2016

Improving Patient Care Delivery in a Small Alaska Native Health Care Organization

Annette Cecile Siemens
Walden University

Walden University

College of Health Sciences

This is to certify that the doctoral dissertation by

Annette Siemens

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

Review Committee
Dr. Monica Gordon, Committee Chairperson, Public Health Faculty
Dr. Marie Caputi, Committee Member, Public Health Faculty
Dr. Amany Refaat, University Reviewer, Public Health Faculty

Chief Academic Officer
Eric Riedel, Ph.D.

Walden University
2016

Abstract

Improving Patient Care Delivery in a Small Alaska Native Health Care Organization

by

Annette Cecile Siemens

MPH-Loma Linda University, 1998

MSN-University of Wyoming, 1986

BSN-BIOLA University, 1979

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

Walden University

January 2016

Abstract

American Indian and Alaska Natives are burdened by a higher incidence of chronic diseases than non-Native populations. In an effort to improve the health status of its patients, the Ukudigaunal Wellness Center (UWC) partnered with the Improving Patient Care (IPC) Collaborative to implement changes designed to improve chronic disease care for Native Alaskans through intensive monitoring of screening for chronic disease and selected chronic disease outcomes. For this program evaluation, the units of analysis were the changes in health service delivery and the resulting patient clinical outcomes. The data source was the Registration and Patient Management System (RPMS), repository for the data collected over the 14 months of the collaborative. This system produced Shewhart run charts to show the percentage screening rates for patients achieving IPC processes and outcome measures. The findings showed that the process measures that met IPC goals were due to improvements in service delivery by UWC. Goals for other services, such as diagnostic screenings, were not met because these clinical components had to be coordinated with facilities outside UWC. Outcome measures for BP and HgbA1c control were not met as these depended on the patients' abilities to self-manage the required procedures. The implications for social change included: (a) Positive outcome in managing chronic diseases is possible by combining chronic care models with Deming's model for improvement; (b) Increased patient awareness of chronic conditions and their long term consequences tended to support more responsible and successful patient self-management; (c) Use of external medical resources should be considered when patient privacy and confidentiality are concerns.

Improving Patient Care Delivery in a Small Alaska Native Health Care Organization

by

Annette Cecile Siemens

MPH-Loma Linda University, 1998

MSN-University of Wyoming, 1986

BSN-BIOLA University, 1979

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

Walden University

January 2016

Dedication

This dissertation is dedicated to the Unangan people of the Aleutians. Their resilience in the face of many adverse events in history is an inspiration.

Acknowledgments

I would like to acknowledge my parents who supported me during this extended journey. They encouraged me to keep on pursuing my goals. I would also like to acknowledge James Spillane for his assistance with GPRA and RPMS data retrieval and reports. I would also like to thank my health board committee for their support of this study and for their efforts to improve the health of the Unangan people. In addition, I would like to thank the Indian Health Service IPC National Team for passing on their knowledge and understanding about the IPC process. I would like to also thank Dr. Gordon for her patience with me when circumstances forced a change of topic mid-dissertation and lost motivation to continue. Also, I would like to thank Dr. Caputi for her guidance in the structuring and presentation of my work.

Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction to the Study

Chronic Disease Significance

Providing quality health care for individuals with chronic disease is important to prevent complications and progression. Many researchers emphasize the importance of providing quality care, but maintain that some providers are not fulfilling this mandate. Patients are not getting recommended preventive screenings, are not receiving adequate medications for their chronic condition and are not meeting recommended target goals for their chronic condition (Cohen, Clark et al., 2004; Clark et.al., 2011; Wagner et al., 2001). Providing quality care for chronic disease is important for many reasons such as decreasing the cost of health care, decreasing the impact on the health care system in terms of patient volume, and for improving patient outcomes.

Chronic disease is a significant burden on the health care system in the United States. Chronic disease is defined as a health condition that persists over a long period (Wagner, Austin, & VonKorff, 1996). Chronic disease may be progressive and disabling and result in decreased quality of life and cause early death. The top chronic diseases include diabetes, hypertension, cancer, asthma, stroke, heart disease, and lung disease (CDC, 2012). About 40% of the U.S. population has a chronic disease, and 21% have more than one chronic disease (Anderson & Horvath, 2004). These reports and studies support the need for programs to improve chronic disease care. Additionally, chronic disease stresses the health care system in terms of patient volume.

The large number of individuals with chronic conditions tests the capacity of the health care system. Individuals with chronic disease use the health care system at a much higher rate than the rest of the population (Anderson & Horvath, 2004). Not only do chronic diseases stress the health care system, they are also the leading causes of both disability and death in the United States (Anderson & Horvath, 2004; Centers for Disease Control, 2012). According to the Centers for Disease Control (2007, 2008), 25.8 million individuals live with diabetes, which is the leading cause of kidney failure, non-traumatic lower-extremity amputations, and blindness among adults. In addition, the Centers for Disease Control (2011) stated that about 60% of individuals with diabetes have some form of nervous system damage. An estimated 30% of the U.S. population has one or more form of cardiovascular disease (Bertoia, Waring, Supta, Roberts, & Eaton, 2012; Mensah & Brown, 2007). The studies mentioned above demonstrate the large scope of chronic diseases and thus the need for additional studies to investigate ways to prevent chronic disease and to prevent complications for individuals with chronic disease.

In addition to increased morbidity and mortality, patients with chronic disease also experience decreased job productivity and a decreased quality of life (Bertoia, 2012; Mokdad, Marks, Stroup, & Gerberding, 2004). Alvere Health (2007) found that for every 1,000 individuals with asthma, diabetes, and hypertension, 1,221 work days are lost each year. Asthma accounts for 8 million work days lost each year (Goetzel et al., 2004). The financial cost to the U.S. economy due to worker absenteeism and decreased productivity from chronic disease was estimated to be over $1 trillion in 2003 (DeVol & Bedroussian, 2007). Work productivity and days lost to chronic disease could be improved by better management of chronic disease. In addition to lost productivity and days lost, chronic disease also has financial consequences.

Chronic disease also is a financial drain on the health care system in the United States. About 78% of health care spending in the United States is used to treat chronic disease (Anderson & Horvath, 2004). According to the American Diabetes Association (2011), diabetes costs amounted to $174 billion in the United States in 2007. If the costs of gestational diabetes, undiagnosed diabetes, and prediabetes are also factored in, then the cost goes up to a $218 billion (author, year). Heart disease and stroke also have high costs. The outlay for heart disease and stroke care is $432 billion a year in the United States (Mensah & Brown, 2007). Lung disease also has significant financial cost to the health care system. It is estimated that lung disease costs amount to $154 billion each year in the United States (National Heart, Lung and Blood Institute, 2004). By 2023, experts estimate that the total cost of caring for chronic disease will exceed $1.6 trillion (DeVol & Bedroussian, 2007). As chronic diseases increase it is reasonable to expect that the cost of caring for chronic disease will also increase. This increase is yet another reason that supports the need for improvement in chronic disease care.

Alaska Native Disparities

Chronic diseases occur in all populations, but some groups are impacted by chronic disease to a greater extent. A disparity in chronic diseases exists between the overall U.S. population and Native American people (Acton et al., 2002; Amparo, Far, & Dietz, 2011; Indian Health Service [IHS], 2013; Sequist et al., 2010). Particularly Type 2 diabetes is more prevalent among Native American people than all other racial groups in the United States (IHS, 2013). Diabetes prevalence rates increased among American Indian and Alaska Native people by almost 50% in the 1990s (Acton et al., 2002). The disparity in diabetes prevalence indicates the need for improved methods of chronic care among American Indian and Alaska Native people.

Among American Indian and Alaska Native people, some groups have even higher incidences of diabetes. The Pima Indians of Arizona have over a 50% rate of diabetes, which is the highest rate of diabetes among any group in the world (Shulz et al., 2006). American Indian and Alaska Native people are more than twice as likely to be diagnosed with diabetes as the general U.S. population, as well as three to four times more likely to have complications from their diabetes (IHS, 2007). The rate of heart disease among Native Americans is now twice that of the general population (IHS, 2003), and is the leading cause of death among Native American Indians (IHS, 2013). These rates point to the need for improvements in chronic disease care and prevention among American Indians and Alaska Native people.

Factors contributing to these health disparities include limited health insurance (Medicaid, Medicare, or private), issues of quality of care, and a lack of access to appropriate health care facilities (Office of the General Council, 2004) and funding. Chronic underfunding has been a long standing issue in the Indian Health Service, the federal agency tasked with the care of Alaska Native and American Indian individuals. The Indian Health Service receives $4.1 billion**,** which amounts to expenditures per person that are well below other agencies such as Medicaid, Medicare, and the Veterans Administration (IHS, 2013; Sequest et al., 2010). The Indian Health Service has limited resources compared to other agencies which has limited their ability to respond to chronic care needs. Other issues have also impacted the provision of adequate chronic care within the Indian Health Service.

Another of these recurring issues for the provision of adequate care for chronic disease conditions is understaffing and provider turnover. High turnover leads to gaps in coverage and disrupts continuity of care. In exit interviews, IHS providers reported that poor quality of housing, remote location of assignments, low pay compared to private sector, and overwhelming patient loads lead were factors leading to their resignation (Kim, 2000; Office of the General Counsel, 2004). Many issues impacted the ability of the IHS to provide adequate chronic care. Discussions about this issue within the IHS and in consultation with tribal partners and other entities lead to the development of a patient care collaborative.

Indian Health Service Patient Care Collaborative

In an attempt to address patient care issues and systems issues, the Indian Health Service partnered with the Institute for Health Care Improvement in 2006 to develop the Improving Patient Care collaborative (IPC). The goals of IPC are to (a) improve access to primary care, (b) provide primary care that is high quality, (c) provide care that is coordinated across the continuum of primary care, inpatient care, and care in the community, (d) promote changes guided by input from the American Indian and Alaska Naïve community and Tribal leaders, and (e) make changes in care that are measurable and real (IHS, 2012).

Collaborative Goals

The purpose of the IHS Improving Patient Care Collaborative was to improve and change the IHS. To accomplish this goal, the IHS plan was to develop high performing and innovative health care teams. The goal was to aim for improved access to care and improved quality of care for American Indian and Alaska Native people. Expected results include strengthened relationships between the health care providers and the various American Indian and Alaska Native communities, as well as improved health outcomes (IHS, 2012).

The IHS identified 11 high leverage changes that were to be accomplished by collaborative. These changes include (a) engaged leadership, (b) improved capacity, (c) developing mechanisms for communication, (d) mobilizing resources, (e) ensure community participation in IPC processes, (f) assisting patients with self-care, (g) empanelment, (h) multidisciplinary care teams, (i) enhanced access to care, (j) evidence-based practice, and (k) improved clinical information systems (IHS, 2011). Leadership was to be engaged in the process at multiple levels (e.g., team leaders, midlevel managers and top leadership). Leadership not only received training on improvement processes, but also on how to motivate teams and empower them to make changes.

Improvement capacity and capability was to be built into the entire system and not just the clinical sites; Methods of listening to and communicating transparently with staff and the community were in development. The organizations were to mobilize, facilitate care coordination, and partner with community resources.

The Improving Patient Care (IPC) 3 was the third cycle of the program and had 89 participant organizations. UWC participated in IPC 3, lasting 18 months, is a part of the Quality and Innovation Learning Network (QILN), a continuation of the care improvement journey. The IPC was in its fourth cycle of the program within the IHS. The 32 organizations across the United States were participants in IPC4, and included hospitals and clinics operated by the federal government via the IHS, urban Indian Centers and hospitals, and clinics managed by American Indian and Alaska Native tribes. IHS was anticipating 100% participation in IPC by all IHS facilities and organizations, whether federal, urban, or tribal by 2015 (IHS, 2013). The goal of IHS was to transform the way service is delivered to Alaska Native and American Indians (Roubideaux, 2011).

Statement of the Problem

The rate of diabetes and other chronic illness among Alaska**'s** Native people has steadily increased over the last 20 years. Past programs and the delivery of care have not been successful in changing the outcomes for American Indian and Native Alaskan people with chronic diseases. Researchers have described the outcomes of participation by large practices or organizations (Asch, Baker, & Keesay, 2005: Chin et al., 2007; Daniel et al., 2004; Grossman et al., 2008). However, in the search for information about small health collaboratives, few studies appeared. Little is known about quality improvements in the IHS and the results of participation in health care collaboratives and networks, particularly their impact on rural clinics.

Purpose

The purpose of this study was to evaluate the process and outcomes of participation in the IHS IPC collaborative for a small tribal health organization, the Ukudigatunal Wellness Center (UWC). In this study, I described the implementation of IPC at the UWC and evaluated the effect of participation in the IHS/IPC on the organization's performance and selected patient outcomes.

Nature of the Study

The study was quantitative in nature and used evaluation methodology to determine the impact of participation in the IHS IPC collaborative. The model used as a framework for the study was the chronic care model as modified by the IHS for the collaborative and the model for improvement. Archived data collected during the collaborative was used to develop statistical run charts as described by Carey and Lloyd (2001) and Langley et al. (2009). Run charts are included to assist in the evaluation of various IPC process and outcome measures and process measures for screening rates for both preventive and chronic care. Some outcome measures, such as percent of patients with good glucose control or good blood pressure control, were also a part of the database for evaluation. I used archived data collected during the collaborative. The population under study was a small (fewer than 10 employees) Alaska Native nonprofit clinic located 800 air miles the parent company and closest hospital in the Aleutian Islands.

The Research Questions

The principal research question for the study was the following: Did participation in the IPC improve the delivery of care and outcomes at the clinic? The associated questions included the following:

1. What criteria did the organization use to measure the success of the implementation?
2. What was the effect of this implementation on the organization's performance?

Conceptual Framework for the Study

The conceptual framework included the Wagner (2001 chronic care model and the Deming (1986) model for improvement. These models formed the core framework to evaluate the IHS IPC collaborative, as developed by the Institute for Health Care Improvement. The basis for all collaborative learning sessions, team activities, and changes was the chronic care model and the model for improvement.

The Chronic Care Model

The chronic care model (CCM) is an evidence-based mode developed to improve the care of chronic disease (Wagner et al., 2001; Wagner, Austin, & Von Korff, 1996). Wagner, in collaboration with the Improving Chronic Illness Care Program of the MacColl Institute for Healthcare Innovation, developed the model. The CCM (see Figure 1) incorporates factors conducive to more positive interactions between health care providers and those with chronic illness.

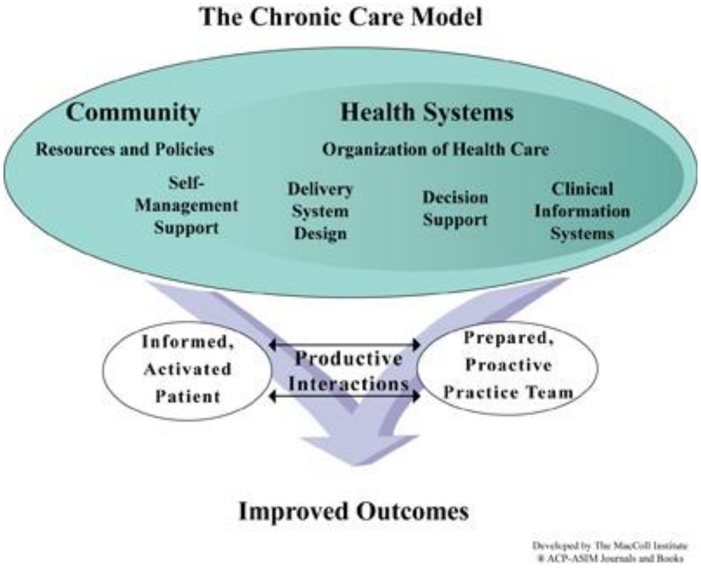

Figure 1. The chronic care model
(Wagner, 1998) Republished by permission see Appendix A.

In the chronic care model, community resources and policies join with health system resources. The redesign of the health care system ensures that individuals have the skills to self-manage their chronic illness. An improved health care system design would impart to providers the information they need to make clinical decisions in regard to chronic care. In theory, interactions between the provider and the patient in this improved system will lead to improved patient outcomes and improved provider and patient satisfaction (Wagner, 1998).

The IHS IPC program has further adapted the chronic care model to reflect care within Alaska Native and American Indian Communities. See Figure 2.

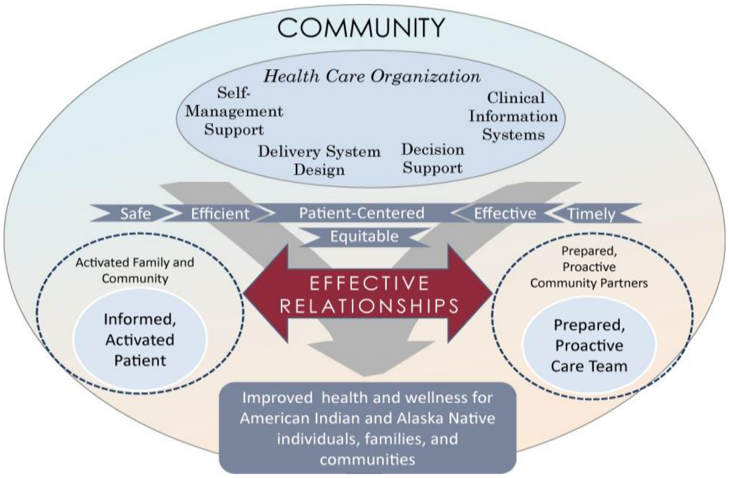

Figure 2: IPC care model
(Indian Health Service, no date).

The Model for Improvement

The MFI is another key conceptual dimension used in the IHS IPC program. The bases of this model were three key questions.

1. What are we trying to accomplish?
2. How will we know that a change is an improvement?
3. What changes can we make that will result in improvement? (Langley et al., 2009).

These key questions were in turn connected to the Plan-Do-Study-Act cycle (Figure 3).

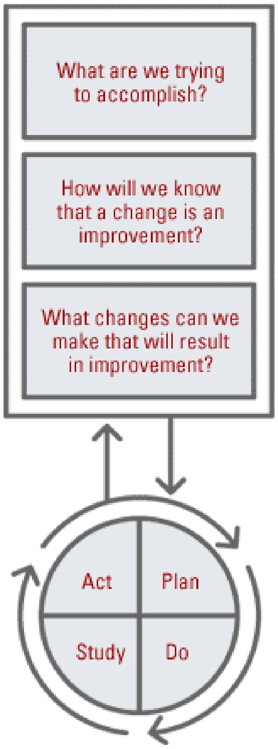

Figure 3: Model for improvement (Langley et al., 2009)

According to Langley et al. (2009), the model did not replace other change models, but instead accelerated improvement through the use of small plan, do, study, act (PDSA) cycles. The model was not a rigid one and could easily be useful in a variety of settings from large organizations to small organizations. The purpose of the model was to test changes on a small scale before being applied system wide. When doing testing on a small scale, multiple tests ran easily.

Definitions

*Action plan***:** Work plans prepared by teams to guide tests for change, implementation, and spread (IHS, 2014).

Chronic disease: A condition that is ongoing (a year or more), requires continued medical care, and/or limits in some way activities of daily living (Ward, Shiller, Goodman, 2014).

Clinical Information System (CIS): An integrated, comprehensive, patient-centered information system like the Patient and Registration Management System (RPMS) (IHS, 2014).

Cycle time: The amount of time that a patient spends at a clinic visit. The cycle time is used to identify areas of backlog that can be improved (HIS, 2014).

Micro system: A smaller portion of the entire organization like one clinic or one provider in a clinic (IHS, 2014).

For a more complete list of definitions please see Appendix B.

Assumptions

- The chronic care model was an appropriate foundation for the study.
- Procedure and process change would improve patient outcomes.
- Patients would provide responses, according to their personal experiences.
- The RPMS was consistent in its data collection process.

Scope

The population in this study attended a small Alaska Native clinic. The micro system (subset for the IPC process) was the medical portion of the clinic. The organization support staff and parent company, located in Anchorage, was not included in the IPC program or the evaluation. Findings in this study would be applicable to other small clinics and other tribal health facilities.

Limitations

- With the size of the organization, the outcomes may not be transferable to larger organizations.
- The IPC collaborative is IHS specific. The results may not be applicable to non-American Indian or Alaska Native clinic.
- The behavioral health component of the clinic was not included in the evaluation for the IPC.

Significance

This study provided information on the impact of participation in the IHS IPC collaborative for a small Alaska Native Tribal Health Clinic. As such, it may provide guidelines for other small clinics that are attempting to improve their patient care for chronic disease. Results may have potential social implications for individuals with chronic disease who may have less disability and live longer with improvements in patient care.

This study was unique because I addressed an area that few scholars have examined. Quality improvement was a relatively new field (Sifrim, Barker, & Mate, 2012). Since 2009, tribal organizations, IHS organizations, and Urban Indian Health sites have been participating in IPC, yet little research has emerged about the process or impact on their participation. Also missing from the literature are studies about quality improvement in small organizations with few resources. The results of this research increased knowledge about the impact of participation on a small, nonprofit, tribal health organization.

Summary

Chronic illness places significant strain on the health system in the United States and even more so for providing care to Alaska Natives and American Indians. The IHS has adopted chronic care collaboratives as a means of improving care for those beneficiaries receiving care at IHS clinics, Urban Indian Health Centers, or Tribal health facilities. These collaboratives use the model for improvement and the chronic care model as the basis for improving care.

In the next chapter, literature relevant to the problem will be reviewed to provide a basis for understanding the problem, and to understand concepts and issues relevant to chronic care collaboratives, the chronic care model, and the model for improvement. Chapter 2 provides a review of the literature, covering a variety of studies in improving chronic disease management. Additionally, a review of studies in which collaboratives improve chronic care follows. Finally, studies on the evaluation of chronic care improvement as a research methodology are explored.

Chapter 3 includes the purpose of the study with a description of the methodology for the study. Also presented is a description of what patient care outcomes changed as a result of participation in the IPC. Concluding this chapter is a description of how I evaluated whether the organization was able to meet their goals set forth at the beginning of their participation in IHS/IPC.

In Chapter 4, I present the results from the data collected on the IPC measures: the collaborative results for both process and outcome measures. The process measures include such items as screening for domestic violence and other preventive care and screenings. Outcome measures include control of blood pressure, control of lipids, and control of HgbA1c.

Chapter 5 is a brief overview of the study, a summary, and interpretation of the findings and conclusions. The chapter also includes a discussion of the implications for social change and recommendations. The chapter ends with my reflections on the study.

Chapter 2: Literature Review

Introduction

The purpose of this study was to evaluate the process and outcomes of participation in the IHS IPC collaborative for a small tribal health organization in Alaska. This chapter includes a review of the literature pertinent to improving health care. The topics covered in this chapter include the following: chronic disease care and need for improvement, collaborative studies and chronic disease management, collaborative studies to improve systems, problems with collaborative studies, studies using the chronic care model, and evaluation as a research methodology.

I identified studies through EBSCO Host through the Walden University library, from the National Library of Medicine (PubMed), and Google Scholar. I also obtained print articles from the University of Alaska Anchorage Health Sciences Library. Key words searched included the following: *chronic care*, *chronic care and improvement*, *quality care*, *health care and improvement*, *health care and collaboratives*, *chronic disease care*, *chronic disease care and improvement*, *chronic care model*, *model for improvement*, *American Indian and Alaska Native health care*, and *evaluation research*. I obtained articles going back to the 1980s to 1990s to get original articles relating to chronic care and the model for improvement. My major focus on collaborative studies were from the last 10 years.

Types of Studies

Chronic Disease Management

Chronic health conditions are challenges to the health care system. Many investigators (Bodenheimer, 2003; Burwick, Nolan, & Whittington, 2008; Duckers, Wagner, & Groenewegen, 2008; Hroscikoski et al., 2006; McGlynn et al., 2003) have found that health care provided to persons experiencing chronic disease is inadequate. Seventy-six percent of adults in the United States have received screening for hypercholesterolemia (Centers for Disease Control, 2012). However, more than 80% with hypercholesterolemia also have levels above those recommended (Ford, Li, Pearson, Zhao, & Mokdad, 2010).

