

CARE COORDINATION OF THE DIABETIC
PATIENT IN THE OUTPATIENT
SETTING

by

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DEDICATION

This paper is dedicated to my family. Thank you all for your patience, understanding, constant encouragement and cheerleading. I could not have done this without all your love and support.

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ABSTRACT

Diabetes Mellitus is a serious disease that affects about 29.1 million people in the United States and is the seventh leading cause of death. The U.S. spends about one tenth of our healthcare dollars on diabetes and its complications. Uncontrolled diabetes can lead to other serious conditions such as kidney failure and cardiovascular disease. Diabetes is a chronic disease that can be managed by maintaining a steady blood glucose level with the aid of medication, proper diet, and exercise. With proper ongoing diabetic self-management education patients have better control of their diabetes and are more likely to follow best practice treatment recommendations. The local problem at Big Sky Family Medicine is that only 50% of their diabetic patients are in good control with their HbA1C at less than 7%. The microsystem assessment revealed there was no standardized approach to diabetes care and management. A literature review was done to identify best practice for diabetes management. Care that was patient centered, provided care coordination and ongoing diabetic self-management education proved effective. The general aim of this project was to improve the effectiveness of diabetes care at BSFM. A proposed protocol was developed and an ideal process was created as shown in figure 2. Standardized teaching materials are identified along with pre and post testing forms to identify patient knowledge and satisfaction. The evaluation of the protocol will be based primarily on the improvement of the patients HbA1c readings along with BP readings, LDL results, and increase in patient knowledge and satisfaction. The evaluation of the protocol will be based primarily on the improvement of the patients HbA1c readings along with BP readings, LDL results, and increase in patient knowledge and satisfaction. A CNL would be the ideal choice to implement this protocol due to their ability to design, implement and evaluate change along with the ability to coordinate and delegate patient care.

CHAPTER ONE

INTRODUCTION

Background

Diabetes mellitus (DM) is a serious disease characterized by hyperglycemia resulting in defects in insulin secretion, insulin action, or both (McCance & Huether, 2010). About 29.1 million people (9.3%) in the U.S. have diabetes and approximately 27.8% of those people are undiagnosed (CDC, 2014). Diabetes is the seventh leading cause of death in the U.S. and is most likely underreported (CDC, 2014). Diabetes can affect many parts of the body. It is associated with serious complications such as microvascular disease, heart disease, stroke, kidney failure, blindness, lower-limb neuropathy and amputation (CDC, 2014). The cost of caring for patients with diabetes is astronomical-- one in ten health care dollars is spent on diabetes or its complications. This is because people with diabetes have medical expenditures 2.3 times higher than those without diabetes and the amount spent on diabetes has risen 41% in 5 years (ADA, 2014). According to the American Diabetes Association (2014), \$245 billion were spent on diabetes in 2012. Nearly \$176 billion of that was direct medical cost and \$69 billion was due to reduced productivity. Government insurance such as Medicare, Medicaid, and the Veterans Administration cover nearly two-thirds (62.4%) of the cost of diabetic care in the U.S. The remaining costs are covered by private insurance (34.4%) or paid out of pocket (3.2%) by those who are uninsured.

Diabetes is a complex disease that has been categorized into 3 different types by the American Diabetes Association (ADA) – gestational diabetes, type 1, and type 2 (McCance & Huether 2010). The first, gestational diabetes, is a form of glucose intolerance that usually affects pregnant women in their second or third trimester (CDC, 2014). During pregnancy, the levels of blood glucose for both mother and the fetus rise and require modifications in diet and activity and, in some cases, insulin administration. About 5-10% of women with gestational diabetes continue to have high blood glucose levels following birth and are diagnosed with diabetes, usually type 2, later in life. The second category of diabetes is called type 1 diabetes. This is the most common form in children under the age of 12 and is characterized by a loss of beta cells in the pancreatic islets (McCance & Huether 2010). Without these cells, the body is unable to produce insulin which is needed to convert sugar and other food into energy. Approximately 5% of persons living with diabetes have been diagnosed with type 1 diabetes. (CDC, 2014). Type 2 diabetes is the third form and occurs when the body does not secrete enough insulin or the body becomes insulin resistant (McCance & Huether, 2010). Type 2 is the most common form of diabetes, accounting for 90-95% of all diabetic diagnoses (CDC, 2014). An environmental- genetic interaction appears to be responsible for type 2 diabetes (McCance & Huether, 2010). Some individuals may be genetically predisposed to beta cell dysfunction and are therefore at risk for type 2 diabetes. Other risk factors include age, obesity, hypertension, physical inactivity, family history, impaired glucose metabolism, and race/ethnicity (CDC, 2014).

The diagnostic criteria for diabetes is based on analysis of blood glucose levels. Patients with diabetes must check their plasma glucose levels (blood sugars) several times per day to determine if treatment is effective. Blood glucose level is assessed in a variety of ways. Normal plasma glucose levels range from 70-130mg/dl before a meal (pre-prandial) and <180mg/dl one to two hours after the beginning of a meal (post prandial). Plasma glucose levels are evaluated at different times to determine if there are problems with glucose metabolism. The fasting plasma glucose level (FPG) in diabetics is greater than or equal to 126mg/dl, the 2-hour plasma glucose is greater than or equal to 200mg/dl, and the random plasma glucose level in a person with classic symptoms of hyperglycemia or hypoglycemic crisis can be greater than or equal to 200mg/dl (McCance & Huether, 2010).

The glycosylated hemoglobin (HbA1c) level is also an important diagnostic tool because it is a measure of the amount of glucose that has bonded to a person's hemoglobin over time. The HbA1c level correlates well with average glucose levels—it increases along with the average plasma glucose level. Persons with uncontrolled diabetes have HbA1c levels that are greater than or equal to 6.5%. Table 1 depicts the correlation between HbA1c levels and mean plasma glucose levels (ADA Standards of Care, 2014).

Table 1. Correlation of HbA1c with Mean Plasma Glucose Levels

A1C (%)	Mg/dl	Mmol/L
6	126	7.0
7	154	8.6
8	183	10.2
9	212	11.8
10	240	13.4
11	269	14.9
12	298	16.5

According to the ADA, the HbA1c goal for average non-pregnant diabetic patients should be <7% as lowering the HbA1c below that level has been shown to reduce microvascular complications of diabetes (ADA, 2014). HbA1c reflects average glycemia over several months and when checked regularly provides the opportunity for timely changes to the patient's treatment plan such as adjustments in their medication dosing. The HbA1c should be checked every 3 months in patients with poor glycemic control or in patients with changes in their treatment plan such as medication dosing.

Patients who demonstrate good control and have an HbA1c within target (<7%) can be checked every 6 months. There are a number of other lab tests and exams that should be done on a regular basis for a diabetic, but the HbA1c is one of the best ways to identify the patient's compliance and overall blood sugar control.

Diabetes can be treated and managed like many other chronic illnesses by taking medications that lower blood glucose levels, following a healthy diet, and engaging in physical activities/exercise (ADA, 2014). People with type 1 diabetes have to replace insulin either via injection or a pump to survive. Many type 2 diabetics can control their blood glucose through healthy eating and regular physical activity, but a large portion of them also require an oral antidiabetic medication or insulin. Patient education and self-management are also important aspects of managing this chronic disease. Achieving tight blood sugar control can help reduce the risk of complications such as eye disease, nerve damage, and kidney problems. Tight blood sugar control is defined as maintaining glucose levels within a normal range (70-130 mg/dl) around the clock (Lehne, 2013).

