outcomes.

> Like webcast [diabetes boot camp] about like insulin and medication adjustments and all that. I found that really useful… So I think that was great. We can all help the patients on the same level of knowledge and we can understand each other better. So that was really useful. (Team East, Interview)

One team member from Team East discussed integrating the knowledge provided during Diabetes Boot Camp on new medications and using the PDSA method to test using the medications with clients:

> The new medication, they were not much used at that point in our community. And, since we had that meeting [diabetes boot camp], the doctors started to use them a little more, you know. But, same thing, they're trying slow and they're trying just on a few patients. And they're waiting to see, like, is there going to be too many side effect…we're going to start little clinic just for those patients, you know, to have a regular follow-up just to make sure, you know, they're taking the meds and they don't have any complications and, you know, they don't get bladder infections. (Team East, Interview)

4.3.4. Aligning Care to Clients' Preferences and Culture

When developing strategies to improve diabetes care, the clinical QI teams drew upon knowledge of clients' previous experiences with care and accessing services to better align care to clients' preferences and needs. Building from concerns over low attendance to diabetes medical appointments or participation in diabetes program and initiatives, both teams focused many of their QI strategies on reorganizing how diabetes care and services were provided to better meet clients' preferences for accessing diabetes care and improve the number of people that were accessing diabetes clinical services and programs.

To reduce the need for clients to come into health centre multiple times to see different healthcare professionals, Team West and Team East implemented QI strategies where clients could see multiple healthcare professionals during one visit, including group or joint medical visits and diabetes clinic days. Implementing joint appointments with multiple healthcare professionals to improve clients' access to care was described by one team member from Team East:

> We tried to have more collaboration... trying to make joint appointments to avoid the patient to come twice in a week to see the nurse and then the nutritionist in the same week. (Team East, Interview)

When developing their diabetes clinic days, team members of Team East discussed how many of their clients had expressed wanting to see the same nurse when they came into the health centre so that there was consistency and continuity in the care they received. In the past the team experienced challenges providing continuity in care because of high staff turnover, many staff holidays, and the family physicians were not always there. One team member described this challenge:

> We've been struggling for so many years with, to have only one person, one health provider to provide the care all the time with the same people. You know, you would come to the clinic and you would ask for the nurse. And that's the nurse [you] would always see. (Clinical QI Team B, Interview)

Another important part of Team East's diabetes clinic days was adapting the frequency of the follow-up appointments based on clients' preferences and schedules. During workshop breakout sessions, the team discussed how frequent follow-up is not always easily done in practice because "clients have preferences for how often they would like to come, which often do not align to when the clinical team wants them to come" (Team East, observation field notes). In relation, the team members also described how during the diabetes clinic days the nurses would use motivational interviewing techniques with each client where clients set their own objectives for improving their health and diabetes self-management. One team member from Team East expanded on the importance of having clients set their own goals and discussed how they wanted to move away "from a colonial system that comes in and manages everything for them" (Team East, observation field notes).

Both teams also worked on making changes to their existing diabetes program and services to better meet their clients' needs. Team West focused on reorganizing their existing diabetes screening program within the health centre by implementing joint, ad hoc appointments with the diabetes educator and family physician. The diabetes educator previously only offered diabetes screening appointments to clients one week out of the month which caused challenges for some people to access services and resulted in low attendance.

> We are trying to get more people in, and meet their needs, so we're doing an ad hoc type of scheduling, whereas before, we just set out a diabetes

week, and try to get everybody in the diabetes week. (Clinical QI Team A, Interview)

To improve clients' attendance at retinal screening appointments, Team East reorganized when their tele-ophthalmology screening program was provided by offering appointments on evenings and weekends and providing notes to clients' to take time off work.

Both teams frequently relied on feedback from their clients when evaluating the success of their QI strategies – the "study" stage of the PDSA cycle. For instance, Team East asked for people's feedback on whether they liked coming into the health centre to see the same nurse for diabetes clinic days. This feedback was then used to adapt their QI strategies to meet people's preferences and improve access to diabetes care. The value of client feedback to determine the success of their QI activities is exemplified in the following two quotes from team members when asked to describe the impact of their QI activities for people with diabetes in the community:

> Like the group medical visit, we had really, really good feedback from those participants. (Team West, Interview)

> We tried that way of working with only a small number of patients because it requires a high – big involvement from the patient to agree to come for many weeks in a row. And for the nurse also to commit to see those 10 patients regularly on top of their caseload also…. Yeah, but that helps. The patients that were followed closely they really appreciated that we did that together… I think it made a good difference that they were really taken care of. (Team East, Interview)

In addition to making changes to diabetes care services to align with clients' preferences and needs, team members discussed the importance of implementing QI strategies that aligned with the culture of the community. Both teams developed QI strategies that integrated the cultural traditions and practices of the community in order to provide more culturally appropriate diabetes care services. For instance, Team West

incorporated community traditions and a narrative approach in their group medical visit,

as described by one team member:

> I think in terms of the community and the narrative type of thing, this is just a fabulous way of providing diabetes care… it is so culturally relevant and I was very excited about trying this... it would be sitting in a circle and there can be a centrepiece. You could have somebody maybe opening with sweet grass or a prayer, that type of thing, and then even if there's a symbol of something in the, in the centre that's … the concept of centering is that we're in a circle and the facilitators are not lecturing, they're not standing at the front of the room looking at them. Everyone is equal in the circle…I'm excited about those elements, you see it's so culturally relevant, and especially when, you know, when you are on a group visit and it's like, well, the doctor's health visit should be confidential, but it's a community disease and that makes it look more like that we're all in this together. You may have different manifestations from me but we're all in this lifestyle community change together. (Team West, Interview)

Team East adapted their healthy eating workshops to include traditional community food

recipes, such as healthy recipes for bannock. They also implemented a community health

representative-led blood pressure program in order to provide care in the community's

local Cree language.

> That was a little PDSA that we put in place to make sure that the community health representative did the blood pressure on the patients, and then took them to the nurse and stayed there with the nurse to be able to translate into Cree if necessary what the nurse was saying. Because here, a lot of the nurses speak Franglish [colloquial term for a mix of French and English]. (Team East, Interview)

4.4. Strengthening Relationships and Building Partnerships with the Community

This theme reflects clinical QI teams' efforts to connect to the community by

building relationships and partnerships with community members and leaders. This theme

is comprised of three sub-themes: 1) strengthening relationships with community

members; 2) building partnerships with the community QI team; and 3) building

partnerships with community groups and leadership.

4.4.1. Strengthening Relationships with Community Members

An important part of clinical QI teams' diabetes QI activities was strengthening and building relationships and trust with community members and their clients. Team members felt that strategies that helped to build relationships and trust with their clients would, in turn, improve the likelihood that clients attended diabetes medical appointments or participated in diabetes programs.

Both teams developed QI strategies they felt could help foster relationships with their clients. Team West discussed during workshop breakout sessions how the group medical visits and the joint appointments with the diabetes educator and the family physician were implemented to help build relationships with the client and improve the likelihood clients would attend follow-up appointments with the diabetes educator. This was particularly important because the diabetes educator was new to working in the community. Similarly, team members from Team East felt that by implementing diabetes clinic days, where the client would see the same nurse at each visit, would not only improve consistency and continuity of care, but also help to build relationships and trust with their clients and increase the number of people with diabetes coming into the health centre to see them. However, both teams discussed how it was challenging to evaluate the early success of their QI strategies for improving access to diabetes care and that it may take longer to fully understand the success of their QI strategies because they recognized that building relationships with their clients takes time.

Another important part of building relationships with community members was increasing the health centre staff's presence and visibility in the community, outside of the health centre. Both clinical QI teams discussed the importance of developing

strategies that improved the health centre staff's presence and outreach in the community

and felt that by doing so they could work on building relationships and trust with

community members. One team member from Team West described how increasing their

presence and outreach in the community, through QI strategies such as offering healthy

snacks or information booths at the band office, helped to foster relationships with

community members and increase the number of people coming to the health centre to

receive information about diabetes.

> Team Member: We're definitely seeing more people coming in to get information, who are readier to change. Like, you get people who come in and they say they want to change but they don't really yet. It just seems like people are more open to it now.
>
> Interviewer: And why would you say that is?
>
> Team Member: Well, we've just, we've increased our presence in the community, so I'm hoping it's because they now know us and we're not just complete strangers. (Team West, Interview)

Similarly, in Team East, the team members discussed increasing their presence and

visibility in the community and developed community outreach strategies, such as

providing information about diabetes and healthy eating at community workout sessions

and cooking workshops in the community.

> The community activities that we're doing. They're really – people are asking for that. Like the cooking workshops I'm doing people are really – when I skipped a few months they come to me and they ask for that. (Team East, Interview)

However, one team member from Clinical QI Team B expressed: "I'm not sure if it had a

big impact because we did not do as much outreach as we wanted to." (Team East,

Interview).

4.4.2. Building Partnerships with the Community QI Team

Both clinical QI teams discussed the importance of working with the community QI team on developing and implementing their diabetes QI strategies and worked on building a partnership with the community QI team throughout the FA-Clinical QI Program. The meanings for building a partnership with the community QI team and how the clinical QI teams worked with the community QI team differed across the two clinical QI teams.

While they did not plan active efforts early in the program to work with the community QI Team, during the second and third workshop Team West discussed finding ways to work with the community QI team on their diabetes QI strategies moving forward because they found overlap in some of the diabetes education QI strategies they were working on. However, team members' perspectives differed on the extent of partnerships between the clinical and community QI teams over the course of the FA-Clinical QI Program. One team member from Team West described how it was easy for the two teams to connect and work together because team members from both teams were located in the same building: "the majority of the people on both the clinical and community teams, are all housed under our health centre building, so I think that made a big difference in, you know, being able to connect with people regularly." (Team West, Interview). Another team member from Team West, who was also a member of the community QI team, described the benefit of having overlap of team members on the both teams: "Even just a bit of an overlap of the two I feel is very helpful because you can talk separately about community and clinical but at the end of the day they kind of have to work together." (Team West, Interview). On the other hand, while one team

member agreed that the two teams should collaborate, from their point view they did not

feel like they worked with the community QI team on QI activities.

> They weren't really working side by side from my angle, maybe that's because there were some people that were on both teams, so they were able to have that connection to some of the community. I never met the community team at all so perhaps a thing that could be encouraging is to get the clinical and community teams together just to say, what is our common goal and what are you guys doing versus what we're doing… more just the fact that there should be some interaction between the two teams. (Team West, Interview)

Building on the information that the community QI team had shared with the team,

Team East discussed during breakout sessions at the first workshop the importance of

working closely with the community QI team and receiving input from them when

developing their diabetes QI strategies. The team felt it was important to continue work

closely with the community QI team so that the community QI team could continuously

share their suggestions on how the clinical QI team could improve the way diabetes care

is provided. Additionally, by working closely with the community QI team, team

members felt they could improve non-Indigenous healthcare professionals' knowledge of

the community's culture and values, as well as strengthen the relationship between the

community and clinical staff. The team discussed working with the community QI team

on their diabetes QI activities by having a community feast and inviting them to weekly

staff meetings in the health centre. During the first workshop the team members

expressed excitement of working with the community QI team as they moved forward in

developing and implementing their QI strategies in the community. One team member

described this excitement during their interview:

> We were really excited to have the community team and the clinical team to get to meet each other and to – especially to get the comments from the community and to hear from them what they think about our delivery of services. We were really excited when we wanted to change the way we

> deliver the care to diabetic patients based on their needs… That was something I was really excited about. Tell us the way you want us to do it. (Team East, Interview)

However, team members expressed difficulty connecting and meeting with the community QI team. "We had really good intentions to meet with the community team and the clinical team regularly but it never happened" (Team East, Interview). There were often scheduling conflicts and time constraints. The two teams discussed various strategies to try to connect but still were unable to meet, as described by one team member:

> At first the community team said that they wanted to do a feast and to invite all the clinic workers to talk about their cultural – how do they see diabetes care more from their culture, their tradition. How do they want their diabetes care to be delivered to them. This didn't happen. So they said we might just do something smaller like bannock and tea. Then this didn't happen. (Team East, Interview)

Team members described feeling discouraged that the meetings did not happen because they felt it was important that the community QI team help them adapt the way diabetes care is provided to the community's culture: "we're different culture, you know, so we can't just guess." (Team East, Interview). Despite challenges in meeting, the team expressed that they would continue to try to meet and work with the community QI team and recognized that building a partnership and relationship with the community QI team could take more time. One team member described the value in hearing the community QI team's perspectives at the first workshop and continuing to think about the information they shared:

> But at least we heard from them. We know that – what they want and what they don't want. The follow-up was hard but I still keep that in mind when I'm doing my activities or doing my teaching one-on-one. So that was very useful. (Team East, Interview)

4.4.3. *Building Partnerships with Community Groups and Leadership*

Building partnerships with community groups and leadership was important in supporting the team' QI activities. Both teams expressed feeling well supported by the community on their diabetes QI activities. One team member from Team West described feeling supported by the community on various initiatives:

> I think the community was fairly proactive and really wanted to move ahead in various different initiatives, whether it was diabetes or fetal alcohol prevention, a number of issues. (Team West, Interview)

One team member from Team West described how working on partnerships with community groups helped to facilitate more community engagement: "we've done a lot to improve our community partnerships, we have more community members contact our team to help with any kind of health promotion or diabetes prevention areas." (Team West, Interview).

