

DESIGNING A HYPERTENSION MANAGEMENT PROGRAM
FOR FAMILY HEALTHCARE

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Designing a Hypertension Management Program for Family HealthCare

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ABSTRACT

The purpose of the practice improvement project was to determine the hypertension management needs of the Family HealthCare (FHC) clinic in Fargo, ND by staff interviews, observation, and data review as well as to develop a hypertension management program to meet those needs. The clinic's needs and barriers regarding hypertension patients were identified and addressed in the newly proposed hypertension management program.

FHC did not have a structured hypertension management program. The main barriers identified included poor patient follow-up, limited patient educational materials on hypertension, and ineffective patient flow. The program was developed based on the U.S. Department of Health and Human Services Health Resources and Services Administration's hypertension control program. Items addressed in the program were correct blood-pressure taking techniques, evidence-based guidelines regarding patients with hypertension, hypertension tools for providers, education for providers and patients, and follow-up recommendations.

The hypertension management program is to be managed by a quality improvement (QI) team that consists of providers, nurses, pharmacists, dietitians, health coaches, receptionists, and schedulers. The QI team will be responsible for evaluating the progress of the program using FHC's Uniform Data Set report. The goal is to increase hypertension control (patients with a blood pressure of less than 140/90) to 70%. The hypertension program and recommendations were presented to the clinic director Dr. Espejo. The goal was for FHC staff members to recognize the benefits of the hypertension management program and for them to decide to try to implement the program at their facility.

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I want to thank my loving husband Daniel for being by my side during these last nine years of school. I would also like to thank my son Leander for being such a wonderful baby while I have been in graduate school and the child I am pregnant with for not making me ill. My family is my drive and focus! A special thanks to my selfless mother and loving father whom are always there for me. I would also like to thank my other family members and friends for their enormous support, love, and the laughs that helped me on this journey.

DEDICATION

I dedicate the project to my loving family: DJ, Leander, and baby D 2.

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CHAPTER 1. INTRODUCTION

Hypertension affects one third of the adults in the United States (Institute of Medicine [IOM], 2010). According to 2009 statistics, over 300,000 people died from hypertension, either as a primary cause or as a contributing cause (Center for Disease Control and Prevention [CDC], 2011c). One-quarter of Americans have pre-hypertension and are at risk for developing hypertension, and subsequently, cardiovascular disease (CDC, 2011c). As of 2013, nearly 78 million people in the United States had hypertension, with the highest of the people with hypertension being African Americans, Caucasians, and Hispanics (Go, Roger et al., 2013). Among those individuals affected by hypertension, 81.5% are aware of the diagnosis. Among people with a known diagnosis, 74.9% are treated, and 52.5% have achieved a blood pressure at the target level (Go, Bauman, et al., 2013). Wang and Ramachandran (2005) found that two thirds of individuals with hypertension are untreated or under-treated.

In America, 41.9 million men and 27.8 million women have pre-hypertension; 12.8 million men, and 12.2 million women have stage I hypertension, and 4.1 million men and 6.9 million women have stage II hypertension (Madhur & Maron, 2014). More males have hypertension until the age of 45 at which time the incidence becomes equal between males and females (Madhur & Maron, 2014). Hypertension caused 40.6% of the deaths from cardiovascular disease in 2013 (Go, Robert, et al., 2013). Cardiovascular morbidity and mortality are highly impacted by hypertension (U.S. Department of Health and Human Services [USDHHS], 2012). A rise in systolic blood pressure (BP) of 20 mmHg or a diastolic increase of 10 mmHg from a starting blood pressure of 115/75 doubles mortality from ischemic heart disease or stroke (USDHHS, 2012). Not only does hypertension put individuals at risk for death, but also strains the economy. In 2009, the United States spent an estimated \$76 billion on hypertension related

health care services, medications, and sick days from work (CDC, 2011c). According to Koçkaya and Wertheimer (2011), in 2009, the direct, indirect, and total costs to the U.S. health system per year were \$54.2 billion, \$19.2 billion, and \$73.3 billion, respectively. Controlling hypertension can help prevent hypertension related complications that can further increase costs.

Hypertension

Hypertension is a constant pumping of blood through blood vessels at a force higher than normal. Blood pressure consists of the pressure while the heart is contracting (systolic blood pressure) and while the heart is relaxing (diastolic blood pressure) (Copstead & Banasik, 2010). Systolic blood pressure should be less than 120, and diastolic blood pressure should be less than 80 (USDHHS, 2004). According to the Eighth Joint National Committee (JNC 8), strong evidence exists to support treating hypertensive persons aged 60 years or older to a BP goal of less than 150/90 mm Hg and hypertensive persons 30 through 59 years of age to a diastolic goal of less than 90 mm Hg (James, et al., 2014). However, insufficient evidence exists for hypertensive persons younger than 60 years for a systolic goal, or in those younger than 30 years for a diastolic goal; therefore, the panel recommends a BP of less than 140/90 mm Hg for those groups based on expert opinion (James, et al., 2014). The same thresholds and goals are recommended for hypertensive adults with diabetes, non-diabetics with chronic kidney disease (CKD) and the general hypertensive population younger than 60 years (James et al., 2014).

Blood pressure rises with age and is affected by certain lifestyle choices, such as, diets high in sodium, a lack of potassium, a low intake of fruits and vegetables, higher-than-normal body mass index (BMI; greater than 24.9), inactivity, smoking, alcohol, birth control pills, certain medications (stimulants, diet pills, and pseudoephedrine), and diabetes (CDC, 2011c; Wedro, 2010). Other identifiable risk factors for hypertension include sleep apnea, chronic renal

disease, primary aldosteronism, renovascular disease, chronic steroid use, Cushing's syndrome, pheochromocytoma, coarctation of the aorta, hyperthyroidism, and parathyroid disease (Copstead & Banasik, 2010). Hypertension can also be genetic, indicating a high level of importance for individuals with a family history to recognize they are at greater risk for developing hypertension and cardiovascular disease. High blood pressure is considered a silent killer because many people do not have symptoms or are not aware that their blood pressure is elevated (World Health Organization [WHO], 2011b). Symptoms of hypertension may include early morning headaches, epistaxis, ectopic heartbeats, tinnitus, nausea, vomiting, confusion, fatigue, anxiety, chest pain, and muscle tremors (WHO, 2011b). Many times patient are unaware that they have hypertension until they develop a complication from it (Wedro, 2010).

Complications of hypertension include a cerebral vascular accident (CVA), transient ischemic attack, renal failure, eye damage with progressive vision loss, aneurysms, and cardiovascular disease (CVD; Wedro, 2010). Cardiovascular disease is the number one cause of death for both men and women in the United States (ND Department of Health [NDDH], 2011). Over 17 million people worldwide die from cardiovascular diseases each year (IOM, 2010). Controlling hypertension is important to prevent or limit the development of CVD (WHO, 2011a).

Uncontrolled hypertension can lead to CVD, which is a problem for everyone in the United States, including the people in North Dakota (CDC, 2010). Cardiovascular disease is the number one cause of death for both men and women in North Dakota and United States (NDDH, 2011). The Center for Disease Control and Prevention states that, from 2008-2010, there were 415 men per 100,000 men who were 35 years of age and older in North Dakota who died each year from CVD (2011b). In North Dakota, men's death rate from CVD is almost double the rate

for women over 34 years of age, 230 per 100,000 (CDC, 2010). Between 2008 and 2010, there were similar statistics for the United States. There were 448 per 100,000 men over 35 years old who died each year from CVD and 288 per 100,000 women (CDC, 2010). North Dakota's death rate for CVD was 179 per 100,000 people in 2009 (NDDH, 2010). In the United States, the CVD mortality rate among men 35 and older is 529 deaths per 100,000 people, which is much higher than North Dakota's rate (CDC, 2011b). The incidence of CVD in North Dakota and the United States represents how important is it for men and women to control their blood pressure and to potentially prevent a leading cause of CVD.

Hypertension Management Programs

Hypertension is an escalating problem that demands improvement and should be the focus of primary care providers. In 2011, 82.6% of adults had contact with their primary care provider (Schiller, Lucas, & Peregoy, 2012). Primary care is the ideal setting for hypertension identification, management, and prevention of its complications. The patient and primary care provider relationship can strongly influence hypertension control as well as how a clinic monitors and manages a patient's hypertension (Petrella, 2004). The relationship between the provider and patient should be based on trust, which can result in an increased adherence to and compliance with treatment plans (Petrella, 2004). Well-designed hypertension programs have shown to improve blood pressure control among patients with hypertension, however to be successful the program must be implemented and utilized correctly (Jones, 2002). A program should be well organized. The stakeholders need to be identified, introduced to the program, and become committed. The program should define the staff's roles and responsibilities. Identifying who and how a program will be implemented and evaluated is important. Health care

organizations are more successful if they are managed in a systematic manner, such as a well-designed program (USDHHS, 2012).

Medicare and Medicaid developed an incentive program for healthcare facilities to increase use and function of the EHR. The clinic has to prove they are “meaningfully using” the EHR to improve patient care and after doing so receive a financial incentive. There are three stages to the program. Stage one involves meeting 14 core objectives and five of the ten menu set objectives for a 90-day period in the first year and full year in the second. Examples of the first stage core objectives include e-prescribing, maintaining an active medication list, or record and chart changes in vital signs. The first stage focuses on data capturing and sharing. The second stage focuses on advanced clinical processes and requires 17 core objectives and three of the six menu objectives be met. Examples of the core objectives in the second stage include medication reconciliation, recording smoking status for those older than 13 years, or recording demographic information. The final stage focuses on improved outcomes. In addition to the objectives, the clinic must report clinical quality measures (three core measures and three additional measures). Clinical quality measures can measure any aspects of patient care, such as, health outcomes, clinical processes, patient safety, care coordination, etc. (Centers for Medicare & Medicaid Services, 2014).

The National Committee for Quality Assurance (NCQA) is an organization devoted to improving health quality in the United States (Committee for Quality Assurance [CFQA], n.d.). The NCQA manages physicians, health plans, and medical groups that voluntarily seek accreditation. Health plan performance is measured through the Healthcare Effectiveness Data and Information Set (HEDIS) and the Consumer Assessment of Healthcare Providers and Systems (CAHPS; CFQA, n.d.). HEDIS is a commonly used set of performance measures in the

healthcare industry. There are 75 measures in eight domains of care (CFQA, n.d.). The eight domains are effectiveness of care, access/availability of care, satisfaction of care, use of services, health-plan stability, cost of care, informed health care choices, and health plan descriptive information. CAHPS are patient surveys that are sent to patients after they receive care at a healthcare facility.

HEDIS includes performance measures related to various health care issues, such as hypertension control, advising smokers to quit, antidepressant medication management, cervical cancer screening, comprehensive diabetes care, etc. (USDHHS, n.d.). Performance measures allow a healthcare facility to document and monitor how well it is caring for patients. The performance measure for hypertension control is designed to gauge the effectiveness of the care provided to individuals with hypertension (USDHHS, 2012). In the HRSA program, the definition of hypertension control is the percentage of patients aged 18-85 who were diagnosed with hypertension and who have a blood pressure that was controlled (less than 140/90) within the measurement year (USDHHS, 2012).

Hypertension is a chronic condition that requires on going monitoring and care. Well-designed hypertension programs have shown to improve blood pressure control among patients with hypertension, however to be successful the program must be implemented and utilized correctly (Jones, 2002). Health care organizations are more successful at controlling hypertension if patient care is managed in a systematic manner, such as a well-organized program (USDHHS, 2012).

Background and Significance of the Project

Hypertension programs provide structure and guidance for managing hypertension patients. Chronic conditions, such as hypertension, require team-oriented, longitudinal care with

the utilization of information technology and a focus on patient-centered care (American Medical Group Foundation [AMGF], 2013). Family HealthCare (FHC) was the focus for the practice-improvement project. FHC is a primary-care clinic that sees individuals with chronic conditions, such as hypertension, diabetes, heart failure, depression, etc. Although FHC manages the care of hypertension, a hypertension management program does not exist.

Family HealthCare is a clinic that provides comprehensive primary care to patients of all ages, ethnicities, and socioeconomic statuses. FHC also offers a full pharmacy, lab, and optometry and dentistry services. The clinic offers discounted prices and a sliding scale fee based on a patient's income. The clinic also offers homeless health services, refugee health services, and medical interpreters. According to FHC's (2012) *Uniform Data Set (UDS) Report*, the majority of patients at FHC were white (64%), with the second most common ethnicity being African American (18%); see Figure 1 for a complete breakdown of the patient ethnicities. The racial demographic distribution of FHC clients, differs from the general population of Fargo, where in 2010, 90% of the residents were Caucasian (City of Fargo, 2014). Most FHC patients reside in Fargo (59%) and Moorhead (18%). Figure 2 provides information on the other areas where FHC patients reside. In 2012, FHC had 11,159 patients, and the majority (34%) of the patients were between the ages of 25 and 44 and almost a quarter were between the ages of 45-64. Figure 3 provides the age ranges for the patients seen at FHC in 2012. Most FHC patients are uninsured (52%) or have government-assisted insurance, Medicaid (28%); see Figure 4 for further breakdown of insurance coverage.

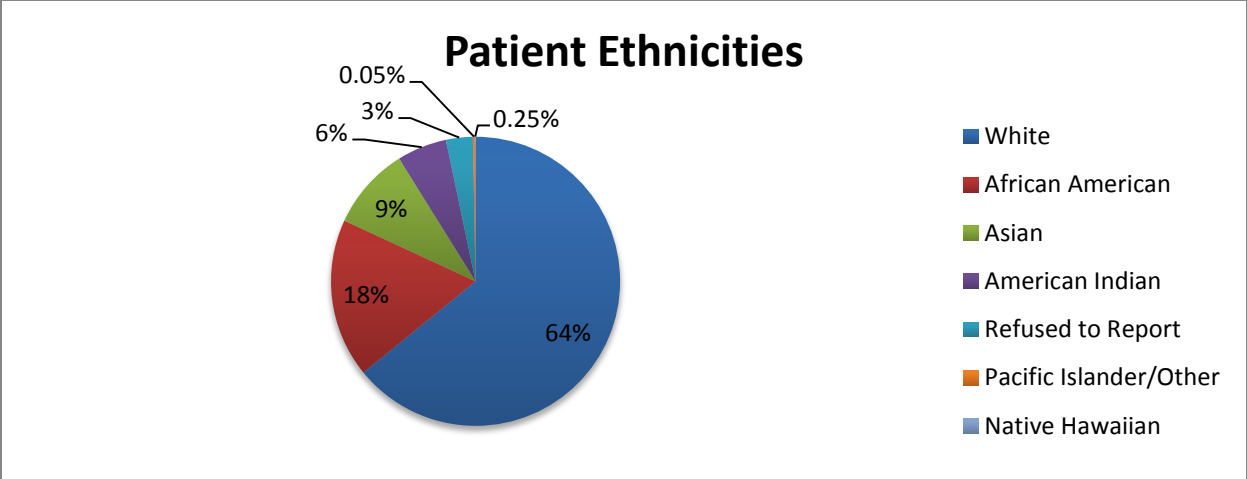


Figure 1. Patient ethnicities. The breakdown of ethnicities at FHC in 2012.