Eighty percent of adults with asthma have uncontrolled disease (Calhoun et al., 2012) and 50% of people with high blood pressure have readings that are above ranges considered to be controlled (Egan, Zhao, & Axon, 2010). Another 43% of individuals with diabetes do not have controlled blood sugars (Cheung et al., 2009). Additionally, even though recommendations for best practices exist, care for individuals with chronic disease varies widely among providers (Bodenheimer, Chen, & Bennette, 2009; Kilo, 1998; United States Department of Health and Human Services (USDHHS), 2009). Expert recommendations and best practices were available for providers in the provision of care to their patients with chronic conditions. Collaboratives were one method proposed to help providers improve care provided for chronic conditions.

Collaborative Studies Research

Studies on improving health care quality were sparse until the 1950s (Stiles & Mick, 1994). At that time the Joint Commission on Accreditation of Hospitals (JCAH), now the Joint Commission, formed and through its various work on accreditation of hospitals and clinics increased the quality of health care research (Goran, Roberts, & Rodak, 1976). During this time, Donabedian conceptualized three dimensions of quality: structure, process, and outcome as the framework for improving health care (Williams & Torrens, 2002).

By the mid-1980s, an increased interest in quality of care was a driver for concerns over escalating health care costs (Stiles & Mick, 1994). In response to this concern, health care organizations looked to alternative models found in manufacturing and other non-health industries for new ways to improve health care delivery (Berwick, 1989; Chassin, 1997; Shah & Layman, 2005). Initial quality improvement focused on administrative areas, such as record keeping, scheduling, and billing (Ferlie & Shortell, 2001). Later quality improvement focused on improvement of the entire health care system. It was during this time that studies on collaboratives began to appear.

Collaborative Care Management

The Institute of Medicine (IOM) published two landmark reports regarding health care delivery. The first report from IOM (2000) focused on the number of patients killed or injured each year as a result of medical error. This report was an impetus for providers to begin addressing quality within their organizations. In a follow-up report, IOM (2001) reviewed causes of the gap in quality health care. In this second report, the IOM (2001) acknowledged that (a) health systems were complex and (b) these systems needed redesign if they were to meet the needs of patients in the health care system.

The Institute for Health Care Improvement (IHI) was another entity whose main activity is to improve health care systems and health care quality. At its inception, the IHI focused on providing courses on quality improvement. However, scholars who examined studies associated with HIS activities failed to demonstrate evidence of any significant change in care or quality (Kilo, 1998). In 1999, the IHI made a fundamental change in their methods for bringing about quality care improvement by instituting a collaborative model.

The purpose of this model was to support changes at the organizational level and bring about improvement in chronic health care. Instead of taking place in a onetime event, subsequent collaboratives took place over an extended period of time and involved face-to-face learning sessions followed by periodic phone conferences (IHI, 2012). Organizations participating in a collaborative agree on the improvement goals and monitored their ongoing progress through gathering data on specific measures. Teams submitted projects for improvement and use small change cycles to move their clinical site toward improvement (IHI, 2012). Quality improvement collaboratives were among the most widely used models in health systems around the United States (Grossman et al., 2008).

Research on Health Improvement Collaboratives

The results from collaboratives were primarily positive. Collaboratives for improving the care of depression had a positive effect on patient outcomes (Gilbody, Bower, Fletcher, Richards, & Sutton, 2006). Multiple care collaboratives to address diabetes self-management and improve blood sugars showed positive results (Asch, Mangione, Broder, Rosen, & Keeler, 2007; Fleming et al., 2001). In contrast to these positive results, some researchers found progress in care, but little improvement in disease outcomes (Landon et al., 2007). Although evidence supporting improvements in patient outcomes with clinic participation in a patient care collaborative is contradictory, those studies finding positive outcomes were more common than those with no improvement. Further information about studies for specific chronic conditions will be covered later in this chapter.

Collaboratives to improve care for chronic diseases came into existence in the late 1980s (Kilo, 1998). A variety of clinics, hospitals, or other interested health organizations came together for a period of time to improve some aspects of patient care. The participants engaged in a series of meetings (e.g., virtual or face-to-face) to gain knowledge about best practices, how to improve quality, and how to make changes in their own organizations. The specific purpose of a collaborative could vary. Some strove to improve patient outcomes, such as decrease average blood sugar (Rosenqvist, Carlson, & Luft, 1988) or decrease drug errors (Leape et al., 2000). Others sought to decrease hospital costs and lengths of patient hospital stays (Reid et al., 2010) or provide support for health care providers (Grossman et al., 2008). The Institute for Health Care Improvement was one example of an organization responsible for organizing over 1,000 different clinics, hospitals, and other health entities into patient care collaboratives.

Quality improvement collaboratives used multiple approaches to improve care. Some collaboratives focused on specific chronic health care problems, while others focused on improving systems. The following is an examination of chronic condition-specific studies and those involving systems change. The results of collaboratives in terms of improving patient care have been mixed. Koffman, Granade, and Anwun (2008) reported that belonging to a chronic disease collaborative leads to improved outcomes for patients with cardiovascular disease. Daniel et al. (2004) reported that a Washington state diabetes collaborative in 1998-99 and in 2000-2001 showed improvement in process measures and less in outcomes measures. The size of the participating organization participating in the diabetes collaborative varied from large to single office practices. Similar results appeared in a North Carolina diabetes disparity collaborative in 2000-2001.

Improvements in several process measures included increased self-management education for patients, increased use of a diabetes registry, and improved decision support for providers. The only reported outcome measure to show improvement was HbgA1c levels (Wang et al., 2004). Chin et al. (2004) reported similar results in a study of 19 community health centers (CHCs) involved in a diabetes collaborative. Participating CHCs showed significant improvements in care processes, but not intermediate outcomes. Participants in both of these collaboratives self-reported their data and their own evaluation of outcomes. No outside observer or validation of the data or processes existed.

Asthma care process showed improvement with participation in patient care collaborative (Schonlau et al., 2005). Patients in the intervention group who attended educational session, set goals, monitored peak flow rates, and used asthma medications correctly showed a slight increase in control. However, the change was not significant. Homer et al. (2005) reported no improvement in asthma care in a randomized trial of collaborative participation. Theorized was that negative outcome might be related to a short follow-up period and also a low participation rate. Asthma care was one area of chronic care that may or may not be helped by clinic participation in a collaborative. Time also appeared to be a factor. Changing entire patient care systems took time, so following a clinic for a longer period of time might be a factor in positive outcomes.

A collaborative for depression care involving 18 different clinics in a large 600 provider multispecialty health group showed only small process improvement. The degree of improvement varied widely among the groups and seemed more connected to personalities on teams rather than actual systems change. The authors concluded that changes were only the first step toward quality improvement and more time was needed to fully see the concept of implementation of the CCM fully realized (Hroscikoski et al., 2006). In contrast, Dwight-Johnson, Eli, and Lee (2005) found that when a clinic staff was involved in depression collaborative, patients in an intervention group had improved emotional well-being. The changes were thought to contribute to the positive outcome, specifically, case management, physician feedback, self-management support, and proactive care.

Authors of other studies have not differentiated between chronic diseases and instead look to improve the system providing care across the spectrum of chronic diseases. Systems changes made by organizations seeking to improve diabetes care included: (a) providing case management for difficult cases, (b) forming collaborative teams within the clinic, group visits, (c) developing systems to identify those with diabetes, (d) regular registry reports, (e) system prompts for diabetes testing, and (f) using a population approach (Spere-Hillen et al., 2000).

Problems with Collaborative Studies

One criticism of outcomes of collaborative was the difficulty in identifying which of the changes in a collaborative are responsible for improved outcomes (Spere-Hillen et. al., 2000). The conclusion that one may make from all of these studies was that collaboratives addressing the entire system had the greatest impact on patient outcomes. All the components of the IHI collaboratives enhanced primary care across the spectrum of chronic disease. The studies above revealed positive results in large organizations, small medical practices and both rural and urban settings. However, the literature lacked studies in several areas. This study filled in gaps in the literature both in term of remoteness of this particular setting, limited infrastructure capacity and one that took place in an Alaskan Native setting.

Chronic Care Model

The aim of the CCM was to modify health care delivery systems in ways that made the patient the center of the visit. In an organization utilizing the CCM, visits should be proactive, planned and population-based (Coleman et al., 2009). The CCM had interventions within six core areas to improve care and patient outcomes. These areas of change included: (a) redesign the system of health care delivery, (b) provider decision support, (c) information systems, (d) community connections, (e) patient self-management support, and (f) health system organization (Glasgow et al., 2002).

The purpose of the majority of reviewed studies was to examine ways of improving chronic disease patient care using the chronic care model (CCM). These studies vary widely in the degree to which they incorporated the CCM and generally organized around one or more components of the chronic care model as listed above (Coleman, Austin, Brach, & Wagner, 2009). The majority of studies using the chronic care model took place within collaboratives (Coleman, et al., 2009). The chronic care model had also been used widely in studies not associated with a patient care collaborative.

In contrast to the studies mentioned above, other studies with programs incorporating components of the chronic care model outside of participation in a collaborative also made improvements (Minkman, Ahaus, & Huijskan, 2007; Ouwens, Wollersheim, Hermens, Hulscher, & Grohs, 2005; Tsai, Morton, Mangione, & Keeler, 2005). Small, private practice clinics reported that their offices were able to make process improvement and additionally some outcome improvement in implementing the CCM. Although they were not able to achieve their original organizational target goals, improvements occurred in percent of patients with controlled blood pressure, A1C levels and LDL cholesterol levels. An additional bonus of incorporating the CCM was improved provider and patient satisfaction. After three years, patient outcome improvements continued to be made (Mohler & Mohler, 2005).

Although the conceptual framework for the CCM was well developed, no specific steps or methods were available to guide clinical practices interested in its implementation (Hroscikoski et al, 2006). Groups must figure out how the model fit in their particular system. Participating in a collaborative with CCM was one method to enable organizations to evaluate their own system and introduce the organization to the change process.

Evaluation as a Research Method

The tradition of evaluation as a discipline was fairly young (Pawson & Tilley, 2011). In the 1960s social program evaluations in the U.S. began as the cost of social welfare rapidly expanded (Bell, 1983). These experiments created interest in the financial, professional and academic communities, and evaluation as a method spread rapidly (Sadish, Cook, & Eviton, 1991). This movement continued with the development of evaluation societies being founded in the UK, Europe and Australia between 1994 and 1995 (Pawson & Tilley, 2011).

According to Pawson and Tilley (2011), the four main perspectives for evaluation research included: experimental, pragmatic, naturalistic and pluralist approaches. The basis of early evaluation research was experimentation logic with one group receiving an intervention or treatment and the other none. The theory of causation was the basis for this type of study. If the control and test groups were similar before the beginning of the program, then the assumption was that the program was the cause of the change. By inferring causation, the researcher attempted to control for any other potential cause agent.

One of the earliest studies of social change and experimental research was the Sesame Street study (Bogatz & Ball, 1971). The underlying principle of the study was the idea that children's brains changed rapidly between the ages of two to five and early education gave children a jump start. The outcome of this research was a series of educational television programs (Pawson & Tilley, 2011). Other early evaluation studies were on prison reform (Martinson, 1974; Ross & Gendreau, 1980).

One issue being discussed during this period was the capacity of the experimental approach to develop enough evidence to support public policy. Eventually, researchers concluded that if enough experimental studies were completed, patterns would develop and predictions become possible (Pawson & Tilley, 2011).

A second perspective of evaluation research was pragmatism. In this view the researcher investigated utility, feasibility, accuracy and propriety (Pawson & Tilley, 2011). Here researchers used a variety of tools to collect information through sampling, interviews, questionnaires, and analysis of data (Patton, 1980). The purpose was to determine whether a program was feasible in terms of finance, politics, and achievability.

In the 1970s phenomenology and naturalism became popular. In this type of study, program evaluation could not be treated merely as a set of independent/dependent variables, but rather as understanding the complex processes that involve human interaction. The concepts of phenomenology and naturalism lead to some important developments in research evaluation. One of the first was the concept of evaluation as processes rather than examining outcomes. These studies involved the inclusion of stakeholders in program development and negotiations over program changes. The stakeholders were the primary voice, not the researcher (Guba & Lincoln, 1983).

The main concern about the naturalist approach was that its context would affect the actions and thoughts of stakeholders. The outcomes would most likely vary from the past and be different in the future, as well as results from the same study done in different groups (Pawson & Tilley, 2011).

Pluralism incorporated methods from several types of studies including experimentation, policy making, and involving stake holder views (Rossi & Freeman, 1985). This type of evaluation approach had both breadth and depth and as such required more resources than other methods. In this approach, theory drove evaluation. Theory driven evaluation anticipated variation in the delivery of a particular program and built alternative comparisons into the design (Pawson & Tilley, 2011), an idea first introduced by Chen and Rossi (1981).

The study of improvement had traditionally involved three types of data: classification, count and continuous. Continuous data were often called variables data. For classification data, descriptors were one of two categories. Examples of classification data included positive/negative, good/bad. Count data included objectionable attributes (e.g., number of medication errors) or the amount of a particular unit (e.g., the number of patient visits to a clinic). These counts were continuous variables because the intent was to follow the progression of either improvement or lack of improvement (Provost & Murray, 2011).

Studies Using Evaluation as Methodology

Evaluation research in medical care was generally multifaceted. Depending on the structure and purpose of the particular program, many different approaches were available. One popular method in evaluation research was surveys of key stakeholders including administrators, mid-level managers, community members, primary care providers, program recipients, or other individuals involved in the development, provision or analysis of a particular program.

In their evaluation of tobacco cessation activities in 60 New York City low income clinics, Hung and Shelly (2009) developed surveys with the six components of the chronic care model. For example, in developing questions to address delivery system design, they asked binary questions, 1(for yes) and 2 (for no), as to whether the clinic conducted group visits, offered activities for smokers contemplating quitting, a dedicated tobacco cessation program coordinator, and whether the clinic dedicated tobacco treatment specialists to provide cessation counseling. Each of the six chronic care model components likewise had survey questions. Some of the questions involved a scale, such as 0 (for never) to 1 (always), but no open ended survey questions. Use of clinical information systems, such as electronic health record reminders and registries, was the strongest correlate of tobacco cessation after adjusting for all other CCM elements.

Damin et al. (2008) used surveys differently. They administered purposefully-directed surveys of 12 health centers in Australia providing care to indigenous people. These surveys were both mailed and on-site face-to-face group interviews. The mail out survey was for information on clinic resources and financing, and personnel relating to chronic care. The taped, in-person interviews involved staff asking to comment on successes and difficulties in provision of chronic illness care. The mailed survey questions revolved around all 6 components of the CCM. The face-to-face survey involved collation using a SWOT (strengths, weaknesses, opportunities and threats) format.

Other evaluation studies had outcome and/or process measures to determine the effectiveness of the intervention or program. In a study evaluating the effectiveness of team care working with individuals with depression (Johnson et al., 2012) used outcome and process measures. The results of provider documented depression scales and scaled marginal model were the results as their outcome measures. Process measures included the number of visits with providers, use of medications and specialty care referrals. Surveys were instruments used for all program participants as validation of provider reported outcomes.

Another evaluation of asthma care collaboratives compared 6 different clinics and found that improved process of care measures linked to better self-management. Patients also reported increased satisfaction with their care and communication with their provider. However, the collaborative time (12 months) was too short to detect any long term improvement in health for those individuals with asthma (Schonlau et al., 2005).

One potential weakness of self-reported data was that activities, such as health behavior modification counseling, could be overestimated (Thorndike, Rigotti, Stafford, & Singer, 1998). In contrast, Hung and Shelley (2009) found that patient reports of behavior modification counseling did not significantly differ from what the provider reported.

Summary

Patient care collaboratives come in many shapes and sizes, and overall research provided evidence that they improved patient care. The basis for the majority of patient care collaboratives was either the model for improvement and/or the chronic care model. The chronic care model was particularly complex with researchers having difficulty trying to differentiate which part of the model was responsible for improving patient care.

Evaluation as a research methodology was relatively new with many different ways in which evaluation was useful in research. For this study both process and outcome were measures of the evaluation of the collaborative. This type of research was appropriate to the study being undertaken.

Chapter 3 is a description of the study methodology and rationale for the proposed research. The chapter includes an in depth description of the research setting and the IPC program. In addition, research design, data collection procedures, data analysis methods and the role of the researcher conclude the chapter.

Chapter 3: Research Method

Introduction

This chapter is a presentation of the methodology and rationale for the research and includes the research setting and programs to be was evaluated, research design, data collection procedures, data analysis, the role of the researcher, and the ethical issues associated with this study. The integrated central concepts of evaluation were a part of the research design, and the evaluation development of the research method was in relation to the IHS/IPC collaborative. The research focus was on the change (happened and planned) that occurred during the course of participation in the IHS/IPC collaborative.

The purpose of this evaluation research was to evaluate the effect of participation in the IHS/IPC on the organization's performance and selected patient outcomes. The data collection involved descriptions of what patient care changes took place as a result of participation in the IPC. Changes in patient outcomes (e.g., percent of patients HgbA1C in control, percent of patients with BP in control) were points of evaluation, as well as process changes screening for various health indicators such as screening for Body Mass Index (BMI), tobacco use, and cancer screening. Additionally, this examination included whether the organization met its goals set forth at the beginning of their participation in IHS/IPC. The time frame was the period of implementation and participation in IPC/QILN from December 2011 to June 2013. For a description of the IPC process, see Appendix C.

Research Approach

The purpose of this study was to determine the effectiveness of the implementation of the IPC goals by analyzing data from its implementation of IHS/IPC at UWC over a 15-month period. The research questions were the following: (a) Did participation in the IPC improve care at the clinic and (b) What was the impact of the IPC collaborative on identified process and outcome goals? The data gathered involved indicators related to patient care improvement. Data collected were from computer software programs tied to the clinic electronic health record including iCare (a population-based patient management system) and the IHS RPMS.

Research Setting and Program

Description of the Clinic

The research setting was a small, tribally run clinic, the Ukudigatunal (a pseudonym –an Aleut word meaning good health) UWC, located on a remote island in the Aleutian Islands of Alaska, 800 air miles from the nearest hospital. The research setting was limited only to the medical clinic. The concept of IPC was to start small in a microsystem and then broaden it. The medical clinic was the microsystem where the initial IPC activities took place.

The clinic was in a leased building situated centrally between two population centers located on separate islands. A bridge joined the two islands. The clinic was one of four clinics on the island. In addition to UWC, two chiropractor clinics and a larger clinic were part of the Health and Resource Administration (HRSA) clinic or Community Health Center (CHC). UWC consists of two exam rooms, a small dispensary, a small lab, a dental operatory, an x-ray unit, and several offices. The behavioral health offices and social worker offices are located off site at another building due to lack of space in the present facility

Available Clinical Services

UWC is a primary care clinic. The clinical providers (Family Nurse Practitioner, Physician's Assistant and Community Health Aide manage care for patients across the life span. Services provided include preventive care, such as well child checks, immunizations, prenatal care, women's annual exams, men's health, sports physicals, and teen health. In addition, care was available for most acute illnesses and minor emergencies. Chronic care for most chronic conditions was also available as was end of life care. The clinic staff also conducted home visits for elders or others who are unable to make it to the clinic for their visits. Staff also were involved in community outreach, such as diabetes prevention fun runs, health fairs, weight loss competitions, and public services announcements on a variety of topics.

The clinic staff referred all significant trauma or extremely ill patients to the CHC with their staff of two physicians, three physicians' assistants/nurse practitioners, three registered nurses, and six medical assistants. Medical assistants double as lab techs and radiology techs. The community health center had a three bay emergency room with a trauma room, a moderate complexity lab, and full x-ray services.

Prenatal patients went off island at 37 weeks to await delivery in Anchorage. UWC referred their patients for delivery at the Alaska Native Medical Center. The hospital provided housing either at patient quarters in the hospital or at a local hotel until delivery. The clinic had a patient population base of 350 individuals (IHS, 2013). About 30% of the clinic population was under the age of 18 and 17% are over the age of 60. The number of patients seen each month ranged from 90-120. The busiest times of the year was during the various fishing seasons (e.g., cod, halibut, salmon, and king crab) in the area. In addition to local qualified residents (e.g., Alaska Native or American Indian who were permanent residents), the UWC clinic had Alaskan Native or American Indian patients who traveled to the island to work in the local fish processors.

The island's population was approximately 4,500 people living on the island year round. However, during the Alaska pollock (a species of cod) and crab fishery seasons, the population could increase to 9,000. Most seasonal workers came from the contiguous United States or overseas. The clinic staff saw about ten new American Indian/Alaska Native patients coming to the island for the fishery each year. The active patient population for the clinic was about 350 individuals. Hours of operation were 8:00 am to 4:30 pm Monday through Friday. The providers rotated taking call for after hours and weekend emergencies. The provider on call carried a cell phone in case of an emergency. For more information on the history of the UWC see Appendix F. For more information on the clinic personnel and clinic setting see Appendix G.

Research Methodology

For this study, a summative evaluation method was the research design. The primary focus and unit of analysis was the medical component of the UWC. The primary overarching research question to be answered was the following: Did participation in the

IPC improve care at the clinic? A second research question was the following: What was the impact of the IPC collaborative on identified process and outcome goals?

The methodology involved analyzing data collected during the collaborative on clinical process and patient outcome measures. Process measures included screenings for general health risks, such as obesity, tobacco use, domestic violence/intimate partner violence, depression, elevated blood pressure, cervical cancer screening, screening for breast cancer, and screening for colorectal cancer. The comprehensive diabetes care measure required that an individual receive a screening foot exam, blood pressure, nephropathy screen (urine for microalbumin) retinal exam, measurement of lipids, and HgbA1c within the last year. A final process measure was tobacco users who received a cessation intervention (See Table 1). These data elements were useful in answering both research questions as to the improvement of patient care and impact identified process goals.

Patient outcome measures included in the study were blood pressure in control for individuals with hypertension and lipids in control for those individuals with elevated lipids and HgbA1c in control for individuals with diabetes (See Table 1). Whether or not the clinic reached the goals established at the beginning of the collaborative answered the research question: Did participation in the IPC improve care at the clinic? What was the impact on identified outcome goals?

Table 1

Process and Outcome Measures with Associated Goals

Patient Care Process Measures	Measure	Goal
Preventive Screenings	BMI	80%
	Tobacco Screening,	80%
	DV/IPC Screening Depression	
	Screening	80%
	Blood Pressure Screening	80%
	Tobacco use screening	80%
	Tobacco cessation provided	70%
	Colorectal cancer screening,	70%
	Cervical cancer screening, Breast	70%
	cancer screening	70%
	Foot exam	70%
	HgbA1c measured	70%
	Retinal eye exam	70%
Patient Outcome Measures		
Control of blood Pressure,	Control of blood pressure	70%
Lipids & A1c	Control of lipids	70%
	Control of diabetes	70%

.

To demonstrate the improvement or lack of improvement over time during the collaborative, run charts were the data source for each outcome and process measure. A run chart or trend chart had data values shown as points connected by lines. The purpose of a run chart was to show direction up or down and change of a specific measure over time. The x axis was the time and the y axis, the measurement scale (Provost & Murray, 2011). The run chart was an appropriate method in quality improvement projects as a needed process to follow up over time to evaluate whether an improvement was due to chance or due to the implemented programs (Carey & Lloyd, 2001; Langley et al., 2009; Provost & Murray, 2011).

This research was an internal evaluation of the clinic organization. One advantage to internal evaluation was that the researcher was familiar with the organizational operations and history. One disadvantages to conducting an internal evaluation involved being too close to an organization, so that objectivity became more difficult.

Role of the Researcher

The researcher was part of the organization and worked in the clinic where the IPC Collaborative takes place. Additionally, the researcher was familiar with the decision making style of the organization and could communicate results more frequently. The role of the researcher was participant-observer.

Due to the small size of staff in the clinic, it would have been impossible for the researcher to be only an observer. The employer required all staff to participate in the IPC Collaborative. The researcher was a co-worker to all the other members of the staff and the supervisor to two of the staff, the medical assistant and the Community Health Aide. The clinic administrator and staff in the Anchorage office directed IPC activities. Doing a study within one's own work environment presented a particular challenge. To maximize objectivity, the researcher reviewed the findings with the organization's quality improvement program manager and the clinical applications coordinator.