Similarly, team members from Team East expressed feeling supported by the community's band office and health committee. They felt that the band manager was able to advocate for resources to help with the teams' diabetes QI activities. One team member described their conversation with a member of Chief and Council after giving a presentation at the local regional health conference on resources needed to address challenges community members encountered when trying to make changes to improve their health:

> He shook my hand and he said, you know what, we have to sit together at least a few times a year to see what's being done at the Band, the money that we have. And, you know, if you need money for some projects, submit it, it's fine to do it. He seem[ed] to be very motivated. (Team East, Interview)

4.5. Organizational Structure, Support and Capacity for Diabetes Primary Care and Quality Improvement

Integral to the clinical QI teams' ability to implement changes in practice to improve diabetes care was having the organizational structure, support and capacity for diabetes care. This is further explored in the following three sub-themes: 1) making changes within the existing structure and capacity of the community's primary care setting; 2) time to dedicate to quality improvement; and 3) leadership and team support.

4.5.1. Making Changes within the Existing Structure and Capacity of the Community's Primary Care Setting

Clinical QI team members described how they focused their QI activities on areas of diabetes care where the team felt they had the ability and control to make changes. One team member from Team West described how the team implemented changes where they felt they could within the existing structures of their health centre: "Sometimes there's some pushback or some resistance, but I think we're able to do what we can within the current kind of structure of clinical and community programs." (Team West, Interview). Team members described focusing their diabetes QI activities on making changes in areas where they felt they could make a difference, leaving aside things that were out of their control. This is exemplified in the following quote:

> The project was all about making it small. So, you know, we took the things that we knew we could make a difference on right away. And we just left aside the things that were too big and too expensive or, you know, impossible to clear right now, you know. (Team East, Interview).

During workshop breakout sessions, team members often expressed feeling unable to make changes in some areas they felt were important for improving the quality of diabetes care because of issues with staffing and system integration. Both teams

discussed how it was difficult to improve care without having people who were dedicated to diabetes care in the community, such as diabetes educators. For Team West, this involved discussion at the first workshop around the recent loss of the diabetes educator and felt that client care had declined in their absence. For Team East, team members discussed challenges in providing diabetes management because some nurses had limited knowledge of diabetes care or confidence in providing diabetes management. Additionally, dedicated diabetes support in the community was limited to a regional diabetes educator who visited the community once a year. Team members from both teams felt that issues around staffing were out of their control and were dependent on healthcare management and leadership to make changes.

Team members from Team West also described challenges with implementing changes to improve the sharing of client lists and clinical information between the diabetes education program and the primary care clinic. These challenges were because of existing policies and privacy concerns with giving the diabetes education program staff access to the primary care clinic's EMR. One team member described how this affected their ability to implement some changes to improve diabetes care: "Some things are harder to do on the clinical side with our EMR, and our charting system, when some of that is kind of out of our hands." (Team West, Interview).

While the clinical QI teams felt unable to make changes in some areas they felt were important, they were able to develop small changes in practice to help improve the quality diabetes care. For instance, while waiting for privacy issues with the EMR to be worked out, team members from Team West developed other QI strategies to improve the sharing of clinical information between the diabetes education program and the primary

clinic, such as the diabetes educator printing off and sharing summary visit notes with the family physicians. The team also discussed ways to compensate for the recent loss of the diabetes educator on the team, including drawing on other resources to improve follow-up on clinical practice guideline (CPGs) recommendations. This included QI strategies to make better use of the new EMR and teaching other healthcare professionals how to do foot examinations. One team member described how having a new EMR helped to implement strategies to improve care at the same time as losing the diabetes educator working the community:

> It started at the same time as losing CDE [certified diabetes educator] and waiting for a new CDE to come on board. So there was a lot of transition and a lot other things that were happening at the same time that both helped and hindered the process. What really helped is that we [had] the fresh EMR and we could put things into place right away. (Test West, Interview)

Similarly, Team East tried to find ways to restructure care and work with available staffing to improve the capacity of the team to provide diabetes care, including providing training on diabetes care for community health representatives, developing diabetes clinic days, and creating diabetes templates for staff to use with clients. However, one team member described during their end-of-program interview how the team continues to face challenges with implementing changes to improve diabetes care because of some staff's limited knowledge of diabetes care and staff turnover.

> Well the high turnover of nurses made it really hard. It made it hard for us to do a good follow-up because the reality up north the nurses go on holidays and then the agencies that come to replace those nurses don't necessarily have the knowledge or the confidence in taking care of diabetes patients… So that was hard to have a really good follow-up with the patients. The nurses are here for eight weeks or so and then they leave for a month and they come back for eight weeks, they leave. So that was hard. And then I have my own holidays on top of that, so. (Team East, Interview)

4.5.2. *Time to Dedicate to Quality Improvement*

The ability to dedicate time to diabetes QI activities varied within the clinical QI teams. Some team members found it easier to take time to participate in the FA-Clinical QI Program when QI activities were an extension of their current role within the health centre. One team member described how their current role in diabetes programming facilitated their participation in the program:

> Probably what made it easy, and facilitated my participation, is that, in the area of diabetes, that's the program that I coordinate here at the health centre. So, you know, I could make time for it, and it – some of the things weren't too far from my regular work as the coordinator of the diabetes program, since we do some community events, and clinical work as well. (Team West, Interview)

Whereas other team members found it difficult to test new diabetes QI strategies in practice: "I mean there're challenges to everything I guess. Time constraints maybe for the PDSAs we don't always have time to put them into place." (Team West, Interview). Some team members expressed concerns over their ability to implement QI strategies on top of their current workload and existing professional responsibilities.

> Well I think I didn't have enough time to do everything we would like. Like we wanted to give out some tools for – to support the nurses when they were doing their follow up with clients. At first I said I would develop some teaching tools, visual tools. I didn't have enough time to do that mainly because I have so many other things to do. (Team East, Interview)

Team members from Team East also described challenges with implementing practice changes because of an increase in emergencies in the health centre and limited staffing support, as described in the following quote:

> We would try something new, like, every week and would keep track of the progress that we've made. But we've really been struggling because in [community name] the timing couldn't work, I think. I don't know what happened all of a sudden but this year requests for health services has exploded, completely exploded. It's crazy… It was a bit of everything. But

> I think it was really an explosion, and the amount of emergencies that were showing up to the clinic and the severity of care that it would require…. And the staff has not much increased yet. But it's going to increase, like, in the few weeks. We're currently hiring a lot of people. But we have a lack of lodging, a lack of office space, a lack of staff. And then so we're always, like, you know, pushing forward, you know, pushing things forward. So we just catch up and deal with emergencies. So that's why it's been so hard. (Team East, Interview)

4.5.3. Leadership and Team Support

Support from healthcare leadership, QI team members, and other healthcare professionals working in the health centre was important to enabling teams' diabetes QI activities. When asked what supported the development and implementation of changes in practice to improve diabetes care, one team member from Team West described the importance of having management and a team that were open to change:

> I mean, our team was really, really actively involved, and really open to change... So, really, I think it's the team, and also the support, and the management structure that is open to doing these things, and trying new things. (Team West, Interview)

Team members from both clinical QI teams described how their health directors were supportive of QI. One team member from Team West described the support provided by their community's health director: "Our director, you know, who has kind of given us permission to participate.... And was really supportive, and really visualises, like [they] want our community to have the best diabetes program in Canada." (Team West, Interview). Team members described how support from their health director was critical to their ability to participate in FA-Clinical QI program workshops and to take time out of their schedule to dedicate to QI.

> My boss was very understanding when it came time to attend meetings and do teleconferences. That I take an hour away to participate in these things so that I can bring that back to my community and see how it fits into our picture. (Team East, Interview)

In addition to supporting QI, team members described the importance of having the health director's support in making changes in the health centre and diabetes programs to improve diabetes care. "We have a lot of autonomy in our programs, and a lot of freedom to do what we feel is best" (Team West, Interview).

Having supportive, dedicated, and motivated members on the clinical QI team was also essential to enabling the teams' diabetes QI activities, particularly in maintaining momentum on their QI strategies and continuing to meet and work together as a team. One team member described the importance of having motivated and dedicated team members:

> Sometimes it was hard to keep momentum going. So to keep having the meetings, and to keep thinking, okay, what else can we do, and that didn't work, and, you know, if a few things don't work, it's easy to feel discouraged, and then you feel like, okay, let's just move onto something else, because these aren't working… Yeah, and knowing that efforts were made, and things. I think it really does take a team of, you know, motivated and dedicated people. And everyone's so busy with all different kinds of schedules, that by the end, we were just kind of having meetings with whoever could come, so there might have been just two or three people present. (Team West, Interview)

Team members from Team East described challenges with maintaining momentum and continuing to meet as a team when some team members were on holidays or leave, but, as described in the following quote, the team found ways to ensure the team continued to meet:

> The challenging part was you know, we'd get something going and then one or two or three of the members would either go on holidays or go on sick leave, and then that part of the system would slow down or shut down… which is always the case in the north, here. But kind of [name of clinical team member] and I being the constants, were the ones that you know, tried to keep the meetings going where, you know, [other team members] phoned in from wherever they were and we just did some little PDSAs for each week and see how we met those. (Team East, Interview)

Team members also expressed needing dedication and buy-in from other healthcare professionals working in the health centre for their QI activities. At the first workshop, Team East discussed how it was important for all staff in the health centre to be involved in their QI activities and decided to integrate discussion on QI during the health centre's weekly staff meeting so that all staff could be involved in decision-making and planning for QI. During the second and third workshop, team members shared how other healthcare professionals had started to become more interested in learning about diabetes and dedicated to diabetes care and QI. Team members shared how other healthcare professionals appreciated working as a team on QI, but expressed concerns in sustaining their efforts if there was staff turnover:

> I think the nurses also appreciated to work more as a team so I wish this continues. But again those nurses aren't going to be here forever just because north is north. And I don't know about the new ones. Like we're going to have to start over again or no. But as long as those nurses are here I think that teamwork was well established and we all want to continue working that way. (Team East, Interview)

4.6. Facilitating Diabetes Quality Improvement

This theme explores the facilitation process of team-based diabetes QI within primary care settings in First Nations communities in Canada, with a particular focus on the role of program facilitators in facilitating teams' QI process and how clinical QI teams adopted the Model for Improvement method for facilitating QI. This theme is grouped into the following three sub-themes: 1) engaging team discussion and reflection; 2) providing reassurance and support; and 3) facilitating learning and a culture for quality improvement.