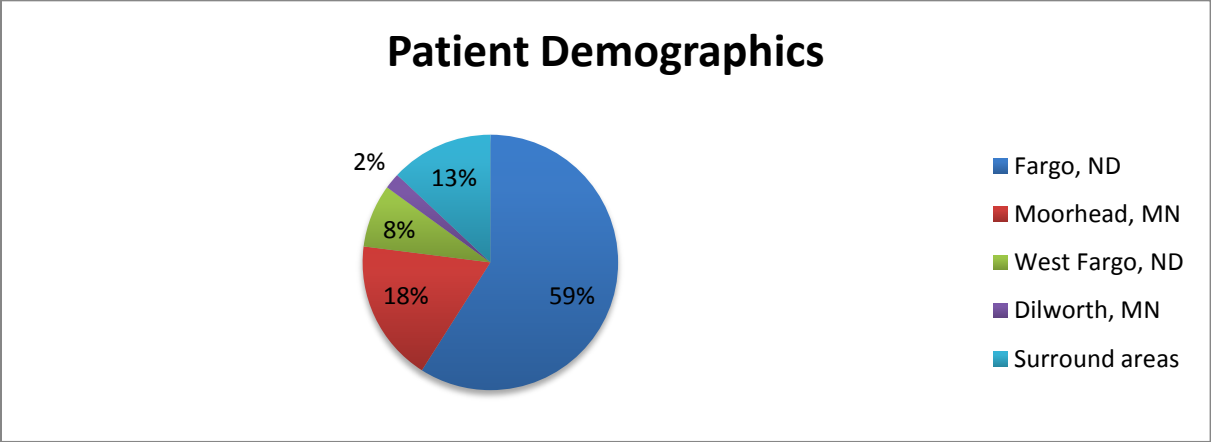


Figure 2. Patient demographics. Identified residency of FHC patients in 2012.

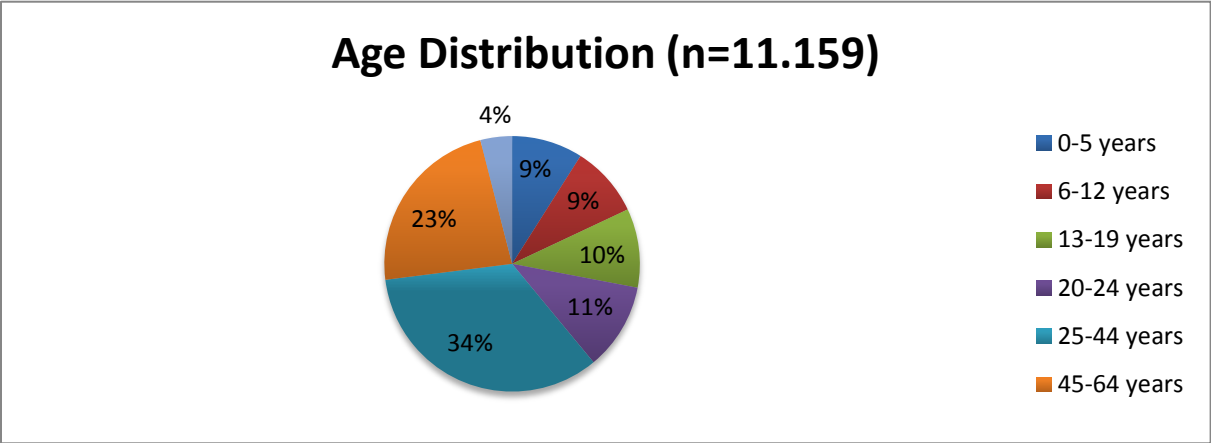


Figure 3. Age distribution. The age distribution for FHC patients in 2012.

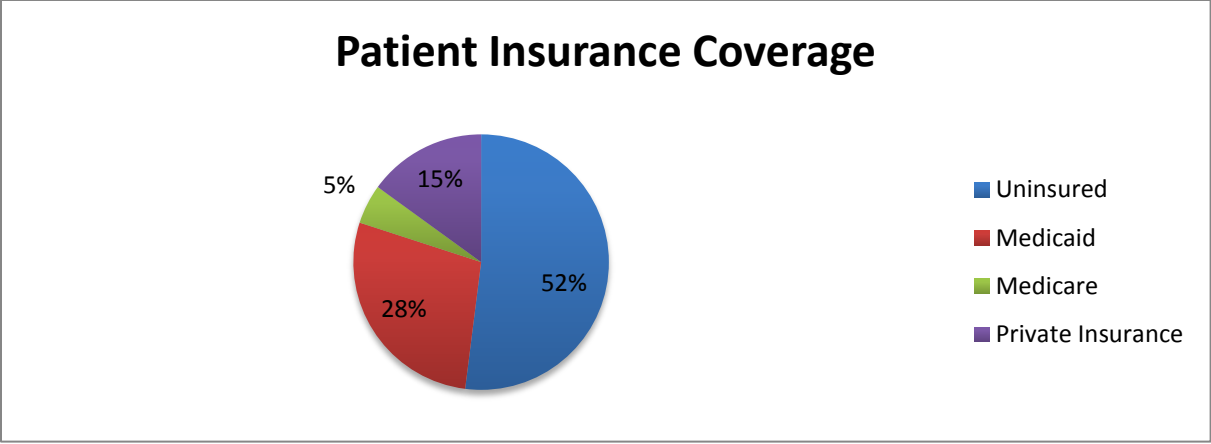


Figure 4. Patient insurance coverage. Insurance coverage of FHC patients in 2012.

My primary clinical rotations for the NDSU Doctor of Nursing (DNP) Practice program were at Family HealthCare (FHC). I participated in the care of many patients with hypertension, more specifically, uncontrolled hypertension. If a patient’s blood pressure was not to goal, the antihypertensive medication was adjusted, and the patient was re-educated on hypertension control, including the importance of a normal BMI, regular exercise, and a low sodium diet in controlling hypertension. The patient was asked to return to the clinic for a free nurse visit to have his/her blood pressure rechecked. A nurse visit consists of registering at the front desk to see a nurse; the nurse measures the blood pressure and documents it in the electronic medical record (EMR). The nurse follows a policy and procedure that ensures that the appropriate follow-up is recommended to the patient depending on the BP level. The patient is not charged for the nurse visit as long as a provider is not required to be seen. Patients are responsible to return for a nurse visit. Many times, patients did not return for a provider visit, or if they did, it was weeks, months, or even years later.

Using the EMR, FHC does a follow-up check on those individuals who have hypertension and have not been to the clinic in the past six months. FHC does not have a system in place to notify the staff if a patient has not returned for a blood-pressure check if needed

before the six-month marker. According to JNC 8, the main goal of hypertension treatment is to obtain and maintain hypertension control, which cannot be monitored if a patient is not having his /her BP measured (James et al., 2014). The lack of recommended follow-up for hypertension patients sparked my interest in the project. The clinic's current hypertension management was reviewed. Based on FHC's quarterly UDS reports, hypertension control was not to the targeted goal of 70%. The definition of controlled BP for the report's purpose considered a blood pressure of less than 140/90 for individuals with the diagnosis of hypertension. The recognized gaps in hypertension management kindled a discussion with FHC clinic providers and staff about identifying barriers to effective blood pressure control and designing a hypertension management program for FHC that addressed those barriers and promoted improved hypertension control. The discussion led to the idea of creating the program for my practice improvement project.

Successful hypertension management depends on multiple factors as well as the commitment of patients, families, healthcare staff, providers, healthcare organizations, and communities (Go, Bauman et al., 2013). The project was important to staff because improved hypertension control can potentially decrease patient's hypertension complications and frequent patient visits. Providing high-quality care to patients can be fulfilling to staff. Fewer hypertension complications may increase patient satisfaction because individuals tend to value their health. Patient satisfaction can be increased with better patient flow and improved patient education. Improved patient flow could potentially decrease the wait time for appointments and enhance the overall efficiency of the clinic. Education teaches patients about their health conditions, which can increase their autonomy. The program is also important to the patients because preventing hypertension complications can decrease morbidity, mortality, and financial strains. Providers can benefit from the program with better patient outcomes and gratification for

providing quality care. The program can also help improve quality measures that affect the provider's performance evaluation and reimbursement. FHC would like to improve the quality of hypertension management to improve patient outcomes. FHC has recognized the need for an organized hypertension management program and share in the goal of creating one to fit FHC's demands.

Project Description with Purpose and Objectives

In 2012, 1,649 of the 11,159 (6%) patients at FHC had hypertension (FHC, 2012). The clinic has processes in place to help patients control their blood pressure. Examples include free nurse visits and the use of health coaches. FHC, however, needed a structured and organized approach to increase blood-pressure control for its patients. A synopsis (Appendix C) of the proposed project was sent to the staff at FHC, and the clinical director and administration thought the proposed project would benefit the clinic and approved moving forward.

FHC did not have a structured hypertension management program to guide staff in caring for hypertension patients. The clinic's current process for monitoring hypertensive patients was reviewed with informal staff interviews and observation of patient flow and care. See Appendix D for a list of items that were discussed with FHC staff. FHC staff helped identify the shortcomings of FHC's current management of hypertension; staff recommendations guided the design of the hypertension management program. The hypertension program was individualized to the needs of the clinic and its patients. Staff involvement in the planning process has been shown to increase the success of implementing new programs. Staff involvement increases personal commitment, eases the transition of changes, and helps staff members maintain a sense of control (Marks, 2010). The literature review covered evidence based treatment of hypertension and hypertension management programs. The program included resources the clinic already

uses, such as BP checks at nurse visits, health coaches, and the electronic medical record.

Informational technology (IT) staff, the pharmacy, and interpreters were also considered when planning the program.

Different methods of program evaluation were considered. The chosen evaluation method was the best option because the report was familiar to staff and the quality improvement staff already used the report at FHC. The recommended evaluation method was to use the UDS report that is already run quarterly at FHC. The quality improvement person at FHC generates the UDS electronically. The UDS report has information on patient demographics, patient diversity, patients' insurance status, and clinical-outcome measures. The UDS report allows for the easiest, least time-consuming, and most efficient way to evaluate the program's effectiveness. FHC tracks 26 diseases on the UDS report. Hypertension control is one of the clinical outcomes FHC reports. FHC has set its goal to have greater than 70% of adult patients with hypertension to have a recent blood pressure of less than 140/90. The UDS has shown the past percentages: 2011, 54%; 2012, 57%; January 2013, 54%; February 2013, 54%; March 2013, 56%; and April 2013, 55% (FHC, 2012). See Figure 5. The data prior to the project and future quarterly data will be compared for at least one year following implementation. The quality improvement (QI) team will use the information to discuss the program's progress at quarterly meetings.

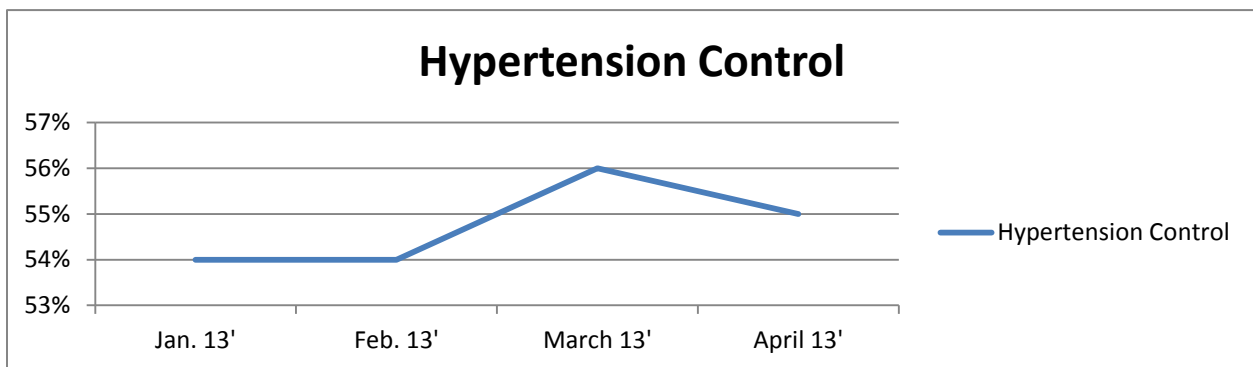


Figure 5. Hypertension control. Percentage of patients with controlled hypertension (<140-90) over four months at FHC.

The purpose of the practice-improvement project was to assess the current hypertension management practices and to create a program that meets the FHC's needs and improves the rate of successfully managed hypertension patients. The technological resources required for the project included: an electronic medical record, functioning computers, and email and telephone communications. Personnel resources included willing FHC staff members who could be interviewed during the assessment of their current program, staff willing to provide feedback for a hypertension management program, and approval by the FHC head to proceed with the project. There were no budget requirements to consider. There were four main objectives of the project:

1. Identify current hypertension control rates among adult patients diagnosed with hypertension at FHC
2. Identify needs, gaps, and barriers in current hypertension management practices at FHC
3. Develop a hypertension management program that works for and benefits the patients, staff, and FHC clinic
4. Present FHC with a suggested way to evaluate the hypertension management program after implementation

CHAPTER 2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

Literature Review

Introduction

The literature review explored the topic of hypertension management and the effectiveness of hypertension management programs. The purpose of the review was to determine which hypertension program would be a good fit for implementation at Family HealthCare. Hypertension and consequential complications were the motivating factors for the review of hypertension management. Hypertension control requires a multifaceted approach with considerations of accurate measurement, cultural differences in hypertension management, education regarding prevention of hypertension by living a healthy lifestyle, identification, and treatment of secondary causes, physical exam, diagnostic testing, and patient education.