It is very important for diabetic patients to have good control of their diabetes to prevent complications from diabetes and other disease processes. The risk of death from cardiovascular disease nearly doubles for diabetic patients. In 2010 hospitalization rates for heart attack were 1.8 times higher in diabetics and 1.5 times higher for stroke. In 2005-2008, over 28% of diabetics who were 40 years of age and older, had diabetic retinopathy that can lead to vision loss. Diabetes was listed as the primary cause of kidney failure in 44% of all new cases in 2011. And almost 50,000 people are being treated for kidney failure due to diabetes. Early detection and treatment of diabetes can decrease the the development and severity of complications and also prevent progression

of the disease. This would also reduce the amount of money that is spent on diabetes and its complications.

Early detection and ongoing management of diabetes is the responsibility of the primary care provider (Wang, Chawla, Colombo, Snyder, & Nigam, 2014). Primary care providers provide 90% of the diabetes care which accounts for about 3% of all primary care visits (Emerson, 2006). The ADA has published Standards of Care that provide physicians, patients, clinicians, researchers, payers, and other interested people tools that identify components of best practices in diabetic care, general treatment goals, and methods to evaluate the quality of diabetes care. (ADA, 2014)

Diabetic self- management education (DSME) substantially contributes to in positive clinical outcomes such as lower A1C, improved quality of life, healthy coping, and lower costs by improving diabetes knowledge and improving self-care behavior (Moran, Burson, Critchett, & Olla, 2011). Patients who have been involved in diabetic education appear to use primary and preventative services more frequently and have a lower rate of unplanned acute and inpatient hospital services (ADA, 2014). Patients who have received diabetic education are also more likely to follow the best practice treatment recommendations. Failing to adhere to the treatment plan negatively affects not only the health of the patient but also dramatically increases healthcare utilization and overall cost of care. Research has shown that there is a 15% increase in odds that a patient who is not adhering to his diabetic medication regime will use the ED or become hospitalized resulting in about \$4.7 million dollars per year (Wang, et al. 2014).

The purpose of DSME is to educate patients about diabetes, and assist them in making lifestyle and behavioral changes. Knowledge about the disease and how it is

managed through diet, exercise and medications, can empower patients to take control of their diabetes rather than let it control them (Hollis, Glaister, & Lapsley, 2014). To be effective, DSME needs to be individualized, client centered, and have support and participation from the entire health care team, including the patient. DSME can be provided individually or in group settings.

Diabetic education by a Certified Diabetic Educator (CDE) is the standard of care for diabetic patients to increase their self-management skills and to encourage preventative care (Ackroyd and Wexler, 2014). Diabetic patients who received team-based care generally had better outcomes in diabetes, renal, and cardiovascular health. Those who also received case management had some of the strongest effects of any on HbA1c, LDL, and blood pressure.

That said, DSME is not designed to be a onetime thing. To maintain continuing positive outcomes and reduce risk of further complications, patients need ongoing education on diabetes and self-management training (Mullen, & Watts Kelley, 2006). Emotional and practical support provided by a trusted professional nurse is very important and will ensure the patient adheres to the management plan (Mulder, Lokhorst, Rutten, & van Woerkum, 2014). Given the importance of DSME, it is surprising to note that the number of patients who actually receive DMSE is low (Emerson, 2006). Intuitively it makes sense that the person's primary care provider would be the best person to manage a chronic illness like diabetes. However, this cannot be done easily in practices that focus on acute care management of chronic conditions. In this type of primary care model, providers usually meet with patients once a quarter (every 3 months) for a 10-minute visit. This makes it difficult, if not impossible, to engage in an in-depth

conversation about issues affecting diabetic control, assist patients with setting personal goals, or address any current knowledge deficits. In this fast paced model, the primary care nursing staff are also not able to devote any extra time to teaching. Many clinic nurses and medical assistants are not trained as diabetic educators. In order to meet the growing need of diabetic patients in the primary care setting, it is important to examine the microsystem and work flow to identify ways to ensure that DSME is fully integrated into the primary care practice. The purpose of this project was to examine a specific microsystem and develop an evidence-based protocol that would ensure DSME was fully integrated into the primary care practice.

Local Problem

The mission of Big Sky Family Medicine (BSFM) is to improve the health, comfort, and lives of the patients while maintaining respect, integrity, stewardship, and excellence. It is a family practice clinic that serves patients from newborns to geriatrics and gained recognition as a Patient-Centered Medical Home (PCMH) in 2014. According to the National Committee for Quality Assurance (NCQA 2014), the PCMH is a model of primary care that is oriented to the whole person and delivered with a team approach. This can be achieved by partnering with patients and families through an understanding of and respect for culture, unique needs, preferences, and values. The goal of the medical home model is to provide safe, high quality patient care with more access by the patient to their primary provider. The PCMH model is designed to achieve these aims through comprehensive patient-centered care, increased care coordination, performance measurement, and chronic disease management. The PCMH providers and

staff are expected to use evidenced-based practice and continually improve their practice to maintain the highest level of quality and standards. The PCMH differs from a traditional clinic because they are required to participate in continuous quality reporting in order to maintain the PCMH recognition. Making improvements in the number of patients with an A1C within good control ($<7\%$) is an important goal of this clinic based on ADA standards (ADA, 2014).

In the medical home model, the primary care provider leads the care team and communicates with all of the other providers and specialists. Using the metaphor of a wheel, the primary care provider (PCP) serves as the hub and coordinates the patient-centered care with the other healthcare providers and specialists as the spokes of the wheel. The PCP is expected to initiate the majority of the patient referrals and then follow-up with the patient again after he/she has completed those appointments. The PCP receives all the office and procedure notes from the other health care providers to ensure that patient's medical record is complete and up to date.

The staff at the BSFM are very proud of the care they provide. The nursing staff and providers work hard to develop very positive relationships with their patients. The primary care provider, medical home staff, patient, and their families are all part of the patient's healthcare team, and the patient and family are also expected to be engaged in the patient's care and development of their treatment plan. One of the core elements of the PCMH which encourages better, comprehensive care is care coordination offered by a Care Coordinator. The Care Coordinator (CC) is responsible for maintaining continuous communication between providers and follows up with patients through telephone or electronic means. The CC can provide reminders for preventative foot care and eye

appointments along with the follow up communication. Also, CCs arrange joint appointments with the provider and other health care providers.

Having a designated Care Coordinator is also vital to the success of a PCMH. The CC can ensure smooth transitions from an acute setting back into the community, ensuring the patient has the proper in-home care and resources along with the education needed to incorporate any new changes to the treatment plan into the patient's daily life. It is important that the CC develop strong relationships with the patients with diabetes.

In order to ensure patient involvement, it is important that the patient have access to the provider through either an electronic portal in the EMR or be able to schedule unplanned/urgent visits as needed with their primary provider. The nursing staff quite often can assist the patient with identifying deficits and needs, but they do not have the time or knowledge to provide comprehensive diabetic education.