4.6.1. Engaging Team Discussion and Reflection

Program facilitators played key roles in engaging team discussion and reflection. This sub-theme is comprised of the following categories: 1) keeping the team focused; 2) encouraging team reflection; and 3) involving team members in discussion.

Keeping the Team Focused

Both the community and Western research team facilitators played key roles in helping to keep the team focused during workshop breakout sessions as they moved through the QI process. The community facilitators helped to guide teams through the QI process, starting from identifying priority areas for improvement, and then moving on in later breakout sessions to develop and plan specific QI strategies. The community facilitators kept the teams focused when team members started prematurely planning details around their specific diabetes QI strategies and veered the team back to discussing priority areas for improvement.

It was observed that the community facilitators sometimes had challenges in engaging the team in discussion and moving things forward. During the first workshop it was observed that community facilitators were not as confident in engaging team discussion, particularly when the teams started developing QI strategies and using PDSA cycles. Western research team facilitators supported the community facilitators when they had challenges in engaging team discussion by providing encouragement and reminding them to keep the team focused or to go around the table to ask for individual team member input.

Encouraging Team Reflection

In addition to helping keep the team focused, both community facilitators and Western research team facilitators encouraged team reflection during team discussion. This was particularly important when identifying priority areas for improvement at the first workshop. Facilitators suggested team members step back from the information provided in the clinical readiness report and reflect on other things within the system or their roles and experiences to identify areas to target their QI activities.

Involving team members in discussion

Involving each team member and getting individual input was an important role of the community facilitator when leading team discussions during breakout sessions and team meetings back in the community. In the words of one of the community facilitators: "as the facilitator, [I] facilitated the meetings, making sure everyone's ideas and thoughts are heard… and getting consensus, and going with what people are agreeing on, and things like that." Community facilitators would ask individual team members to provide their thoughts about the information provided on the readiness report, to individually identify areas for improvement, or provide suggestions when planning QI strategies. However, community facilitators were sometimes inconsistent in asking for individual team member input and had particular challenges in making sure they were engaging all team members in discussion.

4.6.2. Providing Reassurance and Support

The Western research team facilitators acted as a source of reassurance and support to the team throughout their participation. One community facilitator described how it was helpful to have the support of the research team to discuss the teams' QI activities

and things they tried over the course FA-Clinical QI program: "I think the support, like

the weekly huddles and things from the research team, they [were] really helpful, and

encouraging and reassuring" (Team West, Interview). The Western research team

facilitators reassured the clinical QI teams that they were on the right track as they

progressed in developing and implementing their QI strategies, as well as reassured them

that some of the barriers to QI they were encountering were part of the normal QI process

and that other teams also struggled with these barriers (e.g., time constraints). They also

provided support and suggestions for QI including providing examples of what other

communities have done and strategies to overcome barriers they were encountering.

> Every time I came across a barrier the [research] team was there to step up
> and help us… I've never felt that supported… when you say you'll
> support us and help us and that you've seen everything and anything…
> they truly, truly did. And I felt extremely comfortable reaching out. (Team
> West, Interview)

4.6.3. *Facilitating Learning and a Culture for Quality Improvement*

Clinical QI team members felt that the Western research team facilitators provided

expertise in applying QI methods and provided support throughout their participation in

the FA-Clinical QI Program. The Western research team facilitators were instrumental in

helping clinical QI teams understand and apply the Model for Improvement and PDSA

cycles. During breakout sessions at the first workshop when teams were starting to

develop QI strategies, team members at times appeared uncertain on how to apply some

of the QI concepts from the Model for Improvement, such as developing QI goals, or how

to test QI strategies using the steps outlined in the PDSA cycle method. Community

facilitators appeared less confident in helping guide the team through the PDSA cycle

method. Western research team facilitators helped the team set QI goals that were

specific, feasible and measurable but in particular, they helped them through each step of

testing QI strategies using PDSA cycles, encouraging the team to develop small, quick

tests of change and ensuring they were feasible and tested on a small number of clients.

As described by one team member:

> Well, it was nice to have people like you [research team] who were there,
> kind of guiding the discussion. And especially when these PDSAs are- and
> you're trying to wrap your head around them and not making them too big
> and small and you have chunks to be able to cycle them through. So that
> was really useful, to have somebody being there to do that and guide us
> and redirect us. (Team West, Interview)

By the second and third workshop, community facilitators were able to effectively

facilitate team discussion and help the team break down their ideas into small tests of

change using PDSA cycles. While the Western research team facilitators were less

involved in guiding team discussion at subsequent workshops, they still provided key

support for teams throughout their participation and QI process. One community

facilitator and team member highlighted how at the third workshop the Western research

team facilitator's support was essential to applying QI methods and changing their way of

thinking:

> I really liked the support when we did the one meeting [workshop 3] with
> [Western research team facilitator]. And we were really, like, targeting
> problems and [Western research team facilitator] was helping us to break
> it down, because it's really tough, eh, to change that mindset. To take a
> problem and to break it down to something that's feasible and to
> something that's really small, we tend to think too big. So I found this was
> tough. And [Western research team facilitator] was able to [break] down
> the things. (Team East, Interview)

During end-of-program interviews, many clinical QI team members described how

the Model for Improvement and the PDSA cycles had become "second nature" and

"basically ingrained in them now, just to think of everything that way". One team

member further described how these QI methods changed their way of thinking:

It changed our mindset, completely. But, at the end of the day, the PDSA tool that you gave us, the way we changed our minds when facing a problem, I mean, it's priceless … I mean, it's really amazing. What we have tried is we took the problems that we had and we broke it, like, as much as we could in small little pieces and we were able to do some changes. And that was … really, just to tackle the problem in the way that you showed us to do so. I mean, this is great. I mean, we're using it every day… with anything that happens. (Team East, Interview)

Another team member from Team West, described how it gave them the confidence and competency to make changes in practice:

Its given us confidence, and competence in making changes to what's, you know, to the current status quo, I guess, and try new things, and innovating, and kind of experimenting with what works, because I think it's easy to just stay with what has been done… that just comes with experience, with trying a few things, and learning, like if doesn't work this time, we'll try something else, and not being scared to try something new, and just having, you know, having done it throughout the program. (Team West, Interview)

Team members from Team West described how they are now always thinking of how ways to improve and using PDSA cycles to test out strategies to improve care:

I think the PDSAs for - our team kind of started to kind of joke about them, so everything we do now, we say, oh, that's a PDSA, so any kind of little thing that might be a change, or that might kind of result in a different outcome. Oh, we should do a PDSA for this… we're definitely always thinking of how we can improve, whether it's our attendance to programs, or the way that we're delivering things, or the way that we're communicating, things like that. (Team West, Interview)

Team members from Team East described sharing the QI method with other healthcare professionals in the health centre and how the method had become embedded within their procedures for practice improvements. As one team member described:

We've incorporated some of that PDSA cycle [method] into our whole clinic as well, When the clinic gets together on Fridays, someone says you know, why don't we try this and between the community facilitator and I, we have a look at it and say okay, that's a little bit too big, let's try this first. And we write it down and we do that for a week, and everybody understands exactly what we like to do for a week. And then you know,

based on how well it worked, we would add the next part to it. (Team East, Interview).

4.7. Summary

This chapter presented the within-case descriptions for two clinical QI teams that participated in the FA-Clinical QI Program and the four themes that emerged from the cross-case analysis of multiple data sources: 1) drawing upon multiple sources of information and knowledge to inform diabetes QI activities; 2) strengthening relationships and building partnerships with the community; 3) organizational structure, support, and capacity for diabetes primary care and quality improvement; and 4) facilitating diabetes quality improvement. It is important to note that while these themes were presented and discussed separately, there are connections between the themes and sub-themes, which are explored in the following discussion chapter. Summary tables of the findings are provided in Appendix H for reference.

In summary, the clinical QI teams were able to successfully develop, implement and test various strategies in practice to improve diabetes care in First Nations communities. Clinical QI teams drew upon various sources of knowledge and information throughout their process of developing and implementing changes in practice. Building relationships with community members and partnerships with community groups and leadership was a valued and important part of the teams' QI process. Additionally, essential to implementing changes in practice and maintaining momentum was having supportive management and a team that was motivated and dedicated to QI. However, the organizational structure and existing capacity and resources affected the teams' ability to implement changes. The community and Western research team facilitators were integral to facilitating team discussion and team learning.

Chapter 5: Discussion and Conclusion

This study utilized community-based participatory research (CBPR) and case study methodologies to explore the experiences of two clinical QI teams as they engaged in developing and implementing changes in practice to improve diabetes care in First Nations communities in Canada. To explore these experiences, this study focused on three sub-research questions: 1) how are various types of knowledge used by clinical QI teams to inform their diabetes QI activities?; 2) how are diabetes QI activities shaped by the context of primary care services within First Nations communities in Canada?; and 3) what factors support or hinder clinical QI teams' diabetes QI activities? In this chapter, key findings are summarized and discussed as they relate to the literature and to the study's three sub-research questions. This is followed by recommendations for future quality improvement collaborative (QIC) programs in Indigenous health care settings, a discussion on the strengths and weaknesses of the Promoting Action on Research Implementation in Health Services (PARIHS) Framework for understanding implementation of practice changes within an Indigenous context, strengths and limitations of the study, recommendations for future research, and conclusion.

5.1. Successful Implementation of Changes in Practice

A first of its kind in Canada, the FA-Clinical QI Program demonstrated the potential to improve access to quality and culturally appropriate care and improve the health and well-being of First Nations peoples living with diabetes. The Model for Improvement and Plan-Do-Study-Act (PDSA) cycle process provided clinical QI teams with a method for problem-solving local challenges to the provision of diabetes care in First Nations communities. Team members described how it provided them with a

method for identifying problems within their health care system, allowed them to set their own QI goals, and enhanced their skills to collect and evaluate information from within their practice. Importantly, the program facilitated a context where the organization has the skill set, confidence, and mindset to test, implement, and evaluate changes in practice to improve the quality of care provided to people living with diabetes in First Nations communities in Canada. A shared and collective commitment to change and the capability to do so are considered key elements to the successful implementation of complex changes in health care settings (Weiner, 2009).

5.2. The Use of Knowledge to Inform Decision-Making for Diabetes QI Activities in First Nations Communities

The findings of this study showed how clinical QI teams used both tacit and explicit knowledge to inform decisions on the development and implementation of changes in practice to improve diabetes care. Our findings support that research evidence is taken up and adopted in practice when it considered consistent and congruent with clinical experience and clients' values and preferences (Rycroft-Malone et al., 2004). Clinical QI teams worked to improve the implementation and follow-up on diabetes care processes recommended in clinical practice guidelines (CPGs) and integrated workshop plenary topics on optimal diabetes care approaches into their QI strategies. Many of these QI strategies integrated knowledge of optimal care approaches from research evidence with other forms of evidence, such as team members' experiences and clients' preferences for diabetes care. When developing QI strategies, teams drew upon tacit knowledge of clients' previous experiences with care and accessing diabetes services to develop strategies that better met their clients' needs and preferences for how diabetes

care is provided. Some team members even alluded to how CPGs recommendations are not always appropriate if it does not align with clients' goals and preferences for care. Additionally, teams adapted research evidence on effective care practices by incorporating the cultural traditions and practices of the community. For example, Team West integrated a narrative approach to group medical visits that respected the community's oral traditions for sharing knowledge. These findings support the growing research base that research evidence is rarely taken up in a linear fashion, but rather is blended with other forms of knowledge and negotiated and adapted within the context it is applied (Wieringa & Greenhalgh, 2015).