Hypertension Management

The following information was used to create an evidenced based hypertension management program. The National Heart, Lung, and Blood Institute (NHLBI) Classification of Hypertension defined a normal BP as less than 120 systolic or less than 80 diastolic, pre-hypertension as 120-139/81-89, hypertension Stage I as 140-159/90-99, and Stage II as greater than 160 systolic or 100 diastolic (USDHHS, 2004). The diagnosis of hypertension is made when an adult patient has a blood pressure above 140/90 on two separate occasions (USDHHS, 2012).

Accurate measurement of blood pressure is the first step in hypertension management. Accuracy improves with correct technique and includes the following steps: the patient should be seated in a chair with the back supported, feet flat on the floor, and arm at heart level; the patient should not have smoked, ingested caffeine, or exercised in the previous 30 minutes; and the patient and provider should not talk during the measurement. The correct size for the cuff is 80%

of the arm's length and 40% of the width. On initial visits, the staff takes two blood pressures, five minutes apart and uses the average of the two readings. The provider should confirm elevated readings in the contralateral arm and use the arm with consistent higher readings. Finger cuffs should not be used, and it is recommended to remove (not push up) constrictive clothing (Davis, 2013a). An auscultatory gap is more common in the elderly. For the elderly, the systolic blood pressure is often underestimated because of vascular disease. In the obese, it is common to have a short upper arm length relative to upper arm width. A wrist cuff may be used (as long as you place the cuff at heart level to avoid error) on individuals with obesity, but finger cuffs should still be avoided (Davis, 2013b). For individuals with arrhythmias, BP varies beat-to-beat with irregular rhythms. An automated device is inaccurate if the BP is only taken once for those patients with atrial fibrillation. The proper blood-pressure technique for someone with atrial fibrillation is to measure the BP several times and then average the readings. If an individual has severe, regular, bradycardia, the cuff is deflated slowly to prevent underestimating the systolic blood pressure and overestimating the diastolic blood pressure (Aronow et al., 2011).

Cultural groups benefit from individualized hypertension management for the reason that different treatment regimens work better for different ethnicities. African Americans respond better to a low sodium or the Dietary Approach to Stop Hypertension (DASH) diet. African Americans typically respond better to diuretics and calcium channel blockers than hypertension medication classes. African Americans and Asians have an increased risk of developing angioedema from Ace inhibitors (USDHHS, 2004). JNC 7 emphasizes the importance of educating patients about hypertension control including the benefits of exercise; BMI in the normal range; eating a low-sodium, healthy diet; and limiting caffeine, alcohol, and smoking. JNC 8 also strongly supports emphasizing lifestyle treatments, such as weight control, a healthy

diet, and regular exercise, to improve BP control and to decrease the need for medication (James et al., 2014). Regular aerobic exercise for at least 30 minutes per day, most days of the week can decrease systolic BP by 4-9 mmHg (Whelton, Chin, Xin, & He, 2002). Maintaining a normal body weight (BMI 18.5-24.9) can decrease systolic BP by 5-20 mmHg/10 kg (He, Whelton, Appel, Charleston, & Klag, 2000). Patients who use tobacco should be counseled and encouraged to stop smoking. Systolic BP can be decreased by 2-4 mmHg by limiting daily alcohol consumption to fewer than two drinks for men and less than one drink for women (Xin et al., 2001). JNC 7 also emphasizes the importance educating patients about medication compliance, regular follow-up, and close monitoring by the provider (USDHHS, 2004).

The DASH diet promotes a diet rich in fruits, vegetables, low fat dairy, low cholesterol, low fat, low sodium, high potassium, and high calcium. If followed, the DASH diet can decrease systolic BP by 8-14 mmHg (Sacks et al., 2001). A positive correlation exists between high sodium diets and hypertension (Katsuyuki et al., 2010). Limiting daily sodium intake to less than 2.4 g can decrease systolic BP by 2-8 mmHg (Chobanian & Hill, 2000). The primary contributors of hypertension include excess body weight, excess dietary sodium, a sedentary lifestyle, poor diet, and excess alcohol intake (USDHHS, 2004).

Although only 5 to 10% of patients have an identifiable cause of hypertension, the time should be taken to evaluate because treating the cause could treat the hypertension (Onusko, 2003). The first step in hypertension management is to rule out an identifiable cause of secondary hypertension, especially if the age, physical exam, history, or diagnostic testing suggest a secondary cause. Clues to a secondary cause include a sudden onset of hypertension, hypertension that responds poorly to treatment or hypertension that was once well controlled that is now difficult to control (USDHHS, 2004). Examples of a secondary cause of hypertension can

include chronic kidney disease (CKD), coarctation of the aorta, Cushing syndrome, medication, obstructive uropathy, Pheochromocytoma, primary aldosteronism or other mineralocorticoid excess, renovascular hypertension, sleep apnea, or thyroid or parathyroid disease (Davis, 2013a). Identifying and treating the underlying cause of hypertension should be the provider's priority.

A comprehensive assessment of hypertension includes a complete history and physical examination of the patient. A thorough history incorporates an extensive past medical history, social history, and family history. The social history addresses work environment, home environment, alcohol intake, drug use, tobacco use, diet, medications, and allergies. Many secondary causes of hypertension can be hereditary, therefore the family history can be integral in identification of a secondary cause. The physical exam includes an accurate measurement of BP including a measurement from the contralateral arm. The JNC 7 recommends measurement of BMI and waist circumference. Examination of the fundi aids in identification of hypertensive retinopathy. The JNC 7 recommends evaluation and auscultation of the carotid arteries, abdominal aorta, renal arteries, and the femoral arteries for bruits. The presence of bruits provides diagnostic clues for arterial stenosis, such as renal and carotid artery stenosis, treatable secondary causes of hypertension. Palpation of the thyroid gland may uncover hypothyroidism, a secondary cause of hypertension. A thorough examination of the cardiovascular and pulmonary systems is recommended. The cardiovascular exam is assessing the point of maximal index, and if displaced can indicate left ventricular hypertrophy. An irregular rate and rhythm of the heart can indicate electrical disturbances caused by hypertrophy or ischemic changes. Examination of the abdomen is completed to assess for enlarged kidneys, masses, a distended bladder, and an abdominal aortic pulsation. The abdominal exam helps rule out secondary causes of hypertension, such as, obstructive uropathy or polycystic kidney disease. The lower extremities

are inspected and palpated for edema and pulses to assess for peripheral vascular disease or signs of heart failure. A thorough neurological assessment should be completed to evaluate for cerebral vascular disease (USDHHS, 2004).

After diagnosis and prior to beginning treatment for hypertension, the JNC 7 recommends obtaining a 12-lead EKG, urinalysis, blood glucose or a hemoglobin A1C, hematocrit, potassium, creatinine or estimated glomerular filtration rate (GFR), calcium, and fasting lipid panel (USDHHS, 2004). The purpose of the history, physical examination, and diagnostic testing is to identify secondary causes of hypertension, and to assess for hypertension induced-end-organ damage. Examples of end organ damage include left ventricular hypertrophy, angina, heart failure, transient ischemia attacks, CKD, peripheral artery disease, and retinopathy (USDHHS, 2004).

According to the JNC 8, hypertensive patients need follow-up monthly, or individualized to the patients' needs, until the target blood pressure is met (James et al., 2014). Visits that are more frequent may be necessary for patients with Stage II hypertension, or those with confounding co-morbid conditions. After the patient reaches and sustains goal BP, follow-up is recommended every 3-6 months (USDHHS, 2004).

JNC 8 released an updated evidenced-based guideline for the management of high blood pressure in adults in February 2014. JNC 7 and JNC 8 have minor differences. JNC 8 does not use the definitions of hypertension and pre-hypertension, instead refers to thresholds at which pharmacologic treatment should be initiated. JNC 7 recommended five drug classes as initial therapy; however, JNC 8 recommends just four classes (angiotensin-converting enzyme inhibitor, angiotensin II receptor antagonist, calcium channel blockers, and diuretics). JNC 7 defined compelling indications for use of certain classes of medication, while JNC 8

recommends considering specific drug classes based on race, or diagnosis of diabetes, and chronic kidney disease. The scope of JNC 8 is much narrower and does not address topics, such as, blood pressure measurement methods, secondary hypertension, and resistant hypertension (James et al., 2014).

Hypertension Management Programs

An effective hypertension management program is evidenced based and appropriate to the population treated. A multifaceted approach to program development should take into account the stakeholders and their differing interests. Comprehensive hypertension management programs incorporate clinical guidelines, support coordination of care, establish uniform best practices, and increase the standard of care. Evidence based practice and guidelines encompass a stronger scientific foundation that contributes to improved consistency, efficiency, effectiveness, quality, and safety of health care (Timmermans & Maurck, 2005).

The Institute of Medicine (IOM, 2010) has joined the CDC and the Division for Heart Disease and Stroke Prevention (DHDSP) in the use of population-based strategies to improve hypertension among individuals, families, and communities. The group recommends strengthening hypertension surveillance to track the progress for the purpose of reducing hypertension prevalence, and increasing public awareness about the identification and treatment of hypertension. The group also recommends involving public health organizations in policy and program development in such matters as cutting sodium intake and, ensuring adequate potassium intake. Another goal for the group was to determine why there might be poor physician adherence to current guidelines regarding hypertension management. The resource and information on physician adherence and public awareness was taken into account when planning FHC's program.

The Heart & Stroke Foundation of Canada created a Hypertension Management Program (HMP) that included professional education, an evidence-informed hypertension flow sheet, comparative provider practice reports, and an implementation guide (Heart & Stroke Foundation, n.d.). The Hypertension Management Program helps provide direction for providers to improve the detection of hypertension, its management, and its treatment while encouraging patient self-management. The program has been active for three years, and has been successful with an average reduction in blood pressure of 6.4/3.8 mmHg and a 41% increase in the number of individuals with hypertension who were controlled to their target BP. The program had an impressive 60% increase for individuals working on lifestyle modifications and an increase in provider knowledge about the best-practice guidelines on hypertension from 34% to 89%. The program also resulted in increased satisfaction for inter-professional collaboration and improvement in follow-up. The program lacked educational materials for patient use. The success of lifestyle modifications in improving hypertension control was applied to the program developed for FHC.

Applied Health Outcomes is a pharmaceutical company that developed and piloted a hypertension management program. The project's goal was to improve the medical management of hypertension in population-based health care settings (Maue, et al., 2003). The objectives of the hypertension management program were to determine a clinic's current hypertension management strategy and then identify and suggest ways for the clinic to better control hypertension. The project also aimed to improve hypertension awareness as well as patient and provider knowledge about hypertension complications. One final objective was to improve patient adherence to hypertension treatment by promoting simpler treatment regimens and measuring the interventions' effects. The program showed promise regarding improved

hypertension management following a physician-focused intervention (Maue et al., 2003). The program is limited to the success of population-based medical decisions and lacks a comprehensive hypertension management plan.

A local hospital recently initiated a pilot hypertension management program and hypertensive practice guidelines. The hypertension guideline includes an easy-to-follow flow chart developed to assist providers with hypertension identification and management. The flow chart has information on diagnosing hypertension, cardiovascular risk factors, causes, target organ diseases, and diagnostics. The next section has advice on lifestyle modifications for the provider to utilize, such as, health coaches and educational materials. The third section has compelling indications for treatment regimens. The final section has information on follow-up and meeting goal BP's. Outcome data are not yet available for this program (Sanford Health, 2013). The guideline provided helpful information on condensing a hypertension program.

Green et al. (2011) conducted a study about electronic communications and home blood pressure monitoring published in the *Journal of Medical Internet Research*. The study involved a trial program among 10 clinics that involved pharmacist management via the web to improve blood pressure control. The study found that older patients, those with lower socioeconomic status, and individuals with lower levels of education had less access to a computer and were less willing to participate in such a program because of the lack of computer access (Green et al., 2011). The resource was helpful because FHC has a number of patients with low socioeconomic status and incorporating web-based monitoring for follow up may not be widely used based on Green and colleagues' research.

The American Medical Group Foundation and American Medical Group Association (AMGA) have acknowledged the challenge of blood pressure control among providers. The two

groups developed a toolkit for providers to address the common challenges associated with effectively treating and managing high blood pressure (AMGF, 2013). The asymptomatic nature of hypertension poses a large challenge to hypertension control. The lack of symptoms increases non-adherence to providers recommended treatment of hypertension, such as medications or lifestyle modifications. Providers are not treating hypertension urgently or aggressively enough. Another challenge identified is lack of public recognition of hypertension (AMGF, 2013).

The toolkit information is divided into six categories, which are referred to as planks in the toolkit. The first plank has 11 tools to help ensure that staff members are trained to accurately measure blood pressure. The second plank has a hypertension treatment algorithm and guideline for treating hypertension. The third plank provides a way to identify and address hypertension for every hypertension patient at every primary care and cardiology visit. The fourth plank has policies, procedures, and standing orders to ensure that patients who are newly diagnosed with hypertension or are not to their goal BP are seen in the clinic within 30 days. Hypertension prevention, patient engagement, and self-management tools are part of the fifth plank. The fifth plank contains tools such as a patient-education flyer, BP tracking sheet, blood-pressure report card, blood-pressure tracking card, after-visit summary, patient and physician questionnaires. The sixth plank discusses a registry used to track hypertension patients. The seventh plank focuses on educating staff about the importance of BP goals and metrics with a hypertension report, clinical level performance report, quarterly status report, and physician quality report cards. The final plank discusses care coordination and encourages specialty departments to refer the patient to primary care if a BP measurement at their clinic is not to goal. The information is extensive and thorough. However, the program lacks a guiding theoretical framework.

The U.S. Department of Health and Human Services (2012) Health Resources and Services Administration (HRSA) designed a program for hypertension control. There are six parts to the program. The first part of the program discusses the importance of evaluating the effectiveness for the care and management of those with hypertension with performance measures. A good performance measure must be relevant, measurable, accurate and feasible (USDHHS, 2012). To ensure that the characteristics of a good measure are met HRSA uses the performance measure on hypertension control endorsed by NCQA to guide the hypertension control program. The program provides evidence from the National Heart, Lung, and Blood Institute about increasing trends in the awareness, treatment, and control of high blood pressure. The program is significant because even modest improvements in blood pressure have been shown to reduce mortality and morbidity.

The second part of the program emphasizes three key components for program success: (a) clear direction, (b) functional infrastructure for quality improvement, and (c) commitment from leadership. Clear direction is the aim statement or the defined goal of what is trying to be accomplished. A functional infrastructure has four essential components to support quality improvement efforts: quality improvement teams, tools, and resources, organizing improvements, and building on things that have worked for others.