There are two types of providers in this particular clinic—continuity providers and prompt care providers. Four family practice physicians and two family nurse practitioners (FNP) are known as continuity providers. The continuity providers have scheduled appointments Monday through Friday and serve as primary care providers. They see patients for a wide range of medical needs including wellness visits, chronic disease management, skin biopsies or lesion removals, and scheduled urgent visits.

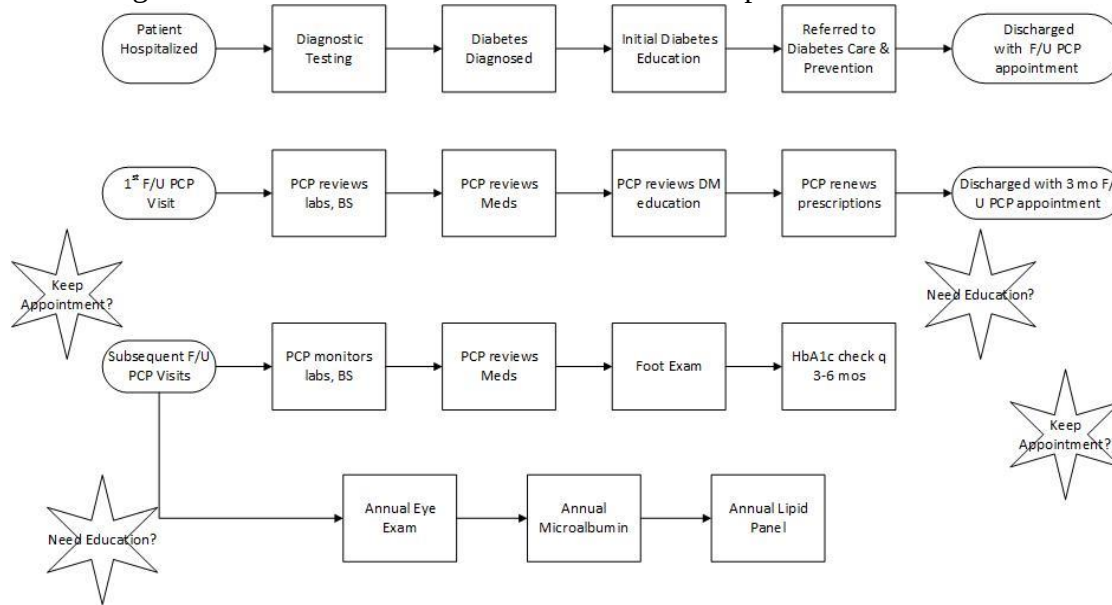
Five physician assistants (PA) staff the Prompt Care walk in clinic. This service is available Monday through Saturday and patients do not need a referral to be seen in Prompt Care. Here the providers treat a wide variety of urgent conditions and needs. The providers support staff is made up of nine CMAs and 4 LPNs. There is one RN who

is the Care Coordinator. There are also nine office staff members along with one practice manager.

Approximately 7700 continuity visits occurred in 2014, with approximately 9% or 693 visits for diabetes (ICD-9 code 250.00). Of those 693 diabetic visits, only 50% had a HbA1c within good control ($<7\%$).

Figure 1 displays the process that is currently in place for treating newly diagnosed diabetic patients. Following the hospitalization and diagnosis of diabetes, the patient is seen within 14 days of discharge for a hospital follow up by one of the continuity providers. This would be a 30 minute follow-up if the patient is an established patient or possibly 45 minutes if the patient is new to the clinic.

Figure 1. Current State of New Diabetic Follow-up



During the initial visit, the provider reviews the hospital records including diagnostic testing and develops the management plan with the patient. The provider will try and determine how the patient is managing at home, how successful they are with the blood sugar monitoring, and review the blood sugar logs. Based on those results there may be medication changes. If the patient was not referred to the Diabetes Care and Prevention program the provider may initiate this at the initial visit. The patient will be asked to follow up with the provider in 3 months. At the 3 month visit, the provider reviews the blood sugar logs and makes any needed medication adjustments, discusses the patient's diet and exercise habits, examines their feet, and orders any needed lab work. This visit and subsequent visits will last 15 minutes.

The microsystem assessment revealed that there is no standardized approach guiding this process or method for documenting the ongoing care provided. For

example, one provider may see the patient in the office every 3 months, and another provider may see their diabetic patients every 6 months. If a patient cancels the visit or seen by another provider, there is no documented plan that guides the overall management of the person's care. There is also currently no method for monitoring tests or procedures, like annual foot exams, for diabetic patients in a systematic way. There is also no time during the follow-up visits to determine if there are educational needs or provide any in-depth diabetic teaching or medication instruction that may be needed. The clinic did implement a process at the beginning of 2014 to track any missed or cancelled visits. Those patients who need to be rescheduled are identified by the Care Coordinator by running a daily cancelled/missed visit report. The CC creates a telephone encounter indicating the need for follow up and then these patients are called by the front office staff to reschedule those follow up visits. At this time there is no process in place to track or monitor which diabetic patients are in need of an HbA1c or other yearly testing.

In summary, diabetes is a significant concern in our country in general, and in our community in particular. With excellent management of diet, medications, and lifestyle by the patient who is working with the health care team, persons can live productive lives for many years with this chronic illness. However in our local setting there is much room for improvement. Treatment of diabetic patients is not standardized and does not include recommended practices that promote self-management and effective control of the disease.

The general aim of this project is to improve the effectiveness of diabetes care provided at BSFM. The process of diabetes management begins when the patient is

admitted to the clinic and ends when the patient is discharged from the clinic. It is important to address this issue now because at least 50% of the diabetics who are currently receiving services are at risk for complications due to elevated HbA1c levels. This significantly increases their risk of complications from diabetes. The specific aim for this project is to increase the number of patients whose HbA1c is $<7\%$ by 10% in 6 months.

CHAPTER 2

REVIEW OF THE LITERATURE

A review of the literature was done to identify best practice in diabetic care and case management within a primary care patient-centered medical home. Relevant literature was found through searches in research data bases such as CINAHL, PubMed, and Medline along with nursing journals, textbooks, and common internet sites such as the American Diabetes Association. The data and evidence was then organized, analyzed, and critiqued.

Chronic Care Model

The Chronic Care Model (CCM) is often used for the management of diabetes in primary care settings and often has positive outcomes reported (Stellefson, Dipnarine, & Stopka 2013). The CCM uses a systematic approach to restructuring medical care to create partnerships between health systems and communities. The CCM is used to identify the essential elements of a health care system that encourage high quality chronic disease care (Improving Chronic Illness, 2015). Those elements include community, the health system, self-management support, delivery system design, clinical information systems, and decision support. Evidence-based concepts help to foster interactions between well informed, active patients and the providers with the resources and expertise. The CCM can be used in any health care setting and coincides with the goals of a PCMH.

According to Stellefson et al. (2013) CCM was effective in managing diabetes by PCPs. They were able to use the EMR and disease registry to establish patient-centered goals, monitor progress, and identify lapses in care. There was evidence that using the CCM assisted in organizational changes to redefine health care team roles and establish DSME programs which in turn improved clinical and behavioral outcomes.