That said, tacit knowledge appeared to play a greater role in teams' collective decision-making for QI. Our findings showed that tacit knowledge was used by teams to identify gaps in care, identify priority areas to target for improvement, and generate ideas for QI strategies. This took the form of local, context-specific practice knowledge and the perspectives and experiences of team members, community members, and other clinical QI teams participating in the FA-Clinical QI Program. These findings extend the literature on the significant role tacit knowledge plays in clinical decision-making in primary care settings to decision-making around the development and planning of QI activities (Gabbay & le May, 2004; Quinlan, 2009). The greater role of tacit knowledge in decision-making around QI may be contrary to what one expects in a program that aims to enhance the use of explicit, research-derived evidence. Other studies in the field of public health have also found that tacit knowledge can exert a greater influence on program planning than explicit knowledge derived from research (Kothari, Bickford, Edwards, Dobbins, & Meyer, 2011).

With regards to local context-specific practice information, team members described how the Model for Improvement and PDSA cycles provided them with a method to collect and evaluate information from within their practice to identify problems within the system and areas of care to target for QI. Through PDSA cycles, QIC programs traditionally emphasize measuring objective, clinical performance data (explicit codified knowledge) to identify gaps in care and measure the success of QI strategies (Nadeem et al., 2013). However, our findings showed that clinical process and outcome measures stored in the First Nations Diabetes Registry and Surveillance System (FNDSS) or existing charting systems in the community did not appear to play a large role in informing QI activities. Limitations of these systems notwithstanding, teams seemed to rely more on tacit knowledge of others and their perspectives on the quality of diabetes care and health care delivery to identify gaps in care and areas to target for QI. This included team members' perspectives provided in their clinical readiness report. Additionally, rather than measuring improvements in clinical processes and outcome measures to evaluate the success of their QI strategies, teams relied mostly on feedback provided from clients on their satisfaction with the new or adapted approaches to diabetes care and used this information as a measure of the impact of their QI strategies.

These findings are consistent with those of Farr and Cressey (2015) who explored how healthcare professionals understand and assess their own performance and quality of care. Contrary to conventional performance measures, the authors found that healthcare professionals' perceptions of the quality of practice relied upon relational and tacit dimensions of care, including their values, motivations, and behaviours, and interactions with patients. Similarly, other studies evaluating QIC programs showed that some

healthcare professionals wished there was less focus on clinical outcomes and more on patient characteristics and working together as a team (Paquette-Warren et al., 2014).

Within the context of primary care in First Nations communities, this study demonstrated the importance of community members' perspectives for informing teams' diabetes QI activities. Community members, from both within and outside the clinical QI team, provided unique insight into the community's culture and shared ideas on ways the clinical QI teams could improve diabetes care. Our findings showed how non-Indigenous team members valued Indigenous team members' knowledge and drew upon their perspectives to provide insight into barriers accessing care and asked for their opinions on areas needing improvement. This highlights how some non-Indigenous healthcare professionals may be separated from the broader community and have a limited understanding of the community's culture. These findings have potential important implications for both practice and QI programs in First Nations health care settings. This may include finding ways to help bridge connections with the community and build opportunities for community members, Indigenous healthcare providers, and non-Indigenous healthcare professionals to work and collaborate together to improve care.

Notably, other research has shown how drawing up the tacit knowledge of community members and their understanding of the community and how and why things are-the-way-they-are can help healthcare professionals identify essential factors for the successful implementation of health services and programs (Gibson et al., 2015; Roy & Campbell, 2015). Non-Indigenous healthcare professionals' recognition of local Indigenous knowledge and actions taken to improve understanding of the community can reduce the colonial history of health care services and improve access to care (Davy et al.,

2016; Roy & Campbell, 2015). For QI programs in First Nations health care settings, it is important to consider the participation of Indigenous healthcare professionals as members of the QI team. Bhattacharyya, Rasooly, et al. (2011) found that perceptions of the barriers to the provision of diabetes care in First Nations communities in Canada varied between community health representatives and other healthcare care professionals including physicians and nurses. Indigenous healthcare professionals, such as community health representatives, have a deep understanding of the community's culture and problems affecting the health of their communities (National Collaborating Centre for Aboriginal Health, 2011a). They can act as cultural mentors for non-Indigenous staff and assist in the provision of culturally appropriate and safe health services (Gibson et al., 2015), which may potentially lead to improved access to quality and culturally appropriate care.

5.2.1. *Supporting and Facilitating the Sharing of Knowledge in Indigenous Primary Care Settings*

Team discussion and reflection was an essential part of the clinical QI teams' QI process as it facilitated the sharing and interaction of explicit and tacit knowledge. The team breakout sessions at the workshops facilitated a space for sharing and reflection on research-based diabetes care strategies and tacit knowledge of team members, community members, and other teams participating in the FA-Clinical QI Program. Facilitating the sharing and reflection on various forms of knowledge is an essential aspect for the implementation of health services (Rycroft-Malone et al., 2004). Importantly, the workshops and team meetings provided a unique opportunity for teams to discuss, share and reflect upon community members' perspectives to inform changes to the provision of

diabetes care services, which healthcare professionals may not have the time or the space to do so in daily practice.

Consistent with other studies, the findings demonstrated how meeting as team at the workshops, as well as back in the community, facilitated the sharing of various team members' clinical experiences and enabled the teams' QI process (Hilts et al., 2013; Kotecha, Brown, et al., 2015; Quinlan, 2009; Shaw, Howard, Etz, Hudson, & Crabtree, 2012). With team members from diverse roles in providing diabetes care in the community, team discussion provided further insight and a more comprehensive understanding of other people's roles in providing care, care gaps, and strengths and challenges in the delivery of diabetes care in the community. The sharing of diverse team members' perspectives was facilitated through the clinical readiness consultation process during the first workshop where teams' discussed their team's clinical readiness report. The clinical readiness report captured team members' perspectives on the context of diabetes care in the community as they aligned to optimal chronic disease care approaches outlined in the Expanded Chronic Care Model. This has important implications for QI because processes and tools such as this can help formalize a process for capturing, merging, and sharing of both tacit and research-based knowledge of optimal approaches to diabetes care (Kothari, Hovanec, Sibbald, Donelle, & Tucker, 2016). Additionally, this is a key aspect of organizational knowledge creation theory which posits that organizational knowledge is created through the process of making available and amplifying the tacit knowledge of individuals within the organization (Nonaka, von Krogh, & Voelpel, 2006). This organizational knowledge can, in turn, be used to the benefit of the team and the organization. Our findings showed how teams

used the knowledge provided on their clinical readiness reports to identify areas to target

for QI and to generate ideas for QI strategies.

These findings agree with those of Shaw et al. (2012), signifying the benefit of

providing space within daily practice for healthcare professionals to share and reflect on

explicit and tacit knowledge sources to enhance the quality of care and improve the

health of First Nations peoples. Within First Nations health care settings, where

healthcare professionals from diverse cultural backgrounds are working together to solve

problems in primary and diabetes care, it will require strategies that enable an ethical and

safe space for the sharing and integration of tacit and explicit knowledge from both

Western and Indigenous knowledge systems (Roy & Campbell, 2015).

For enabling QI and the sharing of tacit knowledge, Hess, Reed, Turco,

Parboosingh, & Bernstein (2015) propose a daily practice model involving planned

interactions among team members facilitated by individuals trained in team dialogue

techniques. Correspondingly, our findings demonstrated that the community and Western

researcher team facilitators in the FA-Clinical QI Program were instrumental in

facilitating team discussion for QI and reflection on experiential knowledge. However,

the level of team member involvement in team discussion varied with some team

members tending to dominate conversations, which may be indicative of the existing

culture and professional hierarchies within the team.

While the community facilitator may theoretically be an ideal person to facilitate

daily practice dialogue and interaction among the team, our findings showed that they

were not always able to effectively facilitate team discussion or ensure all team members'

voices around the table were heard. This has important implications for practice as what

is considered valuable evidence for informing decisions can vary within professional groups (Rycroft-Malone et al., 2013). Through experience and training, other studies have shown that practice facilitators are effective at encouraging team member involvement and collective decision-making within existing professional hierarchies (Kotecha, Han, et al., 2015). However, in these studies, practice facilitators were external to the healthcare organization and no longer worked with the teams at the completion of the QIC program. The community facilitator may play an important role in sustaining team-based reflection and facilitating the sharing of knowledge after the completion of the formal QIC program. With the community facilitator embedded within the existing culture of the healthcare team in the community, future programs may explore strategies that can enhance training and skills for community facilitators. Through enhanced training on facilitating team dialogue and handling group dynamics, the community facilitator can play an effective role in daily practice dialogue and flattening professional hierarchies through the empowerment of a space for all team members' voices to be heard, which, in turn, can help establish and maintain a culture for QI (Hilts et al., 2013).

5.3. Importance of Relationships and Partnerships

Within the context of primary care settings in First Nations community, the importance of strengthening and building relationships with the community emerged as an important factor in shaping how QI activities emerged and evolved throughout the FA-Clinical QI Program.

5.3.1. *Relationships with Clients*

Clinical QI teams felt that building relationships and trust with clients was an integral part of their diabetes QI activities and for improving access to diabetes care.

Through focus groups and interviews with First Nations peoples living with diabetes, Jacklin et al. (2017) found that access to diabetes care was mediated by historical trauma caused by the history of colonization in Canada and systemic abuse and discrimination that First Nations peoples experienced. This trauma often materialized into mistrust of healthcare professionals and avoidance of the health care system. Developing respectful and trusting relationships between healthcare professionals and communities members has been cited as key factor to enabling the implementation of services for improving chronic disease care in primary health care settings in Indigenous communities and in addressing access to services and social determinants of health for First Nations peoples (Gibson et al., 2015; National Collaborating Centre for Aboriginal Health, 2011a).

Studies have shown that shortages of healthcare professionals and high turnover within First Nations communities, especially in remote and isolated communities, creates challenges in building and nurturing trustful relationships with Indigenous clients and providing consistency and continuity in diabetes care (Crowshoe et al., 2017; Tarlier, Browne, & Johnson, 2007; Vukic & Keddy, 2002). As described by Minore et al. (2004), clients who have "to tell and retell their stories to ever-changing faces, often give up and abandon treatment" (p.364). This resonated with our findings, particularly for Team East who work in a remote First Nation community. Team East discussed how clients with diabetes preferred to have continuity and consistency in the care they received, but due to staff shortages and turnover in the health centre, the team had been struggling for many years before the FA-Clinical QI Program to provide continuity in care. The team implemented diabetes clinic days in the health centre where clients would see the same nurse at each visit. The goal was not only to improve the continuity of care but to forge

trusting and respectful relationships with clients. Moreover, the team seemed to recognize how authoritarian and paternalistic clinical encounters can trigger traumatic memories for their clients (Jacklin et al., 2017), and thus, integrated motivation interviewing techniques in their diabetes clinic days, a method that acknowledges people's strengths and autonomy to set their goals for diabetes management (Rubak, Sandbaek, Lauritzen, & Christensen, 2005). Stories such as these demonstrate the potential power of the QI process in the FA-Clinical QI Program in enabling change for improving the quality of diabetes care and access to services in First Nations communities.

5.3.2. *Partnerships with the Community QI Team and Community Programs*

Both teams recognized that building partnerships with the community QI team was important to inform the development and implementation of strategies to improve diabetes care in the community. In each community, the community QI team worked in parallel to the clinical QI team, focusing on QI strategies within community-based diabetes programs (e.g., school diabetes prevention programs). Clinical QI team members acknowledged the need to work with the community QI team on common goals for QI as they found overlap in some the QI activities they were working on. For Team East, these partnerships were important for informing their QI activities and adapting care to the community's culture through the sharing of community member's knowledge of the community and thoughts on ways to improve care. Community partnerships in the design and implementation of health care services can ensure that services are respectful of the local culture and traditions of the community (Gibson et al., 2015; Roussos & Fawcett, 2000). As Davy et al. (2016) found in their framework synthesis, care strategies that

address the social and cultural aspects of health within their particular context are crucial for improving access to health care services for Indigenous communities.

