DECREASING BLOOD PRESSURE READINGS USING A PATIENT-CENTERED INTERPROFESSIONAL TEAM APPROACH

by

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Abstract

**Background and Purpose:** Hypertension is one of the most modifiable risk factors for the prevention of heart disease. Current practice involves medical management of hypertension by the primary care provider. Provision of medical management alone is not improving blood pressures of patients with hypertension. Therefore, a patient-centered interprofessional team was developed to address the lack of a coordinated approach to the management of hypertensive patients.

**Methods:** The family nurse practitioner as clinician guides the interprofessional team in the management of hypertension. An interprofessional team was implemented in a rural Midwestern family practice clinic. Patients included were 18 to 60 years old with a diagnosis of hypertension. At least two previous blood pressure readings were required, and the last reading must have remained elevated over 140/90. Initial blood pressure readings were compared to final visit readings to measure improvement. Systolic blood pressure was reduced significantly throughout the project (p = 0.0067).

**Conclusion:** Implementation of the interprofessional team in the management of hypertension has provided a positive improvement in the BP of the patients participating.

**Implications for Practice:** The interprofessional team design supports the perfect environment for advanced practice nursing leadership.
Decreasing Blood Pressure Readings Using a Patient-Centered Interprofessional Team Approach

Hypertension (HTN) is one of the most modifiable risk factors for the prevention of heart disease. The Eighth Joint National Commission (JNC8) reports the average risk of heart disease and stroke mortality is decreased significantly with the control of high blood pressure (BP) (James, et.al., 2014). Studies show that one in three adults in the United States has HTN with only half that number having good control of this disease (Carter, Hayden, & Green, 2012; Go, Lawrence, Williams, & Sanchez, 2013). The Centers for Disease Control (CDC) and the American Heart Association (AHA) estimate that 53% of persons diagnosed with HTN have uncontrolled blood pressure (Santschi, 2014).

Hypertension, as a chronic disease, requires lifelong treatment to reduce heart disease and therefore, stroke. Lifelong treatments require interventions for lifestyle changes (Valderrama, Tong, Ayla, & Keenan, 2010). Adherence to lifestyle changes is low; the reasons for non-adherence and the need for intervention vary for compliance with each individual (Uzun et al., 2006). Margolius (2010) notes that 50% of patients neither participate in developing nor comprehend their care plan.

There is a need to incorporate other healthcare disciplines in the management of HTN to address non-adherence issues and incorporate patient-centered care. There are currently 32 million Americans with uncontrolled HTN; with the shortage of primary care physicians, this number is expected to increase (Margolius, 2010). The Community Preventative Services Task Force (2014) recommends team-based care to make every effort to meet the goal of the Healthy People 2020 initiative of 61.2% of adults having controlled BP. Evidence supports the nurse
practitioner in leading the interprofessional team to provide health care management of primary care at comparable or better quality and at a lower cost than provided by other healthcare professionals (Allen, 2014). Research shows the addition of the behavioral health specialist and registered pharmacist to the healthcare team improved the success of lifestyle changes and medication compliance (Mino-Leon, Reyes-Morales, & Flores-Hernandez, 2015; Proia, et al., 2014; Shaw et al., 2013).

Current practice involves medical management by the primary care provider. Provision of medical management using JNC8 guidelines alone is not improving BP of patients with HTN. There is no organized use of other available professionals to integrate their knowledge in the care of the HTN patient. Therefore, a patient-centered interprofessional team was developed to address the lack of a coordinated approach in the management of hypertensive patients. This report describes the implementation of a successful patient-centered interprofessional team approach for the management of HTN.

**Methods**

A rural Midwestern family practice clinic was chosen for this patient-centered interprofessional team approach. One full-time family nurse practitioner (FNP), and one part-time physician, as primary providers, individually manage HTN, using JNC8 guidelines, a diagnosis centered plan of care. Additional available staff includes a clinical psychologist (CP) and a registered pharmacist (RP). All staff members worked unconnectedly in a six-exam room office suite.

The interprofessional, patient-centered, team approach replaces single-provider, disease focused, medical management of HTN, with patient-centered care plans that shift the focus of
care from the disease to the individual. The following is a detailed explanation of an interprofessional team created for the management of HTN in the family practice clinic.

**Design**

The interprofessional team was created from available staff located in the clinic to integrate physical, mental, and behavioral health in a patient-centered model of care. In addition to the FNP, members of the interprofessional team include a registered nurse manager, a medical assistant, an in-house registered pharmacist (RP), and a clinical psychologist (CP). The FNP as primary provider selected patients to participate and lead the team in providing patient-centered care.

The FNP, as team leader, analyzed the electronic medical records (EMR) for potential participants between the age of 18-60 years old with the diagnosis of HTN (n=321). Many patients did not follow up after the first visit so a sub-query was created to include only those patients with at least two previous BP readings taken on two separate occasions (n=100). An additional query was created to select only patients where the last BP reading remained elevated over 140/90 (n=41). The patients in this final group were eligible for the interprofessional team. The nurse manager invited qualified patients to participate in the project. Of the 41 patients, qualified for the intervention, 27 patients agreed to participate. If the patient agreed to participate, the nurse manager scheduled an appointment for the patient with the HTN interprofessional team. Although 27 patients agreed to participate, only 20 participated, with eight of the 20 not completing all the visits. This participation rate was comparable to the patient norm of the clinic as patients often reschedule or do not show for appointments.