The third part of the program discusses implementing the hypertension control program by the means of a critical pathway. A critical pathway allows for a visual depiction of evidence based medical guidelines and the steps taken to achieve optimal hypertension control. The program separates the factors that can affect hypertension control into patient-related, care-team related, and health-system-related. Patient-related factors include age, cultural differences, health literacy, co-morbid conditions, and socioeconomic status. Care-team factors include staff

education, staff skill set, the staff's cultural competence, and the level of appreciation for each individual's work effort to improve care outcomes. Health-system factors include the cost of services, scheduling and appointment availability, and clinic location. The factors are added to the critical pathway and reviewed to identify potential areas of improvement. The other piece of implementation is to establish data infrastructure. Data infrastructure involves monitoring a performance measure over time and using the value to track progress. Creating a data infrastructure involves three steps. The first step is to establish baseline data. The second step involves tracking and monitoring the performance as changes are applied. The quality improvement team makes changes to the program, and after the changes, the measure needs to be recalculated and tracked. The final step in the development of data infrastructure is performing systemic analysis of the data in preparation for more changes.

The fourth part of the program discusses performance-improvement strategies. This part goes in to detail about how the care-model approach is used to implement the program's changes. The critical pathway approach is a second quality model for guiding change that is discussed.

The fifth part emphasizes the importance of continued monitoring for the program and ongoing assessment of the measure to ensure that the program's intended goal is met. Expanding the program to other areas can also be evaluated after the initial program is set. The final part provides the case study for a health care center that used this approach to improve hypertension control.

Multiple hypertension programs are available to guide providers in achieving optimal blood pressure control among patients, but the U.S. Department of Health and Human Services Health Resources and Services program was the one used for this practice-improvement project.

The HRSA program was chosen because it provides the backbones for developing a program that was individualized for FHC's needs. The program also utilized the Chronic Care Model, the same theoretical framework that FHC follows. Successful quality improvement projects require a systemic approach for measuring change, testing small changes, and tracking the impact of the changes over time (USDHHS, 2012). The program can be built around clinics even if the documentation, patient flow, and staffing models differ. The program encourages the organization to establish a quality improvement (QI) team to focus on hypertension management. The QI team can consist of pharmacists, nurses, providers, health educators, patient outreach specialists, patient navigators, scheduling staff, information specialists, case managers, receptionists, administrative staff, medical assistants, or health coaches (USDHHS, 2012). A provider who is passionate about hypertension control would be useful as the "provider champion" for improvement and to serve as the QI team leader. The QI team's objective is to work together to explore how each individual team member's actions influence others and how each person can influence a patient's blood-pressure control.

Hypertension Education Handout

I reviewed the literature on patient-education handouts about hypertension. The goal of the search was to find a hypertension education handout that was accurate, one to two pages, easy to read, concise and available in multiple languages. Patient education handouts should be less than two pages long, have a font size 12 or larger, have simple language, avoid acronyms, be written with an active voice, and should not contain too much information (Indian Health Services [IHS], n.d.). The handouts should be written at a sixth grade reading level (Merriman, 2006). Communication specialist Thomas Lang (1999) recommends that patient handouts be easily accessible, appropriate for the patient's needs, easily understood, easily remembered,

easily referenced, and visually appealing. The patient handout should facilitate discussion of hypertension between the patient and providers, and not just handed to patients (IHS, n.d.). The handout should be written in non-medical terms at the sixth- to eighth-grade reading level (American Academy of Pediatrics [AAP], 2011). Almost 90 million Americans have limited literacy (AAP, 2011). Plain language not only benefits individuals who have limited literacy, but it also conveys the health message better and helps people without a medical background or high literacy level retain the information (AAP, 2011). The handout needs to include the definition of hypertension, prevention methods for hypertension, and hypertension treatment.

The NHLBI has a comprehensive patient handout on hypertension, but the document is seven pages long. This length provides too much information and may overwhelm patients. The National Institute on Aging has a great resource with information about medication adherence and compliance. The resource, being five pages long, was too lengthy. The American Society of Hypertension has an educational handout in English and Spanish, but the handout was 14 pages long (American Society of Hypertension, 2010). The American Heart Association (2012) has a handout explaining the risk factors, complications, and prevention of hypertension, but is only available in English. A hypertension handout written in the six common languages spoken by FHC patients could not be found on one individual site. The common languages spoken at FHC are English, Spanish, Nepali, Somali, Bosnian, and Swahili. Many FHC patients do not use English as a primary language, so it is important to find an educational handout in the most common languages used at FHC. The CDC has a concise and accurate hypertension handout (written in English) for patients that includes information on what hypertension is, how hypertension is treated and diagnosed, and how hypertension can be prevented (CDC, n.d.). Spanish, Bosnian, and Somali handouts can be found through MedlinePlus; they describe what

hypertension is, how to prevent it, and warning signs of when to call 911 (MedlinePlus, 2013). A Swahili handout discussed what blood pressure is, ways to lower blood pressure, medications for treatment, and measuring blood pressure at home (Blood Pressure UK, n.d.). Each site has similar information about hypertension. The benefit of the different sites is having the information translated into various languages. No site translates the information to Nepali, so that task would need to be done by the FHC interpreters. The other option would be to use the CDC resource and to have the FHC interpreters translate it into the top five languages.

Theoretical Framework

The Chronic Care Model (CCM) and the critical pathway approach were both described in HRSA's hypertension control program. The CCM was chosen to guide this project. Approval was obtained from American College of Physicians to use the CCM image; see Appendix B. The MacColl Center approved the use of the CCM information. Copyright was not required because the project is for educational, non-profit purposes. The CCM was developed by the employees of the MacColl Center for Health Care Innovation at the Group Health Research Institute and was later revised by The Robert Wood Johnson Foundation ("The Chronic Care Model," n.d.).

The CCM consists of six elements for a health care system that are required to provide and manage chronic health conditions more successfully. See Figure 5 for the CCM image. The CCM's goals are to decrease health care costs, to increase provider satisfaction, and to foster healthier patients. The elements of the CCM are described below along with examples from the FHC ("The Chronic Care Model," n.d.).

1. Health system. The health system needs to be organized in a manner to promote safe and high quality health care. Examples pertaining to the project include the QI leader being engaged and communicating with FHC staff.

2. Delivery system. The delivery system design is proactive in providing effective and efficient care to patients. Using a multi-disciplinary approach to manage hypertension management at FHC is an example of the delivery system.
3. Decision support. Decision support focuses on evidence-based guidelines and the incorporation of patient preferences. The project uses many clinical guidelines, such as JNC 7 and JNC 8, to develop the hypertension management program.
4. Clinical information systems. Providers and patients are updated and reminded when services are needed, which also aids in tracking the care provided by using data collection tools and the EMR.
5. Self-management support. This element of the CCM focuses on patient involvement with goal setting and empowering patients to manage their health. An example would be providing a BP record keeping card to the patient for self-management support.
6. Community. The focus is on utilizing community resources to meet the patient, family, and community needs.

The goal of the CCM is improved patient outcomes, encouraging productive interactions between an informed, activated patient and a prepared, proactive practice team. The CCM serves as a guide for managing a chronic health condition such as hypertension. The CCM has been successful at addressing the infrastructure and support required to ensure high-quality care for hypertension (Lewanczuk, 2008). Many models have been proposed, but the CCM has been widely accepted and suited for the diagnosis and treatment of hypertension (Lewanczuk, 2008). Improved chronic care is increasing due to evidence about effective system changes (Wagner et al., 2001). The CCM has been used at more than a hundred health care organizations to improve the quality of care for chronic conditions such as hypertension (Wagner et al., 2001). Using the

CCM has improved hypertension treatment and patients' medication adherence (Carter, Bosworth, & Green, 2012). Multiple studies have shown the effectiveness of team-based care models, such as CCM, to engage patients. Carter and colleagues (2012) have found that team-based care models are an effective and efficient way to manage hypertension. Adopting a program such as CCM can help care become more patient centered, personalized, timely, and collaborative (Carter et al., 2012). CCM is becoming an important tactical framework for disease-management and practice-improvement projects (Fiandt, 2006).

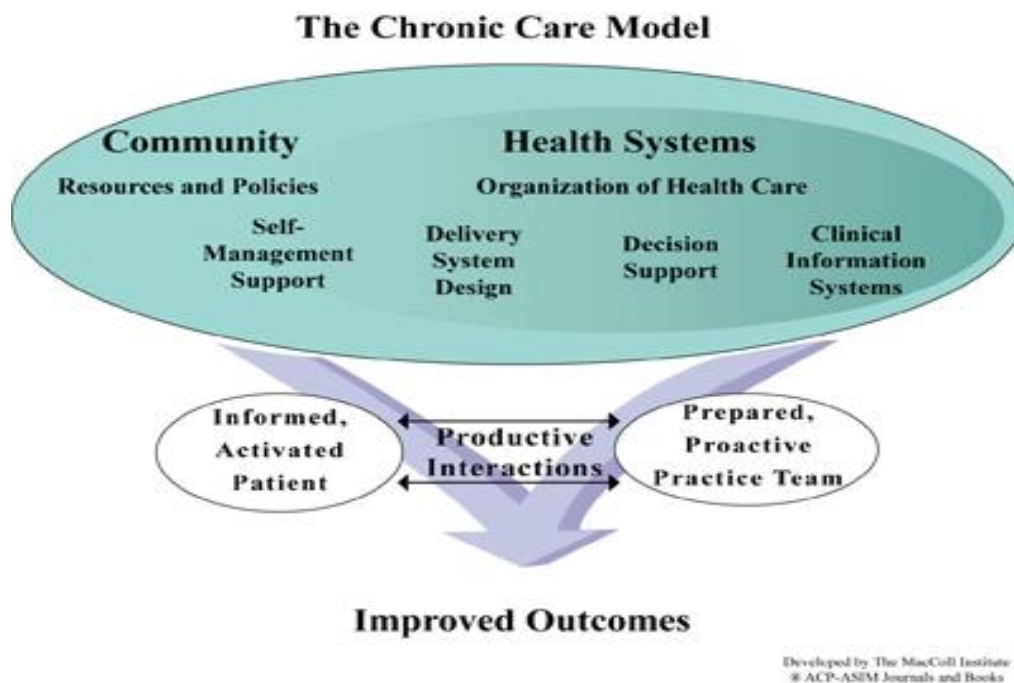


Figure 6. The Chronic Care Model (“The Chronic Care Model,” n.d.)

Congruence of the Project to the FHC Goals

FHC’s mission is to provide efficient and effective family centered care. FHC’s vision is to be recognized for providing quality primary care for individuals in need, especially those with chronic health conditions such as hypertension. The clinic’s values coincide with the practice-improvement project’s goal. FHC strives to collaborate with patients in their healthcare, which coincides with the fifth element of the CCM self-management support. FHC seeks innovative

ways to approach care, coinciding with the third element of the CCM decision support. Innovations include advancement of care, such as evidence-based guidelines. FHC tries to continually evaluate and improve performance, which corresponds with two of the project's main objectives: (a) identify needs, gaps, and barriers for current hypertension management practices at FHC and (b) develop a hypertension management program that works for and benefits the patients, staff, and FHC clinic (FHC, n.d.). The purpose of the practice improvement project is to assess the current hypertension management practices and to create a program that meets the FHC needs and improves the rate of successfully managed hypertension patients.

CHAPTER 3. PROJECT OBJECTIVES AND DESIGN

Project Outline

The project was designed around the four objectives. The first objective was to identify current hypertension control rates among adult patients diagnosed with hypertension at FHC. The second objective was to identify the needs, gaps, and barriers for the current hypertension management practice at FHC. The third objective was to develop a hypertension management program that works for and benefits the patients, staff, and FHC clinic. The final objective was to present FHC with a suggested way to evaluate the hypertension management program after implementation. The project's outline was as follows.

1. Recognize need for a hypertension management program
2. Literature review
 - a. Hypertension management
 - b. Hypertension programs
 - c. Educational handouts about hypertension for patients
 - d. Guiding framework: Chronic Care Model
3. Proposal meeting
4. Assess needs
5. Creation of an evidence-based hypertension program
6. Present program to the Medical director at FHC

Needs Assessment

The current hypertension management practices and the gaps in evidence-based practice were identified by staff interviews, observation, and data review. The FHC staff was informally questioned about how patients with hypertension are currently managed and what changes staff

members felt were necessary. See Appendix D for a list of questions asked of the FHC staff. The staff included licensed practical nurses, registered nurses, nurse practitioners, physicians, a clinical director, and information technology (IT) staff. The staff was mainly interviewed during the summer and fall of 2013. Observation and multiple brief conversations were completed throughout my clinical time at FHC (fall of 2012 to the fall of 2013). Further clarification or questioning of staff was done in person or via email communications. The nurses were questioned because they are an integral part of educating patients, counseling patients, managing cases, and taking an accurate blood-pressure measurement. Nurses reported inconsistency with the use of the BP tracking cards by nursing staff. In addition, they felt that the responsibility for patient follow-up rested primarily with the patients. The nurses were responsible for contacting patients with hypertension who had not followed up in the past six months. The providers were important to interview because they manage, treat, and re-evaluate the patient's hypertension. The providers reported a lack of patient follow up and gave suggestions about patient-education handouts. IT staff helped clarify how the EMR could be used to track the desired data. The EMR helps staff keep an accurate and complete medical record which also supports staff communications (Carter et al., 2012). The IT staff member explained that search criteria (diagnosis of hypertension, last visit, last blood pressure, etc.) can be modified to create different report types, if needed.

The physical layout of the clinic includes three floors. The first floor has a registration area, lab, pharmacy, radiology, workout area, and other offices. The second floor has two nurse's stations, and the third floor has the third nurse's station. The third floor also houses dentistry. There are three nursing stations with three providers at each station. Each provider works with a

licensed practical nurse. Every nursing station has a head registered nurse who coordinates telephone calls, telephone notes, and other issues within the nursing station.

FHC has two nursing policies and procedures pertinent to hypertension. The policy titled “Nurse Only Visit for B/P Check” was effective on 10/01/2011 it is policy and procedure (P&P) number 109 (FHC, 2010). The FHC’s policy is to improve BP monitoring and control by providing patients with the ability to have their BP checked by a nurse during clinic hours without scheduling an appointment (FHC, 2001). The procedure includes registering the patient to see nursing. The nurse follows P&P number 142 to take the BP, and if the BP is less than 120/80, the patient may leave. If the systolic BP is between 120 and 139 or if the diastolic BP is 80-89, the patient is instructed to recheck in one month. If the systolic BP is 140-159 or if the diastolic BP is 90-99, the patient is instructed to recheck in two weeks. If the systolic BP is greater than 160 or if the diastolic BP is greater than 100, the nurse will notify the provider on site, and the patient will be evaluated that day. The final step in the procedure is completing the documentation.