However, for Team East, the findings showed challenges bringing the two teams together. This potentially may be due to the physical separation between the health centre and other community-based programs. Whereas for Team West, partnerships with the community QI team were facilitated through the sharing of space within the health centre and having team members on both teams. Future QI programs may explore strategies for supporting continual partnerships and knowledge sharing among healthcare professionals and community-based health programs.

5.4. The Influence of Context: Facilitators and Barriers to QI in Indigenous Communities

Several contextual factors emerged in this study as essential to supporting QI in primary care settings in First Nations communities in Canada. For both teams, this included dedicated and motivated team members, buy-in from healthcare professionals outside of the QI team, support from community groups and leaders, and support from healthcare leadership. Other QI literature, including within Indigenous primary care settings in Australia, has cited healthcare leadership support as a critical enabling factor for QI and has been associated with positive health service outcomes (Dückers et al., 2009; Gardner, Dowden, Togni, & Bailie, 2010; Newham, Schierhout, Bailie, & Ward, 2016; Versteeg, Laurant, Franx, Jacobs, & Wensing, 2012). Additionally, team members described time available within existing professional responsibilities as an important factor to enabling, and inversely hindering, their ability to dedicate to QI efforts. This included time available to dedicate to community outreach activities and for building

relationships and partnerships. This finding supports other QI research which found time constraints as a barrier to participating in QI activities (Harris et al., 2015; Paquette-Warren et al., 2014).

In addition to these factors, our findings showed how the organizational context of each team shaped their process for implementing strategies for improving diabetes care in different ways. Existing organizational resources and structures, such as staffing and system integration, affected the teams' ability to implement and sustain changes to diabetes care. The findings indicated a need for healthcare professionals in the community dedicated to diabetes care. For Team West, this appeared to emerge as a temporary challenge due to delays in hiring a new diabetes educator. Whereas, for Team East, challenges with staff shortages, turnover, and limited diabetes training appeared to be more pervasive and limited their ability to implement changes and dedicate time to QI activities during their participation in the FA-Clinical QI Program. Newham et al. (2016) also found that contextual factors such as staff shortages and turnover and associated time constraints were critical barriers to QI activities in Indigenous communities in Australia.

For Team West, the most substantial barrier to QI they encountered was existing organizational privacy policies around access to the primary care clinic's EMR, which limited their ability to share client information and improve communication between the diabetes education program and the primary care clinic. Privacy issues around access to medical records and sharing of client information is a common concern described in the literature (Ludwick & Doucette, 2009; Ozair, Jamshed, Sharma, & Aggarwal, 2015). Similarly, in their evaluation of a QIC program in Ontario, Paquette-Warren et al. (2014) found that privacy concerns around sharing of information limited teams participation in

QI activities and partnerships with community-based programs. However, within an Indigenous context, it is important to highlight that our findings may indicate jurisdictional issues that can arise between federal, provincial, and community-run services.

Systemic-level barriers to diabetes care in First Nations communities in Canada including workforce barriers (staff shortages and turnover) and health policies around access remain prevalent in the current literature (Bhattacharyya, Estey, et al., 2011; Crowshoe et al., 2017; Jacklin et al., 2017). In a recent study by Crowshoe et al. (2017), family physicians and specialists who provide care in First Nations communities in Canada described how structural barriers continually hindered their ability to provide the best support to clients with diabetes and felt powerless to transform service. Our findings demonstrated that even in the presence of structural and policy challenges teams were motivated to change and to implement small changes within areas of care where they felt they could make a difference. However, as expressed in the concerns of some of the team members in this study, these system-level challenges may jeopardize the ability to see sustained improvements in care and sustain a culture for QI. This suggests the need for policy reform and infrastructure support to adequately address issues with access to quality care and improve health outcomes for people living with diabetes in First Nations communities in Canada.

5.5. The Role of Facilitators: Facilitating Learning and a Culture for QI

At the beginning of the FA-Clinical QI Program, clinical QI teams were uncertain on how to apply the Model for Improvement and PDSA cycle method for developing and testing their QI strategies. Community facilitators appeared less confident in helping

teams apply the PDSA cycle method, which may be as a result of less experience at the time. Consistent with other QI research, the external Western research team facilitators helped to guide teams through the QI process and in particular, apply the PDSA cycle method to their specific context and QI strategies (Kotecha, Han, et al., 2015; Paquette-Warren et al., 2014). As the program progressed to the second and third workshop, it was observed that community facilitators were able to effectively guide teams' through the QI process and that Western research facilitators needed to provide less guidance and direction in applying the PDSA cycle method. This may be due to the community facilitator and the team members themselves becoming more confident and familiar with the method over time. Nonetheless, Western research team facilitator support throughout the program was appreciated by team members and community facilitators. Western research team facilitators reassured teams that they were on the right track in their QI process and applying the PDSA cycle method, as well as supported the teams to overcome barriers. These findings support Reed and Card's (2016) argument that while the PDSA cycle method seems simple, understanding how to apply and adapt the PDSA method to different problems and different stages of QI requires an extensive set of skills and experience. Supported by other research (Stetler et al., 2006), this, in turn, suggests that an external facilitator plays a key role in helping teams and internal facilitators understand QI processes as well as an important role in providing a source of encouragement and mentorship.

During end-of-program interviews, team members described an improved understanding of the QI process and how QI methods had become second nature and inherent in their way of thinking. For Team East, the Model for Improvement and PDSA

cycle method spread beyond those directly involved in the program, becoming embedded within procedures in the health centre. As such, the program facilitated a culture for QI in their practices, defined as the "way things are done around here" (McCormack et al., 2002, p.97). While others have suggested that the purpose of facilitation in QI programs is more oriented to *task and goal* achievement (Stetler et al., 2006), our findings suggest that the Western research team facilitators in the FA-Clinical Program provided a more *holistic* focused facilitation by helping teams reflect and change their ways of working and thinking around QI (Harvey et al., 2002). This demonstrates the potential effectiveness of facilitation and the FA-Clinical QI Program by stimulating organizational learning and changes to organizational processes (Berta et al., 2015). Importantly, and as eloquently said by Batalden and Davidoff (2007), "healthcare will not realize its full potential unless change making becomes an intrinsic part of everyone's job, every day, in all parts of the system" (p.2).

5.6. Recommendations for Future Quality Improvement Collaborative Programs

In addition to the recommendations described in the previous sections, other recommendations for future QIC programs in First Nations communities emerged through the findings of this study related to supporting knowledge translation and QI. First, team members described how the workshop plenary sessions helped to improve their overall knowledge of diabetes care and helped to keep them up to date with current diabetes care practices. This is important given an ever-changing landscape of diabetes care as new care approaches and treatments become available. However, some team members did not feel they learned anything new at the second and third workshops. Given the value of dedicated time to work as a team during workshop breakout sessions,

future QI programs may want to find a balance between providing "new" knowledge at workshops and providing opportunities for team-based sharing in the creation of knowledge for QI.

The clinical readiness tool helped to identify priority areas for improvement and generate ideas for QI at the beginning of the program, but the report was inconsistently used to inform diabetes QI activities at the second and third-time points. This may be because the second and third consultation process occurred in the community at the discretion of team rather than built in the team's workshop breakout sessions, or within the case of Team East, because the information can be discouraging or overwhelming to look at. Future QI programs may want to explore formalized facilitation efforts to enhance understanding of the potential value of the tool for informing QI activities. Likewise, future programs and research may want to explore the usefulness of this tool over time as teams engage in diabetes QI activities.

Lastly, team members valued opportunities to network with other participating teams in the FA-Clinical QI Program to learn about similar experiences, challenges, and ideas for QI strategies. However, some questioned its value, suggesting that the team updates at the workshop were too long. Other knowledge exchange strategies may facilitate the sharing of knowledge between teams participating in QIC programs across Canada. One potential alternative knowledge exchange strategy may be virtual communities of practice or online forums. In a systematic review of online knowledge exchange strategies, the authors identified virtual communities of practice as a pragmatic, flexible, and time efficient way for healthcare professionals to network and share knowledge (Mairs, Mcneil, Mcleod, Prorok, & Stolee, 2013).

5.7. Using the PARIHS Framework to Understand Implementation within First Nations Health Care Settings

This study provided an opportunity to reflect and examine the utility of the PARIHS Framework for understanding implementation within the context of primary care settings in First Nations communities. Overall, the PARIHS Framework helped to make sense of the complexity of implementing changes in clinical practice and the dynamic interplay between the three core elements. During data analysis each of the core three elements were useful for understanding and grouping the data into categories and themes. Descriptions of the underlying theoretical assumptions of each of the elements helped to understand the connection among multiple components of the FA-Clinical QI Program and themes that emerged during data analysis. However, there were limitations using the framework in this study.

Based on the themes that emerged during data analysis, there are limitations to the depth of each of the three core elements in capturing an understanding of the implementation of practice changes within primary care settings in First Nations communities. The core element of evidence within the framework does not capture the finding from this study which showed that community members' perspectives, outside of the clinical interaction, were important sources of knowledge for informing teams' decision-making around their diabetes QI activities. Secondly, the context element and sub-elements of leadership, culture, and evaluation focus on the local healthcare organizational setting. The findings in this study showed that contextual factors outside of the immediate local organizational setting, such as the support of community leadership and building community partnerships, were important factors when implementing

changes for improving diabetes care in First Nations communities. Furthermore, within

Indigenous settings, it is integral to consider the broader social, historical, and political

factors that may impact implementation and clinical care; these are important macro

system-level factors that other authors found missing from the PARIHS Framework

(Flottorp et al., 2013). These limitations of the framework support the argument by

McCalman et al. (2016) that while promising in the absence of Indigenous-specific

implementation frameworks, international theoretical understandings of implementation

may not adequately explain the implementation of health services or programs within

Indigenous health care settings.

In summary, the PARIHS Framework was useful for understanding complexity of

implementing practices changes within First Nations primary care settings in Canada.

However, there were specific limitations to using the framework that related to unique

factors to consider within these settings. Using the PARIHS Framework in an iterative

approach of inductive and theory-driven analysis allowed for exploring other concepts

and constructs not included in the framework, which in turn may help to build on the

existing framework and theory of implementation.

5.8. Study Quality and Strengths

In this section, I have summarized key quality considerations weaved throughout

this thesis and discuss the strengths and quality of this study in relation to unifying

criteria for qualitative research (Tracy, 2010). Unifying criteria were chosen because they

are flexible and sensitive to the diversity of methodologies and paradigmatic locations

employed within qualitative research (Ravenek & Rudman, 2013).

With limited knowledge on the implementation processes occurring within QIC programs, this study provided an in-depth understanding of diabetes QI activities occurring across diverse primary care contexts in First Nations communities. Importantly, these in-depth, rich descriptions provided findings for community partners that may help identify factors important for the sustainability of QI and chronic disease care, and can generate insight for future research, policy, and programs. In-depth, contextual descriptions are important for the future development and implementation of programs across wider settings. Milat, Newson, & King (2014) found that most decisions regarding scale-up and implementation of programs were influenced by multiple forms of evidence, where in-depth local contextual evidence was given higher value. Decision-makers often need more information on the delivery of a program and contextual factors encountered during implementation to make decisions regarding their expansion and scale-up (Edwards & Barker, 2014; Milat et al., 2012). In the current political climate with calls to action for addressing Indigenous health issues and health care delivery, this study illustrated how a QIC program might facilitate the improvements in access and quality of care across diverse primary care settings in First Nations communities in Canada, and the factors that can support QI in these settings.