Diabetes Care In A Primary Care Medical Home

The definition of a PCMH by the American College of Physicians is a care delivery model whereby patient treatment is coordinated through their primary care physician to ensure they receive the necessary care when and where they need it, in a manner they can understand (Wang, Chawla, Colombo, & Snyder, 2014). The use of Care Coordination in this model is vital to help manage patients with diabetes and other chronic diseases to prevent avoidable complications.

According to Wang et al. (2014), the current health care system is better suited to treat acute episodes of illness rather than actively managing chronic illness to prevent crisis which Primary Care physicians can do through mechanisms like early detection and ongoing management of care. Prior research had shown that diabetics are 15% more likely to visit the Emergency Department (ED) if they lapse in adherence to their diabetic medication regime. The ability to have the diabetic population adhere to their plan of care could lead to savings of up to 4.7 billion dollars annually. Adoption of a PCMH model has been shown to increase the patient experience and decrease the use of the ED. The PCMH care model supports patient engagement and between visit care which may help improve diabetes care delivery and outcomes, but will depend on specific strategies

and implementation approach (Ackroyd & Wexler, 2014). Diabetic patients who receive team based care generally have better outcomes in renal health, cardiovascular, and diabetes. Patients have increased access to their provider in between regular visits. Patients also have access to their limited health record including lab results via electronic patient portal.

Watts, Lawrence, & Kern (2011) state other than the provider, the Case Manager is a professional who oversees care coordination. The Case Manager is responsible for coordinating and implementing care and that this is an effective intervention to improve glycemic control. Nurse Case Managers align with the core principles of the PCMH model of enhanced access and coordinated comprehensive care. Case management is an important intervention for people at risk for excessive healthcare utilization and at high risk for adverse outcomes (Norris et al. 2002). Case management was found effective in improving HbA1c and was also found effective when provided in conjunction with disease management, DSME, reminder calls, and support interventions.

Diabetic Self-Management

An important part of diabetes care is providing education to the patients with the aim of improving their self-management activities (Mulder, Lokhorst, Rutten, & van Woerkum, 2014). Even though the need for diabetes self-management education (DSME) is a crucial component of diabetic care, the number of patients who receive it is surprisingly low (Emerson, 2006). For diabetic patients to have stable glycemic control, they need to have good self-management through a combination of healthy diet, regular exercise, and possibly medication (Mulder, et.al 2014). Unfortunately less than 20% of

type 2 diabetics reach all three of the target goals for blood pressure, lipid levels, and blood glucose (HbA1c). And only 58% report adherence to diabetic medication regimens.

The majority of diabetic patients receive their care from a PCP. However, successful diabetes management in the primary care setting may be less than optimal because it is based on the traditional model of acute/episodic care (Moran, Burson, Critchett, & Olla, 2011). Diabetics are at risk of developing complications of the disease if they don't receive adequate education, management and support. Patients who receive diabetes education in the primary care clinic experience positive clinical outcomes and reduced medical. Diabetes education and management models that encourage patient engagement and build self-efficacy have been shown to improve self-management skills and clinical outcomes along with significantly lowering the rate of hospitalization.

Case Management and team changes had the strongest effects of any intervention on HbA1c, LDL, and blood pressure. Naik, Teal, Rodriguez, & Haidet (2011) suggest that greater awareness of the ABC concepts leads to better diabetes self-management and glycemic control. The ABC concepts can be used as a foundation of self-management and focus on the predictive value of three key metabolic markers: HbA1c, systolic blood pressure, and low density lipoprotein (LDL) cholesterol levels. Diabetes education needs to stress the importance of teaching patients to know the clinical significance of these values. Naik et al. (2011) found doing face to face education either individually or in groups using an empowerment approach to DSME had a profound effect on their understanding of their ABC values and recalling of their personal goals.

Patients with diabetes are responsible for their day to day management of their disease. Diabetes management depends on patient behaviors and skills (Langford, Sawyer, Gioimo, Brownson, & O'toole 2007). Therefore, self-management support is vital to preparing patients to manage their health and become empowered. This again takes a patient-centered approach to equip patients with the tools needed to make informed decisions and improve their health. Collaborative goal setting is one of the tools that can be used to improve diabetes self-management. The support of effective goal setting can cultivate a sense of responsibility and accountability in patients managing their own care. Engaging patients in the goal setting process can facilitate learning and provide emotional support.

Stellefson et al. (2013) found having diabetic educators or nurses provide instruction on medication, goal setting, foot care, and interpretation of lab findings had a positive impact on the patient's psychosocial and clinical outcomes. Follow-up telephone calls allowed clinicians to monitor patient progress toward the collaborative goals that were set at the office visit. The telephone calls were associated with improvements in interpersonal process of care, physical activity, function, and slightly better metabolic outcomes like the ABC concepts.

Summary of Literature Review

Managing diabetic patients in a primary care setting needs to have a patient-centered team approach (Moran, et al. 2011). The studies found that having education and follow-up that focused on the collaborative goals of the patient and the provider had better clinical outcomes (Moran, et al. 2011). The patient needs to be empowered by the

health care team and be engaged in their own education and diabetic management. The use of a Care Coordinator to manage the registry of patients, support patient self-management, coordinate care throughout the healthcare system, and provide follow-up visits or telephone calls as needed has been shown to decrease ED visits, increase patient adherence to their plan of care, and decrease healthcare cost (Mullen et al. 2006, Wang et al. 2014).

CHAPTER 3

METHODS

Design

The general aim of this project is to improve the effectiveness of diabetes care provided at BSFM. The design incorporated the first phase of the Plan-Do-Study-Act cycle of improvement which included a comprehensive microsystem assessment, diagnosis of the problem, and development of an intervention (Nelson, Batalden, & Godfrey, 2007). The actual testing and evaluation of the proposed intervention was not included in this project.

Setting/Sample

The setting for the project was a primary care medical home located in northwest Montana. A microsystem assessment that was completed prior to the development of the project revealed that 7700 continuity visits occurred in 2014, with approximately 9% or 693 visits for diabetes (ICD-9 code 250.00). Of those 693 diabetic visits, only 50% had a HbA1c within good control ($<7\%$). The population that was the target of the planning process was diabetic patients with a HbA1c $>7\%$ who were receiving care from the PCMH.

Procedures

The CNL student conducted a review of the literature to identify best practices in

diabetes care management and created programming designed to manage the care of high risk diabetics ($\text{HbA1c} \geq 7\%$) in the selected microsystem. An evidence-based protocol guiding long term management of diabetic patients in primary care was developed for the PCMH. A current state assessment of diabetes care was created during the microsystem assessment, reviewed and revised to create a future state assessment depicting the ideal patient flow that would occur as a result of the new protocol. Patient education materials that would be used to teach self-management skills to diabetic patients treated in the new protocol were developed along with an evaluation plan.

Ethical Issues

The development of the protocol and patient education materials did not involve patients or staff and did not require IRB review. The IRB reviewed the methods used to conduct the microsystem assessment to ensure confidentiality was protected during that phase of the project.