Study Unit

The organization under study was the medical component of the Ukudigatunal Wellness Center (a pseudonym) excluding its behavioral health section. The behavioral health clinic was off site, not a part of the electronic health record, and did not participate in IPC activities. A total of seven employees staffed the medical clinic. The patient population of the UWC was 350 active patients, including men, women and children of varying ages, and types of diseases.

Instruments

The Registration and Patient Management System (RPMS) and iCare tools were the processes for data collection to determine goal achievement. These software programs were integral to the RPMS electronic health record (EHR) system and included de-identified data from the patient electronic health records.

Data Collection Process

Collection of data during the Improving Patient Care Collaborative was accomplished by using a variety of tools. These tools included the RPMS data management system tool, such as (VGEN), Government Performance, and Reporting Act Reports (GPRA), Patient Care Component Query (QMAN), and iCare. See Appendix D for the Data Collection sheet used during the collaborative. For this study, the archived de-identified data, retrieved from the agency's own archived records and submitted to the IPC program.

Data Analysis Plan

Data from 13 health related process measures and from three patient outcome measures were the sources for using Shewart type run charts. The purpose of using the run charts was to follow the improvement or lack of improvement in these measures over the length of the collaborative (see Figure 4). The patient-related process measures included:

- BMI measured: This percent was for active patient (ages 2-84) screened for BMI in the last year. An active patient was one who has been seen in the clinic at least two times in the last three years.
- Tobacco screening: This measure was the percent of active patients (ages 5-84) screened for tobacco use in the last year.
- DV/IPV screening: This percent of active patients (ages 16-84) who had screenings for domestic violence and intimate partner violence in the last year.
- Depression screening: The number of active patients (ages 18-84) screened for depression in the last year.
- Blood pressure screening: The number of active patients (ages 18-84) screened for blood pressure in the last year.
- Tobacco cessation provided: The number of those active patients who used tobacco and received tobacco cessation counseling in the last year.
- Colorectal cancer screening: The number of active patients (ages 50-80) screened for colorectal cancer in the past year. This screening could include fecal occult blood testing, sigmoidoscopy or colonoscopy.
- Cervical cancer screening: The number of active women (ages 21-60) screened for cervical cancer in the last three years.
- Breast cancer screening: The number of active women (ages 40-84) who had a mammogram in the last two years.
- Diabetic foot exam: This measure was the number of active patients with diabetes who received a diabetic foot exam in the last year.

- Diabetic retinal eye exam: The number of active patients with diabetes who received a retinal eye exam in the last year. This included an exam by an optometrist, ophthalmologist, or a retinal photo via Joselyn Vision Network (JVN) camera.

The patient outcome measures included: (a) Control of blood pressure for all active patients with hypertension or diabetes who had a blood pressure under 140/90 in their last three visits. (b) Control of lipids involved all active patients on lipid lowering medications with a LDL under 120 in the last year. (c) Control of diabetes included all active patients with diabetes with an HgbA1C under 7.0 in the last year.

This type of data had traditionally been the type used in improvement evaluations (Provost & Murray, 2011). Run charts provided descriptive statistics to document the percentage of patients in each health measure who received various preventive screenings. By increasing screenings patients with elevated blood pressure and/or lipids could be identified. Addressing these issues leads to improved health outcomes (Kern, Barron, Dhopshwarkar, Edwards, & Kaushai, 2011). Information from these charts was a demonstration of the IPC impact on various processes and patient outcome goals.

Data were trustworthy because either the goal was met or it was not. Triangulating took place between programs for the RPMS and iCare, which involved slightly different tools to gather the same data. The agency Clinical Applications Coordinator (CAC) and the quality improvement program manager reviewed the data results. Run charts were plots of data characteristics in chronological sequence and useful in revealing trends.

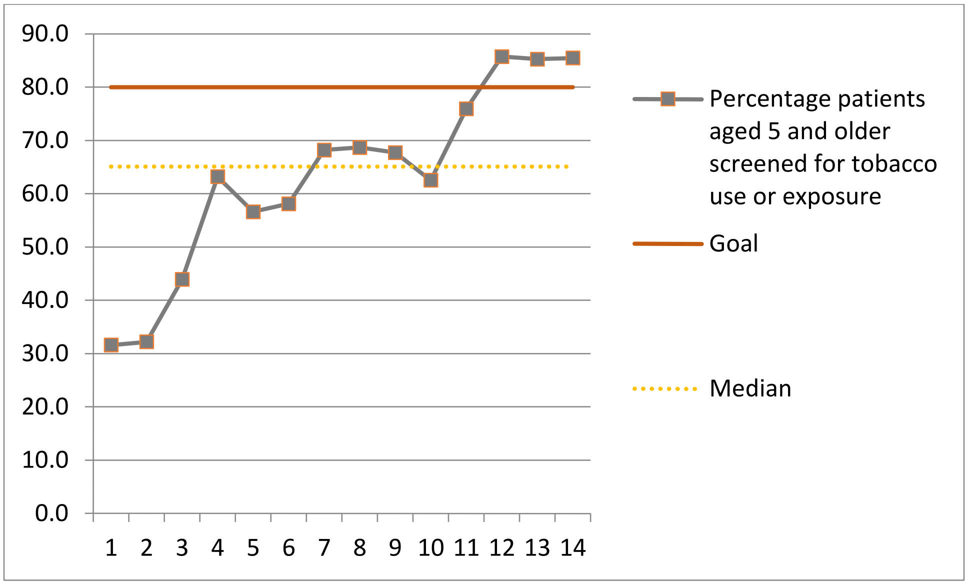

Figure 4: Example of a Run Chart

In the example above, the red line is the goal. The green line was the percentage of patients over the age of five screened for tobacco use or exposure. The dotted line was the median for all the data. This example run chart showed steady progress in the number of individuals screened for tobacco use.

The run charts were part of the data analysis and provided the data to answer both research questions: (a) Did participation in the IPC improve care at the clinic, and (b) What was the impact of the Improving Patient Care (IPC) Collaborative on identified process and outcome goals? By observing the run chart over time, the researcher interpreted whether a change occurred, no change noted, or an improvement. This study provided data as signals of indicators that the anticipated for change was moving in the desired direction (i.e., the percent of patients with blood pressure under control was going up).

Issues and Procedures

The parent agency Health Board approved the study. The Walden University IRB approval number is 04-08-14-0064012. Data eliminated patient identifiers and was anonymous. Data stored on the local clinic server was accessible only by an agency providing a password changing every 90 days. Data was accessible to the clinical applications coordinator (CAC), the quality improvement lead, and the researcher.

The final results would be available and disseminated to the clinic staff, the agency leadership, and the Health Board members. Data was not destroyed as the agency intended to continue participation in IPC in the future. The parent agency for the clinic was committed to an ongoing quality improvement process that extended past the time of participation in the IPC.

Summary

Chapter 3 encompassed a discussion of the methodology, evaluation research, used in this study. Summative evaluation was the methodology used in the study. An in-depth description of the clinic and community illustrated its data collection process. The chapter concluded with the data analysis plan with run charts for interpretation. Evaluation methodology was a valid method of research and assisted in determining the effectiveness of the IPC program.

Chapter 4 is a presentation of the results from the data collected on the IPC measures, as well as the collaborative results for both process and outcome measures. The process measures include such items as screening for domestic violence and other preventive care screenings. Outcome measures include control of blood pressure, control of lipids and control of HgbA1c.

Chapter 4: Results

Introduction

The purpose of this study was to evaluate the process and selected patient outcome measures as part of participation in the IHS IPC collaborative for a small tribal health organization. In this chapter, I report the data that represent patient care changes that occurred as a result of UWC's participation in the IPC. Changes in patient outcomes (e.g., the increased percentage of patients who had HgbA1C and BP brought under control) were among the measurable indicators that served as the basis for the evaluation. Process changes included the number of individuals screened for depression and other preventive screenings. Overall, this study was an assessment of whether the organization was able to meet its goals, defined at the beginning of the participation in IHS/IPC.

This collaborative took place over a 15-month period between 2011 and 2012. Data collection began 3 months into the collaborative and continued for the period of the collaborative. The resulting archived data represented 13 process measures and three patient outcome measures, specifically analyzed with the results presented in this chapter. Guiding the data analysis were two research questions:

1. Did participation in the IPC improve care at the clinic?
2. What was the impact of the IPC collaborative on identified process and outcome goals?

The findings in this chapter were to demonstrate the outcomes of participating in the IHS patient care improvement collaborative.

Demographics

The clinic participated in the IPC collaborative with individuals in each of the measures varying according to the measure. The patient population also varied according to appropriate age range and number of patients who met the collaborative definition for each category. Some of the measures, such as BMI, included patients as young as 2 years. Other measures, such as colorectal cancer screening, started at age 51.

Table 2

UWC Clinic Demographics (2011-2012)

Sex		
	Female	57%
	Male	43%
Age		
	Age 0-9	1%
	Age 10-19	12%
	Age 20-29	17%
	Age 30-39	18%
	Age 40-49	18%
	Age 50-59	11%
	Age 60-69	16%
	Age 70-79	1%
	Age 80-89	1%
Race		
	American Indian/Alaska Native	100%

The population of the clinic at the beginning of the collaborative numbered over 350. During the period of the collaborative, this number fluctuated slightly as families moved away from the area, passed away, or otherwise became inactive. Table 2 provides the gender and age distribution of the population served by the clinic. Females were the majority (57%) and adults 18-70 years represented 12.4% compared to 87.6% for ages 2-17 years.

IPC Measures Description

Measures for this study were in two basic groupings: process measures and patient outcome measures. Process measures encompassed health risk screening including screening for obesity, screening for tobacco use, screening for DV/IPV, screening for depression, blood pressure screening, colorectal cancer screening, cervical cancer screening, breast cancer screening, and provision of tobacco cessation counseling for tobacco users. Additional comprehensive diabetes screening was a process measure that required an individual with diabetes to receive a foot exam screening, blood pressure, nephropathy measurement (urine for microalbumin), retinal screening exam, and measurement of HgbA1c. If a patient with diabetes did not receive all these screenings, they did not meet the measure. Patient outcome measures were used to address chronic disease patient outcomes. These measures included the percent of individuals with hypertension whose blood pressure was controlled, individuals with hyperlipidemia with lipids within normal, and individuals with diabetes whose A1c was in control.

Results of Collaborative Process Measures

The main research focus for this study was identifying the effects of the IPC collaborative on identified process and outcome goals. The following section is a presentation of the results of the IPC process measures followed by the outcome measures. See Table 3 for a summary of the process measures as collected from January 2011 through December 2012.

Table 3

Process Measures (January 2011-December 2012)

Screening Measure	IPC Goal	% Screened at Beginning	% Screened at End	Percent Improvement
Body Mass Index	80%	80 %	96.5%	16.5%
DV/IPV*	80%	7.9%	90%	82.1%
Depression	80%	15.1%	99.3%	78.2%
Alcohol misuse	80%	27.2%	95.9%	68.7%
Blood pressure	80%	48.9%	93.9%	45%
Tobacco use	80%	31.6%	85.5%	53.5%
Colorectal screening	70%	25 %	60%	35%
Cervical cancer screening	70%	36.5%	84.6%	58.1%
Breast cancer screening	70%	35.7%	62.5%	26.8%
Diabetes care	70%	13.1 %	60%	46.9%
Tobacco counseling	70%	36.5%	84.6%	58.1%

**Note*. Domestic Violence/intimate partner violence

For the majority of these measures, the clinic staff began to see an increase in the percentage screenings in the third month of data tracking. This change could be attributable to key staff individuals attending an IPC conference on the IPC goals, and subsequent weekly IPC teleconferences, and two follow up face-to-face IPC meetings. The only three process measures not to meet IPC goals were screening for colorectal cancer, breast cancer screening, and comprehensive diabetes screening, which required measurement of blood pressure, LDL, nephropathy screen, HgbA1C, a foot exam, and retinal eye exam.

Body Mass Index –Screening for Obesity

At the beginning of the collaborative, only 49.1% of the clinic patients had a BMI measured. Although the clinic was obtaining weights on patients at most visits, heights were missing. A steady increase in BMI began from the third month of the collaborative (See Figure 5).

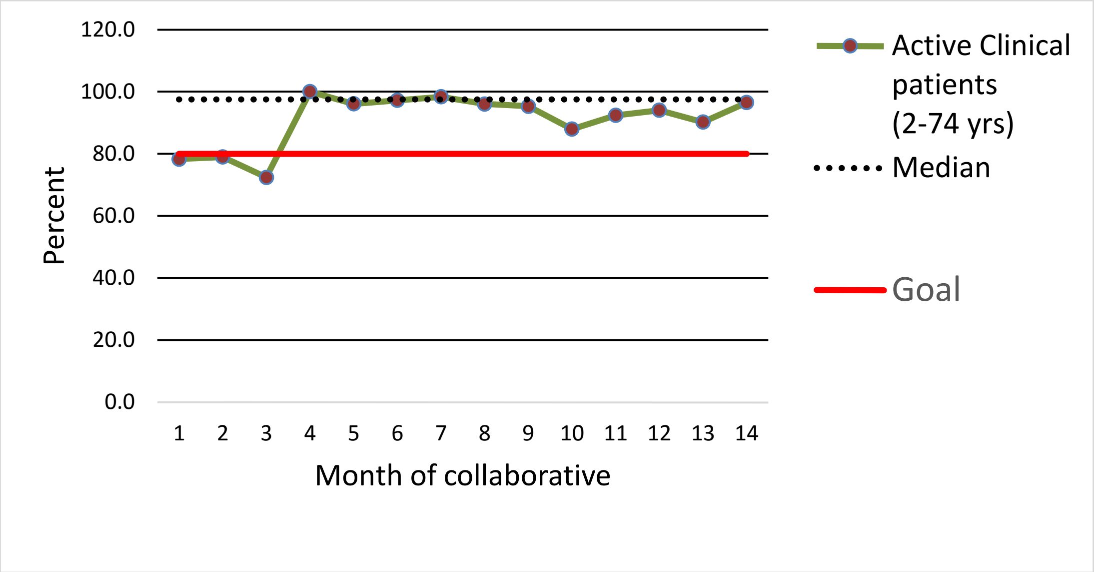

Figure 5. Percent of patients screened for BMI (2011-2012)

This difference can be attributed to key staff members attending an IPC learning session and being oriented to IPC goals. All staff shared these goals with a concerted effort to get BMIs entered for the majority of patients coming to the clinic. The clinic had been measuring weight, but had been inconsistent in getting heights for patients. Clinic processes were changed to measure a patient's height at least once a year. As a result of the change in clinic processes, the clinic met the collaborative goal of 80% of the patients being assessed for BMI. These data provided answers the research question: How did participation in the collaborative impact selected process goals?

Domestic Violence/Intimate Partner Violence Screening

The measure with the lowest starting score was DV/IPV. The DV/IPV screening questions proved difficult for the staff to ask because they were asking personal questions of family members and friends. In the fourth month of the collaborative, the institution of a three-part paper questionnaire became part of a PDSA process to help improve collection of data. The tool included questions about alcohol use, depression, tobacco use, and DV/IPV (see Appendix E). The provider handed this form to the patient and entered the results into the system. Although progress occurred toward the goal, the clinic was still short of reaching the goal. In another PDSA cycle, the front desk at check-in handed out the survey with the results entered by the receptionist.

During the fifth through eighth months, a steady increase was noticeable in the percentage of screened patients. At the end of the eighth month of the collaborative, the front desk receptionist resigned, and a series of temporary individuals covered the position. As a result, the surveys were not consistently handed out, and the percent of individuals screened dropped from 66% screened to 41% screened. By the end of the eleventh month, the front desk position was permanently filled, and the routine of handing out the surveys at check-in was once more established, and screening continued to improve (See Figure 6). In a subsequent PDSA the case manager entered the results of the screening and the clinic was able to meet the goal in the 12th month of the collaborative.

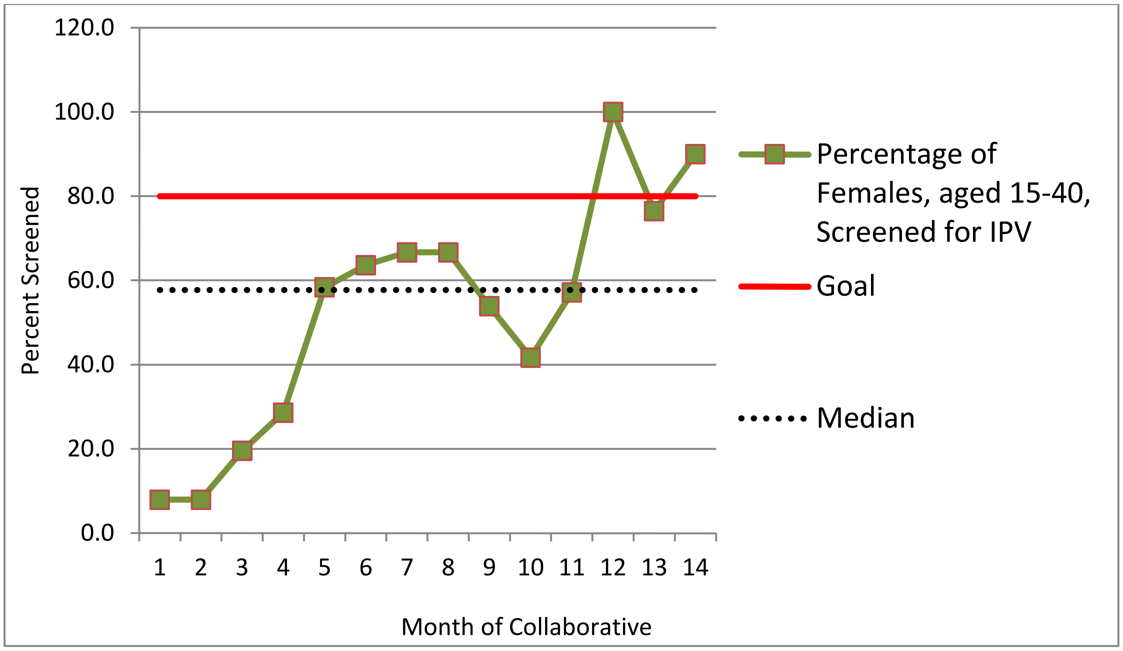

Figure 6. Percent of females aged 15-40 screened for DV/IPV (2011-2012)

Depression Screening

At the beginning of the collaborative the clinic staff screened about 15% of patients over the age of 18 for depression. This measure proved be a difficult for the clinic staff because they were asking family and friends sensitive questions. Originally, the screening occurred face-to-face with the person rooming the patient asking the questions. By four months into the collaborative no change was made in the percentage of patients screened for depression.

A PDSA cycle discussed in the paragraph above was instituted and involved the use of a paper screening form with two depression questions (a) Over the past two weeks have you felt down, depressed or hopeless (yes or no), and (b) Do you ever feel little interest or pleasure in doing things (yes or no). This form was handed to the patient by the provider and results were entered by the provider. Although movement toward improving the percentage of patients screened for depression, the clinic still had not reached collaborative goals.

In another PDSA cycle the receptionist at the front desk distributed the questionnaire at time of patient check-in at the clinic. The patient then completed the questionnaire after being placed in the exam room, while waiting for the provider. The questionnaire was then handed back to the receptionist who then entered the results. As discussed in the paragraph on IPV/DV screening, the front desk receptionist resigned and as series of fill-in receptionists worked the front desk. As a result, inconsistency occurred in handing out the questionnaire and in entry of the results. In a subsequent PDSA cycle, the case manager then entered the results of the screening into the electronic health record. This practice steadily increased the documentation of screening.

By the end of the collaborative, over 93% of individuals completed the screening questionnaire for depression and the results of the screenings were entered into the electronic health record. (See Figure 7). Changes in clinic processes and use of tools provided by the IPC were instrumental in the clinic meeting this goal. This data provided an answer to the research question: What impact did IPC have on selected process goals?

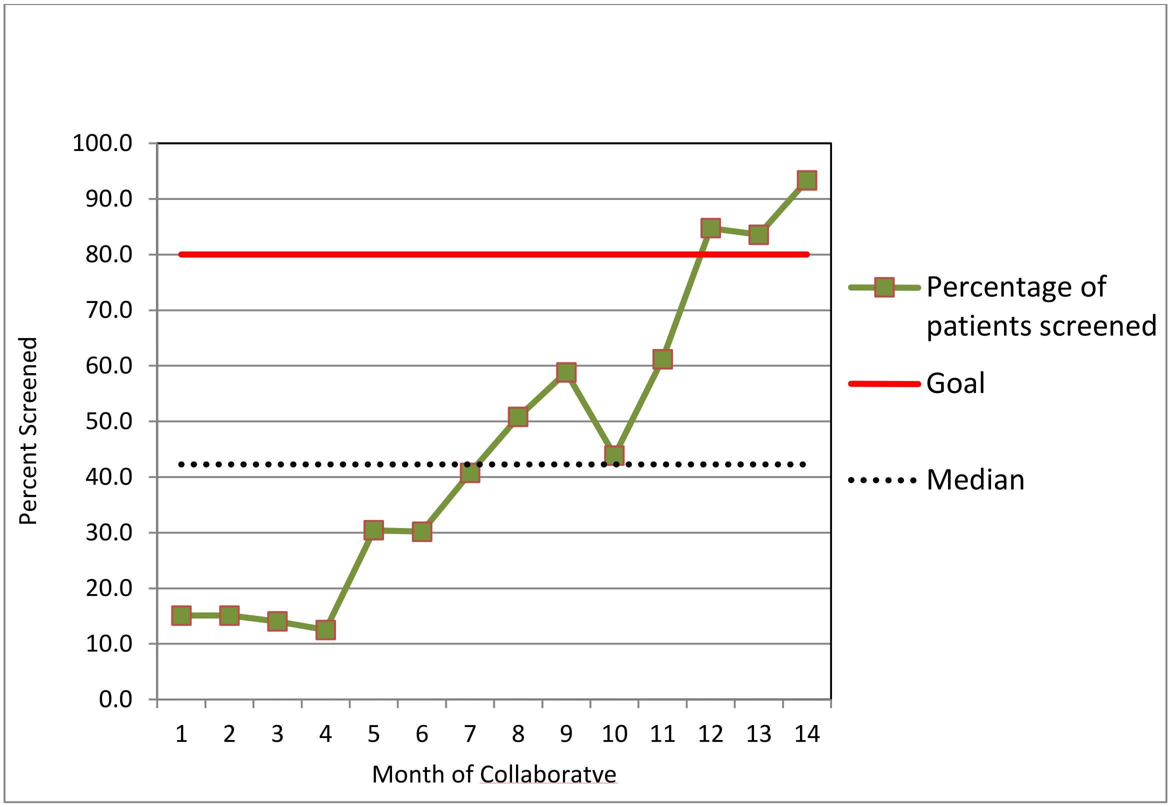

Figure 7. Percent of active patients over age 18 screened for depression (2011-2012)

Alcohol Misuse Screening

The following data were the results for the research question: What was the impact of participation in IPC on selected process measures. At the beginning of the collaborative only 27.2% of patients were screened for alcohol use. As with the two other behavioral health measures, this question proved difficult for staff to ask of their family members and friends. Numbers of individuals screened did not change much until the clinic instituted a paper screening form as described in the paragraphs above. The changes included: Do you ever feel like you should cut down on your drinking? (yes or no) Do people annoy you by criticizing your drinking? (yes or no) Do you ever feel bad or guilty about your drinking? (yes or no) Do you ever have a drink first thing in the morning to steady your nerves or get rid of a hangover? (yes or no).

The front desk receptionist handed out the questionnaire at patient check-in. The patient then filled in the screening questionnaire while waiting for the provider to come into the room. Initially, the provider entered the results. In subsequent PDSAs the receptionist entered the results and in the final PDSA for this measure the case manager entered the results of the screening into the electronic health record. After implementing screening at the time of check-in, the numbers screened steadily increased and by the end of the collaborative the clinic staff had screened 95.9 % of the patients (See Figure 8). The clinic met the collaborative goal of screening 80% of their patients for alcohol misuse. Use of PDSA cycles and tools provided by the collaborative were instrumental in the clinic meeting the goal for this measure.