Quality criteria for CBPR and constructivist case study methodology were considered throughout this research. The data collection and analysis methods employed remained consistent with the methodologies and paradigm guiding this research, which in turn enhanced the rigour and credibility of this study. Rigour was established by providing detailed descriptions on how communities were involved throughout the FORGE AHEAD Research Program and this sub-study. Rigour is enhanced in CBPR by

describing the participatory process including the signing of research agreements, hiring of community representatives as members of the research team, and their involvement in developing and evaluating research (Israel et al., 1998; Macaulay et al., 1999; Salsberg et al., 2015). Within the context of this sub-study, community representatives were continually involved in conversations around the scope of this research, ensuring that the study findings would generate knowledge beneficial to the community. I involved community representatives in the interpretation of the initial findings to obtain valuable insight into the data from those directly involved in QI activities within the community.

Rigour was also enhanced by remaining consistent with the key tenants of case study methodology from a constructivist paradigmatic location, including: 1) demonstrating coherency with the type of questions case study is suited to answer; 2) clearly defining the case and the phenomenon of interest; 3) describing in detail how cases were selected and used sampling procedures that fit the purpose of the research; 4) being transparent in the paradigmatic, disciplinary and theoretical perspectives informing this research; and 5) using multiple data collection sources and case study analysis methods that are consistent with the constructivist approaches to case study (Hyett et al., 2014; Meyer, 2001; Stake, 2006; Thomas, 2011).

The credibility of the findings were enhanced in multiple ways. I continually discussed the conceptualization of this research with the Principal Investigator and other research staff to ensure an appropriate fit of the research questions with the primary program evaluation objectives and data collection methods. For data I was not involved in collecting, I listened to audio-recordings and, when unclear, I discussed the context of the situation and interaction with other research staff involved. Also, confidence in the

findings was achieved by being reflexive and transparent throughout the research, including being transparent in my background and role within this research, and keeping a reflexive journal to record all decisions and examine the impact of my biases, values and feelings on the research process (Carpenter & Suto, 2008).

Using multiple data collection methods and involving First Nations community representatives and other researchers from diverse disciplinary backgrounds enhanced the richness and credibility of the findings and provided a deeper understanding of teams' QI activities. Consistent with CBPR, this also allowed for the integration of multiple perspectives and knowledge systems, and the voices of all participants and researchers into the research findings (Finlay, 2002; Kidd & Kral, 2005). Utilizing and triangulating multiple perspectives and methods allowed for different aspects of the data to be explored and challenged my preconceptions and assumptions. The purpose of the triangulation was not to converge on the same conclusion, but to holistically capture teams' QI activities. In the presentation of the findings, I emphasized the preservation of multiple perspectives and developing thick descriptions of the clinical QI teams, their activities and contexts, in order to develop a "vicarious experience for the reader [and] give them a sense of being there" (Stake, 1995, p.85). This in turn enhances the resonance and transferability of the findings to other settings (Tracy, 2010). The findings from this study may resonate with other healthcare teams engaging in QI efforts.

5.9. Study Limitations

This study utilized case study methodology with two clinical QI teams from First Nations communities participating in the FA-Clinical QI Program. One major critique of case study methodology is the limited generalizability of the findings due to small sample

size (Flyvbjerg, 2006). The findings in this study were generated from multiple data sources with a small number of participants. However, case study methodology, and qualitative research more generally, focuses more on the particularization and contextualization of research findings rather than generalization (Stake, 1995). The study findings attend to complexities of diabetes QI activities as they are situated within two particular First Nations communities and primary care contexts, from which may inform and provide insight for the development of future research, programs, and policies.

There are inherent limitations to the use of secondary data sources in qualitative research, including the overall fit of the data to the objectives of the sub-study, the lack of understanding of the context of the research, and the lack of control over data collection (Heaton, 2013; Hinds, Vogel, & Clarke-Steffen, 1997). My prior involvement in the program and data collection and knowledge of the available data sources enhances the credibility of research using secondary data sources because I was aware of the overall fit of the data to the research questions and had prior knowledge of the research context (Hinds et al., 1997). However, it is important to discuss some limitations that were encountered when using secondary data to answer the research questions in this sub-study.

The use of various forms of knowledge and the perceived value of this knowledge for informing teams' diabetes QI activities emerged in interviews when team member participants discussed components of the FA-Clinical QI Program, such workshops, clinical readiness reports, and FNDSS. Participants were not explicitly asked about the use and value of various forms knowledge, such as research evidence or tacit knowledge, which would have enriched the findings in this sub-study. However, asking participants

on the value and usefulness of knowledge, particularly research evidence and CPGs, may have introduced social desirability bias. Participants may have answered positively to please the researcher or because of the evidence-based practice imperative that holds healthcare professionals accountable for the use of research evidence in clinical practice and decision-making.

Secondly, the use of secondary data sources in qualitative research precluded simultaneous data collection and analysis and the ability to return to participants to further explore emerging findings and deeper meaning (Thorne, 1998). The findings from this study would have been enriched by exploring emerging themes from data collected throughout the FA-Clinical QI Program, such as observational or implementation support notes, with participants during end-of-program team member interviews.

Lastly, it important to discuss limitations to the data sources used in this sub-study. Participant bias may exist for end-of-program team member interviews, as not all clinical QI team members who were purposefully selected consented to participate. Those who consented to participate in interviews may have had more positive experiences than those that did not. Interviews also relied on participant recall of activities occurring over an 18-month time period. Additionally, documentation of teams' QI activities using PDSA cycle templates was limited in capturing the experiences of the teams. This study would have benefited from using other methods to capture a more comprehensive picture of QI activities occurring during action periods. This may include brief interviews or sharing circles with clinical QI team members during action periods. Nonetheless, triangulating this data with other sources helped to connect data and provide a clearer and more in-depth understanding of teams' experiences in developing and implementing QI strategies.

5.10. Recommendations for Future Research

The findings of this study begin to paint a picture for understanding the process of developing and implementing changes in practice to improve the quality of diabetes care in First Nations communities in Canada. Future research may further explore some of the themes that emerged in this study. This may include further exploring how various forms of knowledge are negotiated and integrated to inform QI activities, how Western and Indigenous knowledge systems come together to inform clinical practice and change, and strategies that can help facilitate an ethical and safe space for doing so (Smylie et al., 2004; Vukic et al., 2012). Additionally, research may further explore the role of program facilitators. For example, how research team and community facilitators independently and collectively work together to support teams' QI activities or how the role of facilitators changes over the course of the QI program. This may include exploring the four stages and characteristics of the facilitator role described by Dogherty, Harrison, and Graham (2010): planning for change, leading and managing change, monitoring progress and ongoing implementation and evaluating change.

Lastly, it is important to note that while discussing the findings of this sub-study the community evaluation liaisons shared things that happened after the program and data collection was complete. For instance, how the program provided impetus to advocate for more resources to support diabetes care in the community, or how they continued to use PDSA cycle methods to improve other programming and services beyond diabetes. Future research could explore the sustainability of QI in communities and how participation raises awareness of inequities and promotes advocacy for change. Also, it is important to note that these findings will be used to inform the primary program

evaluation of the FA-Clinical QI Program and the broader FORGE AHEAD Research

Program. Future research may explore the research questions in this sub-study with

additional teams and communities that participated in the program.

5.11. Personal Reflection

While there were some challenges experienced in the process of this research, my

overall experience has been truly rewarding. I have learned so much throughout my

journey in this research. In the development of the proposal for this study, I learned about

the importance of reflecting on the philosophical and paradigmatic viewpoints that guide

qualitative research and how they transcended all aspects of a study. I started to think

about things I have never thought of before such as how I see the world and how I see

myself as a researcher. This reflection I believe helped to create a stronger and more

rigourous study. I also learned more about qualitative methodologies and gained a better

understanding of the principles underlying CBPR.

Through my experience and process in this CBPR study, I have had the pleasure

to work with a wonderful group of people. I especially found the process of sharing and

discussing the findings of this study with community representatives an enriching and

rewarding experience. At the time of sharing the findings with them, I was in the thick of

data analysis and deeply immersed in the data. Our conversations helped to bring me

back to the bigger picture of why this type of research is important. They were very

passionate about the work they did to improve care in their communities and described

the impact of the program for them personally and for people living with diabetes in the

community. They graciously shared their knowledge and insights with me for which I

will forever be thankful. I am grateful for the partnerships and relationships that were

formed before and during this study and hope that I will have opportunities to work with them again in the future. My hope is that they feel the same.

5.12. Conclusion

This study aimed to explore the experiences of two clinical QI teams that participated in the FA-Clinical QI Program to provide a more in-depth understanding of QI processes occurring across diverse primary care settings in First Nations communities in Canada. In partnering with First Nations communities in this study, this research embodied the principles of CBPR emphasizing the involvement of community representatives throughout the research process and respectful, open and honest communication. Constructivist case study methodology informed by an implementation science framework was used to explore the research questions. This study provides insight into how clinical QI teams drew upon multiple sources of knowledge and information to inform their QI activities. With diverse First Nations communities and primary care contexts across Canada, this study aimed to provide a better understanding of how QI activities evolve across diverse First Nations contexts for primary care delivery in Canada. Within this context, tacit knowledge in the form of community members' perspectives played an important role in informing QI activities and improving the provision of diabetes care services and access to care. Also, this study highlighted the importance of strengthening relationships and building partnerships with the community and the contextual factors that individually shaped each clinical QI team's QI process.

Moreover, this study demonstrated the potential benefit of the FA-Clinical QI in improving the quality of diabetes care and highlighted key implementation processes that support or hinder QI and made suggestions for future programs. These findings and suggestions may support the future adaptation and implementation of QIC programs for

other First Nations communities across Canada that may benefit from such a program. Lastly, it demonstrated contextual factors and inequities in access to care influencing the provision of diabetes care in First Nations communities, with the hope that this can inform future community action and changes in policy to support diabetes care and QI.

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Appendices

Appendix A: Operational and Conceptual Definitions

In alphabetical order below, I have provided the key operational and conceptual definitions used throughout this thesis.

Clinical QI Team: a small group of healthcare professionals working within a primary care setting in a First Nation community and participating in the FA-Clinical QI Program. It is not inclusive of all team members within the larger clinical team or circle of care in the community.

Context: the environment or setting in which the proposed change to improve the quality of diabetes care is implemented and carried out (Rycroft-Malone, 2011). It does not refer to one particular place or location within the community. It may include social, organizational, political and historical contexts (Stake, 1995, 2006).

Diabetes QI Activities: the process of developing and implementing changes in practice to improve the quality of diabetes care in First Nations communities in Canada through an iterative QI process based on the Model for Improvement (phenomenon of interest in this study).

First Nations Community: In Canada, many communities have adopted First Nations to replace the term Indian band (National Aboriginal Health Organization (NAHO), 2017). In the context of this research and the FORGE AHEAD Research Program, each First Nations community partner has self-identified their community's geographical area and common identity, culture, and language.

Indigenous Peoples: Indigenous refers to first inhabitants of pre-colonial, pre-settler lands and their descendants (United Nations, 2006). In Canada, Indigenous peoples represent three collective groups who identify themselves as either First Nations, Metis, and Inuit (Indigenous and Northern Affairs Canada [INAC], 2016c).

Indigenous and Aboriginal are both collective terms for First Nations, Inuit, and Métis peoples but Indigenous is now considered the more accepted term. It recognizes Indigenous peoples' legal rights under the United Nations Declaration of the Rights of Indigenous Peoples (Joseph, 2016; National Aboriginal Health Organization (NAHO), 2017).

Knowledge: Knowledge is broadly defined and includes Indigenous knowledge (held by Indigenous peoples), explicit or codified knowledge, or tacit knowledge (acquired through experience and practice) (Landry et al., 2006; Nonaka, 1994; Smylie et al., 2014).

Primary care: Primary care focuses on health care services, including health promotion, illness and injury prevention, and the diagnosis and treatment of illness and injury (Government of Canada, 2012). Primary care provides first contact care for new health problems and comprehensive care for the majority of health problems (Friedberg, Hussey, & Schneider, 2010). Primary care is an element within primary health care, which refers to a broader approach to health and a spectrum of services beyond the traditional health care system such as income, housing, and education (Government of Canada, 2012).