CHAPTER 4

RESULTS

The protocol that was developed integrated several new practices with existing processes and significantly expands the role of the clinic's Care Coordinator who also takes on the role of managing the care of persons with HbA1c >7%. Figure 2 displays the future state process flow chart that was created for this project. The deployment flow chart was used to demonstrate the coordinated work that is designed to occur in the clinic for patients who are newly diagnosed with diabetes. Patients who are currently being treated for diabetes will also be included in the flow (Appendix A). The flow begins with the patient receiving a follow up phone call from the CC within 2 business days of hospital discharge or being seen by the PCP for diabetes. During this time, the CC determines if any required lab tests have been ordered and reviews all patient medications. Within 14 days, the patient will be seen by the PCP in the PCMH who reviews the patient's lab results and medications. If the HbA1c is >7%, the patient is introduced to the CM who administers a pre-test, provides education and helps the patient set goals for diabetes self-management. The patient will be given a packet of information including the diabetes care schedule for adults and diabetes self-management education materials (Be SMART about diabetes, and a template for developing a plan for living successfully with diabetes). Based on the information in the pre-test, the CC will determine the patient's stage of readiness and develop a patient specific plan of care and education. The patient will be able to select the areas they would like additional DSME.

The patient will be scheduled to follow up with the CC again in 2 weeks to review blood sugar records and self-management education. The CC and patient will review the information given to the patient at the first visit and progress made on the patients individualized goals set at the first visit. This will continue to be a work in progress based on the patient's goals and readiness for change. The patient will be given the opportunity to schedule a follow-up visit with the CC for any additional diabetic education or reinforcement. They will also be offered to have additional education classes at Diabetes Care and Prevention Center if needed.

Patients who have HbA1c >7%, will receive monthly follow-up telephone calls from the CC. During this phone call the CC will refer to the patients care plan and goals developed with their PCP. The CC will offer support and encouragement through motivational interviewing. The CC will encourage the patient to become empowered to take charge of their own care and diabetic self-management. These encounters will be documented as a telephone encounter in the electronic medical record (EMR) and will continue for at least 6 months. At the end of the 6 month period, the patient and CC will reevaluate the effectiveness of the calls based on improved clinical findings and patient satisfaction. The monthly phone calls will be continued if the health care team determines they are needed. The provider may choose to have the patient follow up at different time intervals based on individual patient needs. The CC will monitor their progress with monthly phone calls for up to six months depending on the patient's willingness to participate and readiness for change. The patient will return to the clinic for follow up care with the PCP every 3 months. During that visit, the PCP will review the goals, VS, lab values, and complete a visual foot exam. The PCP will make any

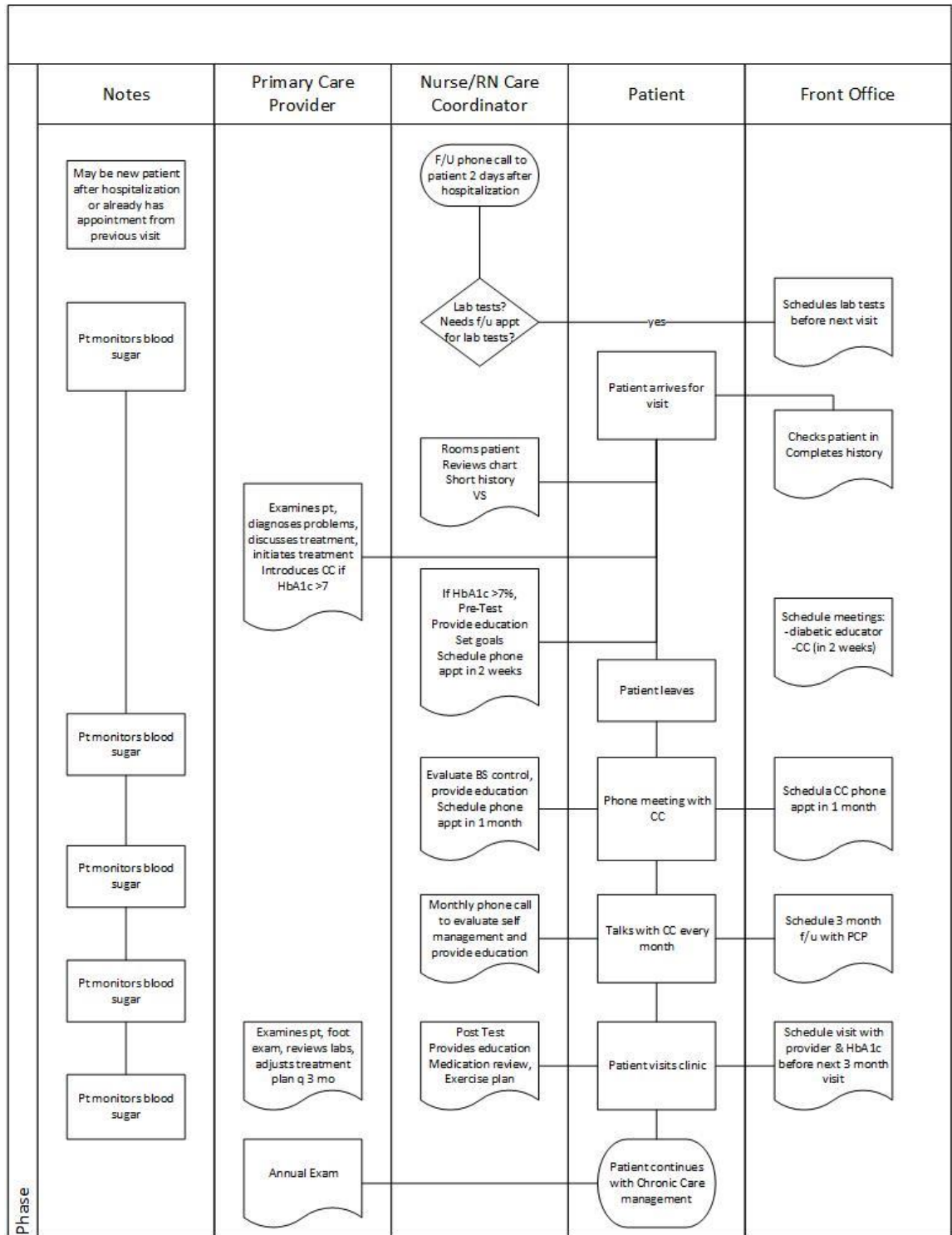
changes and adjustments to the plan of care during the follow up visits based on these assessments.

At the patient's annual comprehensive examination the provider will also offer formal diabetic education provided by the certified diabetic educators at the Diabetes Care and Prevention Center. This annual education is a covered service under Medicare and Medicaid and a number of insurance plans. In between any formal diabetic education at the Diabetes Care and Prevention Center, the patient will have access to diabetic education from their primary care provider, the clinical staff, or the CC. Progress will be tracked through the EMR where CC activities and labs will be documented in an excel spreadsheet.

Care Coordination Protocol

Care Coordinators have the daunting challenge to put the pieces of diabetic disease management, patient self-management education, and patient engagement together to improve patient outcomes and decrease cost. Having a CC in the primary care clinic is vital component to well managed chronic diseases such as diabetes. The CC has the ability to support patient engagement, encourage continued education and goal setting, and provide well management coordinated care throughout the health care continuum. This portion of the paper describes the protocol that was developed for this project along with the implementation and evaluation plans.