P&P 142 titled “Blood Pressure” was created on 07/01/2001 and has no revision date listed (FHC, 2001). The policy aids in the assessment of a patient’s circulatory system; the patient’s pulse and weight should be assessed with the blood-pressure check. Equipment for P&P 142 includes a blood pressure cuff and stethoscope; the policy states that a pediatric size cuff is used for small children, that a large size is used for obese people, and that a thigh size cuff is used for extremely obese individuals. The procedure is explained to the patient including information about having the arm bare and supported at heart level. The patient should not smoke or ingest caffeine within 30 minutes prior to the measurement, which is consistent with the JNC 7 guidelines. The patient should rest for five minutes before the measurement is taken.

The center of the cuff should be placed over the brachial artery and wrapped evenly. The bladder of the cuff should encircle 80% of the arm. Measurements should be taken with a calibrated device or a mercury sphygmomanometer. The radial artery is palpated while the cuff is inflated rapidly. The nurses should continue pumping the cuff 20-30 mmHg beyond the time when they can no longer palpate the radial pulse. The diaphragm of the stethoscope should be placed over the brachial artery, and the cuff valve is released at a rate of 2 mmHg per heartbeat. The systolic pressure is the reading at the first return of sound, and the disappearance of sound again is the diastolic pressure. All the air can now be released from the cuff, and the BP is recorded. Two or more readings that are separated by two minutes should be averaged. If the first two readings differ by more than five mmHg, the nurse should obtain additional readings (FHC, 2001).

Nurses are able to track hypertension patients who have not been to the clinic in the past six months with a report. The six-month report is created through a program called I2I. The I2I program identifies patients with a diagnosis of hypertension who have not been at the clinic in the past six months. The nurse then calls or sends a letter to the individuals who have not followed up in the past six months. If the letter is returned, the account is marked as inactive.

The providers were open to any changes that could improve their patient's hypertension control. Providers identified a list of criteria to be in the educational handout or tool. The criteria included the definition of normal blood pressure and high blood pressure, a list of the consequences for uncontrolled hypertension, information about the importance of taking hypertension medications as prescribed, the process of requesting medication refills, information about the lifelong treatment of hypertension, and a statement about treating and not curing hypertension. The providers requested that the handouts be printed in color and be available in English and the top five foreign languages used at the clinic. The top five non-English languages

at FHC were Nepali, Bosnian, Somali, Swahili, and Spanish. Prior to this project, FHC did not have a standardized patient education handout on hypertension.

At FHC, most providers prescribe 30 days of medication when a medication or dose change is made. The reason for a short-term prescription is to encourage patient follow-up in three to four weeks. One provider suggested that an appointment be automatically generated when the provider recommends follow-up. The appointment request would automatically be sent to registration via the EMR. The registration staff would then make the appointment; a similar process is in place for the referrals that providers order. The potential setbacks to such a process include missed appointments and inefficiency for rescheduling if the first appointment that was automatically made did not work with the patient's schedule.

When a patient calls for a medication refill, the nursing staff reviews the medical record to determine the provider's follow-up plan for the patient. The review is a time-consuming task, but it attempts to ensure that the proper follow-up is being accomplished. The providers can flag the patient's chart in the EMR. The flag is a reminder to the nursing staff that the patient needs a follow-up appointment or needs to return for a nurse only visit. The flag would decrease the nurses' time and effort in locating the follow-up plan. Flagging a patient's chart means the provider puts a notation in the EMR so that the nurse can follow the chart to ensure the reason the patient was flagged by the provider is fulfilled. The nurses can monitor the patient and ensure that he/she follows up. The problem with flagging a patient is that following up with every patient is not possible. In the instance, the provider is more concerned about a patient the flagging process would be a good option. FHC does not have the capability of following-up with every patient because the clinic does not have enough time, staff, or money to call every patient. Calling each patient would require more funding and more staff.

The pharmacist at FHC is in a joint appointed, or shared, position with NDSU. The pharmacist's roles and responsibilities are to complete medication reconciliations, medication reviews, smoking-cessation counseling, and asthma/Chronic Obstructive Pulmonary Disease (COPD) inhaler education. FHC employs two dietitians who provide education about weight loss and diabetes. The dietitians also make recommendations for exercise and refer patients to the health coaches. Providers tend to refer patients to the dietitians for diabetes education and obesity. I rarely observed providers referring patients to the dietitian for hypertension alone. FHC has four health coaches who work at its fitness center. The FHC health coaches focus on educating patients about how to use the exercise equipment and encourage exercise. A program through the YMCA called AmeriCorps provides FHC with the health coaches. The AmeriCorps volunteers are typically college students pursuing a degree in the medical field. The volunteers are given training as health coaches at the YMCA and are compensated with money for their student loans through the AmeriCorps program (K. Polcher, personal communication, March 16, 2014).

FHC's UDS reports the number of patients with 26 conditions. FHC's top six monitored conditions are depression, hypertension, diabetes, obesity, heart disease, and asthma. From the UDS report, the percentage of adults with the diagnosis of hypertension and a blood pressure of less than 140/90 in January 2013 was 54%; in February 2013, it was 54%; in March 2013, it was 56%; and in April 2013, it was 55% (FHC, 2012). FHC would like the percentage of hypertension patients with a BP of less than 140/90 to be 70% or greater. The provider and nurses identified barriers to patient hypertension management as follows: (a) the need for better patient follow-up, (b) the lack of patient education materials on hypertension that are written in layman's terms and in the most frequently spoken languages at FHC, and (c) ineffective patient

flow through the clinic. The hypertension management program was developed to address the identified barriers and to reach FHC's goal of greater than 70% hypertension control.

Design of the Hypertension Management Program

The Chronic Care Model provides an excellent structure and framework for a hypertension management program because hypertension is a chronic disease that requires a comprehensive approach for treatment and management. The CCM has already been an effective framework to structure programs for managing hypertension as well as other chronic diseases, such as congestive heart failure, diabetes, and depression (Wagner et al., 2001). The CCM guided FHC staff in formulating a successful plan to manage hypertension more effectively with the six elements of care. Currently, FHC uses the CCM to guide practice and patient care, which should ease the implementation of the hypertension management program. The CCM was integrated into the hypertension management program and presented to the clinical director (see Appendix E).

The program structure was based on HRSA's hypertension control program because HRSA's program allows FHC to personalize the program to meet the clinic's needs. The program emphasizes developing a quality improvement (QI) team to monitor and sustain the program. The QI team should consist of providers and nurses. The QI team could benefit from including other disciplines, such as, pharmacy, dietitians, health coaches, IT staff, reception, and scheduling. The QI team roles and responsibilities are described in the evaluation plan.

The HRSA program recommends identifying roles for each staff member, so within FHC's program the roles were identified. Nursing is responsible for accurate blood-pressure measurement, educating the patient about hypertension, hypertension prevention, and using the BP tracker card. Nursing is also responsible for medication reconciliation, reviewing required

health maintenance specific for individuals with hypertension, and contacting those requiring follow-up. Providers are recommended to provide a thorough history and physical, to order appropriate diagnostic testing, to educate the patient about hypertension, and to determine appropriate follow-up. The dietitian's role is to educate patients about implementing the DASH diet and regular exercise. The role of the health coach is to support patients and assist with their exercise regimen. The pharmacist's role is to educate the patients about how to correctly take their medications, the side effects, and the need to refill their medications regularly. The role of IT staff is to collaborate with the QI team and to find innovative ways for monitoring follow-up and program evaluation. FHC's QI team would consist of individuals from pharmacy, IT, providers, nursing, lifestyle medicine, and scheduling. A provider who is passionate about hypertension management should be the QI team leader.

The importance of education is emphasized in the HRSA program; therefore, patient, staff, and provider education was a focus for FHC's program. The educational handout chosen addressed what hypertension is, how hypertension can be prevented, and how hypertension is treated. The program included information the nurses should educate patients on regarding hypertension. The program also reviewed how to accurately take a BP. The providers were given information regarding identifiable causes of hypertension, key assessments in the physical exam, and appropriate diagnostics tests to consider for a patient with hypertension.

The HRSA program discussed patient, care team, and health system factors that impact hypertension management. The patient factors identified for FHC include cultural differences in diet, cultural differences in the level of concern about weight gain, and cultural perceptions of causation. Other important patient factors include literacy level, transportation barriers, low socioeconomic status, and being uneducated. In 2012, 52% of FHC patients were uninsured, and

23% had a poverty level of greater than 100% (FHC, 2012). Low economic status can affect a patient's ability to pay for medications or healthy foods. Care-team factors include the staff's education and training, and cultural competence. For change to be successful, the leaders of FHC need to be committed to program success and be supportive of team members and team goals. The FHC leaders include administration and management. For example, leaders may need to give staff member's time from their regular schedules to be a part of the QI team meetings.

The hypertension management program developed for FHC offers two options for an educational handout on hypertension. One option is a list of websites that provide information on hypertension in English, Swahili, Spanish, Bosnian, and Somali. I could not find a hypertension patient-education document in Nepali. Another option is to have individual, language-specific interpreters translate the CDC information sheet into all the commonly used languages at FHC. Translating health information is a complex process and goes beyond simple translation. Medical translation requires the translator to have precise and current technical knowledge (Language Scientific, 2014). Translation requires multiple levels of quality control. The translator must be also aware of the stringent regulatory laws governing medical information translation (Language Scientific, 2014).

Evaluation Plan

Implementation of the hypertension program did not take place in the context of this project. Whether the program will be implemented or not, is dependent on the discretion of the medical director. The medical director was given suggestions and recommendations about implementation and evaluation of the program. There are multiple ways the program's success could be evaluated. The easiest and most efficient way to evaluate the effectiveness of the program would be to use the Uniform Data Set (UDS) Report that can be run monthly. The data

given to me at the beginning of the project reported hypertension control percentages below the goal of 70% (see Figure 5). FHC has set its goal to have greater than 70% of adult patients with hypertension to have a recent blood pressure of less than 140/90. Evaluation will be done by assessing the trends for the percentage of people with controlled hypertension on the UDS report. The expectation is that the percentage of people with controlled hypertension will increase after the program is implemented.

The QI team will be responsible for evaluating the trends of the UDS at quarterly meetings. The QI team needs to analyze and act on the data reports' results. For the program to be successful, the QI team will need to track the program's performance every three months for at least a year. The QI team needs to analyze and evaluate if the performance (hypertension control) is improving, decreasing, flat, or if no there is no recognizable pattern. If the data trends are not improving, the IT staff can create searches that are more specific. IT staff can create searches to identify hypertension control rates divided by provider, race, gender, and age. The QI team can use the detailed searches to narrow down areas that need improvement. The interpretation of data over time is important to determine where the QI team should focus its efforts (UDSHHS, 2012). After the QI team understands what the data mean, it can implement small changes to work toward its goal.

The project goal was to create a hypertension management program to efficiently and effectively improve care for FHC's hypertensive patients. Evaluating this phase of the project is deemed successful if FHC chooses to use the program or even aspects of the program. Implementing and evaluating the project could serve as a practice improvement project for future doctoral students. The implementation and evaluation would be deemed successful if the UDS report has 70% of adults with hypertension having a blood pressure that is less than 140/90.

Institutional Review Board

This project involved informal interviews with staff members at FHC. The project did not require Institutional Review Board (IRB) approval from North Dakota State University (NDSU) because the questions that were asked of participants (providers, nurses, IT, etc.) were not about the individuals, their subjective opinions, or patients, but the questions were, instead, objective questions about current practices, policies, and the capabilities of FHC resources. A letter indicating that no IRB approval was needed is attached as Appendix A; the letter is from Kristy Shirley, CIP Research Compliance Administrator, NDSU IRB. FHC does not have an IRB, and approval came verbally from Dr. Espejo, the clinic's director.

CHAPTER 4. RESULTS AND EVALUATION

Observation of the clinic patient flow and hypertension management was completed from September 2012 to May 2013. The majority of the FHC staff was interviewed on July 31, 2013. FHC staff members explained their current hypertension management practices and identified areas that needed improvement. Further clarification about the practices at FHC took place via personal conversation or email communications. The depth of comments and suggestions received varied among staff members. Direct contact was made with nurses, providers, interpreters, and the medical director. Providers and nurses explained the roles and responsibilities for the pharmacy, health coaches, dietitians, reception, and scheduling staff. The staff interviews, data collection, and observations were completed at FHC without problems, but talking with more disciplines directly may have been beneficial.

The literature review for this practice improvement project provided valuable information that aided in developing an evidence-based hypertension management program for FHC. Seven hypertension programs were reviewed in the literature review. The key was to find a program that was comprehensive and that would fit FHC's needs. The guideline released by the HRSA hypertension control program was adaptable to FHC's needs for a hypertension management program. The program created by HRSA used the CCM as a framework, and FHC uses the same model of care. A care model guides the practice and flow of an organization. Introducing a new care model would be counterproductive because FHC already use the model and because the CCM is ideal for managing chronic health conditions like hypertension. Implementing changes through the six domains of the CCM has shown to improve care delivery (USDHHS, 2012). The CCM is specifically advantageous because the CCM provides a framework for quality

improvement strategies. The CCM helps organize the changes into logical categories (USDHHS, 2012). Because a significant amount of consistent and trustworthy information exists about hypertension management, it was easy to incorporate hypertension guidelines into the program developed by HRSA. The crucial aspect was integrating FHC's needs when developing the program. The resources reliably defined hypertension, correct blood pressure measurement, risk factors for hypertension, strategies to prevent hypertension, treatment of hypertension, and complications of hypertension. The hypertension management programs from the literature review aimed to help organizations control hypertension with patient, staff, and provider education.