Quality Improvement: efforts to make changes in practice to improve the quality of care, system performance, professional development, and health outcomes (Batalden & Davidoff, 2007).

Quality Improvement Strategies: specific changes developed and implemented in practice to improve the quality of care.

Appendix B: Summary of Diabetes Clinical Practice Guideline Recommendations

Care	Screening	Target
Blood Glucose Control	Measure glycosylated hemoglobin (A1C) every three months for most adults. Consider testing at least every 6 months in adults during periods of treatment and lifestyle stability when glycemic targets have been consistently achieved	A1C ≤7.0%
Hypertension	Measure blood pressure (BP) at diagnosis and at every diabetes clinic visit	BP <130/80
Retinopathy	Type 1 diabetes-Screen 5 years after diagnosis, then rescreen annually Type 2 diabetes-Screen at diagnosis and 1-2 years after initial screening if no retinopathy is present.	Early detection and treatment
Neuropathy/Foot examination	Type 1 diabetes-Screen 5 years duration and annually Type 2 diabetes-Screen at diagnosis, then annually Screen for neuropathy with 10-g monofilament or 128 Hz tuning fork at dorsum of great toe.	Early detection and treatment. If neuropathy present: require foot care education, specialized footwear, smoking cessation. If ulcer present: manage by multidisciplinary team with expertise
Dyslipidemia (cholesterol)	Fasting lipid (cholesterol) levels at diagnosis, then yearly if treatment not initiated. More frequent testing if treatment initiated	Low-density lipoprotein (LDL) ≤2.0 mmol/L or ≥50% reduction
Coronary artery disease (CAD)	Conduct CAD risk assessment periodically: CV history, lifestyle, duration of DM, sexual function, abdominal obesity, lipid profile, BP, reduced pulses, bruits, glycemic control, retinopathy, eGFR, ACR. Baseline ECG and every 2 years if >40 years, >30 years and duration >15 years, end organ damage, cardiac risk factors.	First priority in prevention of diabetes complications is reduction of cardiovascular risk by vascular protection through a comprehensive multifaceted approach (pharmacological treatment, lifestyle)

Chronic kidney disease (CKD)	Screening for proteinuria using random urine ACR (2 out of 3 samples over 3 mths) and assessment of renal function using a serum creatinine converted to eGFR. Screen at diagnosis and annually	Normal ACR 60 mL/min Normal eGFR >60 mL/min
Self-monitoring of Blood Glucose	Ensure patient can use glucose meter, interpret results and modify treatment as needed. Develop a blood glucose monitoring schedule with patient and review records.	Premeal (mmol/L) = 4.0-7.0 mmol/L for most patients 2hr Postmeal (mmol/L) = 5.0-10.0 mmol/L for most patients 5.0-8.0 mmol/L if not achieving A1C target
Nutrition	Encourage nutritional therapy (by a registered dietitian) as an integral part of treatment and self-management	Meet nutritional needs by following Eating Well with Canada's Food Guide
Smoking	Encourage patient to stop at each visit; provide support as needed	Smoking cessation
Source: (Canadian Diabetes Association, 2013; Diabetes Canada, n.d.)		

Appendix C: Plan-Do-Study-Act Template

	Test 1	Test 2	Test 3
PLAN Objective questions and predictions (why) Plan to carry out the cycle (who, what, where, when)			
DO Carry out the plan Document problems and unexpected observations Begin data analysis			
STUDY Complete the analysis of the data Compare data to predictions Summarize what was learned			
ACT What changes are to be made? Next cycle?			

Appendix D: Workshop Plenary and Breakout Session Topics

WORKSHOP TOPICS
Workshop #1, Day 1
Clinical Plenary #1 ▪ Diabetes epidemic in Indigenous peoples ▪ Best practices diabetes care: screening and diagnosis; targets and monitoring glycemic control; pharmacological management
Clinical Plenary #2 (QI Tool) ▪ Clinical readiness consultation tool and process
Breakout Session #1 ▪ Clinical readiness consultation ▪ Each community team breaks out to review and discuss their clinical readiness report ▪ Consultation and adjustment of readiness score(s) as determined by team consensus
Clinical Plenary #3 ▪ Chronic care model ▪ Organization of Care/Team-based Care; key players, collaboration, scope of practice, and medical directives
Clinical Plenary #4 ▪ Introduction to the Model for Improvement ▪ How to develop a list of potential areas for improvements according to community priorities
Breakout Session #2 ▪ Begin to identify community priorities
Workshop #1, Day 2
Clinical Plenary #1 ▪ Diabetes complications and risk management: retinopathy; neuropathy (foot and skin care); gestational diabetes; diabetes and cardiovascular disease ▪ Blood pressure and cholesterol control
Clinical Plenary #2 ▪ The Model for Improvement: goal settings and action planning ▪ How to use PDSA cycles
Breakout Session #1 ▪ Developing an action plan
Breakout Session #2 ▪ Developing QI strategies using PDSA cycles
Clinical Plenary #3 (QI Tool) ▪ Diabetes Registry & Surveillance ▪ Using your surveillance system ▪ Value of population level data related to quality improvement

Workshop #2
Team Presentations • Each team presents what the team has accomplished since Workshop #1 • Summarize QI strategies, areas of improvement, successes and challenges
Breakout Session #1 • Continuing the discuss and develop QI activities
Clinical Plenary #1 • Monitoring blood glucose • Insulin • Vascular protection • Depression and diabetes • Mental health • Gestational diabetes
Clinical Plenary #2 • Linking plenary information to QI
Breakout Session #2 • Continuing the discuss and develop QI activities • Planning for action period #2
Workshop #3
Community and clinical team collaboration • Sharing of story boards • Summarize QI strategies, areas of improvement, successes and challenges
Breakout Session #1 • Continuing the discuss and develop QI activities • Planning for action period #3
Clinical Plenary #1 • Motivation interviewing, self-management support, communication
Breakout Session #3 • Continuing the discuss and develop QI activities • Planning for action period #3 • Develop sustainability plans

Appendix E: Sample of the Clinical Readiness Consultation Report

Components of Health Systems	
Components	**Sub-Components**
1 **Delivery System Design:** refers to: the physical layout of the health centre; staffing roles and responsibilities; and client flow and care support processes	1.1 Team Structure and function 1.2 Clinical leadership 1.3 Appointments and scheduling 1.4 Care Planning 1.5 Systematic approach to follow-up 1.6 Continuity of care 1.7 Patient access 1.8 Cultural competence/knowledge 1.9 Physical Infrastructure
2 **Information Systems and Decision Support:** refers to: clinical and other information structures (including structures to support clinical decision-making)	2.1 Maintenance and use of an electronic or paper diabetes registry 2.2 Evidence-based guidelines for diabetes 2.3 Specialist and generalist collaboration
3 **Self-management Support:** refers to health centre structure and processes that support clients and their families to play a major role in maintaining their health, and managing their health problems	3.1 Self-management support, assessment and documentation 3.2 Self-management education, behavioural risk reduction and peer support
4 **Linkages with Community Resources and Other Health Services:** the appropriateness of population health programs and activities	4.1 Communication and cooperation of the health center and other community based organizations and programs 4.2 Linking health center patients to community resources 4.3 Community outreach 4.4 Regional health planning and development of health resources
5 **Organizational Influence and Integration:** refers to the use of organizational leadership to: create a positive workplace culture; support organizational structures and process that promote safe, high quality care; and ensure all the system components contribute to integrated care across the health centre.	5.1 Organizational commitment 5.2 Quality improvement strategies 5.3 Integration of health system components to achieve high quality care for patients with diabetes

Example Component Score Table

Summary of Component Scores			
Component	SCORE 1	SCORE 2	SCORE 3
Delivery System Design: refers to: the physical layout of the health centre; staffing roles and responsibilities; and client flow and care support processes			
Information Systems and Decision Support: refers to: clinical and other information structures (including structures to support clinical decision-making)			
Self-management Support: refers to health centre structure and processes that support clients and their families to play a major role in maintaining their health, and managing their health problems			
Linkages with Community Resources and Other Health Services: the appropriateness of population health programs and activities			
Organizational Influence and Integration: refers to the use of organizational leadership to: create a positive workplace culture; support organizational structures and process that promote safe, high quality care; and ensure all the system components contribute to integrated care across the health centre.			

Example Sub-component Score Table

Delivery System Design			
SUB-COMPONENT	SCORE 1	SCORE 2	SCORE 3	JUSTIFICATION
Team Structure and function				
Clinical leadership				-
Appointments and scheduling				-
Care Planning				-
Systematic approach to follow-up				-
Continuity of care				-
Patient access				-
Cultural competence/knowledge				-
Physical Infrastructure				-

Appendix F: Team Member Interview Guide

PROGRAM-END SEMI-STRUCTURED INTERVIEW GUIDE

PREAMBLE / BASIC DEMOGRAPHICS (5 minutes)

Thank you for <u>taking the time</u> to do this interview. The interview today is meant to be a conversation about your experience in the FORGE AHEAD Program. The questions are divided into four sections: your personal role in FORGE AHEAD; your perceptions about FORGE AHEAD's impact in the community; your perceptions about FORGE AHEAD program outcomes; and future activities in the community.

<u>Please answer the questions based on your personal experience</u>. Everything you say is confidential. You can use the name of people and places. This identifying information will not be transcribed or used when we present the results. I will be using 2 recorders just in case one does not function properly. Do you have any questions before we start?

Before we get into specific questions about FORGE AHEAD, I would just like to confirm some information with you. Please correct me if I am wrong as I read through this information.

Your name is **[insert name]**, you identify as **[insert gender]** and your age falls within the range of **[insert age range]**. Your highest level of education is **[insert education data],** and you have been involved in FORGE AHEAD with **[insert name of community]**. You have been part of the FORGE AHEAD **[Clinical / Community]** team with your role as **[Community Facilitator / Community Data Coordinator / Team Member]**.

{Ask the following question if the database shows a professional title associated with the participant – for e.g. Health Director; Nurse Practitioner; Dietitian etc}

Is your professional role still **[insert professional title]** at **[insert name of institution]?**

{If there is no professional role associated with the participant, ask them the following question}
What would you say is your current professional occupation or role?

{The above bracketed data is generated in a list from the FORGE AHEAD Database. If there is a discrepancy in the demographic information, ask for the correct information and reconfirm the new information}.

{Turn on the recorders}
{Begin the interview}

In the first part of the interview, I would like to discuss your personal role in the FORGE AHEAD program…

SECTION I: PERCEPTIONS ABOUT PERSONAL ROLE IN FORGE AHEAD (15 - 20 minutes)

1. **Can you tell me about your role in the FORGE AHEAD program?**

2. **Describe the factors that had an influence on your ability to participate in the FORGE AHEAD program?**

   a) *Probe* – within your community: professional role, time/funding, readiness, engagement or buy-in (FA teams, broad community, leadership, etc.), training/support you received?
   b) *Probe* – outside your community: Western Research Team formal and informal training/support, materials.

3. **In your role as a [insert role], what did you do to support the development and adoption of trying new ways in the community to address diabetes care (i.e. initiatives, strategies, procedures/protocols, programs)?**
   a) *Probe* – **What was particularly helpful about:** 1) participating in the program activities; 2) using the readiness and QI (PDSA) tools; 3) coming together as a team 4), interaction between clinical and

community team; and 5) availability of registry and surveillance system?

b) ***Probe*** – **What was particularly challenging about**: 1) participating in the program activities; 2) using the readiness and QI (PDSA) tools; 3) coming together as a team; 4) interaction between clinical and community team; and 5) availability of registry and surveillance system?

4. **What could have been done differently to improve your capacity as a FORGE AHEAD team member?**

Switching gears from your personal role in the FORGE AHEAD program, the next few questions are about your perceptions of FORGE AHEAD activities in your community……….