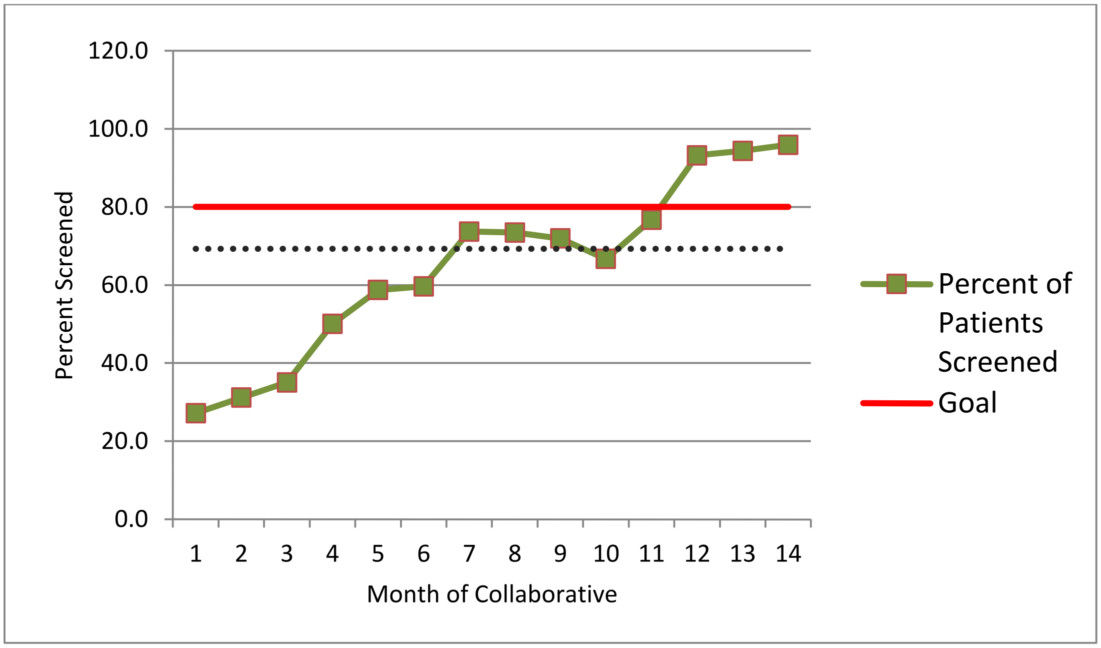

Figure 8. Percent of patients ages 12-75 screened for alcohol misuse (2011-2012)

Blood Pressure Screening

At the beginning of the collaborative, only 48% of patients had blood pressure screening. The numbers started increasing rapidly after the third month of the collaborative. This increase started after key members of the clinic attended the first IPC face to face learning session that reviewed collaborative goals for screening. These goals were reinforced at two subsequent IPC face-to-face learning sessions. In addition to learning about IPC goals the clinic team stove to improve their number out of a sense of friendly competition. At monthly IPC meetings via Adobe Connect with other teams across the Indian Health Service, the IPC National team verbally recognized teams who achieved specific IPC goals or made the greatest improvement. The clinic staff also had the opportunity to showcase clinic screening and patient outcome improvements in a poster session at each of the face-to-face trainings.

At the beginning of the collaborative the staff had not been consistent in getting blood pressures. After learning collaborative goals, clinic procedure for checking in a patient changed and blood pressures became a requirement at every visit unless the patient specifically refused a blood pressure. When patients became educated on the purpose of measuring blood pressures and the clinic participation in the collaborative, few refused the blood pressure screening. After the third month the clinic met the collaborative goal of blood pressure screening at least 80% of patients coming into the clinic (See Figure 9).

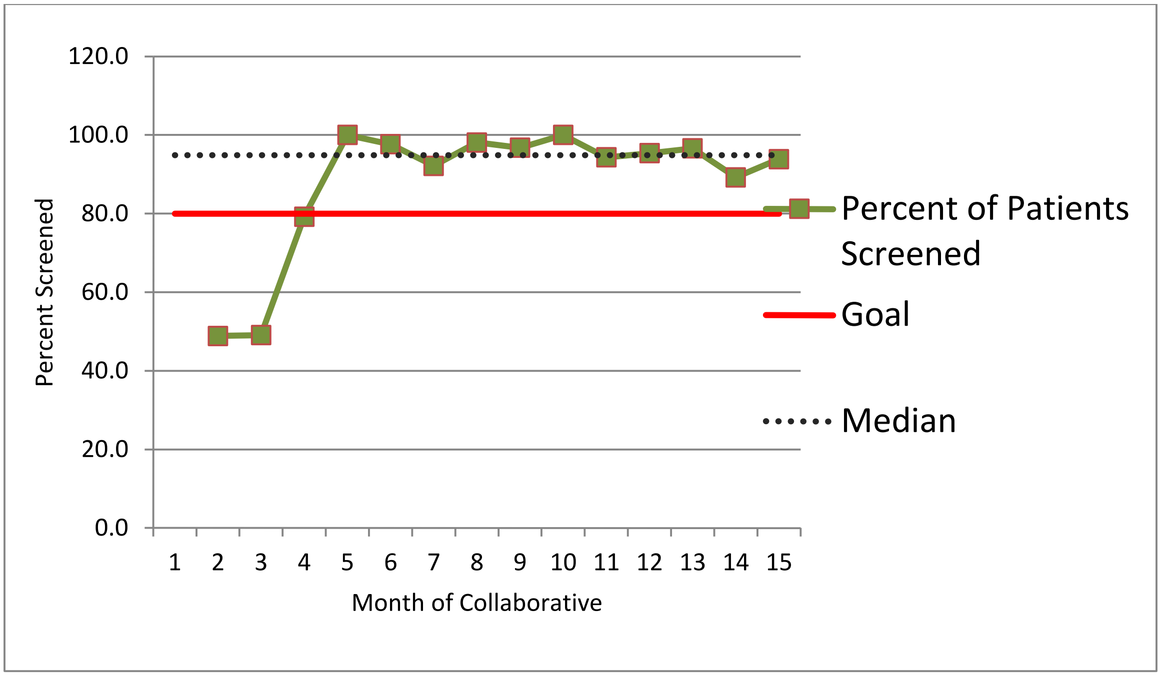

Figure 9. Percent of Patients over Age 20 with BP Screening (2011-2012).

For this particular measure, learning collaborative goals and a change in clinic process were key to improving screening across the length of the collaborative for blood pressure. This data point provided the data answers the research question: What was the impact of participating in the IPC on selected process measures? Although this particular measure improved after clinic personnel were oriented to the IPC process, this was not the same for all measures as will be discussed later in this study.

Tobacco Screening

Data from this measure answers the research question as to which process measures met IPC goals. At the beginning of the collaborative 31.6 percent of active clinic users had screenings for tobacco use. There was a steady increase in the percent of patient screened for tobacco use during the collaborative (See Figure 10). At the end of the collaborative 85.5 % of active clinic users were screened for tobacco use, an increase of 53.9 %.

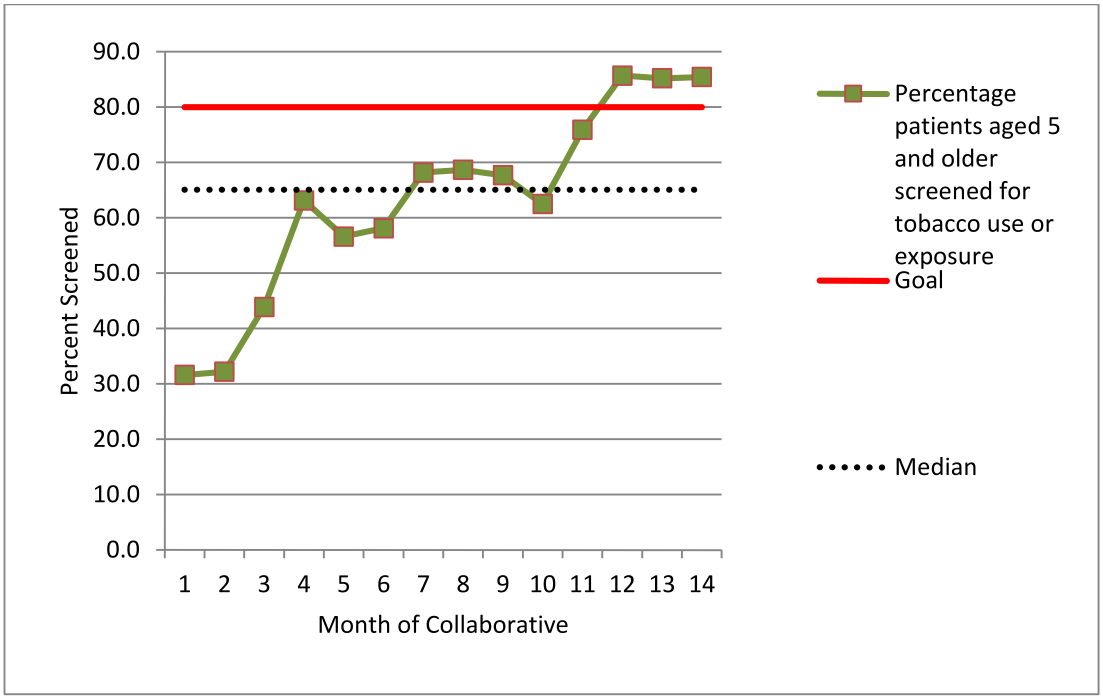

Figure 10. Percent of patients screened for tobacco use (2011-2012)

Providers were responsible for collecting tobacco use data at the beginning of the collaborative. This procedure proved to be an unreliable method of gathering data. The providers had reminders turned on in the electronic health record during the early part of the collaborative, but were inconsistent in using them and in documenting patient responses. Reminders were a little box at the top of the patient's electronic health record.

In one PDSA cycle, the clinic tested a paper survey, handed to patients at check-in. The provider was then responsible to enter the data. Although this initially increased screening for tobacco use from the 4th month of the collaborative to the 10th month of the collaborative, the screened percentage remained about the same. In another PDSA, the case manager entered the responses into the electronic health record with the result of a steady increase in the number of individuals screened for tobacco use.

Through the use of multiple PDSA cycles the clinic process of collecting tobacco use data was modified and the number of individuals screened for tobacco use steadily increased. The clinic met the collaborative goal of screening 80 percent of active clinical users the last three months of the collaborative.

Cancer Screening

Cancer screening process measures answers both research questions as to whether the clinic improved care and what process measures met IPC goals. The cancer screening process measures included colorectal screening, cervical cancer screening and breast cancer screening. These measures were also among the lowest percent of screened at the beginning of the collaborative. Of the three cancer screening processes only cervical cancer screening reached the IPC goal of 70% (See Table 3). The colorectal screening (colonoscopy) and breast cancer screening (mammogram) took place at a hospital 800 miles from the clinic, which created challenges in case management to meet the collaborative goals. Case management will be discussed further in the following paragraphs.

Colorectal Screening

At the beginning of the collaborative, the clinic screened 25%t of patients (aged 51-80) for colorectal cancer. By the end of the collaborative, the percentage increased to 60%, an increase of 35%. The clinic did not achieve the collaborative goal of 70% of the active population being screened for colorectal cancer. However, staff did get closer to the collaborative goal of 70% screening in fourth and sixth month of the collaborative with 64.3% and 66.7% respectively getting screened (see Figure 11).

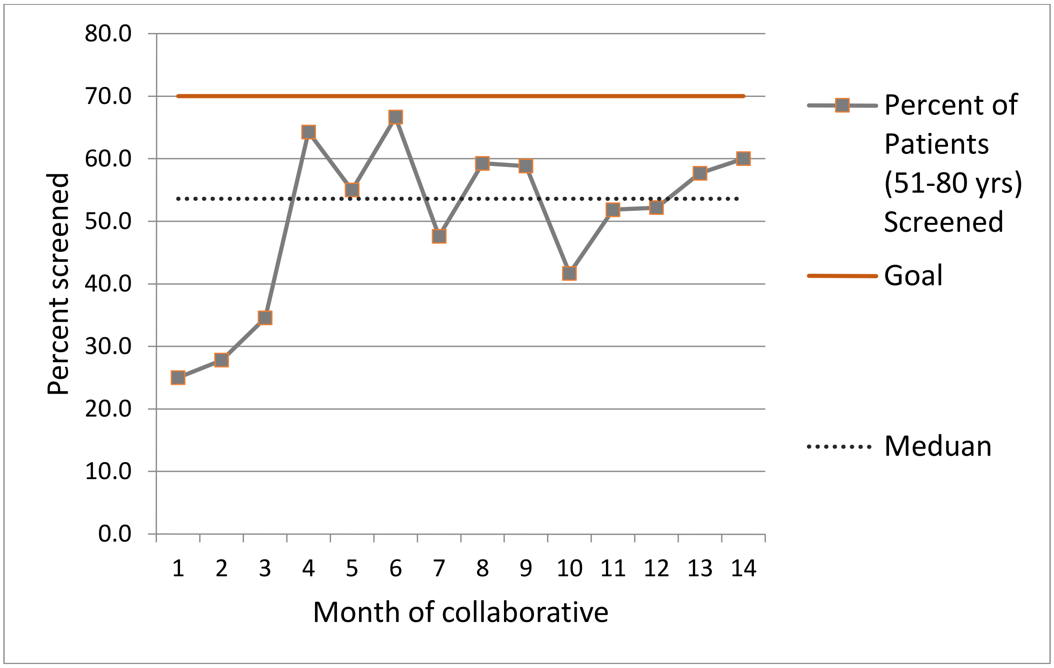

Figure 11. Percent of men and women current on colorectal screening (2011-2012*)*

Although the collaborative allowed the use of fecal occult blood (FOB), such as Hemocult, to meet this measure, the staff chose not to use this method to meet the goal. FOB analysis often produced a high incidence of false positive results due to a high intake of red meat, such as seal and whale and high rates of *h pylori*, possibly causing inflammation and bleeding in the stomach. The local population ate a large amount of marine mammals and also had high rates of *h pylori* making the FOB tests available at that time insensitive as a colorectal cancer screen. Also, the clinic staff decided not to use flexible sigmoidoscopies that do not visualize the right colon.

Prior to the collaborative, two patients had a diagnosis of adenomas of the right colon, which could not be identified with a flexible sigmoidoscopy. Because of these factors, staff believed that all patients should receive a screening of the entire colon. Colonoscopies were not available on island due to issues around anesthesia. Patients were required to fly to the referral hospital 800 miles distant to get this screening. When the patient returned from the referral hospital the results were entered into the electronic health record and the measure was met for that particular patient.

Major barriers to completing colorectal screening existed. These barriers included distance traveled, time away from work (a minimum of three days), and fear of flying due to past bad experiences. Additionally, patients also reported previous bad experiences with the procedure, fear of pain, and embarrassment. PDSAs for community awareness about colorectal cancer were effective at increasing the number of persons who agreed to travel for screening. Additionally, improvements in the electronic health record, and provider training in the use of population management tools were also helpful in tracking, and identifying individuals in need of screening. Provider training in motivational interviewing was also instrumental in the increased rates of individuals who traveled for colorectal cancer screening (See Figure 11).

The electronic health record was updated once the patient returned from the colorectal screening with the results. The measure for colorectal screening was satisfied with the entry of the results. If the results were not entered, the electronic health record showed that the patient was still due for the colonoscopy. Although many PDSA cycles were attempted, support systems changes were made, and provider trainings on motivational interviewing to encourage patients to get a colonoscopy proved helpful to increase the number of individuals who traveled for colorectal screening, the clinic was not successful at meeting the collaborative goals. The clinic did not meet this measure due having to use outside resources off island.

Cervical Cancer Screening

The data for this screening provided answers to the question about what process measures met IPC goals. At the beginning of the collaborative 36.5 % of women, ages 21-64, had screenings for cervical cancer. At the end of the collaborative, 84.5 % of women received screenings for cervical cancer, an increase of 48 %. The clinic met the collaborative goal of screening 70 % for women (aged 21-64) for cervical cancer in the fourth month of the collaborative and then in the eleventh through fourteenth months of the collaborative (See Figure 12).

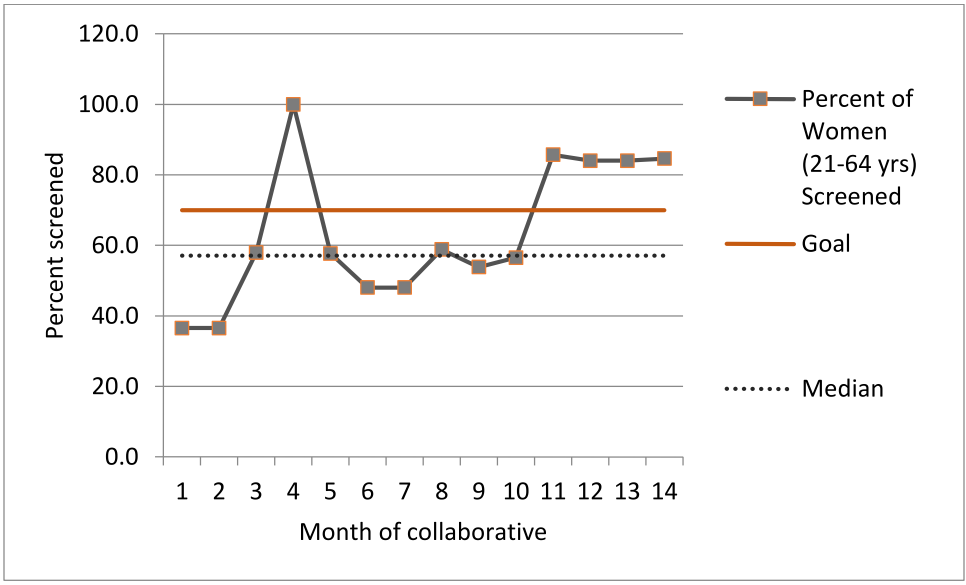

Figure 12. Percent of women (Aged 21-64) screened for cervical cancer (2011-2012)

The clinic did not achieve the IPC goal of 70 % screening in the first three months of the collaborative, because of the lack of consistency in identifying women needing cervical cancer screening and getting them to come for the screening. An overall improvement occurred from the beginning of the collaborative where the clinic started at only 35.7%, screened to 62.5% in the final month of the collaborative, an increase of 26.8%. The staff did not consistently meet the goal of screening 70% of women for cervical cancer.

The spike in number of cervical cancer screenings in the fourth month of the collaborative was due to the clinic bringing in a women's health care provider from outside of the community to perform cervical cancer treatment. A number of women did not want their cervical cancer screening done by someone whom they saw daily in social situations (e.g., the store or community gatherings). In April a women's health care provider from outside the community came to the clinic with the result that more women due for cervical cancer screening had those screenings done. The next month the number screened dropped because no outside provider was available.

In the fifth month of the collaborative, the clinic case manager began using iCare, a population health care management software program, to collect names of individuals due to have a cervical cancer screening. Patients received mailed reminder cards about coming to the clinic for cervical cancer screening. Although this reminder initially did not seem to impact numbers, eventually women started coming in for their cervical cancer screening. The clinic also coordinated with the referral hospital to arrange for cervical cancer screening at the same time the women had their mammogram. This coordinated effort of using outside providers, population management tools and sending reminders lead to improved screening rates.

Breast Cancer Screening

The data for breast cancer screening provided data for determining which process measures met IPC goals. The staff did not reach the IPC goal of 70% screening in two months of the collaborative, because of the lack of consistency in reminding women about the screening and actually doing the screening (See Figure 11). The staff was screening 35.7% of women for breast cancer at the beginning of the collaborative. Implementing population management tools, making better use of local resources, and improved processes increased the screening rate to 62.5% of women, an improvement of 26.8%.

This measure had the least improvement. The data points were not consistent and showed no clear pattern of improvement. Using the rules of run chart interpretation, the researcher cannot say that there was an improvement in this measure. The staff did not meet the goal of screening 70% of women for breast cancer by the end of the collaborative.

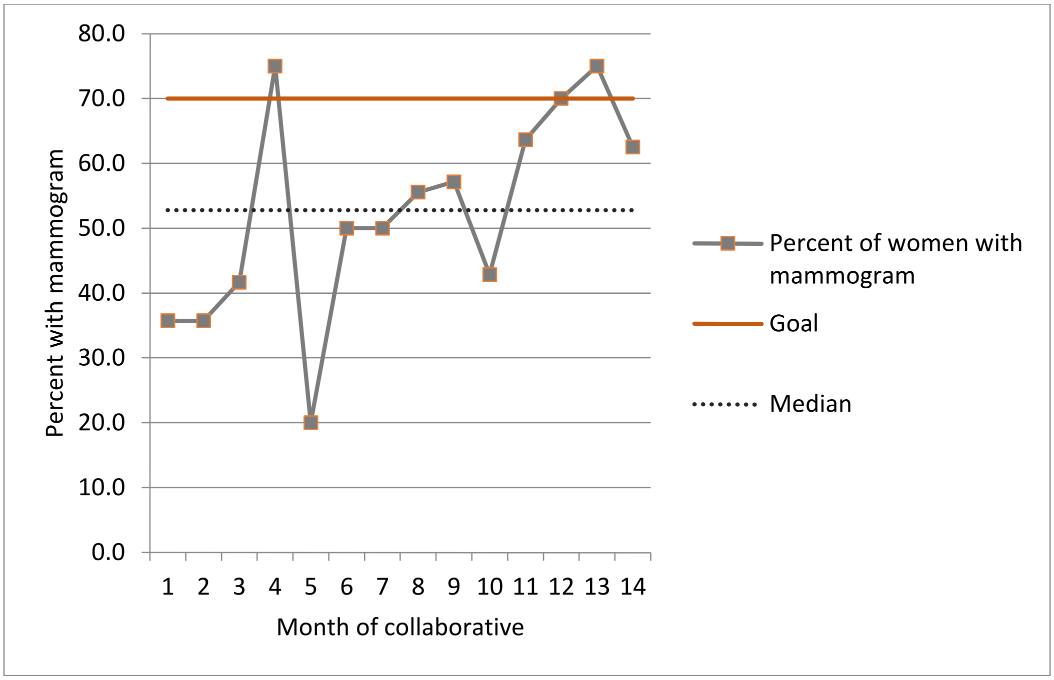

Figure 13. Percent of women screened for breast cancer (2011-2012)

In the fourth month of the collaborative, the large increase in the number of breast cancer screening related to a visiting women's health care provider who did cervical cancer screening, including a clinical breast exam. An appointment for a mammogram might not be requested at the referral hospital until they received a clinical breast exam results form. When women returned from the referral hospital, the results of the mammogram were entered into the electronic health record which satisfied that measure.

In the UWC health care system, women had two choices for mammograms. Women could either (a) travel off island to Anchorage for a mammogram or (b) wait for the mammogram van each year in the fall on the ferry. The tribally-operated hospital paid for travel and for housing for women needing to travel to Anchorage for their mammogram.

The spikes in screening in the fourth month and the eleventh month coincided with the visiting women’s health care provider and the mammogram van arrival on the ferry. Additionally, population management tools and provider reminders, initiated in the clinic, improved the screening numbers.

Two additional prevention process measures are part of the data answering the research question: What was the impact of IPC participation on selected process measures? These measures included diabetes comprehensive care and tobacco user cessation counseling. The tobacco cessation counseling process measure required that a patient, identified as a tobacco user, receive tobacco cessation counseling within the last year. The clinic met one collaborative goal for chronic disease prevention, but not the other.

Diabetes Comprehensive Care

Diabetes comprehensive care was a process measure, requiring a patient with diabetes to have a documented annual A1C, blood pressure, LDL, nephropathy assessment, retinal screen, and foot exam. If any of the elements were missing the measure was not met. At the beginning of the collaborative, 11.8% of patients with diabetes had their documentation at some point in the last year (See Figure 14).