Figure 2: Ideal Process



The new plan for diabetic patients includes a flow chart (Figure 2) that will be used for newly diagnosed patients. The diabetic patients will all be given the same educational information about the frequency of lab testing (Appendix A), diabetes education materials titled -Being SMART about diabetes (Appendix B), and their individual plan for living successfully with diabetes (Appendix C). The newly diagnosed patients will also fill out a pre-test (Appendix D) and a post-test (Appendix E). Existing diabetic patients will be drawn from a monthly review of diabetic patients (Appendix F),

The Diabetic Care Schedule for Adults worksheet was developed by the Diabetic Educators at the Diabetes Care and Prevention department at Kalispell Regional Healthcare and is based on recommendations from the ADA. It provides a list of required lab tests, when each should be done, and the target or goal for each test. For example, the patient should have their HbA1c checked every 3 months with the target less than 7.0%. This worksheet gives the patients a visual of all the testing that should be ordered by their provider. The goal is for the patient to also be proactive and speak up if the provider neglects to request this lab work.

Knowledge about the disease and well managed coordinated care through diet, exercise and medications, can empower patients to take control of their diabetes rather than let it control them (Hollis, Glaister, & Lapsley, 2014). Be SMART about Diabetes has a pictorial list of activities and at the bottom gives the patient the opportunity to write a SMART goal which is specific, measurable, attainable, realistic and timely. This will be supplemented with a document that allows the patient to document goals (My plan for living successfully with Diabetes). It is used to help the patient set goals regarding food/nutrition, physical activity, medication, risk reduction, problem solving,

living/coping, and blood glucose testing. As discussed earlier, to be effective, DSME needs to be individualized, client centered, and have support and participation from the entire health care team, including the patient. These documents help to facilitate that process.

Evaluation of Protocol

Evaluation of the diabetic care protocol will be based primarily on the HbA1c levels of the patients which will be checked every 3 months with the target less than 7.0%. The CC will monitor the EMR registry of diabetics and create quarterly reports of HbA1c levels of diabetic patients. These reports will be reviewed each quarter by the CC and the clinic manager.

Individual treatment effectiveness will be monitored at each visit by reviewing the HbA1c and blood pressure readings. The LDL will be tested yearly and as needed if determined by the provider. The lab results will be reviewed by the provider within 48 hours who will call the patient to discuss results and any changes in the treatment plan.

The CC will measure the patient's satisfaction with the protocol, knowledge changes and effectiveness of care management by examining differences in pre and post test scores.

CHAPTER 5

DISCUSSION

Diabetes is the seventh leading cause of death in the U.S., accounting for 10% of all health care dollars. There is an obvious need to increase the knowledge of our patients and do better case management to ensure proper care and follow up. With the implementation of a Care Coordination plan for BSFM, the health care team will have a detailed process to follow and patients will have support to be engaged in their own healthcare.

This Care Coordination role is ideally suited for the Clinical Nurse Leader (CNL). The CNL is seen as a healthcare leader in all different settings (Harris, Roussel, & Thomas, 2014). In the primary care ambulatory care setting the focus is more on chronic disease management and there is a greater use of the medical home model. This system will reimburse the primary care provider for case managing and is essential for the health of the population. The PCPs using the PCMH model are motivated by increased reimbursement when effectively implementing DMSE. This model needs to be team based and patient-centered. The CNL is an important partner in this evolving medical home model. The CNL will use evidence-based practice to inform treatment and mentor and coach the healthcare team.

The CNL is able to design, implement, and evaluate patient care by coordinating, supervising, and delegating the care provided by the healthcare team. The CNL is positioned to monitor the improvement activities as a coordinator. The expectations of

accountability for patient-centered care, cost-effective care, and measureable outcomes are embedded in the CNL role. The CNL is able to increase patient safety and quality of care by maximizing the use of information technology for population management at the microsystem level. The CNL is able to design protocols that prevent acute illnesses and complications associated with chronic disease.

The CNL fits well in the ambulatory care setting where the goal is to maximize wellness and promote health. They are especially valuable in clinics that provide care to complex high-risk patient populations like diabetics. Their ability to integrate evidence-based practice into treatment plans, coach patients, and mentor the healthcare team is especially valuable in the medical home model of care.

Adding Care Coordination to the management of diabetic patients at BSFM will encourage patients to be more engaged in their plan of care, empowered to participate in decision making regarding their healthcare, have a better understanding of their disease process, and show improved outcomes such as lower HbA1c, blood pressure, and LDL cholesterol. This project provides a roadmap for developing a chronic disease management program that meets the primary care needs of a growing number of diabetics. Patients also play a role in this programming. They need to be ready to change in order for this to be successful. Based on the review of literature that informed this project, the need for a good care team with a more structured education process and Care Coordinator follow up of these complex medical patients is the key to success.

Recommendations for Future Work

Moran et al. (2011) states successful diabetes management in the primary care

setting is an arduous process that requires proven skills in lifestyle counseling as well as significant provider times. Integration of a registered nurse as a certified diabetic educator (RN-CDE) in the PCMH is a logical choice. According to Emerson (2006), diabetes educators can educate, motivate, manage, and assist PCPs in meeting ADA standards of care for their patients and can decrease the barriers to DSME access for patients. BSFM may want to look at the financial benefits of having an RN- CDE on staff even if only part time.

Having an EMR that had increased Care Coordination/ Case Management capabilities would also be very helpful to continue to sort, stratify, and schedule the diabetic patients in more efficient, less labor intensive manner. Future work should focus on developing templates that ensure this information is captured in the EMR and can be easily retrieved.

Conclusion

Diabetes is a significant and expensive problem in healthcare today that impacts more and more Americans each year (CDC, 2014). Patients who take control of their health and manage their diabetes effectively can prevent complications from diabetes and other disease processes, especially if they work closely with care providers and care managers. Working together increases everyone's chances of success.

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APPENDICES

APPENDIX A

DIABETES CARE SCHEDULE

APPENDIX A



310 Sunnyview Lane | Kalispell, MT 59901 | 406-751-5454

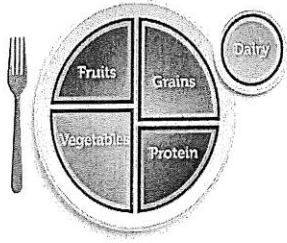
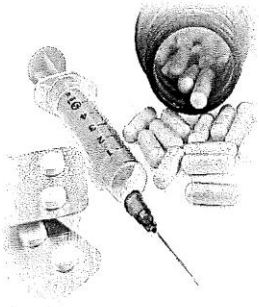
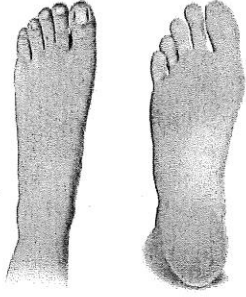
Diabetes Care Schedule for Adults

CHECKPOINT	FREQUENCY	TARGET
A1C	Every 3 months	Less than 7.0%/may be individualized
Blood pressure	Every 3 months	Less than 140/80
Visual foot exam	Every 3 months	Normal
Treatment plan review	Every 3 months	Not applicable
Dental exam	Every 6 months	Normal
LDL Cholesterol	Every year	Less than 100 mg/dL
HDL Cholesterol	Every year	Greater than 40 mg/dL in men Greater than 50 mg/dL in women
Triglycerides	Every year	Less than 150 mg/dL
Urine protein as albumin/creatinine ratio	Every year	Less than 30 mg/g Cr
Retinal eye exam	Every year	Normal
Comprehensive foot exam	Every year	Normal
Flu (influenza) vaccine	Every year	Not applicable
Formal diabetes education	Every year	Not applicable
PPV (pneumonia) vaccine	At age 65, then in 5-6 years	Not applicable

APPENDIX B

BE SMART ABOUT DIABETES

APPENDIX B

Be SMART about Diabetes		
 Daily Activity	 What to eat	 Monitoring
 Medication	 Foot care	 Smoking
 Doctor visits	 Stress	 Other goals
I will (what) _____ (when) _____ (where) _____ (how often) _____ (how long) _____ in order to (why) _____		

APPENDIX C

MY PLAN FOR LIVING SUCCESSFULLY WITH DIABETES

APPENDIX C

*My plan for living successfully with Diabetes*

Name _____ Date _____

- Food Plan and Nutrition:
- ☐ Count carbohydrates at most of my meals and snacks.
 - ☐ Reduce fat in my diet by eating less _____.
 - ☐ Follow the plate method to manage portions.