The hypertension management program was presented to the clinical director, Dr. Espejo, in December 2013. I offered to review the program at a staff meeting, with executives, and/or at a provider meeting. Dr. Espejo felt that presenting the information to him was sufficient, and he accepted the responsibility to disseminate the program to staff. Dr. Espejo was open to the hypertension management program. After the program was presented to him, he asked me to locate a guideline or information about the appropriate follow-up for hypertension patients and criteria for referral to cardiology. I responded with the following recommendations. According to JNC 7, a patient should return monthly until the target blood pressure is met and a referral should be made for secondary hypertension or resistant hypertension (USDHHS, 2004). Resistant hypertension is defined as a blood pressure not to target despite three or more antihypertensive medications from different medication classes including a diuretic (Calhoun et al., 2008). The JNC 8 recommends increasing the dose of the initial drug or adding a second medication if the patient is not to his/her target goal within one month (James et al., 2014). After three

antihypertensive medications from different drug classes are initiated and fail to control blood pressure a referral to a specialist is appropriate (James et al., 2014).

Dr. Espejo was appreciative of the work done and in the future would like to find a system or program that addresses each of the six chronic diseases on which FHC would like to focus. One of the recommendations in the program was to have nurses and providers consistently use BP tracking cards. I suggested that the cards be placed in the room for easy access so that nursing can record the BP measurement for the patient and give the card to the patient to use outside the clinic. Some nurse's stations have the cards in the rooms while others have cards in a drawer at the nurses stations. Dr. Espejo identified that the clinic should be consistent throughout, meaning each nurses station and patient room should be set-up the same way.

Dr. Espejo also said that providers should be practicing based on the most current guidelines. The hypertension management program was developed based on current guidelines. Developing a guideline or algorithm specifically for providers and treating hypertension could be a focus for future improvement. The QI team could research algorithms that are already in practice and choose to integrate one of them into the hypertension management program.

One of FHC's most important considerations is patient satisfaction. Patients were not directly involved in developing the hypertension management program because the literature did not include patients in program development. The program was developed in the hopes that patients' blood pressures would be more controlled which could result in fewer co-morbidities and health complications. Patients may not focus on their blood pressure and may be more concerned with efficient, on-time appointments, staff attitude, and prompt medication refills. Efficiency should be increased with improved patient flow, one of the barriers identified at FHC.

The identified barriers for implementing the program at FHC included staff's lack of recognition about a problem with the clinic's current hypertension management. Staff reluctance to change the current practices could pose as a potential barrier when implementing the program. The increased workload of checking on patients needing follow-up may not be able to be accomplished. Patients may not be able to complete the recommended follow-up visits due to financial, transportation, or time restraints. Another barrier with implementing the program could be staff not distributing the hypertension education handouts. When the provider puts a notation in the EHR for nursing to follow-up with the patient, referred to as flagging the chart, the flag may be missed or not followed up on as requested. Barriers may not exist or be recognizable until the program's revisions are made and implemented.

The potential benefits of implementing the program include fewer missed appointments, an increased percentage of patients with controlled hypertension, utilization of patient education material, and increased referrals to the dietician. FHC could track and trend the number of missed appointments by running a report that had search criteria to include the number of missed appointments for patients with hypertension. FHC can also track and trend the number of dietitian referrals for patients with hypertension. Hypertension control can be evaluated by the UDS report that is run quarterly. Another way to evaluate hypertension control rates is to have IT staff create a report with search criteria, including patients with a blood pressure greater than 140/90, and assess if the number is trending down. Baseline data would need to be obtained before implementing the program. Quarterly reports then can be created and reviewed by the QI team to evaluate for improvement.

The program success will rely heavily on regular meetings for the QI team. The QI team will be responsible for collecting, analyzing, and using the data to take action at the clinic. The

team will collaborate and decide what to address first. Then, small tests of change can be tried to determine what improvements could be implemented to enhance performance (UDSHHS, 2012). The QI team leader is responsible for monitoring the pace of progress to the goal. If progress is not timely, the QI leader and team need to explore why and address the issue. FHC may choose to extend the amount of time to get to its goal or accelerate the improvement efforts.

The following explains how, and to what extent the objectives of the practice-improvement project were met.

1. Identify current hypertension control rates among the FHC's adult patients diagnosed with hypertension
 - a. The first objective was met by analyzing the UDS report. At the beginning of the project, FHC provided its current UDS reports. The following percentages are for hypertension patients with a blood pressure less than 140/90: in 2012, 57%; in January 2013, 54%; in February 2013, 54%; in March 2013, 56%; and in April 2013, 55%. FHC has set its goal to have greater than 70% of adult patients with hypertension to have a recent blood pressure of less than 140/90. On average, hypertension control is 14.8% below FHC's target goal of 70%.
2. Identify needs, gaps, and barriers for FHC's in current hypertension management practice
 - a. The second objective was partially met by observing and interviewing staff about FHC's hypertension management practices. The focus was on providers and nurses. To have a complete needs assessment, pharmacy staff, dietitians, health coaches, reception, and scheduling staff would have needed to be

directly engaged. I cannot say that I identified all of the needs, gaps, and barriers because the days I observed did not encompass all of their practices. Some days may have had more of one type of patient, such as, race, gender, medical problems, or age group. Some days may have had different staff members working which could affect the needs, gaps, and barriers present.

b. The objective was met by reviewing the literature for evidence-based hypertension management programs. The hypertension management programs in the literature were compared to FHC's hypertension management practices. The literature review helped me identify how FHC was and was not providing evidence based care.

3. Develop a hypertension management program that works for and benefits the patients, staff, and FHC clinic

a. The third objective was partially met. The program was developed based on the identified needs, gaps, and barriers detected via staff comments and observations. The program addressed the identified needs, gaps, and barriers by using HRSA's hypertension control program and the CCM. I cannot make the statement that the program will work for FHC because it was not implemented. The developed program should help FHC initiate a hypertension management program, but will rely on the QI team for continuous program monitoring. See Appendix E for FHC's hypertension management program.

4. Present FHC with recommendations to evaluate the hypertension management program after implementation

- a. The fourth objective was met by developing an evaluation plan for the hypertension management program within FHC's current capabilities. FHC has information about hypertension control rates from its UDS report. After the program is implemented, the QI team will analyze the hypertension control rates from the UDS report every three months for at least a year. The goal is for FHC to have a hypertension control rate of 70% or greater. The QI team can work with IT staff to develop specific searches to identify particular areas of concern. The searches can help identify if a certain age group, race, gender, or provider are having more problems with hypertension control. The QI team can then focus on changes to the program that address the problem areas.

CHAPTER 5. DISCUSSION AND RECOMMENDATIONS

Project Limitations

The projects' limitations are discussed in this section. The providers and nurses helped me identify the needs, gaps, and barriers because the hypertension management program developed was focused on their roles and responsibilities. The project limitation is that I focused on nurse and provider contributions to manage hypertension. I did not consider how other staff members and professionals at the clinic could contribute to development of a comprehensive program. The HRSA hypertension control program emphasized having a provider as the leader of the QI team and suggested other members that would be appropriate team members. FHC does not have some of the suggested members, such as, health educators, patient navigators, patient outreach specialists, case managers, or medical assistants. The program may have been more complete by involving pharmacy, dietitians, health coaches, and receptionists because they are an integral part of the FHC clinic. In retrospect, direct feedback with these individuals should have been included when developing the program.

The educational handout came from multiple sites because one individual site did not include all of the languages needed. The information for the educational handouts varied because different sites were used. One handout from the CDC could have been translated into the five languages so that the handouts had consistent information. I could have provided FHC with physical hypertension handouts in the languages I found so they were ready for FHC to use. Providing information on hypertension in only the top five languages used at FHC excludes the patients that speak other languages or dialects.

The project could have been limited to one aspect of hypertension management, such as developing a hypertension treatment algorithm for providers to try. Focusing on one aspect of

hypertension management with implementation and evaluation could have better served FHC. The providers could have tried an evidence-based algorithm. A hypertension patient-education handout could have been implemented. A referral process could have been developed to increase the utilization of dietitians and health coaches by hypertension patients. Focusing on one piece of hypertension management may have made more of an impact on hypertension management than a complete program that may or may not be implemented.

A large limitation was not implementing and evaluating the actual program that was developed. Without implementation and evaluation, the success of the program is unknown. The implementation and evaluation of the hypertension management program would be a worthy topic for future research.

Recommendations for FHC

The project should be continued with the implementation of the hypertension management program and an evaluation of the results. On February 5, 2014, the Eighth Joint National Committee (JNC 8) released its recommendations for hypertension management. At the start of this practice-improvement project, JNC 7 guidelines were the gold standard. JNC 8 relaxes the blood pressure goal for elderly patients (James et al., 2014). FHC staff members are encouraged to review the new guidelines and to decide if they would like to revise the hypertension management program to the new guidelines.

My program did not include pediatric or pregnancy hypertension management. FHC could look at its pediatric population and hypertension, and decide if pediatric guidelines would be beneficial to include. An evidenced based guideline for managing pediatric and adolescent hypertension is called *The Fourth Report on the Diagnosis, Evaluation, and Treatment of High Blood Pressure in Children and Adolescents* (USDHHS, 2005). FHC has one physician and two

advanced practice providers in obstetrics and gynecology. FHC could review the number of pregnant patients with hypertension and decide if adding guidelines for hypertension management of pregnant women would be beneficial. The National Institute for Health and Clinical Excellence (NICE) guidelines provides evidence-based information for hypertension in pregnancy (Redman, 2011). Including pediatric and pregnancy guidelines would expand the current adult hypertension management program to be more complete. A future practice-improvement project could focus on FHC's management of one of these groups or another particular group of hypertension patients, such as, a specific race or resistant hypertension.

FHC gets outcome measures for 26 diseases and conditions. The clinics have chosen to focus on the six most common chronic conditions at FHC. FHC plans to address key components of care for each chronic condition, such as an up-to-date depression questionnaire for patients with depression or recent HgbA1C for those with diabetes. FHC is in the process of purchasing an add-on to for its current electronic medical record that will provide templates for the six chronic-care diseases on which the clinic will be focusing. The templates automatically add the dates and results of lab values that pertain to the chronic disease, such as the last ECG date in the hypertension template. The templates are designed to incorporate evidence-based guidelines and to serve as a reminder for providers about what the recommended best practices are. The templates serve to improve the efficiency of appointments and charting by automatically having the most recent labs and diagnostics listed. Nurses and providers do not have to take the time to search for the most recent labs, diagnostics, questionnaires, etc. The project could be expanded to include improvement for managing all six chronic diseases instead of only hypertension. The QI team will need to re-evaluate hypertension control rates after the new templates are in place. The

QI team will also need to determine how the templates are affecting the hypertension management program.

The clinic may benefit from expanding the number of translated hypertension education materials to languages other than the top five because of the numerous languages spoken by FHC patients. FHC would need to look at the percentage of other languages spoken by its patients and to determine if having education handouts for each language would be worth the time and space of storing the handouts. Perhaps FHC could have a system or site to locate a handout when a rare language is needed, instead of having handouts printed in multiple dialects and languages.

HRSA's hypertension control method encourages small, rapid-cycle tests of change. Small changes are done more quickly, and improvement results more rapidly (USDHHS, 2012). A small change for example would be adding the terminology suggested by JNC 7 to FHC's blood pressure measurement policy. The suggested changes are as follows: when taking a blood-pressure measurement, the patient should be seated in a chair with feet flat on the floor; should not have smoked, ingested caffeine, or exercised in the previous 30 minutes; and should remove (not push up) constrictive clothing; the patient and provider are to not talk during the measurement. Another example is making sure each patient room has BP tracking cards available on the desk.

The clinic started a new pilot program in January 2013. The provider prints a summary of the patient's visit, which includes the patient's reason for the visit, vital signs, medications, allergies, tests ordered, and the follow-up plan. This document is given to the patient at the end of the visit, and the patient is directed to take this form to the reception desk where the patient hands the printed summary form to the reception staff. The reception staff can view the provider's follow-up plan and make any needed appointments. The receptionists can then view

the orders and direct the patient to the lab, radiology, or pharmacy if needed. The receptionist returns the form to patients and directs them accordingly. One provider is currently testing this process.

A few months ago, the clinic started trying new lifestyle medicine appointments. The appointments are recommended for people with complex chronic health needs such as depression, COPD, diabetes, hypertension, heart failure, or multiple co-morbidities. FHC is taking a multidisciplinary approach to chronic disease management by including the pharmacy for a medication review, dietitians for dietary education, and the provider. Dr. Espejo first tested the appointments, and now each provider participates.

The lifestyle medicine appointments and pilot program discussed previously were implemented after the needs assessment was completed for this project. The changes may require the hypertension management program to be adjusted to coincide with the clinic changes. The pilot program may help improve patient flow and patient follow-up (objectives of the hypertension management program) because the reception staff is making the needed appointments before the patient leaves the building. The lifestyle medicine appointments involve a multi-disciplinary approach to chronic disease management similar to the recommendations of the hypertension management program. The hypertension management program could be expanded to address other chronic health conditions on which FHC wants to focus.

Recommendations for Practice Improvements

Before the program would be recommended to other clinics, the implementation and evaluation phases of the project need to be completed. The initial period for implementation is one year. During the year the QI team is to analyze the performance and make changes to help get to the target goal. After one year, the project can be stopped or extended depending on how

the QI team and management feel the project has functioned. If the completed project were successful at improving hypertension control rates, patient flow, and patient follow-up, the program could be tried at other primary-care clinics.

Key pieces of the program would benefit other clinics. Patient education is important, and it should be initiated by providers and reviewed by nurses. Providers should use the handout to discuss hypertension and to highlight important information that is individualized to the patient's needs. The patients should be given the handout to take home and be encouraged to reference as needed.

Understanding the roles and responsibilities of each team member is important for the program's success. A collaborative approach to hypertension management involves nurses, providers, pharmacists, health coaches, dietitians, IT, and receptionists. The motivation of a clinic's staff to improve patient care and regular blood pressure monitoring can influence good blood-pressure control (Ornstein, Nietert, & Dickerson, 2004).

It is the patient's responsibility to return for follow-up and management of their health care problems. The clinic also plays a pivotal role in helping patients in following up. The fifth element of the CCM is self-management, and this element focuses on patient involvement and empowering patients to manage their health. The clinic can help patients make an appointment and can send reminders about the date and time, but coming to the appointment is the patient's responsibility. Primary-care clinics can use aspects of the hypertension management program to improve patient follow-up, patient education, and patient flow.