SECTION II: PERCEPTIONS ABOUT COMMUNITY (20 – 25 minutes)

{NOTE: Do not spend too much time on Question # 5 – Maximum 3 minutes}

5. **Was [name of community] able to establish a Community Advisory Board (CAB) to support FORGE AHEAD activities?**
   a) ***Probe*** – If yes: 1) how was it used; 2) did you find it beneficial to have a CAB; and 3) did an already existing institution take over CAB responsibilities, or was a CAB developed just for FORGE AHEAD program?
   b) ***Probe*** – If no: 1) can you tell me why a CAB was not established; 2) would a CAB have been beneficial to you in supporting FORGE AHEAD activities; and 3) are there committee's or institutions in the community would be similar to a CAB?

6. **How did the FORGE AHEAD program components build capacity to improve diabetes care in [name of community]?**
   a) ***Probe*** – <u>What was helpful</u> about readiness tools, workshops/learning sessions/breakout sessions, PDSA cycles, surveillance system data/reports?

b) *Probe* – <u>What was challenging</u> about readiness tools, workshops/learning sessions/breakout sessions, PDSA cycles, surveillance system data/reports?

{NOTE: Question # 7 – the focus is on the effects of the team having a consultation about readiness, NOT the efficacy of the readiness tool, which is covered in Question # 6}

7. **How did the readiness consultation affect participants' ability to develop and adopt new ways of doing things to address diabetes care (i.e. initiatives, strategies, procedures/protocols, programs)?**

8. **How did teams make use of the quality improvement tools (PDSAs, meetings, agendas, and minutes) to develop and adopt initiatives to address diabetes care?**

{NOTE: Question # 9 very important – spend time and get details to fill in PDSA data gaps}

9. **Can you describe the initiatives your team tried?**
   a. *Probe* - what worked and what did not work; what is still in progress or on hold?

The next two questions are about your perceptions about FORGE AHEAD program outcomes……..

SECTION III: PERCEPTIONS ABOUT OUTCOMES (5 minutes)

10. **How would you describe the impact of FORGE AHEAD for people living with diabetes in [name of community]?**

11. **Think back to the expectations you had at the beginning of the FORGE AHEAD, how did FORGE AHEAD meet those expectations or not?**

This last set of questions is related to future activities in your community……

SECTION IV: FUTURE ACTIVITIES (5 minutes)

12.   **If you were asked to be involved in a program like FORGE AHEAD in the future, which aspects of the program do you believe would be the most important for you?**

13.   **Which aspects of what you learned in FORGE AHEAD do you think will be sustained in [name of community] after the FORGE AHEAD program is finished?**

   a) *Probe* - What would facilitate the sustainability of those activities in your community?
   b) *Probe* – What challenges would your community face in making those activities sustainable?

14.   **Is there anything else you would like to discuss about FORGE AHEAD?**

   Thank you for your participation in the FORGE AHEAD program and taking the time to do this interview.

{Stop the recorders}

Appendix G: Ethics Amendment Approval

Western Research

Research Ethics

Western University Health Science Research Ethics Board
HSREB Amendment Approval Notice

Principal Investigator: Dr. Stewart Harris
Department & Institution: Schulich School of Medicine and Dentistry\Epidemiology & Biostatistics, Western University

Review Type: Expedited
HSREB File Number: 103865
Study Title: Transformation of Indigenous Primary Healthcare Delivery (FORGE AHEAD): Community-driven Innovations and Scale-up Toolkits
Sponsor: AstraZeneca Canada Inc.

HSREB Amendment Approval Date: March 16, 2017
HSREB Expiry Date: June 17, 2017

Documents Approved and/or Received for Information:

Document Name	Comments	Version Date
Revised Western University Protocol	FORGE AHEAD (REB 103865) protocol - clean copy	2017/03/09

The Western University Health Science Research Ethics Board (HSREB) has reviewed and approved the amendment to the above named study, as of the HSREB Initial Approval Date noted above.

HSREB approval for this study remains valid until the HSREB Expiry Date noted above, conditional to timely submission and acceptance of HSREB Continuing Ethics Review.

The Western University HSREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the International Conference on Harmonization of Technical Requirements for Registration of Pharmaceuticals for Human Use Guideline for Good Clinical Practice Practices (ICH E6 R1), the Ontario Personal Health Information Protection Act (PHIPA, 2004), Part 4 of the Natural Health Product Regulations, Health Canada Medical Device Regulations and Part C, Division 5, of the Food and Drug Regulations of Health Canada.

Members of the HSREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB.

The HSREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000940.

EO: Erika Basile ___ Nicole Kaniki ___ Grace Kelly ___ Katelyn Harris___ Nicola Morphet ✓ Karen Gopaul ___

Appendix H: Summary Tables of Findings

The following tables summarizes the findings from this study for reference. Table 6

summarizes the QI strategies that were developed and implemented by the two clinical QI

teams. In Table 7, for each theme and sub-theme, unique within-case findings are shown

that indicate unique team contexts or categories that emerged during analysis. Facilitators

or supportive factors and barriers or lessons learned are also provided.

Table 6: Summary of Team West's and Team's Quality Improvement Strategies

Team West's QI Strategies	Team East's QI Strategies
Linked registries of clients with diabetes between the primary care clinic and the diabetes education program to identify a shared listed of clients with diabetes.	Providing **training for community health representatives** on how to take photographs **for tele-ophthalmology**
Shared client lists between the diabetes education program and homecare services.	A nurse-supported, **community health representative-led blood pressure program**, where community members could come into the clinic to measure their blood pressure
Shared summary visit notes with clients between the diabetes educator and family physicians	Offered **tele-ophthalmology screening appointments** on evenings and weekends, and provided notes for clients to take time off work to attend appointments.
Group medical visits consisted of four self-management education sessions over five weeks. The sessions were led by the diabetes educator and the family physician, with other healthcare professionals providing support such as dietitians and exercise specialists	**Diabetes clinic days**, where a dedicated team of nurses would provide care and follow-up for a small number of clients (2-5 clients each) with the client seeing the same nurse at each visit. The physician, nutritionist, and community health representative would be available for consultation if needed. Using motivational interviewing techniques, the nurse conducted weekly education and self-management support sessions with clients for four visits over one month, where the clients identify and set their own diabetes self-management goals.

Team West's QI Strategies	Team East's QI Strategies
Joint, ad-hoc diabetes appointments with the diabetes educator and family physicians, where the diabetes educator would attempt to see the client on the same-day they were in to see their family physician	**Same-day, joint appointments** with the nurse and nutritionist
Weekly clinical notes and electronic reminders for family physicians, such as reminding them to measure clients' blood glucose	Creating and testing **diabetes templates** for nurses to use when following up with clients with diabetes. Diabetes templates provided a list of clinical measures (e.g., lab tests, blood pressure target, self-management goals) to follow-up with clients on.
Developing "welcome kits" to support newly diagnosed clients with diabetes, such as providing information on a variety of topics about diabetes and service available in the community, and to explain the importance of self-management and frequent follow-up with healthcare professionals	Integrated **discussion on quality improvement during weekly staff meetings** in the health centre. The team invited the community health representative, the community QI team, and members of the health board to the weekly meetings. After a few months of trying this out, one nurse started sending email updates at the end of the week so that staff that were holidays would be aware of what is going on in the clinic that week, such as any new protocols, or any problems that arose
Provided **diabetes screening, awareness and education at local community events** (annual diabetes walk and powwows)	Added a half-hour **educational session on diabetes to the physical workshop program offered in the community**. Nurses would stay after workout sessions to provide people with information about diabetes, including healthy eating
Assessed and discussed clients' mental health and well-being by using the patient health questionnaire and questions on spirituality for improving coping skills	Implemented **cooking workshops** out in the community for making healthy meals which included traditional community recipes
Provided education and training to home care staff and community health workers on how to do foot examinations in the home	
Offered **diabetes information booth and healthy snacks** at the community's band office	

Table 7: Summary Table of Themes and Key Findings (by case)

Theme	Sub-theme	Team West	Team East	Facilitators/ Supportive Factors	Barriers/ Lessons Learned
Drawing Upon Multiple Sources of Information and Knowledge to Inform Diabetes QI activities	Sharing of perspectives & experiences (team, community members, other teams)		• Community QI team members	• Team discussion & reflection • Clinical readiness consultation	• Involvement in team discussion/ team dynamics
	Reflecting on local practice information	• Existing EMR in primary care clinic	• Existing registry & surveillance system	• Team discussion & reflection • Model for Improvement/ PDSA cycle • Clinical readiness report	• Getting stuck in details of clinical readiness report • Discouraging results of clinical readiness report (Team East only) • Use of FNDSS limited
	Integrating research evidence on effective approaches for diabetes care			• Team discussion & reflection • Workshop plenary topics • Diabetes Boot Camp	• Variability in usefulness of the workshops for informing knowledge
	Aligning care to clients' preferences and culture		• Continuity of care (staff turnover)	• Team discussion & reflection	
Strengthening Relationships and Building Partnerships with the Community	Strengthening Relationships with Community Members	• New diabetes educator	• Continuity of care (staff turnover)	• Presence and community outreach	• Time to do outreach activities (Team East only)
	Building Partnerships with the Community QI Team	• Working together on similar QI strategies	• Share suggestions for QI, improve cultural knowledge, strengthen relationship	• Overlap of team members between teams; same building; easy to meet (Team West only)	• Not a member of the community QI team (Team West only) • Difficulty meeting (Team East only)

Theme	Sub-theme	Team West	Team East	Facilitators/ Supportive Factors	Barriers/ Lessons Learned
	Building Partnerships with Community Groups and Leadership		• Band office, health committee, and community leadership	• Community engagement • Advocate for resources	•
Organizational Structure, Support and Capacity for Diabetes Primary Care and Quality Improvement	Making Changes within the Existing Structure and Capacity of the Community's Primary Care Setting	• Loss of diabetes educator	• Turnover	• Finding ways to restructure and make changes within existing structure and resources of the health centre	• Staffing (healthcare professionals dedicated to diabetes care) • System integration/ privacy (Team West only)
	Time to dedicate to QI			• Extension of current role	• Work on top of professional responsibilities
	Leadership and Team Support			• Providing time and support for QI • Maintaining momentum • Buy-in from other healthcare staff (Team East only)	• Turnover – limited maintaining momentum/ sustaining efforts
Facilitating diabetes QI	Engaging team discussion			• Community & Western research team facilitators • Western research team facilitators supporting community facilitators	• Confidence • Inconsistency in asking for individual team member input
	Providing reassurance & support			• Western research team facilitators consistent support • Overcome barriers	

Theme	Sub-theme	Team West	Team East	Facilitators/ Supportive Factors	Barriers/ Lessons Learned
	Facilitating learning and a culture for QI			• Supporting learning of QI methods • Confidence/ knowledge improve over time • Ingrained in way of thinking • Embedded within practice procedures	• Uncertainty/ limited experience

Curriculum Vitae

Meghan Fournie

Education	**Master of Health Information Science** September 2015 – Present Western University, London, Ontario **Bachelor of Health Sciences (BHSc)** September 2003 – June 2007 Honors Specialization in Health Promotion Western University, London, Ontario
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Peer Reviewed Publications	Reichert, S.M., Harris, S.B., Tompkins, J.W., Brown, J.B., **Fournie, M.,** Green, M., Han, H., Kotecha, J., Mequanint, S., Paquette-Warren, J., Roberts, S., Russel, G., Stewart, M., Thind, A., Webster-Bogaert, S., & Birtwhistle, B. (2017). Impact of a primary healthcare quality improvement program on diabetes in Canada: evaluation of the Quality Improvement and Innovation Partnership (QIIP). *BMJ Open Diabetes Research & Care, 5,* 1. Paquette-Warren, J., Tyler, M., **Fournie, M.,** & Harris, S.B. (2017). The Diabetes Evaluation Framework for Innovative National Evaluations (DEFINE): Construct and Content Validation Using a Modified Delphi Method. *Canadian Journal of Diabetes, 41*(3), 281-296

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