- Physical Activity:
- ☐ Increase my activity at least _____ days a week.
 - ☐ Be active for _____ minutes or more _____ times a week.
 - ☐ Start my activity plan on _____.

- Medication:
- ☐ Take my diabetes medication as scheduled.
 - ☐ Ask my pharmacist about medication interactions.

- Risk Reduction:
- ☐ Stop smoking by _____ (date).
 - ☐ Always carry a snack in case of low blood sugar.
 - ☐ Check my feet everyday
 - ☐ Other _____

- Problem Solving:
- ☐ Look for patterns in my record book _____ days a month.
 - ☐ Other _____

- Living and Coping:
- ☐ To help manage stress, I will do _____ times a week.

- Blood Glucose Testing:
- ☐ I will test my BG at least _____ times a day, _____ days a week.
 - ☐ I will write my results in a glucose diary.

APPENDIX D

DIABETES PRE-TEST

APPENDIX D

Diabetic Pre-test

Date: _____

Name: _____ DOB: _____

Primary care provider: _____

MEDICAL HISTORY

Do you have high blood pressure? ☐ Yes ☐ No

Do you have high cholesterol? ☐ Yes ☐ No

How often do you visit your primary physician? _____

When were you diagnosed with Diabetes? _____

Have you had any formal Diabetic education? _____

If yes, when? _____ Where? _____

Do you check your blood sugar every day? ☐ Yes ☐ No

If yes, How often do you check your blood sugars? _____

If yes, do you write the numbers down? ☐ Yes ☐ No

What were your blood sugars for the past day? _____

Do you live alone? ☐ Yes ☐ No

If yes, who do you live with? _____

Do they assist you around the house or with any activities? _____

Do you drive or do you need assistance with transportation? _____

DIET

Do you think you eat a healthy diet? ☐ Yes ☐ No

Do you count calories? ☐ Yes ☐ No

Do you count carbs? ☐ Yes ☐ No

Do you follow the plate method? ☐ Yes ☐ No

Describe what you eat on an average day:

Breakfast _____

Lunch _____

Dinner _____

What would you like to change about your eating habits? _____

ACTIVITY

Do you exercise? ☐ Yes ☐ No

If yes, what are your normal exercise habits? _____

If no, why not? _____

What changes would you like to make with your activity level or way you exercise? _____

MEDICATION

Do you take medication for your diabetes? ☐ Yes ☐ No

If yes, what do you take and how often do you take it? _____

Does anyone assist you with medication management? _____

Do you have any medication questions or concerns? _____

HEALTH HABITS

Do you smoke? ☐ Yes ☐ No If yes, are you interested in quitting? ☐ Yes ☐ No

Do you check your feet on a regular basis? ☐ Yes ☐ No

If yes, How often? _____

If no, why not? _____

Do you have any questions about foot care? _____

How would you describe the amount of stress you have in your life?

☐ Low ☐ medium ☐ high

What causes you the most stress? _____

What do you do to cope with stress? _____

What do you think you could do to decrease the amount of stress in your life?

Diabetes Knowledge

Circle one answer for each line

How do you rate your understanding of:		Poor		Good		Excellent
a	Benefits of improving blood sugar control	1	2	3	4	5
b	Meal plans for blood sugar control	1	2	3	4	5
c	The role of exercise in diabetes care	1	2	3	4	5
d	Medications you are taking	1	2	3	4	5
e	How to use the results of your blood sugar checks	1	2	3	4	5
f	Taking care of your feet	1	2	3	4	5
g	Ways to cope with stress	1	2	3	4	5
h	Prevention of long term complications	1	2	3	4	5
i	Overall diabetes care	1	2	3	4	5

Having a disease like diabetes means you have to manage a lot of different tasks and activities to maintain your optimal level of health. In the next set of questions, **Circle** the

number that corresponds with how confident you are in your ability to do the tasks on a regular basis right now.

Check my blood sugars as often as I should?

Not Sure	1	2	3	4	5	6	7	8	9	10	Very Sure
-------------	---	---	---	---	---	---	---	---	---	----	--------------

Follow a meal plan and prepare foods that are appropriate for a diabetic diet?

Not Sure	1	2	3	4	5	6	7	8	9	10	Very Sure
-------------	---	---	---	---	---	---	---	---	---	----	--------------

Know how often to follow up with the physician and have testing done?

Not Sure	1	2	3	4	5	6	7	8	9	10	Very Sure
-------------	---	---	---	---	---	---	---	---	---	----	--------------

Exercise for at least 20-30 minutes per day, 4 to 5 times per week?

Not Sure	1	2	3	4	5	6	7	8	9	10	Very Sure
-------------	---	---	---	---	---	---	---	---	---	----	--------------

Know what to do if my blood sugars are too High or too Low?

Not Sure	1	2	3	4	5	6	7	8	9	10	Very Sure
-------------	---	---	---	---	---	---	---	---	---	----	--------------

Take your medications as prescribed?

Not Sure	1	2	3	4	5	6	7	8	9	10	Very Sure
-------------	---	---	---	---	---	---	---	---	---	----	--------------

Keep worry and stress from interfering with what you would like to do?

Not Sure	1	2	3	4	5	6	7	8	9	10	Very Sure
-------------	---	---	---	---	---	---	---	---	---	----	--------------

Control your diabetes so that it does not interfere with the things you would like to do
each day?

Not Sure	1	2	3	4	5	6	7	8	9	10	Very Sure
-------------	---	---	---	---	---	---	---	---	---	----	--------------

APPENDIX E

DIABETIC POST-TEST

APPENDIX E

Diabetic Post-test

Date: _____

Name: _____ DOB: _____

Primary care provider: _____ Phone: _____

Height: _____ Weight: _____ HbA1c: _____ Date: _____

Do you have high blood pressure? ☐ Yes ☐ No Blood Pressure: _____Do you have high cholesterol? ☐ Yes ☐ No Total Chol: _____ LDL: _____

Date of last follow-up with PCP: _____

Recent changes in Medications? _____

Do you feel the additional follow-up by the Care Coordinator was helpful? ☐ Yes ☐ No

What was most helpful? _____

What was least helpful? _____

Diabetes Knowledge

Circle one answer for each line

How do you rate your understanding of:		Poor		Good		Excellent
a	Benefits of improving blood sugar control	1	2	3	4	5
b	Meal plans for blood sugar control	1	2	3	4	5
c	The role of exercise in diabetes care	1	2	3	4	5
d	Medications you are taking	1	2	3	4	5
e	How to use the results of your blood sugar checks	1	2	3	4	5
f	Taking care of your feet	1	2	3	4	5
g	Ways to cope with stress	1	2	3	4	5
h	Prevention of long term complications	1	2	3	4	5
i	Overall diabetes care	1	2	3	4	5

Having a disease like diabetes means you have to manage a lot of different tasks and activities to maintain your optimal level of health. In the next set of questions, **Circle** the number that corresponds with how confident you are in your ability to do the tasks on a regular basis right now.