Implications for Practice

According to a study by Orstein et al. (2004), primary care needs to improve its hypertension control rates. Primary care is an opportune area to focus on hypertension control

because its providers have frequent contact with patients (Petrella, 2004). Eighty nine percent of nurse practitioners (NP) are prepared to practice in primary care, and more than 75% practice in primary-care settings (Yee, Boukus, Cross, & Samuel, 2013)The growing number of NP's could potentially address the primary-care shortage that exists (Cassidy, 2012). The quality of care provided by NP's is similar to physicians, and in fact, patients have had increased satisfaction with an NP's care (Cassidy, 2012). The continuity of care that an NP can provide is vital for a chronic condition such as hypertension. NPs tend to focus on patient-centered care and to treat the patient holistically versus treating the high blood pressure alone, which improves patient adherence to treatment (Petrella, 2004). NPs play a crucial role in the team approach needed to effectively manage chronic diseases. FHC and other primary care clinics can benefit by knowing how hypertension control can be improved with a structured hypertension management program such as the one developed for this project.

The current and future practice issues regarding hypertension control were addressed by using the strong scientific evidence gained through the education and literature review. The nurse practitioner serves as a leader in providing evidence based care as well as being an advocate for the patient. I critically appraised the existing hypertension management programs. The chosen program was one that best parallels the values and needs of the studied clinic. Evaluating the hypertension program incorporates information technology using the EMR. IT staff members create searches within the EMR to evaluate hypertension control rates among adults of certain genders, races, and ages. The project encourages the collaboration of multiple healthcare disciplines. The provider, clinic, and patients can benefit from a symbiotic relationship with the goal of hypertension management and fewer complications from hypertension.

Dissemination

Dissemination is the spread of knowledge to a target clinical practice audience (Agency for Healthcare Research and Quality [AHRQ], 2012). Three main goals of dissemination are to increase the availability of evidence-based interventions and to motivate and increase people's ability to use and apply the evidence (AHRQ, 2012). When planning to disseminate information, if and how the information will benefit your target audience should be considered.

I presented a poster on my project in April 2013. The purpose of the presentation was to introduce the projects being developed by the DNP students at NDSU. DNP students presented their practice improvement projects to NDSU faculty members and NPs in the community. The hypertension management program was presented to Dr. Espejo, the clinical director, and he accepted the responsibility of disseminating the program to FHC staff. Dissemination of my findings was done on April 7, 2014 at a poster presentation for NDSU faculty, local nurse practitioners, preceptors, peers, and family of the DNP students. An application was submitted to present my project via a poster presentation at Sanford's Nursing Symposium in May 2014. If I do not get the chance to disseminate my project at the Nursing Symposium, I will consider publishing an article or a brief. See Appendix E for the project's executive summary.

Conclusion

Hypertension can lead to cardiovascular disease and increases morbidity and mortality. The most effective way to reduce the associated risk of stroke and other cardiovascular complications is to control hypertension (Cappuccio, Kerry, Forbes, & Donald, 2004). Many chronic conditions do not have effective treatment as high blood pressure does. The benefits of hypertension control are clear, yet hypertension is still under diagnosed and undertreated (Cappuccio et al., 2004). A comprehensive, multidisciplinary hypertension management

approach is vital for effective hypertension control. The new program provides FHC with a start on comprehensive hypertension management. My clinical rotation allowed me to be involved with staff, providers, and patients, and frequently observe hypertension management at FHC. My day-to-day presence at the clinic and personal relationship with the staff and patients allowed me to create a program specific for FHC's needs. The success of FHC's hypertension control is important to me, and I enjoyed developing the program for FHC.

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APPENDIX A. IRB LETTER



June 11, 2013

Tina Lundeen
Dept of Nursing
Sudro 222B

Re: Your submission to the IRB: "Designing a Blood Pressure Monitoring Program for Family HealthCare"

Research Team: Danielle Danielson

Thank you for your inquiry regarding your project. At this time, the IRB office has determined that the above-referenced protocol does not require Institutional Review Board approval or certification of exempt status because it does not fit the regulatory definition of 'research involving human subjects'.

Dept. of Health & Human Services regulations governing human subjects research (45CFR46, *Protection of Human Subjects*), defines 'research' as "... a systematic investigation, research development, testing and evaluation, designed to contribute to generalizable knowledge." These regulations also define a 'human subject' as "... a living individual about whom an investigator conducting research obtains (1) data through intervention or interaction with the individual, or (2) identifiable private information."

It was determined that your project does not require IRB approval (or certification of exempt status) because information being collected from individuals is about facility policies and practices rather than individual characteristics or opinions. The board makes this determination conditional on the proposed questions received 6/11/2013.

We appreciate your intention to abide by NDSU IRB policies and procedures, and thank you for your patience as the board has reviewed your study. Best wishes for a successful project!

Sincerely,

A handwritten signature in cursive script that reads "Kristy Shirley".

Kristy Shirley, CIP; Research Compliance Administrator

INSTITUTIONAL REVIEW BOARD

NDSU Dept 4000 | PO Box 6050 | Fargo ND 58108-6050 | 701.231.8995 | Fax 701.231.8098 | ndsu.edu/irb

Shipping address: Research 1, 1735 NDSU Research Park Drive, Fargo, ND 58102

NDSU is an EO/AA university.

APPENDIX B. PERMISSION LETTER FOR CHRONIC CARE MODEL



WAEC12135

April 29, 2014

2414 Country Club Pkwy

Moorhead, MN 56560

Dear Ms. Danielson;

Thank you for your request to print (dissertation) the following from *Effective Clinical Practice*: Figure 1, *Effective Clinical Practice*, 1998, Vol1, Chronic Disease Management: What Will It Take to Improve Care for Chronic Illness? Wagner EH

Permission is granted to print 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 in print (dissertation) for not for profit only. ACP does not grant permission to reproduce entire articles or chapters on the Internet unless explicit permission is given. This letter represents the agreement between ACP and Danielle Danielson for request WAEC1217835 and supersedes all prior terms from the requestor.

Thank you for your interest in Annals of Internal Medicine. If you have any further questions or would like to discuss the matter further, please contact me at 856-489-8555 or fax 856-489-4449.

Sincerely,

Gina Brown

Permissions Coordinator

APPENDIX C. EMAIL TO PROVIDERS AT FHC

Hello FHC staff,

I am a student in NDSU's Doctorate of Nurse Practitioner program and am doing a practice improvement project/dissertation for graduation. The purpose of my project is to complete a needs assessment of Family HealthCare in Fargo, ND related to uncontrolled blood pressure. Create a program to improve their uncontrolled hypertensive patients blood pressure with a type of office and home blood pressure monitoring system. I want to identify the needs and barriers of the clinic regarding their hypertension patients. I will then use those things to design a blood pressure program. Things that will be part of the program include correct blood pressure taking techniques, algorithms for treating blood pressures, and follow-up. For example, sometimes a patient is started on a blood pressure medication or the dose is changed and they are supposed to follow up in 1 week, but do not and return in 6 months for a medication refill while the whole time their blood pressure was not controlled. My goal is to see how FHC staff can avoid missing these patients with alerts/flags that the patient is due to return. The nurse can then call the patient to determine if they can report their blood pressure from home, remind them to come to the clinic, or schedule an appointment with the provider if needed. These are a few of the items on my agenda to assess.

I am hoping each provider can meet for 10-15 minutes to help me identify some of the needs, barriers, and capabilities the clinic has to help me begin the project through informal, short interviews. My goal is to be done interviewing staff and gathering information from the clinic by August 2013. I hope to write the policy/program for my DNP dissertation by December 2013. I thank you all very much for your time and cooperation. I truly hope I can help improve the management of patients with hypertension at FHC!

I was hoping to meet with providers on **July 31** at whatever time is convenient for you. I can be flexible on the times because I realize sometimes the day changes and can be busier than anticipated. If you know this day does not work other days I had in mind include *August 13th, 16th, 20th, 21st or 22nd*. You can email or call me with a date or time that will work. Your input is certainly voluntary and will be kept in confidence, please just let me know if you would prefer not to contribute to the project.

Sincerely,

Danielle Danielson, DNP student NDSU

701-238-9909

Danielle.Grandbois@my.ndsu.edu

APPENDIX D. INTERVIEW QUESTIONS FOR FHC STAFF

General:

1. How do you think blood pressure control among hypertensive patients can be improved at FHC?
2. What do you think the barriers are to better blood pressure control among hypertensive patients?
3. Are there current policies for taking a blood pressure or hypertension management at FHC?
4. Do you feel like a hypertension management algorithm would be beneficial?

Nurses:

1. Do you think you would have time to call or send out letters to the patients who are due for a blood pressure follow up or nurse visit that are overdue?
2. If a patient chose to call in their blood pressure instead of coming in for a nurse visit, do you take this call or the front desk? Do you know what level of BP is acceptable or do you tell the provider and they decide what is the goal blood pressure?
3. When nursing takes a blood pressure, do they wait for a few minutes, is it a manual cuff, how do they determine the size, when would they repeat a blood pressure?
4. When a patient comes in for a nurse visit only to have their blood pressure checked do you report all the blood pressures or only ones that are high? What level is high?
5. Do the provider's nurses call the patients and remind them of nurse visits? Are the nurses aware the patient was told to return for a blood pressure recheck? What role do the phone nurses have in follow-ups?

6. When a phone nurse gets a call from a patient for a BP medication refill does the phone nurse ask what the patient's BP has been running? How do alerts for follow up for patients with hypertension compare to those with diabetes?

Providers:

1. Would having an algorithm for the nurses to follow be beneficial? Would you trust the nurses to follow it (standing orders/algorithm) or would you prefer to know the follow up blood pressures and then direct the nurses on what to do and order?
2. What are your suggestions to better HTN control among patients? What would you like to see changed regarding HTN patients at FHC?

IT:

1. Does Centricity have the capability to alert or flag staff if a patient does not follow-up? Do the alerts notify nurses and providers? Once a nurse writes a note that they contacted or did not get a hold of the patient does the provider acknowledge this?
2. Is there the capability to see blood pressure trends among providers? At any interval wanted (monthly, yearly, etc.)?

APPENDIX E. FHC's HYPERTENSION MANAGEMENT PROGRAM

Hypertension programs have shown to increase the control of blood pressure's among those with hypertension. The U. S. Department of Health and Human Services Health Resources and Services Administration released a guide on implementing a hypertension control program and emphasized three key components for success: 1) clear direction, 2) functional infrastructure for quality improvement, and 3) commitment from leadership. After an assessment of FHC's hypertension management, the need for an organized, comprehensive hypertension control program was established.

- 1) Goal: FHC will implement a hypertension control program. The goal of the program is that by February 2015 70% of their adult patients with a diagnosis of hypertension will have a blood pressure of less than 140/90.
- 2) Quality improvement is best established by a functional infrastructure that has shown to be most successful with a systemic approach to measuring change, testing small changes, and tracking the impact of those over time.
 - a. Establish a QI team focused on hypertension management
 - i. Objective: Thinking systemically the team members will work together to explore how each individual team member's actions influence one another's and how each can impact a patient's blood pressure control.
 - ii. A provider who is passionate about hypertension control would be useful as the "provider champion" for improvement and serve as the QI team leader
 - iii. Invite persons from pharmacy, IT, nursing, lifestyle medicine, and scheduling to join in the QI team

- iv. Use the Chronic Care Model or Critical Pathway Approach to implement the hypertension management program and focus on methods of change that have worked in the past for FHC
 - 1. The Chronic Care Model focuses on managing chronic care diseases such as hypertension. The model includes community, health systems, delivery system design, decision support, clinical information systems, and self-management support. The goal is to have healthier patients, more satisfied providers and cost savings.
 - 2. Critical Pathway Approach is also referred to as a clinical pathway. The pathway provides a visual depiction of the steps and process of care provided. By walking through the ideal pathway for patients with hypertension barriers can be identified and improvements made. Three factors are considered: patient factors, care team factors, and health system factors.
- b. Duties: Meet bi-monthly to discuss how new changes are working and discuss new topics. Optional topics to discuss and explore for ongoing improvement are:
 - i. Patient factors that can impact hypertension care
 - 1. Cultural differences among diet, level of concern about weight gain, and perceptions of causation
 - 2. Health literacy : ability to understand educational materials
 - 3. Socioeconomic status: ability to pay for meds and food choices
 - ii. Care team factors influencing hypertension control
 - 1. Staff education, training, and skill set

2. Identify patients cultural beliefs related to hypertension , establish best means of communication and patient literacy

3. Cultural competence

a. African Americans respond better to low sodium DASH diet

b. African Americans may better respond to diuretics and calcium channel blockers than other drug classes

c. African Americans and Asians have increased risk of angioedema from Ace inhibitors

iii. Hypertension among pregnant women

3) Leadership commitment: For change to be successful the leaders of FHC need to be committed to program success and supportive of team members and team goals. For example allowing a block in the QI team member's schedule for the bi-monthly meeting.

Barriers and Solutions

The main issues identified as barriers better blood pressure control were

1) Poor patient follow up

2) Limited patient educational materials on hypertension

3) Ineffective patient flow

Recommendations for improved hypertension management and control

1) Nursing

a. Policy on blood pressure measurement was reviewed and is generally in agreement with JNC 7 guidelines. Recommendations for improvement: patients should be seated in a chair with feet flat on the floor and should not have smoked,

ingested caffeine or exercised in the previous 30 minutes, patient and provider are to not talk during the measurement, and remove constricting clothing (do not push up). Add tips for obtaining an accurate BP measurement (AANP):

i. Elderly individuals

1. Auscultatory gap is more common.
2. Common reason for inaccurate BPs (underestimates SBP).
3. More likely with manual BP measurements.
4. Usually associated with vascular disease.

ii. Individuals with obesity

1. Common to have short upper arm length relative to upper arm width.
2. Wrist cuff may be used (as long as you place at heart level to avoid error).
3. Avoid the use of finger cuffs.

iii. Individuals with arrhythmias

1. BP varies beat-to-beat with irregular rhythms.
2. Automated devices are inaccurate if only taken once in those with Atrial Fibrillation. Need to measure BP several times, then average readings.
3. If severe, regular bradycardia, deflate cuff slower, to prevent underestimating SBP & overestimating DBP

- b. Have reminder cards on how to take a BP measurement correctly can be placed on each blood pressure machine, the card can be secured with Velcro to the machine or a nearby wall for reference for staff and patient reference.
- c. Give patient BP recorder card and review with the patient their target blood pressure and today's blood pressure. Write both on the BP card and encourage the patient to write down BP's done out of the clinic.
 - 1. Goal <140/90 unless diabetic or renal disease <130/80 or individualized by provider
- d. Educate patient about the benefits of exercise in lowering blood pressure. Regular aerobic physical activity at least 30 minutes per day, most days of the week can decrease systolic BP by 4-9 mmHg. Maintaining a normal body weight (BMI 18.5-24.9) can decrease systolic BP by 5-20 mmHg/10 mg.
 - i. Provide information about free access of the workout facilities at FHC
- e. Ask the patient about their current medications and compliance with taking the medications, how they are taking the medications, and lifestyle changes.
- f. Review health maintenance with patient including annual eye visits, cholesterol, and diabetes screening.
- g. Educate patients on key points about hypertension treatment including:
 - i. Importance of medication compliance and procedure for obtaining refills
 - ii. Importance of follow up and close monitoring
 - iii. Smoking Cessation
 - iv. Weight loss

- v. DASH diet (fruits, vegetables, low fat dairy, low cholesterol, low fat, high potassium and calcium)
- vi. Sodium intake <2.4 g daily
- vii. Alcohol consumption should be 2 drinks or less for men and 1 or less for women a day
- h. Nurses should continue to contact patients with hypertension that have not returned for follow up in the past 6 months via telephone or mail.