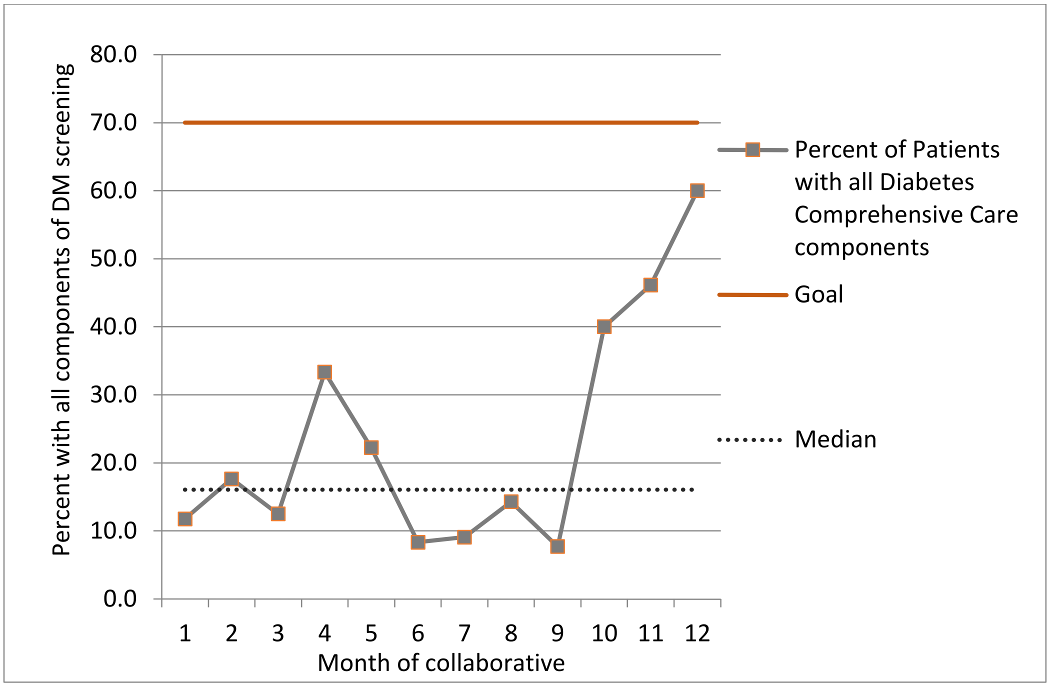

Figure 146. Percent of diabetic patients with documented A1C, BP, LDL, nephropathy assessment, retinal screen & foot exams (2011-2012)

From the eleventh month to the end of the collaborative, the clinic staff saw a steady increase in the percentage of individuals who completed all of their diabetes comprehensive care screens, labs and, exams However, by the end of the collaborative only 60% (an increase of 47.2 %) with diabetes had documented A1C, blood pressure, LDL, nephropathy assessment, retinal screen, and foot exams in the last year. The staff did not reach the collaborative goal of 70% of patients with diabetes completing all their comprehensive care components.

This measure was not met because the clinic did not have either professional or technical resources to meet the goal. Many PDSA cycles were attempted to meet this measure, but none were successful. In the ninth month of the collaborative, the screenings started to rise due to (a) improving case management at the clinic and (b) scheduling dilated eye exams when individuals were going to travel to Anchorage for other health care problems. Although a trend began toward meeting the measure, the staff fell short of the collaborative goal of 70% of patients with diabetes completing all their comprehensive care components.

Tobacco Cessation

This measure provided data for the research question: What was the impact of participation in the IPC on selected process measures? No tobacco cessation data was collected in the first two months of the collaborative. At the beginning of the collaborative 17.6 % of active clinical patients using tobacco received tobacco cessation counseling. A downward trend occurred in the fifth to ninth months of the collaborative (See Figure 15). At the end of the collaborative, 66.7% of tobacco users had tobacco cessation counseling, an increase of 49.1%.

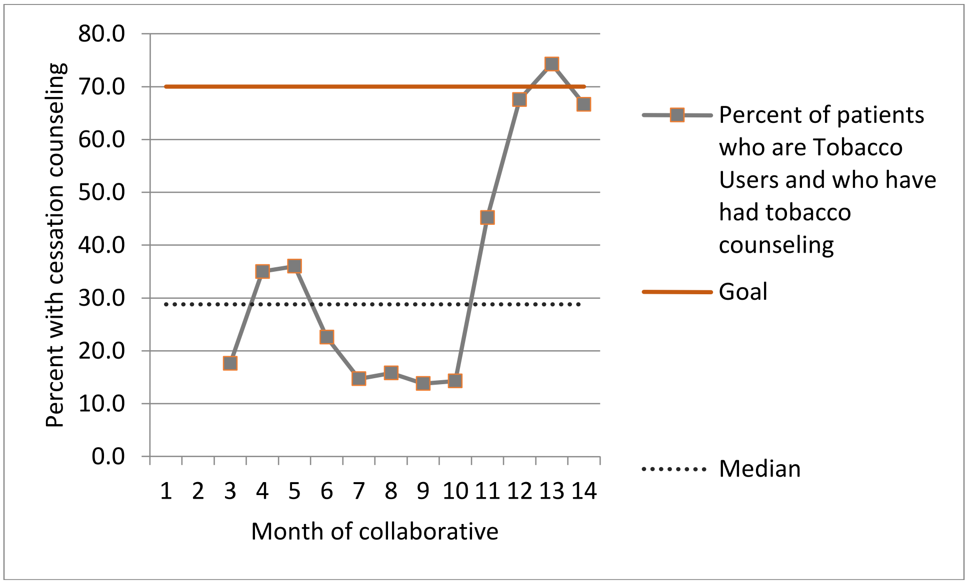

Figure 15. Percent of patient who received tobacco cessation counseling (2011-2012)

Improvements in this measure in the 10th month of the collaborative were as a result of provider education and process improvement in addressing the tobacco cessation goal. The clinic staff met the collaborative goal of counseling 70% of tobacco users to quit only one month during the collaborative.

Results of Collaborative Patient Outcome Measures

The following section presents data to answer the research question as to what outcome measures showed improvement. Outcome measures included: control of blood pressure (BP), control of lipids and control of Hgb A1C. Of the outcome measures the clinic only met the collaborative goal for lipids (See Table 4).

Table 4

Outcome Measures for Chronic Conditions

Measure	IPC Goal	% Screened at Entry	% Screened at End	Percent Improvement
Control of BP	70%	13.1	60	46.9
Control of Lipids	70%	36.5	84.6	58.1
Control of Hgb A1C	70%	35.7	62.5	26.8

Control of Blood Pressure

At the beginning of the collaborative, 13.1 % of patients with hypertension had controlled blood pressure. At the end of the collaborative 57.5% of those with hypertension had controlled blood pressure, an increase of 44% (See Figure 16). This dramatic increase occurred for patients with blood pressure in control began in the third month of the collaborative and was associated with a change in the process for patients who came into the clinic with an elevated blood pressure. Their pressure was checked again at the end of the visit. However, even with these changes in procedure in measuring blood pressure, the clinic did not meet the collaborative goal of 70% of patients having their blood pressure under control.

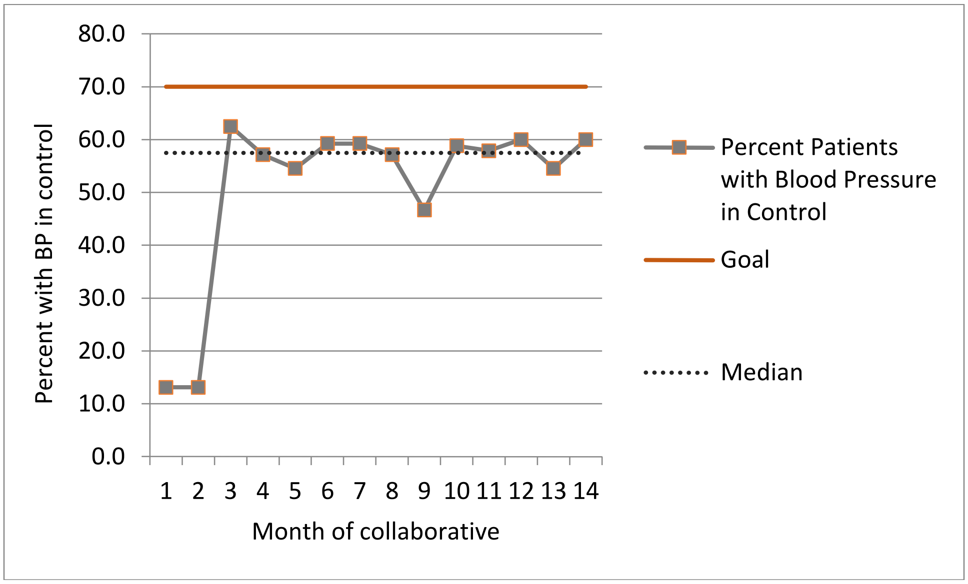

Figure 16. Percent of diabetic patients with BP < 130/80 or a diagnosis of hypertension & BP < 140/90 in 2011-2012

The implementation of the clinic process change was in the third month of the collaborative with a large increase in blood pressures under control. However, after that initial improvement, the numbers in control leveled off. The majority of reasons for not meeting this measure were a result of patients misunderstanding their medication instructions. Patients thought that they had to eat first in order to take their blood pressure medications. When they came in for their fasting lab work, they had not eaten and not taken their medication. The result was elevated blood pressure readings. Also many patients waited until they were out of their medication before coming in for a refill. Again, the result was an individual with an elevated blood pressure. Changing years of habits proved difficult. Getting patients to come back for re-check of their blood pressure also was challenging. Although the clinic staff attempted to improve the clinic process, the collaborative goal of 70 %t of patients with blood pressure control was not achievable.

Control of Lipids

At the beginning of the collaborative, only 4.2% of the patients had their LDL measured and were in control. A downward trend in data occurred from the sixth to the ninth month of the collaborative. Inconsistent data entry for labs into the electronic health record accounted for the low initial numbers and the dip in data (See Figure 17). In the sixth month of the collaborative the clinic lost a key individual who was entering lab data. With fewer results being entered into the electronic health record, any abnormal value that did get entered was enough to decrease the percent of patients whose LDL was in control.

At the end of the collaborative, 80% of individuals received screenings. The following statements made by measured LDLs were in control, an increase of 75.8%. The number in control between the 9th and 11th months probably more accurately reflected data entry issues, rather than actual LDL in control. The clinic met the collaborative goal of 70% in the last three months of the collaborative.

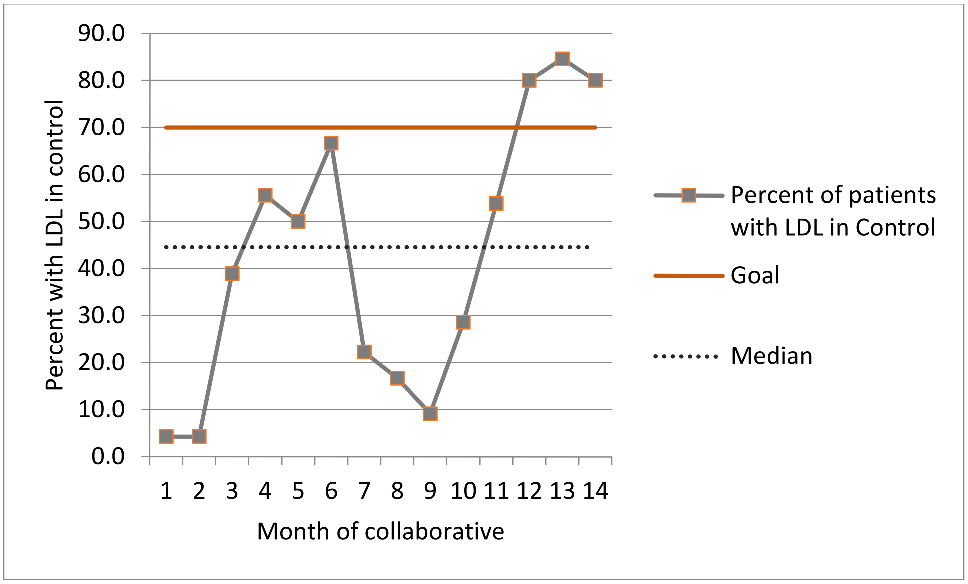

Figure 17. Percent of individuals on cholesterol lowering medications with controlled LDL (2011-2012)

Control of HgbA1c

The data for this measure provided answers for both research questions: Did patient care improve at the clinic and also the question; what outcome measures met collaborative goals? As part of negotiated services with our referral hospital, a diabetes team from the tribally-operated hospital in Anchorage traveled annually to the clinic to provide a diabetes clinic. The team worked with the local clinic staff to manage medications, as well as providing podiatry services and nutrition counseling.

Prior to the visit the clinic had all diabetics come in for blood drawing. The UWC saw patients with diabetes at other times of the year, but this visit was an opportunity for the patient to see a specialist in diabetes care. No measurement of HbgA1cs was available in the sixth and seventh months of the collaborative (See Figure 18). This data mission occurred because patients were busy during the summer months with fishing and other subsistence activities.

Only 21 individuals with type II diabetes were in the clinic population. Because of this small numbers, a few individuals with out of control significantly HgbA1C affected the rest of the group. Improvement after September of the collaborative year reflected the visit of the diabetes team when medication adjustments took place. (See Figure 18)

With a variety of provider education sessions on patient self-management training and data entry improvements assisted the clinic staff to meet the collaborative goal of 70% of the diabetic patients with HgbA1C in control the last two months of the collaborative. Using the rules of run chart interpretation (Provost & Murray, 2011), I cannot say that the improvement in meeting the goals was due to more than chance. I can say that there was a trend toward improvement. More data points past the end of the collaborative would be needed to see if the trend continued or dipped back down past the median.

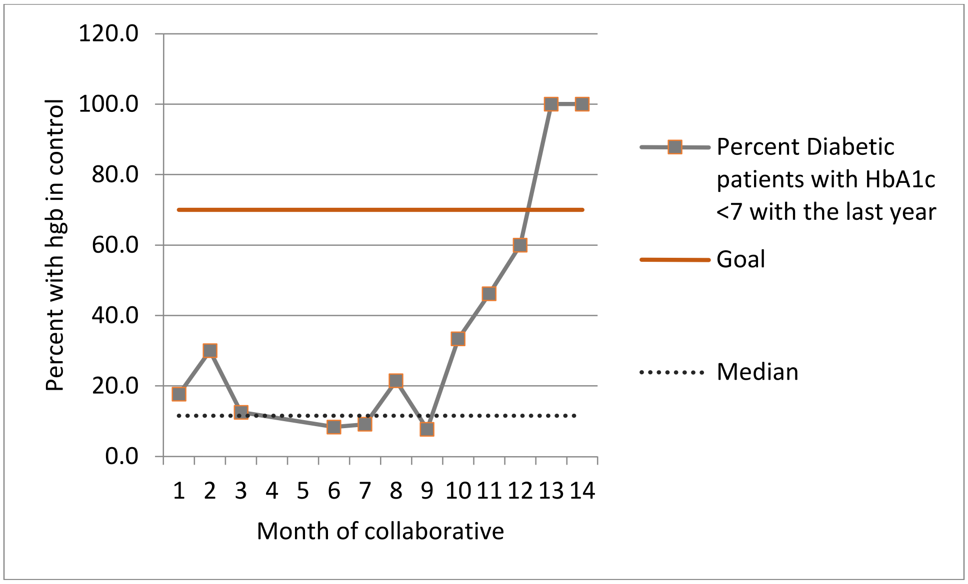

Figure 18. Percent of diabetic patients with HgbA1C less than 7 (2011-2012**)**

Summary

Data from the IPC collaborative indicated positive change. The areas of greatest improvement for process measures were in screening for depression and intimate partner violence with 82.1% and 78.2% improvement respectively. Both measures met collaborative goals of screening 80% of the eligible patient population. Although screening for body mass index improved somewhat (16.5%), the clinic screened over 80% of the patients for BMI during the entire duration of the collaborative. The process measures screening for DV/IPV, depression, alcohol misuse, tobacco use, cervical cancer screening, and tobacco cessation counseling all increased to rates of over 50%.

Other process measures (i.e., screening for blood pressure and diabetes) had increases of 45% and 46.9 % respectively. Process measures showing the least improvement were colorectal (35%) and breast cancer (26.8%) screenings.

The following process screening measures all met collaborative goals of 80%: obesity DV/IPV, depression, alcohol misuse, blood pressure, tobacco use, cervical cancer, and tobacco cessation counseling. Three measures did not meet the collaborative goal of 70% screening: colorectal cancer screening, breast cancer screening, and comprehensive diabetes care.

Patient outcome measures likewise had mixed results.   Although the clinic met the collaborative goals, control of lipids had an improvement of 58.1% and was the only outcome measure to meet the collaborative goal of 70%. Control of HgbA1C had the lowest improvement at 26.8%. Control of blood pressure had an improvement of 46.9% at the end of the collaborative. Control of blood pressure or HgbA1C met the collaborative goal of 70%.

Chapter 5 is a presentation and discussion of the study findings and conclusions along with study limitations and recommendations for future research in this area.

Chapter 5: Discussion, Conclusions, and Recommendations

A Brief Overview of the Study

This study was an evaluation of the impact of participation in the IHS IPC collaborative for a small tribal health organization. The framework for this study was the chronic care model. Providing quality health care for individuals with chronic disease was important in preventing complications and their progression (Clark et al., 2011; Cohen et al., 2004; Wagner et al., 2001). Yet, oftentimes patients did not get the care that they need (Bodenheimer, 2003; Duckers, Wagner, & Groenewegen, 2008; Hroscikoski et al., 2006). Disparities in chronic diseases existed between the overall U.S. population and Native American people (Acton, 2002; Amparo, Far, & Dietz, 2011; IHS, 2013; Sequist et al., 2010).

To address these disparities, the IHS partnered with the Institute for Health Care Improvement to develop a quality improvement patient care collaborative. The goals of the collaborative were to provide high quality, coordinated care and promote measurable changes within the system (IHS, 2012). Patient care improvement collaboratives have been widely used method to improve health care practices in the United States (Grossman et al., 2008). The QWC took part in the IPC collaborative over a period of 15 months in 2011-2012.

The purpose of this study was to determine whether participation in the IHS IPC collaborative improved identified patient care processes and outcomes. The principal research question for the study was the following: Did participation in the IPC improve the delivery of care and outcomes at the clinic? The associated questions included the following:

1. What criteria did the organization use to measure the success of the implementation?
2. What was the effect of this implementation on the organization's performance?

Summary and Interpretation of Findings

Using an evaluation methodology, run charts were the instruments for collecting data and determining whether clinic staff met the collaborative goals for the identified measures. Archived data stored in RPMS collected during participation in the collaborative was the data source for analysis. The results of the study were as follows. All of the preventive screening process measures (i.e. documentation of BMI, domestic violence screen, depression screen, alcohol screen, tobacco use, and blood pressure screen) improved and met collaborative goals. However, for cancer screening (i.e., colorectal, cervical, breast) the clinic met the collaborative goals only for cervical cancer screening. The clinic did not meet collaborative goals for colorectal or breast cancer screening.

For the patient care process measure for comprehensive diabetic care assessment (i.e., Hgb A1C measured, BP measured, LDL measured, nephropathy assessed, retinal exam, and foot exam), the clinic did not meet the collaborative goal of 70%. The clinic staff also did not meet the goal for tobacco cessation counseling. For patient outcome measures (control of blood pressure, lipids, and Hgb A1c), the clinic met collaborative goal only for lipid control. The clinic did not meet the goal for control of either blood pressure or Hgb A1C.

The process measures that met collaborative goals involved the use of PDSAs to improve clinic processes in collecting and documentation of patient screening results. Those process measures that did not meet collaborative goals required the use of external resources such as dilated eye exam, colonoscopies and mammograms. Patient outcome measures, not meeting the collaborative goals, were due to issues around patient self-management.

Discussion of Results

Process Measures for Health Risk Screening

Process measures in this evaluation included health risk screening, cancer screening, tobacco cessation counseling, and comprehensive diabetes care. According to the findings of the evaluation, the clinic met all of the collaborative process measures goals for preventive screenings. Polacsek et al. (2009) had similar conclusions that participation in a health care improvement collaborative improved process outcomes. The improvement in process outcomes was also similar.to studies by Mangione-Smith et al. (2005) and Landen et al. (2007). These positive findings were at odds with the study by Shaw, Chase, Howard, Nujtting, and Crabtree (2012), who found that participation in a health care improvement collaborative resulted in minimal changes in clinic processes.

The preventive measures process goals for this study included BMI assessment, domestic violence screening, depression screening, alcohol misuse screening, blood pressure screening, and tobacco use screening. The clinic met all of these measures through the use of PDSA cycles, which lead to changes in clinic processes (e.g., the institution of paper questionnaires to survey sensitive personal questions). The collection of this sensitive information became routine, and patients were willing to answer these questions on paper. For blood pressure screening, the measure was met because the clinic changed their protocol to require a blood pressure at each visit. The clinic was able to meet preventive screening goals through the use of PDSA cycles from the model for improvement. Incorporating the model for improvement into clinic processes lead to improved numbers of individuals screened for these issues.

For the provider who approaches patient care based on the chronic care model, the hope is that screening will help the provider identify issues that lead to chronic disease. The provider then works collaboratively with the patient to set goals for addressing areas of concern. For example, the patient with the increased BMI can be referred to the nutritionist or given a pass to the local recreation center or pool to increase their physical activity level. The patient with positive DV/IPV, depression, or alcohol misuse screening can be referred for counseling or connected with the appropriate resources.

Process Measures for Cancer Screening

Cancer screening process measure goals in this study were met for cervical cancer screening, but not for colorectal or breast cancer screening. While cervical cancer screening was available at the clinic, screening for colorectal and breast cancer screening was available only at a facility 800 miles from the clinic.

Cervical cancer screening is performed to identify HPV which is the leading cause of cervical cancer. Caught at an early stage, it can be easily treated. The cervical cancer screening measure was met primarily due to the use of a provider from outside of the community. This provided women who were concerned about receiving this exam from local providers an alternative. Additionally, the clinic used case management and population management tools to increase the amount of women receiving cervical cancer screening. These methods are core to the chronic care model as modified by the IHS.

For colon cancer screening, the main reason for not reaching collaborative goals and making very little improvement was due to lack of local access to the screening. This finding was similar to a study by Gupta et al. (2009, in that access to care was the main predictor of participation in colon cancer screening. In this part of Alaska, although colon cancer screening was available at no cost to eligible American Indian and Alaska Native individuals, access to care for colon cancer screening was difficult due to long distances to travel for these services.

Barron et al. (2008) found that reducing time and distance to screening increased participation in screening for colon cancer. One option for increasing screening for colorectal cancer was to provide these services in the local community. However, providing colonoscopies (the preferred method of screening for colon cancer in the Alaska Area IHS) was not feasible due to medical restrictions around anesthesia. The surgery clinic at the referral facility in Anchorage offered to travel to the community to perform flexible sigmoidoscopies; however, this option would miss lesions of the ascending colon.

Another low cost option involving no travel would be to screen by using the newer fecal occult blood testing. This procedure requires the patient to collect a stool specimen, place the sample on a card, and bring it to the clinic for the final step of testing for the presence of blood. The newer fecal occult blood tests were more sensitive for blood coming from the intestine and did not have the same shortfalls of older hemocult tests. However, Morikawa et al. (2005) found that fecal occult blood testing sensitivity could be relatively low depending on the location of the tumor. O'Leary, Olynyk, Neville, and Platell (2003) found that a colonoscopy was the most effective for detecting colorectal cancer, followed by flexible sigmoidoscopy and then annual fecal occult blood testing. This recommendation matches the preferred colorectal screening method for the providers at the clinic.

The best use of available resources would be for the clinic to maximize case management by trying to get the most out of each trip to the referral facility. When patients travel to Anchorage for other specialty clinic appointments, they could have an appointment also for a colonoscopy or mammogram to minimize family and work disruption. Many patients travel to Anchorage for the annual Alaska Federation of Natives Conference or for their regional Alaska Native corporation meetings. Scheduled appointments could be either before or after the conference.

Providers and case managers would need plan far in advance of these meetings as individuals from all over the state were also traveling in to Anchorage for the meetings and appointments at the referral hospital and slots fill up quickly. In terms of breast cancer screening, similar issues also existed regarding access to care. Although mammograms were available at the referral hospital 800 miles away, women were sometimes reluctant to fly due to the time and distance involved and past experiences related to flying in bad weather.