Check my blood sugars as often as I should?

Not Sure	1	2	3	4	5	6	7	8	9	10	Very Sure
-------------	---	---	---	---	---	---	---	---	---	----	--------------

Follow a meal plan and prepare foods that are appropriate for a diabetic diet?

Not Sure	1	2	3	4	5	6	7	8	9	10	Very Sure
-------------	---	---	---	---	---	---	---	---	---	----	--------------

Know how often to follow up with the physician and have testing done?

Not Sure	1	2	3	4	5	6	7	8	9	10	Very Sure
-------------	---	---	---	---	---	---	---	---	---	----	--------------

Exercise for at least 20-30 minutes per day, 4 to 5 times per week?

Not Sure	1	2	3	4	5	6	7	8	9	10	Very Sure
-------------	---	---	---	---	---	---	---	---	---	----	--------------

Know what to do if my blood sugars are too High or too Low?

Not Sure	1	2	3	4	5	6	7	8	9	10	Very Sure
-------------	---	---	---	---	---	---	---	---	---	----	--------------

Take your medications as prescribed?

Not Sure	1	2	3	4	5	6	7	8	9	10	Very Sure
-------------	---	---	---	---	---	---	---	---	---	----	--------------

Keep worry and stress from interfering with what you would like to do?

Not Sure	1	2	3	4	5	6	7	8	9	10	Very Sure
-------------	---	---	---	---	---	---	---	---	---	----	--------------

Control your diabetes so that it does not interfere with the things you would like to do
each day?

Not Sure	1	2	3	4	5	6	7	8	9	10	Very Sure
-------------	---	---	---	---	---	---	---	---	---	----	--------------

APPENDIX F

CONTINUED CARE COORDINATION PLAN

APPENDIX F

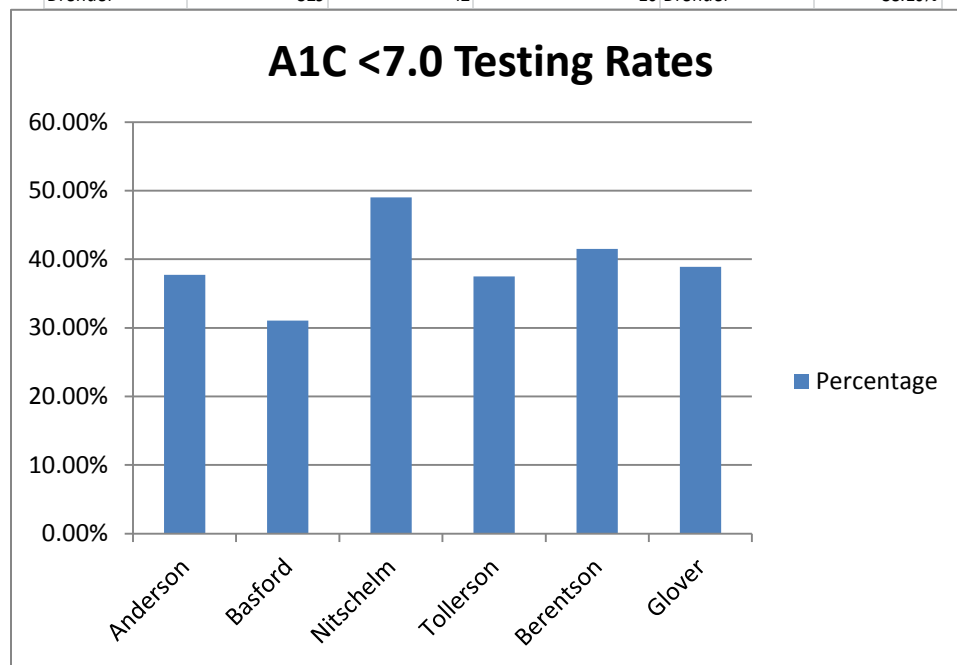
Every month the Care Coordinator will pull the patient panel list from the registry. Under the demographics tab the continuity providers will be listed under the primary care provider, the date of birth (DOB) will be listed by birth month for the current month being run, and then Run New patient panel. For example in January, the DOB will be from January 1 to January 31 and the patient panel will be all the diabetic patients with January birthdays. Then under the ICD tab, 250.00 will be used in the ICD code area and date will be changed from 1 year back from the birth month. For example the date range will be January 1, 2014 to January 31, 2015 will be used and then we will Run Subset for the patient panel. This will give us a patient panel of diabetic patients with the same birth month who have been seen in the last year. This panel can be copied and pasted into a word or excel document to work. The CC will be able use this list to identify the patients in need of labs, foot exams, eye exams, and f/u visits. The CC will identify if the patient is due for follow up with the provider, foot exam, eye exam or labs based on the diabetes care schedule. If the patient is due for any follow up now, the CC will create a telephone encounter and indicate what is needed and send this on to the scheduler. The CC can create an action item for any follow up item needed in the future with the appropriate time frame for follow up. The CC may choose to call patients if there has been documentation of problems getting the patient to come in for visits or follow the plan of care rather than asking scheduling to call the patient.

APPENDIX G

PATIENTS WITH HBA1C <7%

APPENDIX G

Provider	Patient Encounters 10-01-14 to 12-31-14	DX 250.00 Patients (10-01-14 to 12-31-14)	Patients having lab Hemoglobin A1C (Lower Limit 4.0 - Upper Limit 6.9)	Provider	Percentage
Anderson	1127	106	40	Anderson	37.74%
Basford	246	29	9	Basford	31.03%
Nitschelm	1457	104	51	Nitschelm	49.04%
Tollerson	622	64	24	Tollerson	37.50%
Berentson	1006	53	22	Berentson	41.51%
Glover	1028	36	14	Glover	38.89%
Drendel	529	42	16	Drendel	38.10%



APPENDIX H

PATIENTS WITH HBA1C >7%

APPENDIX H

Provider	Patient Encounters 10-01-14 to 12-31-14	DX 250.00 Patients (10-01-14 to 12-31-14)	Patients having lab Hemoglobin A1C (Lower Limit 7.0 - Upper Limit 9.0)	Provider	Percentage
Anderson	1127	106	36	Anderson	33.96%
Basford	246	29	11	Basford	37.93%
Nitschelm	1457	104	34	Nitschelm	32.69%
Tollerson	622	64	17	Tollerson	26.56%
Berentson	1006	53	26	Berentson	49.06%
Glover	1028	36	11	Glover	30.56%
Drendel	529	42	15	Drendel	35.71%