2) Providers

- a. Rule out identifiable cause of hypertension: CKD, coarctation of aorta, Cushing syndrome, drug induced, obstructive uropathy, Pheochromocytoma, primary aldosteronism or other mineralocorticoid excess, renovascular hypertension, sleep apnea, thyroid or parathyroid disease
- b. Recommended diagnostics prior to initiating therapy per JNC 7 guidelines: 12 lead EKG, UA, blood glucose or A1C, hematocrit, serum potassium, creatinine or estimated GFR, calcium, fasting lipid panel
 - i. Serum potassium and creatinine should be monitored 1-2/year when indicated
- c. Physical exam should include: accurate measurement of BP including contralateral arm, BMI and waist circumference. Examination of fundi, auscultation for carotid, abdominal, and femoral bruits, palpation of the thyroid, thorough examination of cardiovascular and pulmonary systems, examination of abdomen for enlarged kidneys, masses, distended bladder, and abdominal aortic

pulsation, lower extremities for edema and pulses, and a thorough neurological assessment

- d. Providers should identify patients that need to return within the next 2 weeks by flagging their chart so the telephone nurse can ensure the patient has returned.

During the call the nurse should reiterate key points about hypertension including, medication compliance and refills, importance of follow up and close monitoring.

- 3) Pharmacy: Educate patients about medication, side effects, importance of taking the medication, and refilling before the medication before it runs out.
- 4) Dietitian and health coach: Accept referrals for those with hypertension and educate and encourage weight loss, regular exercise, smoking cessation, moderate alcohol intake, and DASH diet.
- 5) IT: Be active in QI team to help hypertension control and program evaluation. Identify new ways patients with uncontrolled hypertension can be searched and monitored.
- 6) Provider should remind patient to bring AVS to front desk to schedule new appointments and then can be directed to lab or pharmacy is indicated.
- 7) Identify written educational materials on hypertension that are patient and culturally friendly. Offer and encourage referral to a dietitian or lifestyle coach for new patients with hypertension or patients struggling to meet target BP goal.
 - a. Have educational tools easily accessible either by a handout the provider can click when printing the AVS or have printed educational materials available in each exam room. Consider educational materials be placed in lobby.
 - b. The educational handouts should be readily available in the top 6 languages used by FHC patients: English, Spanish, Bosnian, Nepal, Somali, and Swahili. Here is

a list of options or else the QI team can determine which handouts FHC would like to utilize.

- i. English: http://www.cdc.gov/bloodpressure/docs/ConsumerEd_HBP.pdf
- ii. Spanish: also ASL, Chinese, Arabic, French, Hindi, Hmong, Khmer, Korean, Portuguese, Russian, Somali, Tagalog, Ukrainian, and Vietnamese
<http://www.nlm.nih.gov/medlineplus/languages/highbloodpressure.html>
- iii. Bosnian:
https://www.healthinfotranslations.org/pdfDocs/HighBP_Bos.pdf
- iv. Nepali: English handout to be translated by interpreters at FHC
- v. Somali:
<http://www.rochestergeneral.org/~media/Images/Imported/gedownload/hypertension%20general%20info%20somali.pdf>
- vi. Swahili:
<http://www.rochestergeneral.org/~media/Images/Imported/gedownload/hypertension%20swahili.pdf>

Program Evaluation

One way to evaluate the program is to run the list of people who have not followed up in 6 months every 3 months to see if the number is decreasing. Another option is to work with IT to develop a specific search to include patients with a diagnosis of hypertension and BP's above 140/90 and to run this search monthly to identify if the number is trending down. After 12 months the new changes can be evaluated with the Uniform Data Set (UDS) Report. The goal for FHC is to have greater than 70% of adult patients with hypertension to have a recent blood

pressure of less than 140/90. The UDS has showed the past percentages: 2012, 57%, January 2013, 54%, February 2013, 54%, March 2013, 56%, and April 2013, 55%.

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APPENDIX F. EXECUTIVE SUMMARY OF PROJECT

Introduction

Hypertension affects one third of the adults in the US (High Blood Pressure, 2011). Over 300,000 people died from high blood pressure, either as a primary cause or as a contributing cause (“High Blood Pressure”, 2011). The United States has spent an estimated \$76 billion dollars on hypertension related health care services, medications, and sick days from work because of hypertension (“High Blood Pressure”, 2011). Primary care is the ideal setting for hypertension identification, management, and prevention of its complications. The patient and primary care provider relationship can strongly influence hypertension control as well as how a clinic monitors and manages a patient’s hypertension (Petrella, 2004). The relationship between the provider and patient should be based on trust, which can result in an increased adherence to and compliance with treatment plans (Petrella, 2004). Well-designed hypertension programs have shown to improve blood pressure control among patients with hypertension, however to be successful the program must be implemented and utilized correctly (Jones, 2002).

Hypertension programs provide structure and guidance for managing hypertension patients. Chronic conditions, such as hypertension, require team-oriented, longitudinal care with the utilization of information technology and a focus on patient-centered care (American Medical Group Foundation [AMGF], 2013). Family HealthCare (FHC) was the focus for the practice-improvement project. FHC is a primary-care clinic that sees individuals with chronic conditions, such as hypertension, diabetes, heart failure, depression, etc. Although FHC manages the care of hypertension, a hypertension management program does not exist.

Family HealthCare is a clinic that provides comprehensive primary care to patients of all ages, ethnicities, and socioeconomic status. The project focused on designing a hypertension

management program for FHC. The clinic's current process for monitoring hypertensive patients was reviewed by informal staff interviews and observation of patient flow and care. The literature review covered hypertension management, hypertension management programs, hypertension patient education handouts, and the Chronic Care Model. FHC staff helped identify the current hypertension management practices and identify gaps. Staff involvement increases personal commitment, eases the transition of changes, and helps staff members maintain a sense of control (Marks, 2010). There were four objectives of the hypertension management program.

1. Identify current hypertension control rates among adult patients diagnosed with hypertension at FHC
2. Identify needs, gaps, and barriers in current hypertension management practices at FHC
3. Develop a hypertension management program that works for and benefits the patients, staff, and FHC clinic
4. Present FHC with a suggested way to evaluate the hypertension management program after implementation

Needs Assessment

The current hypertension management practices and the gaps in evidence-based practice were identified by staff interviews, observation, and data review. The FHC staff was informally questioned about how patients with hypertension are currently managed and what changes staff members felt were necessary. The staff included licensed practical nurses, registered nurses, nurse practitioners, physicians, a clinical director, and information technology (IT) staff. The staff were interviewed during the summer and fall of 2013. Observation and multiple brief conversations were completed throughout clinical time at FHC (fall of 2012 to the fall of 2013).

Further clarification or questioning of staff was done in person or via email communications. Nurses reported inconsistency with the use of the BP tracking cards by nursing staff. Also, nurse felt that the responsibility for patient follow-up rested primarily with the patients. The nurses were responsible for contacting patients with hypertension who had not followed up in the past six months. The nurses were questioned because they are an integral part of educating patients, counseling patients, managing cases, and taking an accurate blood-pressure measurement. The providers reported a lack of patient follow up and gave suggestions about patient-education handouts. The providers were important to interview because they manage, treat, and re-evaluate the patient's hypertension. IT staff helped clarify how the EMR could be used to track the desired data. The EMR helps staff keep an accurate and complete medical record which also supports staff communications (Carter et al., 2012). The IT staff member explained that search criteria (diagnosis of hypertension, last visit, last blood pressure, etc.) can be modified to create different report types, if needed.

According to JNC 8, the main goal of hypertension treatment is to obtain and maintain hypertension control, which cannot be monitored if a patient is not having his /her BP measured (James et al., 2014). The lack of recommended follow-up for hypertension patients sparked my interest in the project. The clinic's current hypertension management was reviewed. Based on FHC's quarterly Uniform Data Set (UDS) reports, hypertension control was not to the targeted goal of 70%. The definition of controlled BP for the report's purpose considered a blood pressure of less than 140/90 for individuals with the diagnosis of hypertension. The recognized gaps in hypertension management kindled a discussion with FHC clinic providers and staff about identifying barriers to effective blood pressure control and designing a hypertension management program for FHC that addressed those barriers and promoted improved hypertension control.

The discussion led to the idea of creating the program for my practice improvement project. The main barriers identified included poor patient follow-up, limited patient educational materials on hypertension, and ineffective patient flow.

The Hypertension Management Program

The Chronic Care Model provides an excellent structure and framework for a hypertension management program because hypertension is a chronic disease that requires a comprehensive approach for treatment and management. The CCM has already been an effective framework to structure programs for managing hypertension as well as other chronic diseases, such as congestive heart failure, diabetes, and depression (Wagner et al., 2001). Currently, FHC uses the CCM to guide practice and patient care, which should ease the implementation of the hypertension management program. The CCM was integrated into the hypertension management program.

The hypertension management program for FHC was developed based on the U.S. Department of Health and Human Services Health Resources and Services Administration's hypertension control program (HRSA). The HRSA program emphasized three key components for success: 1) clear direction, 2) functional infrastructure for quality improvement, and 3) commitment from leadership. Items addressed in the program created for FHC were correct blood-pressure taking techniques, evidence-based guidelines regarding patients with hypertension, hypertension tools for providers, education for providers and patients, and follow-up recommendations. The program structure was based on HRSA's hypertension control program because HRSA's program allows FHC to personalize the program to meet the clinic's needs. The HRSA program emphasizes developing a quality improvement (QI) team to monitor and sustain the program. The QI team should consist of providers and nurses. The QI team could

benefit from including other disciplines, such as, pharmacy, dietitians, health coaches, IT staff, reception, and scheduling.

The HRSA program recommends identifying roles for each staff member, so within the program developed for FHC, the roles were identified. Nursing is responsible for accurate blood-pressure measurement, educating the patient about hypertension, hypertension prevention, and using the BP tracker card. Nursing is also responsible for medication reconciliation, reviewing required health maintenance specific for individuals with hypertension, and contacting those requiring follow-up. Providers are recommended to provide a thorough history and physical, to order appropriate diagnostic testing, to educate the patient about hypertension, and to determine appropriate follow-up. The dietitian's role is to educate patients about implementing the DASH diet and regular exercise. The role of the health coach is to support patients and assist with their exercise regimen. The pharmacist's role is to educate the patients about how to correctly take their medications, the side effects, and the need to refill their medications regularly. The role of IT staff is to collaborate with the QI team and to find innovative ways for monitoring follow-up and program evaluation. FHC's QI team would consist of individuals from pharmacy, IT, providers, nursing, lifestyle medicine, and scheduling. A provider who is passionate about hypertension management should be the QI team leader.

The importance of education is emphasized in the HRSA program; therefore, patient, staff, and provider education was a focus for FHC's program. The educational handout chosen addressed what hypertension is, how hypertension can be prevented, and how hypertension is treated. The program included information the nurses should educate patients on regarding hypertension. The program also reviewed how to accurately take a BP. The providers were given

information regarding identifiable causes of hypertension, key assessments in the physical exam, and appropriate diagnostics tests to consider for a patient with hypertension.

The easiest and most efficient way to evaluate the effectiveness of the hypertension management program would be to use the UDS Report that can be run monthly. The data given to me at the beginning of the project reported the following hypertension control percentages: 2012, 57%; January 2013, 54%; February 2013, 54%; March 2013, 56%; and April 2013, 55%. FHC has set its goal to have greater than 70% of adult patients with hypertension to have a recent blood pressure of less than 140/90. Evaluation will be done by assessing the trends for the percentage of people with controlled hypertension on the UDS report. The expectation is that the percentage of people with controlled hypertension will increase after the program is implemented.

The QI team will be responsible for evaluating the trends of the UDS at quarterly meetings. The QI team needs to analyze and act on the data reports' results. For the program to be successful, the QI team will need to track the program's performance every three months for at least a year. The QI team needs to analyze and evaluate if the performance (hypertension control) is improving, decreasing, flat, or if no there is no recognizable pattern. If the data trends are not improving, more specific searches can be created by the IT staff. IT staff can create searches to identify hypertension control rates divided by provider, race, gender, and age. The QI team can use the detailed searches to narrow down areas that need improvement. The interpretation of data over time is important to determine where the QI team should focus its efforts (UDSHHS, 2012). After the QI team understands what the data mean, it can implement small changes to work toward its goal.

Conclusion

Implementation of the hypertension program did not take place in the context of this project. The hypertension management program was presented to the clinical director, Dr. Espejo, in December 2013. I offered to review the program at a staff meeting, with executives, and/or at a provider meeting. Dr. Espejo felt that presenting the information to him was sufficient, and he accepted the responsibility to disseminate the program to staff. Dr. Espejo was open to the hypertension management program. Whether the program will be implemented or not, is dependent on the discretion of the medical director.

The fact the project was not implemented and evaluated is a large limitation of the practice improvement project. FHC should implement and evaluate the project. Or the implementation and evaluation could be a future practice improvement project for other doctoral students. Another limitation is that I focused on nurse and provider contributions to manage hypertension. I did not consider how other staff members and professionals at the clinic could contribute to development of a comprehensive program.

Dr. Espejo was appreciative of the work done and in the future would like to find a system or program that addresses each of the six chronic diseases FHC would like to focus on. The practice improvement project reiterates the importance of hypertension control and that the best way to manage hypertension in a clinical setting is with a hypertension management program. The nurse practitioner serves as a leader in providing evidence based care as well as being an advocate to the patient. Multiple hypertension management programs are available for use. The provider needs to review the programs and utilize one that best parallels with the values of the clinic in need. The provider, clinic, and patients can benefit from a symbiotic relationship with the goal of hypertension management and less complications of hypertension.