Doescher and Jackson (2009) found that rural women, particularly the elderly, were less likely to receive a mammogram than their urban counterpart. Access to care was more difficult to address given the remoteness of the setting. One option for addressing access to care for those women who were reluctant to fly or unable to take long periods off work would be to make use of the mobile mammogram van that travels to the island once a year.

Process Measures for Chronic Disease

Two other chronic disease process measures did not meet collaborative goals: tobacco cessation counseling and diabetes comprehensive care. The clinic almost met the collaborative goal for tobacco cessation counseling, but fell short. Continued improvement occurred as the clinic went through the collaborative. Screening for tobacco use identified patients who can be offered tobacco cessation counseling or information on other resources for intervention. The clinic staff found that by asking this question at every visit, patients started at least thinking about quitting.

Tobacco use in this area of Alaska was among the highest in the state with lung cancer the second leading cause of cancer among AI/AN in this region of Alaska. (ANTHC, 2015). The high rates of tobacco use in the region caused the agency to give tobacco cessation activity a high priority. PDSA cycles, provider education in motivational interviewing, and improved documentation of cessation all contributed to the improvement. Activities based on the chronic care model and the model for improvement were instrumental in the increased performance for this measure.

For the comprehensive diabetes screening measure, one portion of the measure kept the clinic from meeting the goal, retinopathy screening to be performed at the referral hospital 800 miles distance from the clinic. Screening the retina of individuals with diabetes helps to identify eye problems related to diabetes to be caught early and early intervention can prevent vision loss. The measure was not met until the patient actually completed the screening, and the results were entered into the electronic health record.

One option for meeting this goal was to make use of the IHS Joslin Vision Network (JVN) tele-ophthalmology program. The IHS JVN program was a telemedicine program used through much of Indian country for the remote diagnosis and management of diabetic retinopathy. This system involved a non-eye-dilating system that photographed the retina and sent the results electronically to experts for review. Researchers (e.g., Carrol et al., 2011) found this method of looking at the retina to be superior to in-person exams with an optometrist or ophthalmologist. However, some techniques could be useful in training staff to use the system.

The quality of the images of the JVN system depended on the skills of the individual using the camera. The JVN program required providers, going to use the camera, to travel to Arizona for training. Of particular note, the JVN program found that individuals who did not regularly use the camera lost the ability to take quality photos. The JVN program recommendation was that individuals take at least 100 retinal photos each year to remain proficient. The requirement for off-site training was a barrier for the clinic. With cuts in IHS budgets, no funding was available to send a staff member to Arizona for the training.

In addition, fewer than 100 individuals with diabetes were in the entire agency, so keeping skills honed would be difficult. Another possibility was to partner with a sister agency operating clinics in the next region for provision of the service. The camera is provided by the JVN program at no cost to the tribal agencies. Trips for retinopathy screening needed to be carefully coordinated because of the limited availability (i.e., only one camera) for the entire south west and south east region of Alaska.

Patient Outcome Measures

Outcome measures were less successful than process measures with only lipids in control meeting the collaborative goal. Control of BP and control of Hgb A1C did not meet the collaborative goal. In a study over a period of two years Halladay et al. (2014) had similar findings with lipids. A significant improvement occurred in LDL levels. The results, however, had statistically significant improvement in blood pressure and HgbA1c control. Their conclusion was that improvement occurred with four key factors: (a) a diabetes registry, (b) use of standardized care templates, (c) patient care protocols, and (d) self-management support systems.

The IHS IPC Collaborative did not recommend use of standardized care templates or patient protocols. The collaborative mentors did recommend self-management support systems as part of the chronic care model. Classes on self-management support were available at each of the three face-to-face IPC learning sessions. One provider at the UWC attended some of these self-management support classes. The UWC had a diabetes registry and patient self-management support systems in place. Access to the diabetes registry and self-management tools were on site.

Additionally, the clinic had access to experts at the referral hospital via phone or tele video. Although the electronic health record had standardized note templates, two recommended by the collaborative were missing: (a) diabetes and (b) patient care protocols. Knight, Ford, Audehm, Colagiuri and Best (2012) found that participation in a diabetes care collaborative improved control over blood pressure, lipid l and HgbA1C levels. However, undetermined was whether the improvements were due to improved systems changes (e.g., registry clean-up and accurate coding), improved team dynamics, or redesign of clinical care.

Although the UWC saw some improvements in HgsA1c in control, they did not meet the goal. This appeared to be due to issues around patient self-management. As part of the chronic care model, self-management support was an important component and one that needed to be strengthened in the clinic.

Chronic Care Model

Using the chronic care model as a framework for data analysis of patient care for chronic diseases was useful for the majority of process measures. Less certainty existed about the impact on chronic disease outcome. Many unmet measures of collaborative goals made significant improvement. Possibly, if the period of evaluation was extended the outcome measures might have met the collaborative goal.

With the chronic care model and the model for improvement as the framework for improvement, the UWC met the majority of preventive screening measures. The UWC incorporated principles of the IPC collaborative into their own yearly clinic self-evaluation, the expectation was for each employee to develop at least one PDSA cycle during the year. Additionally, participation in the ongoing Quality and Innovation Learning Network was a requirement for every person working at the clinic.

Conclusions

Implications for Social Change and Recommendations

Chronic disease remains a challenge for many American Indian and Alaska Native clinics. Those clinics with small practices, limited resources, and geographical isolation have additional challenges. Staff challenges include adequate staffing, training and appropriately assigning components of data collection, and entry into the electronic health record. Patients face challenges, as well in learning to take responsibility for their own chronic health care issues.

Through such techniques as motivational interviewing and other self-management support tools, a provider can work collaboratively with patients to prevent chronic disease complications. Additionally, organizational changes to systems need to be adequate to meet needs. Allowing the clinic personnel to make small, quick cycle changes to test new processes is important in the journey to improve patient care. Even with limited resources and a small staff, positive changes can improve care for patients. In addition, successes on a small scale can then be shared with the rest of the agency and other organizations of similar size. Others can learn from both UWC’s successes and failures. A program built on the chronic care model and using it for improvement can contribute to significant improvement in patient care.

Data from this study related to professional practice in the following ways (See Figure 19). An organization needs staff to have the will to improve. Administrative support and participation in collaborative processes and methods is instrumental for support of clinic staff activities. Consistent and adequate staffing is important to support collaborative activities and to meet collaborative goals.

When staff is small, the loss of key personnel can lead to decreased data collection and data entry. Improved processes, tested on s small scale, can then be spread throughout the agency and institutionalized. Improved processes lead to improved screening for chronic disease and other health risks. Improved screening is thought to lead to improved outcomes in chronic disease.

Provider training is instrumental in improving understanding of the chronic care model and the tools used for patient self-management and improved management of chronic care conditions. Strong case management is important when trying to coordinate resources that are outside of the clinic. Use of population management tools and electronic health record enhancements such as chronic disease screening reminders all improve screening and access to appropriate resources.

Maximizing resources, either within the agency or through partnering with other organizations also helps to improve screening for chronic disease. All these methods have a basis both in the chronic disease model as modified by the Indian Health Service and through use of the model for improvement.

Figure 19. Relation of data for professional practice

Limitations and Future Recommendations

One limitation on this study was using a tribally-operated clinic, so the findings may not be applicable to larger facilities. Also at the completion of this 14 month study, it was unknown whether the results of participation in the collaborative were ongoing or tapered off after the collaborative ended.

Recommendations for Action

Recommendations flowing from this study would be to freely share both successes our failures with sister agencies in Alaska and smaller tribal groups across the

U.S., struggling with implementation of IPC. The IHS developed a continuation of the IPC for those agencies who completed the collaborative. Clinics may apply to participate in the Quality and Improvement Learning Network (QILN). The QILN is more loosely structured with no face-to-face meetings, but with monthly learning and sharing calls. This program would be a platform for the clinic staff to share their experiences.

For some items, such as measurement of blood pressure and screening for obesity, consistency in clinic procedure is helpful to improve the percentage of people screened. A standard clinic policy which requires weight and blood pressure at each visit results in patients expecting that these two measurements will be taken, and the majority of patients will consent to be weighted and have their blood pressure measured.

To increase screening for items,such as depression, domestic violence, alcohol use, and tobacco use, a consistent method is also helpful. Patients come to expect that these topics will be surveyed at least twice a year and become more comfortable in completing the surveys. Once this routine becomes part of data collection in the clinic, many patients will not refuse the screening. This standardized procedure has opened up dialogue with patients, too embarrassed or not knowing how to ask for help with their life issues.

Recommendations for increasing cervical cancer screening in very small communities are twofold. One is to offer the patient choices. By bringing in an outside women’s health care provider, women, who may not want cervical cancer screening by someone whom they see in the community on a daily basis, may come in for screening. By having this visiting provider also do clinical breast exams, the pre-screening exam required for referral for a mammogram can also be completed. Additionally, the clinic needs to educate the community that providers working at the clinic are able to do the cervical cancer screening. The other option is to coordinate cervical cancer screening to occur at the same time the patient is flown out for mammogram screening. All of these approaches will help to improve cervical cancer screening rates.

For those organizations who, due to isolation or rural location, must sent their patients to a remote facility for colorectal and breast cancer screening, we can offer a few insights. Case management in these two instances is key. Individuals needing the screening need identification, as well as resources to help meet the need. Not every small clinic has access to Indian Health Service or tribally operated resources, such as paid patient travel and housing when being sent to a facility located away from their home town.

If a visiting mammogram unit comes to the area, the clinic needs to do ommunity outreach and case management to get patients in for the screening. Additionally, if patients travel to a remote referral facility for other procedures, a mammogram, or cervical cancer, or colorectal cancer screening appointments could potentially be added. Additionally, particularly for colorectal cancer screening, community outreach and culturally appropriate education is useful in increasing interest in obtaining screening. Also, provider training in motivational interviewing is also helpful to increase screening rates.

Recommendations for action for patient outcome measures include the following. A change in measuring blood pressure from the beginning of the visit to the end of the visit resulted in increases in blood pressure in control. This modification allowed a patient to relax, lowering the blood pressure. In terms of HgbA1c in control, the number of individuals in the study with diabetes was too small to make any firm recommendations. It appears that involving a diabetes team of experts might be helpful in improving A1C in control.

Recommendations for action in terms of control of lipids involve both data entry and provider education. By assigning lab data entry to one individual (in those clinics without a lab on site), data entry is improved. Provider education on motivational interviewing and understanding of lipid management is also a key aspect to lowering lipids.

The study results were shared with the parent agency health board at agency board meetings and further disseminated to the community during a tribal gathering. Results are available for reading by anyone coming to the clinic.

Recommendations for Further Study

Further study is needed on the on-going data collection after completion of the IPC collaborative. The clinic transitioned to the Quality and Innovation Learning Network, a continuation of the processes learned in the collaborative. The monthly teleconferences continued, but no face-to-face meetings. Further study could evaluate whether the changes were permanent or just reflected participation in the IPC collaborative. Additional study could determine ways to improve diabetes care outcomes. What more would be needed to help patients reach their BP and HgbA1c goals?

For the behavioral health screening items, depression, DV/IPC, and alcohol misuse, future studies could focus on how many of the positive screens did receive a referral to behavioral health and whether the patients actually received the service. Assumed is that positive screening leads to referrals, but this study did not investigate that data.

The results of this study offer new information about the effect of participation in a patient care improvement collaborative in a small tribally run clinic. One unique aspect of this collaborative was the scope of the collaborative. The majority of health care collaboratives focused on one or a few outcomes or processes (Nadeem, Olin, Hill, Hoagwood, & Horwitz, 2013). The IHS IPC Collaborative covered 14 measures and focused on improvement across the entire organization from leadership to those providing direct patient care in the clinic.

In conclusion, the IHS IPC Collaborative was effective in assisting the clinic staff to meet the majority of the collaborative goals. By participating in the collaborative the UWC was able to improve many patient care processes and some patient outcomes. Although the clinic did not meet the collaborative goals for breast cancer screening, colon cancer screening, and blood pressure control, or HgbA1c in control, there were improvements the number screened and in control.

The evaluation enabled the researcher to identify and document changes in care provided at the clinic during the patient care collaborative. A variety of methods (e.g., case management, electronic health record enhancements, paper based questionnaires, provider training in motivational interviewing and other processes recommended by the

IPC collaborative for improvement) were useful during PDSA cycles. Through PDSA cycles based on Deming’s model for improvement and the chronic care model with proper support and adequate staffing, improvements occurred in patient care processes, and in one patient outcome.

References

Acton K., Burrows, N., Moore, K., Querec, L., Geiss, L., & Engelgau, M. (2002). Trends in diabetes prevalence among American Indian and Alaska Native children, adolescents, and young adults. *American Journal of Public Health*, 92(9): 1485–1490. Retrieved from www.ncbi.nlm.nih.gov/pmc/articles/PMC1447266.

Alaska Native Tribal Health Consortium Epidemiology Center (2015). Aleutian and Pribilof's Regional Health Profile. Retrieved from http://www.anthctoday.org/epicenter/data/regions/ap/index.html

American Diabetes Association. (2011). Diabetes statistics: Data from the 2011 National Diabetes Fact Sheet. Retrieved from www.diabetes.org/diabetes-basics/diabetes-statistics.

Amparo P, Farr S., & Dietz, P. (2011). Chronic disease risk factors among American Indian/Alaska Native women of reproductive age. P*ublic Health Research, Practice and Policy*, *8*(6), A118-1128 Retrieved from www.cdc.gov/pcd/issues/2011/nov/10_0268.htm

Anderson, G. & Horvath, J. (2003). The growing burden of chronic disease in America. *Public Health Reports, 119*, 263-270. Retrieved from www.ncbi.nlm.nih.gov/pmc/articles/PMC1497638/pdf/15158105.pdf

Asch, S., Baker, D., Keesay, J., Broder, M., Schonalu, M., Rosen, M.,…Keeler, E. (2005). Does the collaborative model improve care for chronic heart failure? *Medical Care, 43*, 667-675. Retrieved from www.randhealth.org.

Baker, D., Asch, S., Keesey, J., Brown, J., Chan, K., Joyce, G., Keeler, E. (2005). Differences in education, knowledge, self-management activities, and health outcomes for patients with heart failure care for under the chronic disease model: The improving chronic illness care evaluation. *Journal of Cardiac Failure*, *11*, 405-413. Retrieved from www.sciencedirect.com/science/article/pii/S1071916405001375.

Barron, R., Rimer, B., Coates, R., Kerner, J., Kaira, G., Melillo, S.,…Leeks, K. (2008) Client-directed interventions to increase community access to breast, cervical, and colorectal cancer screening: A systematic review. *American Journal of Preventive Medicine*, *35*(1), Supplement: S56-S66. doi:10.1016/j.amepre.2008.04.001

Bell, W. (1983). *Contemporary social welfare*. New York, NY: Macmillan.

Berwick, D. (1989). Continuous improvement as an ideal in health care. *The New England Journal of Medicine*, *320*(1), 53-56.

Bertoia, M., Waring, M., Supta, P., Roberts, M., & Eaton, C. (2012). Implications of new hypertension guidelines in the United States. *Hypertension: Journal of the American Heart Association*, *112*, 639-644. doi: 10.11161/HYPERTENSIONAHA.112.193714.

Bodenheimer, T. (2003). Interventions to improve chronic illness care: Evaluating their effectiveness. *Disease Management*, *6*(2), 63-71. doi:10.1089/109350703321908441

Bodenheimer, T., Chen, E., & Bennett, H. (2009). Confronting the growing burden of chronic disease: Can the U.S. health care workforce do the job? *Health Affairs*, *28*(1), 62-74. doi:10.7326/0003-4819-142-10-200505170-00010

Bogatz, G. & Ball, S. (1971). *The second year of Sesame Street: A continuing evaluation.* Princeton, NJ: Educational Testing Service. Retrieved from files.eric.ed.gov/fulltext/ED122800.pdf.

Bouchet, B, Francisco, M., & Ovret, J. (2002). The Zambia quality assurance program: successes and challenges. *International Journal of Quality Health Care*, *14*, Supplement 1:89-95. doi:10.1093/intqhc/14.suppl_1.89

Blumentahal, D. (1996). Quality of care: What is it? *New England Journal of Medicine*. 335:891-894. doi: 10.1056/NEJM199609193351213

Bursell S., Cavallerano J., Cavallerano A., Clermont A., Birkmire-Peters D, Aiello L, Aliello, L. (2001) Stereo non-mydriatic digital-video color retinal imaging compared with early treatment diabetic retinopathy study seven standard field 35-mm stereo color photos for determining level of diabetic retinopathy. *Ophthalmology,* 108(3):572–85. doi:10.1016/S0161-6420(00)00604-7

Burwick, D., Nolan, T.., & Whittington, J. (2008). The triple aim: Care, health and cost. *Health Affairs*, 27(3):759-769). Retrieved from http://content.healthaffairs.org/content/27/3/759.full

Calhoun W., Ameredes, B., King, T., Icitovic, N., Bleecker, E., Castro,…& Boushey, H. (2012). Comparison of physician, biomarker, and symptom-based strategies for adjustment of inhaled corticosteroid therapy in adults with asthma. *Journal of the American Medical Association*, 308:987-997. doi:10.1001/2012.jama.10893.

Carey, R. & Lloyd, R. (2001). Measuring quality improvement in health care: A guide to statistical process control applications. Milwaukee, Wisconsin: American Society for Quality.

Carroll, M., Cullen, T., Ferguson, S., Hogge, N., Horton, M., Kokesh, J. (2011). Innovation in Indian Healthcare: Using health information technology to achieve health equity for American Indian and Alaska Native Populations. *Perspectives in Health Information Management*, Winter 1(8):1-10. Retrieved from www.ncbi.nlm.nih.gov/pmc/articles/PMC3035828/.

Centers for Disease Control and Prevention. (1999). Framework for program evaluation in public health. *MMWR*, 48(No. RR-11). Retrieved from stacks.cdc.gov/view/cdc/5204/.

Centers for Disease Control and Prevention (2003). Health Status of American Indians compared with other racial/ethnic minority populations – selected states, 2001-2002. *Morbidity and Mortality Weekly Report*, 52(47):1148-52. Retrieved from www.cdc.gov/mmwr/preview/mmwrhtml/mm5247a3.htm.

Centers for Disease Control and Prevention. (2003). Diabetes prevalence among American Indians and Alaska Natives and the overall population–United States, 1994–2002. *Morbidity and Mortality Weekly Report*, 52:702–704. Retrieved from www.cdc.gov/mmwr/preview/mmwrhtml/mm5230a3.htm.

Centers for Disease Control and Prevention.(2008). National diabetes fact sheet, 2007. Atlanta, GA: U.S. Department of Health and Human Services; 2008. Retrieved from www.cdc.gov/Diabetes/pubs/factsheet07.htm

Centers for Disease Control and Prevention. (2011). National diabetes fact sheet: National estimates and general information on diabetes and pre-diabetes in the United States, 2011. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. Retrieved from www.cdc.gov/diabetes/pubs/pdf/ndfs_2011.pdf.

Centers for Disease Control and Prevention (2012). Chronic Diseases and Health Promotion. Retrieved from: www.cdc.gov/chronicdisease/overview/index

Centers for Disease Control and Prevention (2012). Chronic Disease Overview. Retrieved from www.cdc.gov/chronicdisease/overview.

Chassin, M. (1997). Assessing strategies for quality improvement. *Health Affairs*, 16(3), 151-161. doi: 10.1377/hlthaff.16.3.151

Chen, H. (1996). A comprehensive typology for program evaluation. *Evaluation Practice*, 17(2): 121-130. doi: 10.1177/109821409601700204.

Chen, H. & Rossi, P. (1981). Evaluating with sense: The theory-driven approach, *Evaluation Review*, 7: 283-302.

Cheung, B., Ong, K., Cherry, S., Sham, P., Tso, A., & Lam K. (2009). Diabetes prevalence and therapeutic target achievement in the United States, 1999-2006. American Journal of Medicine, 122(5), 443-453. DOI: http://dx.doi.org/10.1016/j.amjmed.2008.09.047

Chin, M., Drum, M., Guillen, M., Rimington, A., Levie, J., Krichhoff, A.,…& Schaefer, C. (2007). Improving and sustaining diabetes care in community health centers with the health disparities collaboratives. *Medical Care*, 45 (12): 1135-1143. Doi: 10.2337/diacare.27.1.2

Clark, N., Brenner, J., Johnson, P., Peek, M., Spoonhunter, H., Walton, J.,…& Nelson, B. (2011). Reducing disparities in diabetes: The alliance model for health care improvements. *Diabetes Spectrum*, 24(4), 226-230. doi:10.2337/diaspect.24.4.226

Clarke, A. (1999). *Evaluation, research: An introduction to principles, methods and practic*e. Thousand Oaks, CA: Sage.

Cohen, D., McDaniel, R., Crabtree, B., Ruhe, M., Weyer, S., Tallia, A.,…&.Stange, K. (2004). A practice change model for quality improvement in primary care practice. *Journal of Healthcare Management*, 49(3): 155-170.

Coleman, K., Austin, B., Brach, C., & Wagner, E. (2009). Evidence on the Chronic Care Model in the new millennium. *Health Affairs*, 28(1): 75-85. doi: 10.1377/hlthaff.28.1.75

Coulter, A. (1991). Evaluating the outcomes of health care. In J. Gabe, M. Calnan, & M. Bury (Eds.). The sociology of the health service (pp. 115-139). London: Routledge.

Cretin, Shortell, Keeler (2004). An evaluation of collaborative interventions to improve chronic illness care: Framework and study design. Evaluation Review, 28(1) 28-50. doi:10.1177/0193841X3256298

Damin, S. Baillie, R., Cunningham, J., Robinson, G., Dowden, M., Stewart, A.,…& Weeramanthri, T. (2008). Describing and analyzing primary health care system support for chronic illness care in Indigenous communities in Australia's Northern Territory – use of the Chronic Care Model. *BMC Health Services Research*, 8:112. doi: 10.1186/1472-6963-8-112

Daniel, D., Norman, J., Davis, C., Lee, H., Hindmarsh, M., McCulloch, D.,…& Sugarman, J. (2004). A state-level application of the chronic illness breakthrough series: Results from two collaboratives on diabetes in Washington State. *Joint Commission Journal on Quality and Safety*, 30(92): 69-79. Retrieved from http://www.researchgate.net/publication/7613332_A_state-level_application_of_the_chronic_illness_breakthrough_series_results_from_two_collaboratives_on_diabetes_in_Washington_State.

Daponte, B. (2008). Evaluation essentials: Methods for conducting sound research. San Francisco, CA: Jossey-Boss.

Davis, D., Thomson, M., Oxman, A., & Haynes, R. (1995). Changing physician performance: A systematic review of the effect of continuing medical education strategies. *Journal of the American Medical Association*., 272: 797-802. Retrieved from www.researchgate.net/publication/15547979_Changing_Physician_Performance_A_Systematic_Review_of_the_Effect_of_Continuing_Medical_Education_Strategies

Davidson, E. (2005). Evaluation methodology basics: The nuts and bolts of sound evaluation. Thousand Oaks, CA: Sage.

Deming, W. (1986). Out of the Crisis, Cambridge, MA: MIT Press.

Devol, R. & Bedroussian, A. (2007). An unhealthy America: The economic burden of chronic disease, charting new course to save lives and increase productivity and economic growth. Executive summary and research findings by the Milken Institute, October 2007. Retrieved from http://www.sophe.org/Sophe/PDF/chronic_disease_report.pdf

Doescher, M., and Jackson, E. (2009). Trends in cervical and breast cancer screening practices among women in rural and urban areas of the United States. *Journal of Public Health Management Practice*, 15(3): 200-209. doi: 10.1097/PHH.0b013e3181a117da.

Donobedian, A. (1966). Evaluating the quality of medical care. *Millbank Memorial Fund Quarterly*, 44:166-206.

Duckers M., Wagner C., Groenewegen P. (2008) Developing and testing an instrument to measure the presence of conditions for successful implementation of quality improvement collaboratives. *BMC Health Services Research*. 8:172 doi: 10.3109/13561820.2013.874981

Dwight-Johnson, Eli, K., & Lee, P. (2005). Can collaborative care address the needs of low-income Latinas with comorbid depression and cancer? Results from a randomized pilot study. *Psychosomatics*, 46: 224-232. doi: 10.1176/appi.psy.46.3.224

Egan, B., Zhao, Y., & Axon, R. (2010). U.S. trends in prevalence, awareness, treatment, and control of hypertension, 1988-2008. *Journal of the American Medical Association*, 303(20), 2043-2050. doi:10.1001/jama.2010.650

Ferlie, E. & Shortell, S. (2001). Improving the quality of health care in the United Kingdom and the United States: A framework for change. *The Milbank Quarterly*, 79(2), 283-415. doi:10.1108/JHOM-01-2013-0001

Fitzpatrick, J., Sanders, J., & Worthen, B. (2011). *Program evaluation: Alternative approaches and practical guidelines*. Boston, MA:Pearson

Fleming, B. Greenfield, S., Engelgau., M., Pogach, L., Clauser, S., & Parrot, M. (2001). The Diabetes Quality Improvement Project: moving science into health policy to gain an edge on the diabetes epidemic. *Diabetes Care*, 24: 1815-1820. doi: 10.2337/diacare.24.10.1815

Ford, E., Li, C., Person, W., Shao, G., & Mokdad, A. (2010). Trends in hypercholesterolemia, treatment and control among United States adults. *International Journal of Cardiology*, 40(2), 226-235. doi: doi:10.1016/j.ijcard.2008.11.033

Fortuine, R. (1986). Alaska Native Medical Center: A history 1953-1983. Anchorage, AK: Terragraphica.

Gilbody, S., Bower, P., Fletcher, J., Richards, D., & Sutton, A. (2006). Collaborative care for depression: A cumulative meta-analysis and review of longer-term outcomes. *Archives of Internal Medicine*, 166: 2314-2321. doi:10.1001/archinte.166.21.2314.

Glasgow, R., Funnell, M., Bonomi, A., Davis, C., Beckham, V., & Wagner, E. (2002). Self-management aspects of the improving chronic illness care breakthrough series: Implementation with diabetes and heart failure teams. *Annals of Behavioral Medicine*, 24(2): 80-87. doi: 10.1207/S15324796ABM2402_04

Glasgow, R., Orleans, T., and Wagner, Curry, S., and Solberg, L. (2001). Does the Chronic Care Model serve also as a template for improving prevention? *The Milbank Quarterly*, 79(4): 579-612. doi: 10.1111/1468-0009.00222

Goetzel, R., Long, S., Ozminkowski, R., Hawkins, K., Wang, S., & Lynch, W. (2004). Health Absence disability and presenteeism cost estimates of certain physical and mental health conditions affecting U.S. employers. *Journal of Occupational and Environmental Medicine*, 46(4), 398-412. doi: 10.1097/01.jom.0000121151.40413.bd

Goran, M., Roberts, J., & Rodak, J. (1976). Regulating the quality of hospital care: An analysis of the issues pertinent to national health insurance. In R.H. Egdahl & P.M. Gortman (Eds). *Quality assurance in health care*. (pp,. 61-87). Germantown, MD: Aspen Systems Corporation.

Grossman E., Keegan T., Lessler A, Huong, M., Huynh, L., O’Malley, J., Guadagnoli, E. ,& Landon, B.. Inside the health disparities collaborative: A detailed exploration of quality improvement at community health centers, *Medical Care*. 2008;46:489-496. **doi**: 10.1097/MLR.0b013e31815f536

Guba, Y. & Lincoln, E. (181). *Effective evaluation: Improving the usefulness of evaluation. Results through responsive and naturalistic approaches*. San Francisco: Jossey-Bass.

Gupta, S., Tong, L., Allison, J., Carter, E., Koch, M., Rockey, D.,…& Skinner, C. (2009) Screening for colorectal cancer in a safety-net health care system: Access to care is critical and has implications for screening policy. *Cancer, Epidemiology, Biomarkers and Prevention,* 18(9): 2372-2379. doi: 10.1158/1055-9965.EPI-09-034.

Halladay, J., DeWalt, D., Wise, A, Qaqish, B., Reiter, K., Lee, S.,…& Donahue, K. (2014). More extensive implementation of the Chronic Care Model is associated with better lipid control in diabetes. *Journal of the American Board of Family Medicine,* 27(1): 34-41. doi: 10.3122/jabfm.2014.01.130070.

Hroscikoski, M., Solberk, L., Sperl-Hillen, J., Harper, P., McGrail, M., & Crabtree, B. (2006). Challenges of change a qualitative study of chronic care model implementation. *Annals of Family Medicine,* 4(4): 317-326. doi: 10.1370/afm.570

Homer, C., Forbes, P., Horvitz, L., Peterson, E., Wypij, D., & Heinrich, P. (2005). Impact of a quality improvement program on care and outcomes for children with asthma. *Archives of Pediatric and Adolescent Medicine,* 159:464-469. **doi**:10.1001/archpedi.159.5.464

Hung, D. & Shelley, D. (2009). Impacting Treatment use and costs: Multilevel analysis of the chronic care model and 5A services for treating tobacco use in urban primary care clinics. *Health Services Research*, 44:103-127. doi: 10.1111/j.1475-6773.2008.00944.x

Indian Health Service, Alaska Area. (2013). Alaska 2012 and 2013 IHS Active user population report.

Indian Health Service (no date) The Chronic Care Model for the Indian Health Service. Retrieved from www.ihs.gov/ipc/index.cfm?module=dsp_ipc_models_caremodel

Indian Health Service, (2013). Indian Health Service: Indian Health Disparities. Retrieved from www.ihs.gov/newsroom/factsheets/disparities/.

Indian Health Service, (2013). IHS Diabetes care and outcomes audit. Retrieved from www.ihs.gov/newsroom/factsheets/diabetes.

Indian Health Service, (2011) “Heart Disease & Strokes.” IHS Health and Heritage Brochure- Health Disparities, available at www.ihs.gov.

Indian Health Service, (2011), Improving patient care: Improving the quality and access to care. Evaluation. Retrieved from www.ihs.gov/ipc/index.cfm?module=dsp_ipc_resources_eval.

Indian Health Service (2014). Improving Patient Care Resource Guide. Retrieved from http://www.ihs.gov/ipc/documents/ResourceGuide_IPC5_January2014.pdf

Indian Health Service. (2007). Special Diabetes Program for Indians, 2007 Report to Congress: on the Path to a Healthier Future. Bethesda, MD: US Dept of Health and Human Services, Indian Health Service.

Indian Health Service (2013). "Where are we now?" Opening remarks by Dr. Yvette Roubideaux, Director of the Indian Health Service, given at the Quality and Innovation Virtual Session May 29, 2013.

Institute for Health Care Improvement (2012). *History*. Retrieved from www.ihi.org/about/Pages/History.aspx.

Institute of Medicine (2000). *To err is human: Building a safer health system*. Washington, DC: National Academy Press. Retrieved from http://iom.nationalacademies.org/~/media/Files/Report%20Files/1999/To-Err-is-Human/To%20Err%20is%20Human%201999%20%20report%20brief.pdf

Institute of Medicine (2001). *Crossing the quality chasm: a new health system for the 21st century*. Washington DC.

Johnson, J., AlSayah, F., Wozniak, L., Rees, S., Suprovich, A., Chik, C.,…& Majumdar, S. (2012). Controlled trial of a collaborative primary care team model for patients with diabetes and depression: Rationale and design for a comprehensive evaluation. *BMC Health Services Research*, 12: 258-277. doi:10.1186/1472-6963-10-49

Kern, L., Barron, Yolanda, Dhopeshwarkar, R, Edwards, A., & Kaushai, R. (2011) Electronic Health Records and Ambulatory Quality of Care. *Journal of General Internal Medicine,* 28(4): 496-503. doi: 10.1007/s11606-012-2237-8

Kilo, C. (1998). A framework for collaborative improvement: Lessons from the institute for healthcare improvement's breakthrough series. *Quality Management in Health Care*, 8(4), 1-13. doi:10.1016/j.childyouth.2015.06.00

Kim, C. (2000). Recruitment and retention in the Navajo Area Indian Health Service. *Western Journal of Medicine*, 173: 240-243. Retrieved from www.ncbi.nlm.nih.gov/pmc/articles/PMC1071101/pdf/wjm17300240.pdf

Knight, A., Ford, D., Audehm, R., Colagiuri, S. and Best, J. (2012). The Australian Primary Care Collaboratives Program: improving diabetes care. *BMJ Quality and Safety,* 21: 956-963. doi:10.1136/bmjqs-2011-000460

Koffman, D., Granade, S., & Arwun, V. (2008). Strategies for establishing policy, environmental and systems-level Interventions for managing high blood pressure and high cholesterol in health care settings: A qualitative case study. *Public Health Research, Practice and Policy,* 5(3), 1-16. doi: 10.1186/1471-2458-12-1037.

Landon B., LeRoi, S., Hicks, L., O'Malley, A., Lieu, T., Keegan, T.,…& Guadagnoli, E. (2007). Improving the management of chronic disease at community health centers. *New England Journal of Medicine*, 2007;356:921-934. doi: 10.1056/NEJMsa062860 .

Langley, G., Moen, R., Nolan, K., Nolan, T., Norman, C., & Provost, L. (2009) The Improvement guide: A practical approach to enhancing organizational performance. Second Ed. San Francisco, CA: Jossey-Bass,

Leape, L., Kabcenell, A., Gandhi, T., Carver, P., Nolan, T., & Berwick, D., (2000). Reducing adverse drug events: Lessons from a breakthrough series collaborative.

Joint Commission Journal of Quality Improvement and Patient Safety, 26:321-331. doi:10.1111/j.1475-6773.2010.01102.x.

Mangione-Smith, R., Schonian, M., Chan, K., Keesey, J., Rosen, M., Louis, T., & Keeler, E. (2005) Measuring the effectiveness of a collaborative for quality improvement in pediatric asthma care: Does implementing the Chronic Care Model improve processes and outcomes of care? *Ambulatory Pediatrics*, 5:75-82. doi:10.1186/1471-2318-13-62

Mark, M., Henry, G., & Julnes, G. (2000). *Evaluation: An integrated framework for understanding guiding and improving policies and programs*. San Francisco, CA.

Matthias, S., Mangione-Smith, R., Chan, K., Keesey, J., Rosen, M., Louis, T.,…& Keeler, E. (2005). Evaluation of a quality improvement collaborative in asthma care: Does it improve processes and outcomes of care? *Annals of Family Medicine*, 3(3): 200-208. doi: 10.1370/afm.269

Martinson, R. (1974). What works? Questions and answers about prison reform. *Public Interest*, 35: 22-45.

McGlynn, E., Asch, S., Adams, J., Keesey, J., Hicks, J., DeCristofaro, A., & Kerr, A. (2003). The quality of health care delivered to adults in the United States. *New England Journal of Medicine*, 348: 2635-2645. doi: 10.1056/NEJMsa022615

Mensah, G. & Brown, D. (2007). An overview of cardiovascular disease burden in the United States. *Health Affairs*, 26: 38-48. doi: 10.1377/hlthaff.26.1.38

Minkman, M., Ahaus, L., & Houjsman, R., (2007) Performance improvement based in integrated quality management models: What evidence do we have? A systematic literature review. *International Journal for Quality in Health Care*, 19: 90-104. doi: http://dx.doi.org/10.1093/intqhc/mzl071 90-104

Mohler, P., & Mohler, N. (2005). Improving chronic illness care: Lessons learned in a private practice. *Family Practice Management*, November/December: 50-56.

Mokdad, A., Marks, J., Stroup, D., & Gerberding, J. (2004). Actual causes of death in the United States, 2000. *Journal of the American Medical Association,* 10:1238–1245. doi:10.1001/jama.291.10.1238

Morikawa, T., Kato, J., Yamaji, Y., Wade, R., Misushima, T. and Shiratori, Y. (2005). A comparison of the Immunochemical fecal occult blood test and total colonoscopy in the symptomatic population. *Gastroenterology*, 129(2): 422-428. doi:10.1053/j.gastro.2005.05.056.

Nadeem, E, Olin, S., Hill, L., Hoagwood, K., Horwitz, S. (2013). Understanding the components of quality improvement collaboratives: A systematic literature review. *The Milbank Quarterly*, 91(2): 354-394. doi: 10.1111/milq.12016.

National Heart, Lung, and Blood Institute. (2004). Morbidity and mortality: 2004 Cardiovascular, Lung, and Blood Diseases. Bethesda, MD.

National Park Service, no date. Aleutian World War II: Dutch Harbor bombing, June 1942. Retrieved from www.nps.gov/aleu/historyculture/raid-dutch-harbor.htm

Naylor, J., Schraer, C., Mayer, A., Lanier, A., Treat, C., & Murphy, N. (2003). Diabetes among Alaska Natives: A review. *International Journal of Circumpolar Health,* Dec, 62(4):363-87.

Nolan, K., Schall, M., Fabian, E., & Nolan, T. (2006). Using a framework for spread: The case of patient access in the Veterans Health Administration. *Journal of Quality and Patient Safety,* 31(5): 339-347.

O'Connell, J., Wilson, C., Manson, S., & Acton, K. (2012). The costs of treating American Indian adults with diabetes within the Indian Health Service. *Research and Practice,* 102(2): 301-308. doi: 10.2105/AJPH.2011.300332

O'Leary, B., Olynyk, J., Neville, A., and Platell, C. Cost-Effectiveness of Colorectal Cancer Screening: Comparison of community-based flexible sigmoidoscopy with fecal occult blood testing and colonoscopy. *Journal of Gastroenterology and Hematology*, 19(1):38-47. doi: 10.1111/j.1440-1746.2004.03177.x

Office of the General Counsel, Commission on Civil Rights (2004). Native American health care disparities briefing: Executive summary. Retrieved from www.hss.state.ak.us/commissioner/tribalhealth/docs/Native_American_Health_Care_Disparities.pdf.

Ouwens, M., Wollersheim, H., Hermens, R., Hulscher, M., & Grol, R. (2005). Integrated care programmes for chronically ill patients: a review of systematic reviews. *International Journal of Quality Health Care*, 17(2): 141-6. doi: http://dx.doi.org/10.1093/intqhc/mzi016

Paquette-Warren, Roberts, Fourmie, Tyler, Brown, & Stewart. (2014). Improving chronic care through continuing education of interprofessional primary healthcare teams: a process evaluation. Journal of Interprofessional Care, May, 28(3):232-238. doi: 10.3109/13561820.2013.874981.

Patton, M. (1980). *Practical evaluation*. Beverly Hills, CA: Sage

Patton, M. (2008). *Utilization-focused evaluation* (4th ed). Thousand Oaks, CA: Sage

Pawson, R. & Tilley, N. (2011). *Realistic evaluation*. Los Angeles, CA: Sage

Pearson, Wu, Schaefer, Bonomi, Shortell, Mendel,…& Keeler (2006). Assessing the implementation of the chronic care model in quality improvement collaboratives. *HSR: Health Services Research*, 40:4: 978-996 doi: 10.1111/j.1475-6773.2005.00397.x

Polacsek, M., Orr, L., Letourneau, L., Rogers, V., Holmberg, R., O'Rourke, K.,…& Gortmaker, S. (2009) Impact of a primary care intervention on physician practice and patient and family behavior: Keep ME Healthy – The Main Youth Overweight Collaborative. *Pediatrics*, 123 (suppl. 5):S258-66. Doi: 10.1542/peds.2008-2780C

Posevac, E. & Carey, R. (1997). *Program evaluation: Methods and case studies* (5th Ed). Upper Saddle River, NJ: Prentice Hall.

Preskill, H. & Torres, R. (1998*)*. *Evaluative inquiry for learning in organizations*. Thousand Oaks, CA: Sage

Provist, L. & Murray, S. (2011). *The health care data guide: Learning from data for improvement.* San Francisco, CA: Josey-Bass.

Reid, R., Coleman, K., Johnson, E., Fishman, E., Hsu, C., Soman, M.,…& Larson, E. (2010). The Group Health medical home at year 2: Cost savings, higher patient satisfaction, and less burnout for providers. *Health Affairs*, 28(5): 835-843. doi: 10.1377/hlthaff.2010.0158

Rosenqvist, U., Carlson, A., & Luft, R. (1988). Evaluation of a comprehensive program for diabetes care at the primary health care level. *Diabetes Care*, 11:269-274. doi: 10.2337/diacare.11.3.269

Ross, R. & Gendreau, P. (1980). *Effective correctional treatment*. Toronto: Butterworths.

Rossi, P. & Freeman, H. (1993). *Evaluation: A systematic spproach*, 5th edition, Newbury Park, CA: Sage

Rossi, P., Lipsey, W., & Freeman, H. (2004). *Evaluation: A systematic approach*, 7th edition, Thousand Oaks, CA:Sage

Roubideaux, Y. (2011, April). Improvements in Indian Care. A seminar presented at the Improving Patient Care 3 Collaborative in Denver, Colorado.

Schonlau, M., Mangione-Smith, R., Chan, K., Keesay, J., Rosen, M., Louis, T.,…& Keeler, E. (2005). Evaluation of a quality improvement collaborative in asthma care: Does it improve processes and outcomes of care? *Annals of Family Medicine*, 3(3):200-208). doi: 10.1370/afm.269

Schulz, L., Bennett, P., Ravussin, E., Kidd, J., Kidd, K., Esparaza, J., & Valencia, M. (2006). Effects of traditional and western environments on prevalence of type 2 diabetes in Pima Indians in Mexico and the U.S. *Diabetes Care*, 29(8): 1866-71. doi: 10.2337/dc06-0138

Scrivner, M. (1967). The methodology of evaluation in R.W. Tyler, R. M. Gagne and M. Scriven (eds) *Perspectives of Curriculum Evaluation*, Chicago, IL: Rand McNally.

Sequist,T., Cullen, T., Bernard, K., Shaykevich, S., Oray, J., & Ayanian, J. (2010). Trends in quality of care and barriers to improvements in the Indian Health Service. Journal of *General Internal Medicine,* 26(5):480–6. doi: 10.1007/s11606-010-1594-4.

Shadish, W. Cook, T., & Leviton, L. (1991). Foundations *of Program Evaluation*. Beverly Hills, CA: Sage.

Shah, M. & Layman, E. (2005). Using a multipronged approach to implement organizational performance improvement. *The Health Care Manager*, 24(1), 42-54. doi: 10.1097/00126450-200501000-00008

Shaw, E., Chase, S., Howard, J., Nujtting, P., Crabtree, B. (2012). More black box to explore: How quality improvement collaboratives shape practice change. *Journal of the American Board of Family Medicine*, 25(2): 149-157. doi:10.3122/jabfm.2012.02.110090

Shortell, S., Bennett, C., & Byck, G. (1998). Assessing the impact of continuous quality improvement on clinical practice: What will it take to accelerate the progress? *Milbank Quarterly*, 76:593-634. doi: 10.1111/1468-0009.00107

Shortell, S., Marstellar, & Lin, M. (2004). The role of perceived team effectiveness in improving chronic illness care. *Medical Care*, 42:1040-1048.

Shultz et al. (2006). Effects of traditional and western environments on prevalence of type 2 diabetes in Pima Indians in Mexico and the U.S. *Diabetes Care,* 29(4):1866-1871. doi: 10.2337/dc06-0138

Sifrim, Z., Barker, P., & Mate, K. (2012) What gets published: The characteristics of quality improvement research articles from low and middle-income countries. BMJ Quality and Safety, 21(55):423-31. Retrieved from http://qualitysafety.bmj.com/content/21/1.toc.

Solberg, L., Asche, S., Pawlson, L., Scholle, S., & Shih, S. (2008). Practice systems are associated with high-quality care for diabetes. *The American Journal of Managed Care*, 14(2), 85-92. Retrieved from http://www.internetgroup.ca/clientnet_new/docs/High%20Quality%20Care%20for%20Diabetes.pdf

Spere-Hillen, J., O'Connor, P., Carlson, R., Lawson, T., Halstenson, C., Crowson, T., & Wuorenma, J. (2000). Improving diabetes care in a large health care system: An enhanced primary care approach. *Journal of Quality Improvement,* 20(10). 615-622.

State of Alaska, Department of Labor and Workforce Development. 2010. Demographic data for Atka, Nikolski and Unalaska/Dutch Harbor. Retrieved from live.laborstats.alaska.gov/cen/dparea.cfm

Stiles, R. & Mick, S. (1994). Classifying quality initiatives: A conceptual paradigm for literature review and policy analysis. *Hospital and Health Services*, 39(3), 209-326.

Swarz, D., Schwarz, R., Gauchan B, Andrews, J., Sharma, R., Karelas, G.,…& Smith-Rohrberg, M. (2011). Implementing a systems-oriented morbidity and mortality conference in remote rural Nepal for quality improvement. *BMJ Quality and Safety*, 20(12):1082-1088. doi:10.1136/bmjqs-2011-000273

Streiner, D. & Norman, G. (1995). *Health measurement scales: A practical guide to their development and use*, 2nd edition, New York, NY: Oxford University Press.

Thorndike, A., Rigotti, N., Stafford, R. & Singer, D. (1998). National Patterns in the Treatment of Smokers by Physicians. *Journal of the American Medical Association*, 279(8): 604-608. doi:10.1001/jama.279.8.604.

Tsai, A., Morton, S., Mangione, C. & Keeler, E. (2011). A meta-analysis of interventions to improve care for chronic illness. *American Journal of Managed Care*, 11(8): 478-488. Retrieved from http://www.ajmc.com/journals/issue/2005/2005-08-vol11-n8/Aug05-2103p478-488/

U.S. Department of Health and Human Services. (2009). *National healthcare quality report 2008*. (AHRQ Publication No. 09-10001). Rockville, MD.

Wagner, E. Austin, B, & Von Korff, M., (1996). Organizing care for patients with chronic illness. *Milbank Quarterly*, 74(4), 511-544. doi: 10.2307/3350391

Wagner, E., Austin, B., Davis, C., Hindmarsh, M., Schaefer, J., & Bonami, A. (2001). Improving Chronic Illness Care: Translating Evidence into Action. *Health Affairs.* 20(6):64-78. doi: 10.1377/hlthaff.20.6.64

Wagner, E. (1998). Chronic disease management: What will it take to improve care for Chronic Illness? *Effective Clinical Practice*, 1(1):2-4. Figure of chronic care model republished with permission of the American College of Physicians

Wang, A., Wolf, M., Carlyle, R., Wilkerson, J., Porterfield, D., & Reaves, J. (2004). The North Carolina experience with diabetes health disparities collaboratives. *Joint Commission Journal on Quality and Safety*, 30(7): 396-404.

Ward, B., Shiller, J., & Goodman, A. Multiple Chronic Conditions Among US Adults: A 2012 Update. (2014). Prevention *of Chronic Disease*, April (11):130389-91. Retrieved from doi: http://dx.doi.org/10.5888/pcd11.130389.

Watson, D., Broemeling, A., & Wong, S. (2009). Results-based logic model for primary healthcare: A conceptual foundation for population-based information systems. *Health Policy.* November; 5(Spec No): 33–46. Retrieved from www.researchgate.net/profile/Sabrina_Wong/publication/47636588_A_results-based_logic_model_for_primary_healthcare_a_conceptual_foundation_for_population-based_information_systems/links/02e7e52141b83515ad000000.pdf

Williams, S. & Torrens, P. (Eds). (2002). Introduction to health services. Albany, NY: Delmar.

Wilson, T., Berwick, D., & Cleary, P. (2009). What do collaborative improvement projects do? Experience from seven countries. *Medical Care*, 47(9): 1026-1030. Retrieved from http://www.fachc.org/pdf/WhatDoCollaborativesDo.pdf

Appendix A: Letter of Permission to Use Wagner's Chronic Care Model

ACP
American College of Physicians
internal medicine | Doctors for Adults

ROECP1217560

March 1, 2014

Oonalaska Wellness Center
PO Box 1130 Unalaska,
Alaska 99685

Dear Ms. Siemens:

Thank you for your request for print format of the following from *Effective Clinical Practice:*

Figure 1: Edward H. Wagner, MD, MPH, Chronic Disease Management: What Will It Take To Improve Care for Chronic Illness? Effective Clinical Practice, Aug/Sept 1998, Vol 1

Permission is granted to republish the preceding material with the understanding that you will give appropriate credit to *Effective Clinical Practice* as the original source of the material. **Any translated version must carry a disclaimer stating that the American College of Physicians is not responsible for the accuracy of the translation.** This permission grants non-exclusive, worldwide rights for this edition / volume in print format only. ACP does not grant permission to reproduce entire articles or chapters on the Internet. This letter represents the agreement between ACP and Annette Siemens FNP, BSN, MSN, MPH
for request ROECP1217560 and supersedes all prior terms from the requestor.

Thank you for your interest in *Effective Clinical Practice.* If you have any further questions or would like to discuss the matter further, please contact me at 856-489-8555 or fax 856-489-4999.

Sincerely,

Gina Brown
Permissions Coordinator

Appendix B: Definitions

Action Period: The time between learning sessions when teams work in their home organizations on improving their processes.

Action Period Calls: Calls are scheduled every other week thru the length of the collaborative. The calls are designed to encourage participation from sites. Content is provided and teams share ideas, tools and successes and challenges.

Action Plan: These are work plans prepared by participation teams that help to guide tests for change, implementation and spread.

Advanced Access: A system designed in such a way that patients can received the care they want when and how they want it.

Annotated Run Chart: A line chart that shows results of improvement efforts plotted over time. The changes made are noted on the line chart allowing the viewer to connect results with system changes.

Chronic Disease: a condition that is ongoing (a year or more), requires continued medical care and/or limits in some way activities of daily living.

Clinical Information System (CIS): This is an integrated, comprehensive patient centered information system. The Patient and Registration Management System (RPMS) is an example of a CIS.

Community Health Aide/Practitioner: Alaska Tribal Health System specific provider that is trained to provide direct health care in villages across Alaska.

Cycle Time: The amount of time that a patient spends at a clinic visit. The cycle time is used to identify areas of backlog that can be improved.

Decision Support (DS): A variety of methods to assist patients and providers to make informed choices about care.

Delivery System Design (DSD): Provision of patient care including the roles of the members of the health care teams, types of appointments and follow-up techniques used by the clinic.

Electronic Health Record (EHR): The patient's medical record in electronic form. It provides a variety of functions for data retrieval to support patient review at each encounter and for follow-up.

Government Performance and Results Acts (GPRA): Federally mandated performance indicators with annual goals to measure Indian Health Service (IHS) progress in improving the health status of American Indians and Alaska Natives.

Micro system: A smaller portion of the entire organization (e.g., one clinic or one provider in a clinic).

Virtual Learning Session: Training events of the IPC Collaborative. The virtual learning session are designed for participants to gather new knowledge on presented IPC subject matter, share experiences, and develop strategies to overcome barriers to patient care improvement.

Appendix C: Indian Health Service Improving Patient Collaborative Background and Process

The clinic's overseeing health department began its discussion regarding quality health care in 2009. Several members of the health department attended the Institute for Health Care Improvement conference, which sparked even more interest in the process of improving patient care. At that time the organization became aware of the Indian Health Service IPC program. The agency applied to participate in the collaborative and was selected to start the IPC 3 program in the fall of 2011.

The first task as part of IPC was to complete the pre-work assignments, to be completed prior to attending the first Learning Session. The pre-work laid the foundation for successful improvement activities during the IPC Collaborative. The first pre-work assignment was to identify and choose members of the improvement team. The team should consist of at least one provider, one member of leadership, support staff, and at least one community member. The names were then uploaded to the IPC Knowledge Portal.

The Knowledge Portal (KP) is a secure site that requires registration from IPC members. The KP stores team documents, session information and documents for viewing and review. Individuals have to register and receive a user name and password to access the site. Other pre-work assignments included assessing clinic capabilities in terms of patient centered care. This assignment included the primary care profile, assessing the practice through the eyes of the patient, a primary care practice activity survey, 5 patient care cycle times and developing a story board, outlining current practices of patient care at the clinic.

Members of the core IPC team attended in-person learning sessions in Denver and Phoenix. The last learning session was virtual with three days of on-line Adobe Connect meetings with a presentation of a variety of IPC topics. During each learning session, the UWC team members participated in team meetings to work on goals, solving problems and discussing issues with the IPC National staff.

Time was also set aside during the face-to-face meetings to learn from other IPC 3 teams during poster sessions or networking time during breaks. Each learning session had multiple learning choices depending on the role of the team member, including sessions for providers, sessions for IT personnel, and sessions for managers and leadership. At each learning session a plenary reviewed IPC principles and the core concepts of patient-centered care.

At each learning session, times were available for the various participating teams to meet to work on assignments given at the learning sessions. For example, at learning Session I the teams were to develop an aim statement. The aim statement is a measurable and time-sensitive document, outlining what the team expects will happen as a result of the implemented improvement process. As the team worked on their assignments, experts from the national IPC team rotated among the team tables to provide input and suggestions on assignment’s development.

Upon return to their home clinic, the teams participated in IPC Action Calls every other week. During these calls, teams hear about an IPC topic with the remainder of the time spent on presentations from one or two participating teams on how they have implemented some aspect of the IPC. At the end of the call, the national IPC team is available to answer questions. Teams receive assignments with information on how to submit required data and narrative reports monthly. Selected data sets and a narrative report monthly are uploaded to the IPC site, www.improvingindianhealth.org. Reports and data are available for viewing by registered IPC participants.

The learning sessions build upon each other and the teams are expected to progress in their knowledge of IPC and the ability to apply its principles. Learning Sessions build on information learned during the pre-work done by the teams.

IPC provided an examination of changes in the following areas: leadership, community involvement, patient and the family, identification of the microsystem, completion and refinement, definition of the improvement team, development and optimization of the care team, communication with staff, patients and the community and access and continuity.

Appendix D: Collaborative Monthly Data Collection Table

IPC data collection sheet.

Data to be Collected	Process or Outcome Measure	Goal
% of patients with BMI measured	Process	80%
% of patients with tobacco screen	Process	80%
% of patients with domestic violence screen	Process	80%
% of patients with BP Screen	Process	80%
Percent of patients with depression screen	Process	80%
Percent of patients with colorectal cancer screen	Process	70%
Percent of patients with breast cancer screen	Process	70%
Percent of patients with cervical cancer screen in last three years	Outcome	70%
Percent of patients who smoke	Process	40%
Percent of smokers with cessation visit in last two years	Process	70%
Percent of CVD patients with controlled lipids	Outcome	70%
Percent of DM patients with controlled HgbA1c	Outcome	70%
Percent of HTN pts with controlled BP	Outcome	70%
Staff satisfaction survey	Outcome	Monthly
Visit cycle time	Process	45 min
Patient Satisfaction	Outcome	Rating of 6 or higher
Percent of patients empaneled to a primary care provider	Outcome	90%
Continuity of care to a primary care provider	Process	80%
Third next available appointment to a medical provider	Outcome	0 days
PDSA Cycles	Process	5 per participant

Appendix E: Intake Screening Form

Intake Screen Form

Patient Name: ____________________ MR#:____________ Date:_________

Alcohol Screen/CAGE

Do you ever feel like you should cut down on your drinking?	Y	N
Do people annoy you by criticizing your drinking?	Y	N
Do you ever feel bad or guilty about your drinking?	Y	N
Do you ever have a drink first thing in the morning to steady your nerves or get rid of a hangover?	Y	N

Depression Screen

Over the past 2 weeks have you felt down, depressed or hopeless?	Y	N
Do you ever feel little interest or pleasure in doing things?	Y	N

Intimate Partner Violence/Domestic Abuse Screen

Are you in a relationship in which you have been physically hurt or threatened ?	Y	N
Have you been in the past?	Y	N
Are you in a relationship in which you have been verbally abused or threatened	Y	N
Have you been in the past?	Y	N
Do you feel safe at home and / or your community?	Y	N

Tobacco Screen

Do you smoke?	Y	N
If so how much?		
Thinking about quitting?	Y	N
If so you have a date set?	Y	N
Referral to SCF Tobacco Cessation program ?	Y	N
Do you chew tobacco?	Y	N
If so how much?		
Thinking of quitting?	Y	N

Appendix F: History of the UWC

Originally patrol ships of the Navy provided medical to the community when they visited in the late 1870s. The Coast guard began making some medical visits to the community beginning in 1897 (Fortuine, 1986).

When civil government was established in Alaska in 1884, the Department of Education trained their teachers to in basic health care. The Bureau of Education opened a small hospital on the island in 1926 and provided care to residents. A new hospital was built in 1933 (Fortuine, 1986). This hospital was destroyed during the Japanese attack on June 3, 1942 (National Park Service, no date).

After the war, health care for Alaska Native residents was provided by the Indian Health Service who sent out physicians periodically. The community comprised of non-Natives and Alaska Natives in the late 1970s with support of the local tribe and financial support from the Alaska Area Indian Health Service. The clinic was intended for all members of the community, Alaska Natives and all others. However, over the years, discontent arose over the management of this clinic.

The local tribe felt that the community clinic was not meeting their needs and was culturally unaware, and they were being treated as second class citizens compared to the workers coming in for the crab fisheries. A small Community Health Aide clinic was started in 1986 in a small two room building. The UWC was relocated to a new facility in 1996. The new clinic was located on the second floor of a building, in which the local community health center clinic was located on the first floor. At this time a nurse practitioner and/or physician assistant was added to the staff at UWC.

Administrative operations

UWC is operated by an Alaska Native non-profit organization. The parent organization is located in Anchorage and operates five clinics in the Pribilof islands and in the Western Aleutian islands. Staff in the Anchorage office who also participated in IPC includes the Quality Improvement Coordinator and the Clinical Applications Coordinator.

The parent organization and all its clinics are part of the Alaska Area Indian Health Service (IHS). The IHS works with Alaska Native Tribes and Tribal organizations to provide health services to approximately 150,000 Alaska Natives. There are 228 federally recognized tribes in Alaska. The majority of tribes across the state have formed consortiums in order to maximize their ability to provide health care in their region. A handful of tribes are single entity contractors. These tribal organizations operate under the authority of the Indian Self-Determination and Education Assistance Act, PL 93-638. This act allows tribes to direct and manage their own health care. Tribally managed hospitals are located in Anchorage, Barrow, Bethel, Dillingham, Kotzebue, Nome and Sitka. There are 36 tribal health centers and 180 tribal Community Health Aide clinics across the state (ANMC, no date). The Alaska Native Medical Center is the tertiary hospital for all Alaska Native health care facilities in the state. The hospital is managed by a consortium of tribes from around the state, the Alaska Native Tribal Health Consortium. The representatives to the consortium are appointed by their various tribes.

UWC's funding comes from federal and state grants, and federal appropriation. UWC, via its parent agency, although not required to, provides data to the federal government such as patient encounter numbers and Government Reporting and Accountability Act (GPRA) data.

The parent agency for UWC has a board of directors that oversees its operations. This board of directors is made up of individuals from the member communities that make up the organization. Board members are elected or appointed by their respective tribe to represent their village. Each board member serves a two year term, although many members have been re-appointed. The board meets quarterly to review progress, challenges and to plan for the future.

Appendix G: Description of Clinic Personnel and Clinic Setting

Clinic Personnel

At the time of the collaborative, the UWC staff included three medical providers (two Community Health Aides, one nurse practitioner, and one physician's assistant), one medical assistant, one patient accounts representative, one receptionist, one Community Wellness Advocate, and an administrator. Credentialing for UWC providers is done by a non-profit tribally run agency associated with the referral hospital in Anchorage. This sister agency regularly scheduled required orientation classes for providers new to Alaska. The orientation was a weeklong and included introduction to the cultures of Alaska and the Alaska Native Health Care system and the various specialty clinics at the hospital and associated tribally run agencies.

This same agency operated the primary care clinics (i.e., family medicine, obstetrics and gynecology, internal medicine, pediatrics and optometry) in a building across the street from the hospital. These services required a referral by a UWC provider for eligible AI/AN patients.

Clinic Service Delivery

The UWC is 800 air miles from the nearest hospital in Anchorage. The flight from Anchorage to the island is about 3 hours or more depending on the wind speed and wind direction. A physician visited UWC for two days twice a year. This physician, called the referral physician, is provided by one of the large tribally run non-profit health care corporations in Anchorage. This physician was available for consultation via phone or secure email regarding complex patients. An optometrist and optician also from this large organization visited UWC yearly for a week.

UWC also received a dental visit once a year by a dentist and hygienist from the large tribally operated health organization, for two weeks. The emphasis for these visits was on children, as mandated by IHS policy. If slots were open after the children's appointments, then adults may make appointments.

The clinic also received a yearly three day visit from the referral hospital diabetes care team, comprised of a diabetes nurse practitioner, nutritionist and foot care technician. In the past the clinic also received twice yearly visits from a Women's Health Care provider. However, these services, considered a duplication of services, were discontinued by the tribally run organization in Anchorage.

Pharmacy- Without a pharmacy on the island, the clinic had a Pick Point machine, similar to a vending machine to dispense medications. Prescription medications are kept in a Pick Point machine. In order to "drop" a medication, a script must be faxed to the referral hospital in Anchorage where it is reviewed by a pharmacist in village pharmacy (as opposed to outpatient pharmacy) for correct dose and any drug interactions. The pharmacist then enters the script into their electronic health record which then sends a message to the printer at UWC located next to the Pick Point machine. A label is printed out and the provider then scans the label and the medication drops out of the machine. The provider then scans out the medication so that the inventory in the Pick Point machine is correct.

The Anchorage village pharmacy monitors medication levels and sends out replenishment meds as needed. This process for processing a medication request can take anywhere from 10 minutes to over 30 minutes depending on how many scripts the pharmacy is handling. Village pharmacy receives scripts from 50 different villages. Occasionally the Pick Point runs out of medications due to a sudden increase in certain infections or if the weather has been foggy for extended periods or if a local volcano has blown up and the mail cannot make it through. Chronic medications are mailed directly to the patient by Village pharmacy.

Laboratory - The Ukudigatunal Wellness Center (UWC) had only Clinical Laboratory Improvement Act (CLIA) and waived lab capability. Waived tests offered at the clinic included: automated urine analysis, hemoglobin, and point of care (POC) glucose, sedimentation rate, rapid influenza, rapid strep, rapid trichamonis, urine pregnancy test, saliva alcohol, urine drug screen and Piccolo general chemistry. All other labs went to the referral hospital in Anchorage by the USPS using express mail. Results were generally back the next day or two days later depending on weather in the region. Frequently the ANMC lab was unable to run complete blood counts (CBC) because of mail delays and subsequent breakdown of the sample. The ANMC lab faxed the results to the clinic on a secure fax line in the provider office.

Diagnostic testing -UWC did not have x-ray or ultrasound. If patients needed these tests, they went to the local Community Health Center (CHC). The CHC, located in the same building as UWC, is on the first floor. Contract Health Care funding covered the cost of studies done at the CHC. The CHC had an ultrasound machine, but may or may not be able to provide a qualified staff member to perform the study. The CHC had no qualified ultrasound technician and providers did all studies. No CT or MRI services were available on island.

All other diagnostic testing (e.g., diagnostic ultrasound, stress tests, PET scans, bone density testing, etc.) must be done in Anchorage. Patients who needed further specialty care or diagnostic testing not available on the island went to the Alaska Native Medical Center (ANMC) on a referral basis.

Emergency Care - Major emergencies (e.g., heart attack, severe trauma, surgery cases) leave the island via medevac plane from Anchorage. The average response time is four hours. During the busy crab season, a medevac plane is assigned to stay in Unalaska. However, it may not be available as the medevac company is often busy flying other ill or injured patients. In extreme weather when the medevac plane cannot fly, the U.S. Coast Guard helicopter stationed in Kodiak responds.

The Coast Guard takes the patient to the nearest open airport, usually Cold Bay, a 1 ½ hour flight, where the medevac crew from Anchorage meets them. The patient is then flown on into Anchorage. This process can take up to 5 hours as the helicopter has to respond from Kodiak, and the travel must be approved and coordinated by a flight surgeon located in Seattle.

Patients who do not have an emergent problem go to Anchorage by commercial air carrier. Generally three to four commercial flights are available each day, depending on weather conditions and time of year. Flight cancellations are frequent during the winter months due to high wind or poor visibility and in the summer due to fog. One year no flights were available for three weeks due to a nearby volcano spewing ash into the flight path. The community air strip is too short for jet airliner, so commercial flights are via a Saab 340 double propeller plane, which carry up to 30 passengers.

For those Anchorage Service Unit (a designation left over from the days when the area was administered by the Indian Health Service) patients who needed to make a trip to Anchorage for specialty visits or testing, the tribally run hospital paid round trip airfare from the village to Anchorage and provided housing. Housing was either in quarters in a wing of the hospital building or in a hotel room. The Anchorage Service Area included the Aleutian Chain and Pribilof Islands, Kodiak Island, the outer end of the Alaska Peninsula, the Kenai Peninsula and south central Alaska south of the Alaska Range (Fortuine, 1983). If a patient required medical escort, ANMC also paid for the escort's travel and housing.   The exception to the travel and housing were those patients who were either from out of state or from another Service Unit other than the Anchorage Service Unit. In these cases the patient must either pay their own way to Anchorage or request travel from their home Service Unit or tribe. This policy created hardships, because in some cases, tribes in the contiguous United States did not pay for any travel or care for their tribal members once they left the reservation.

Appendix H: Description of IPC Phases

Phase 1

IPC progressed through three phases. In this first phase, seven activities took place.

Leadership Engagement. IPC understood that organizations may progress through the various phases faster or slower than other organizations. The progress also may not be linear, but rather cyclical in nature. During this activity, IPC sought to involve leadership in the improvement process. Identifying and encouraging a leadership sponsor involved first finding a person in upper management to commit to the process and support IPC activities. Leadership roles included: setting a schedule for review of IPC progress, guiding the IPC process locally and communicating team progress to agency management and Tribal leaders.

Involving and Engaging the Community. Community involvement goals included developing effective ways of listening to and communicating with the local community by means of surveys, PSAs, brochures, town meetings and listening circles. IPC teams were to have at least one community member as part of the local IPC improvement team. The patient as a consumer had ideas and insights that the clinic staff had not considered. Recruiting a community member was a difficult task to accomplish as the IPC team meets weekly and the four learning sessions were four days in length with three of them being held outside of the state.

Identifying the Microsystem. The participating agency chose which part of the clinic setting to change or improve. IPC recommended that an agency start small with one part of their system. This smaller piece was easier to handle and less complex than the whole.

Assess the microsystem. One of the tools for this purpose was the “Green Book” assessment, a fairly extensive look at processes in the microsystem. In addition, IPC members assessed their own abilities in terms of technology and the improvement process.

Developing an Aim Statement. This living document changed as the IPC team improved the way it worked together. The aim statement was to be measurable and have time limits. It provided an initial orientation toward the activities of the improvement initiative and a description of the microsystem in the organization where the improvement would take place. The aim statement was to include expected dates for key milestones and completion date. Also included was a reason for the effort, why it was important, and how it would benefit the organization, and described its impact on patients. The aim also defined anticipated outcomes such as products, tools, deliverables or other success criteria. The aim statement had specific objections with numerical goals.

Strategic Alignment. The IPC aim and goals were to be in line with the agency’s strategic plan. IPC supported the agency in their improvement process activities. IPC was integral to the way the agency operates their clinical services.

Identifying the Improvement Team Members. The team members were active participants in the process and needed support for their participation by upper management. At UWC the improvement team included a nurse practitioner, a physician’s assistant, two community health aides, a receptionist, a patient accounts representative, the clinic administrator and the health director for the organization. Initially the clinical director, a nurse practitioner was in the leadership position, but the team realized that this role more appropriately belonged to the health director and administrator. The nurse practitioner then participated as a medical team member, a closer fit to her role in the clinic.

Phase 2

IPC built upon concepts learned in Phase One. Areas included in Phase 2 are the care team, communication plan, empanelment, clinical information system, access and continuity, transparence of improvement, the pre-visit, capacity for improvement and resources for improvement.

Identification and Development of the Care team. The care team consisted of primary care providers, case manager, and other ancillary providers. This team worked on optimizing their roles and improving communication. The expectation was that each provider worked at the top of their training and certification. In other words, the primary care provider was not expected to check in the patient and gather survey information.

Developing a Communication Plan. The IPC team reviewed communication plans identified in Phase 1 and sought to improve on the chosen methods. The community was informed as to the progress or lack of progress in IPC activities through letters, meetings with the tribal council or in community events, such as health fairs or tribal events such as annual member meetings.

Empanelment. Empanelment refers to the process of placing a patient with a particular provider or care team. The intended result of empanelment was to improve continuity of care and improve outcomes because (1) The patient would be seeing the same provider each visit and (2) The care team would be familiar with the conditions and needs of their panel members. The two UWC teams, named for local berries that residents would recognize (viz., the blueberry and the salmon berry teams), consisted of a nurse practitioner or physician's assistant, and a community health aide. Both teams shared the same case manager.

Optimize the Clinical Information System (CIS). The UWC used the IHS RPMS electronic health record (EHR) with reminders and prompts. This system was similar to the system used by the Veteran's Administration (VA). The built in reminders varied depending on the patient's age, gender, and health status. For example, a 52 year old woman with diabetes might have reminders that she is due to have pap test, lipids assessment, tobacco assessment, functional assessment, and colon cancer screening. Another useful population management tool was iCare, developed by the IHS. Teams followed their panels (group of patients) by logging into iCare and opening lists of patient groups such as those with hypertension, those of childbearing age, those with diabetes, etc. On one screen the providers could see who was due for screenings, immunizations, lab work, etc. The case manager worked with each team to send out letters to those patients who were due for preventive or disease related care.

Access and Continuity of Care. The definition involved patients seeing the same provider at each visit or as often as possible and tracked in IPC reporting. Access to care involved the availability of the patient's provider to their panel members. The item reported to IPC particular to this activity was the third next available appointment.

The goal was to have same day access. If a patient called for an appointment, were they able to see their provider the same day? At UWC the average daily patient census was low, so the clinic seldom had problems with same day patient access to care. Other organizations participating in IPC struggled with open access for their much larger patient populations. *Making Quality Data Available*. The clinic communicated achievements of the collaborative by posting achievements to a wall in the clinic dedicated to IPC outcomes, mailings to all homes and providing reports at community meetings. The aim was to have the IPC process be transparent.

Develop Capacity and Resources for Improvement. As members progressed through IPC, the expectation was to grow in their knowledge about improvement and the ability to apply knowledge from the various learning sessions and homework assignments. The idea was to improve processes to eliminate waste and inefficiencies in care.

Patient experience measures

Patient experience measures included 5 categories: workforce, experience and efficiency, building relationships, access to care, and patient activation. The workforce goal was to improve patient satisfaction. Patients were asked to fill out a satisfaction survey when they come to the clinic. The patients rated their experience on a 1-5 scale with the following ratings: (a) strongly disagree, (b) disagree, (c) neither disagree or agree, (d) agree, (e) strongly agree.

Questions included the following:

1. I have a person who I think of as my personal provider.

2. It is very easy for me to get medical care when I need it.
3. Most of the time, when I visit my doctor’s office, it is well organized and does not waste my time.
4. The information given to me about my health problems is very good.
5. I am sure that I can manage and control most of my health problems
6. Overall the care I receive at the clinic meets my needs
7. I am able to get the care I need and want- when I need and want it at the clinic.

Tracking of the responses to the survey month by month enabled teams to identify improvement in decreasing scores. Although patient satisfaction was a part of collaborative activities, evaluation of patient satisfaction was beyond the scope of this research project and not discussed.

Phase 3

This last phase of IPC had a focus on spread, efficiency, care management, patient self-management and behavioral health integration. A plan for spread to other parts of the clinic was to be developed and implemented. With inefficiencies identified, PDSA cycles became useful in developing solutions for improvement. Case managers and providers developed further skills in care management for their respective panels. Families and patients learned self-management of their health and health conditions. As well as becoming involved in decision making about care provided and provision of the services. Staff members received training in brief action planning and collaborative goal setting in order to help families address health concerns.