Patients were scheduled for three consecutive visits, in two week intervals, over a period
of six weeks. Visits were approximately 50 minutes long and each team member saw the patient at the visits sequentially. Members of the team assisted the patient in building their personal patient-centered plan of care.

Each patient spent approximately 10 minutes of the initial visit with the medical assistant, 10 minutes with the FNP, and 15 minutes each with the CP and the RP in the management of HTN. The medical assistant documented the required data on the flow sheet in the EMR. The advanced practice registered nurse completed a physical exam and reviewed the flow sheet. Pharmaceuticals were prescribed according to the JNC8 2014 evidenced-based guidelines for the management of HTN (James, et.al., 2014). The CP determined the patient’s readiness for change. The RP evaluated the patient’s knowledge of the medications prescribed and assessed for possible adherence issues.

Flow sheets were used to track patient BP. Other data that was used by the team to assist in developing the patient-centered care plan were cardiovascular disease risk factors: the patient’s weight, height, body mass index (BMI), smoking status, alcohol use, and ratio of waist to hip circumference. Cardiovascular risk factors contribute to increased blood pressure and heart disease (Santschi, 2014). The team used the cardiovascular risk factors to develop the patient-centered plan of care. Additionally, the patient was screened for depression using the 2-item Patient Health Questionnaire (PHQ-2) (Arroll et al., 2010). The patient’s PHQ-2 score was recorded on the flow sheet. The CP used this additional information in planning counseling sessions for lifestyle changes to maximize adherence to the care plan (Kaiser Permanente, 2014).

The CP played an active part in assisting the patient to identify their readiness for change using Prochaska’s Transtheoretical model for change (DiClemente & Prochaska, 1998). Patients
identified goals that addressed lifestyle changes in diet and exercise, weight reduction, alcohol consumption, tobacco use, and medication adherence. The CP also addressed depression issues identified in the PHQ-2 as blood pressure resolution is affected by depression (Guerra, et al., 2013).

The RP was the last team member to meet with the patient to introduce self-management skills, assist with creating personal goals, and support medication adherence based on the patient’s readiness to change. The RP evaluated the patient’s knowledge of the medications prescribed and assessed for possible adherence issues. Expanding the patient’s knowledge of medication has demonstrated adherence and lowering of BP (Carter et al., 2012). Self-management skills and goals were developed for home monitoring of BP. On the first visit, patients were provided with a BP cuff and instructed on its use by the RP. The RP also assisted in educating the patient on the importance of medication adherence and assisted in obtaining medications for those that could not afford them.

Follow-up visits were scheduled with the HTN interprofessional team for two, four, and six weeks. Patients’ BPs were recorded, home BP readings were reviewed, and medications were adjusted if needed. Progress with lifestyle changes and goals were evaluated and knowledge reassessed by team members. Each patient was provided with an incentive to return. Visits with the team members were free and those that completed a second visit were provided with a pedometer to track their walking activity. Those who completed the third visit were provided an exercise stretch band to add upper body exercising while walking. Each team member according to his or her discipline provided assistance in evolving a patient-centered plan of care.
The Capella institutional review board (IRB) reviewed the evidenced based implementation project and determined that it did not meet the federal regulations definition of Human Subjects Research. Therefore, IRB oversight was not needed. There was no personal or identifying information collected. Blood pressures were de-identified before collection for analysis. All qualifying patients were given the option to participate.

Results

Implementation of the interprofessional team in the management of hypertension has provided a positive improvement in the BP of the participating patients. Initial BP readings were compared to subsequent visit BP readings to measure improvement. Blood pressures were lowered for patients who did participate.

To maintain reliability, the same MA obtained BP measurements when the patient arrived for their visit. The patient rested in a sitting position for 10 minutes before measuring the BP. Measurements were collected using a manual BP cuff sized to fit the patient’s arm. The patient was seated with back supported in the chair and feet flat on the floor. The arm used to measure the BP was supported on a table at heart height. The patient’s BP was entered in the EMR in a structured data form that allowed retrieval of the measurements. The BP was collected at the initial visit and each follow-up visit at two weeks, four weeks, and six weeks. The following is an analysis of the blood pressure readings.

Data analysis was completed using Jump (JMP) statistical software. No outlier testing was performed, and no data was removed from the analysis. Blanks in the data table represent missed visits and were treated as missing data and played no part in the analysis. Remaining non-missing data for the patient was included in the analysis. Tukey’s Highest Significance Test
(HST) was completed on BP, systolic and diastolic, separately. Tukey’s Highest Significance Test is a single-step multiple-comparison procedure and is most suitable for multiple comparisons and if sample sizes are not equal. Turkey’s HST allowed finding of the average change within individuals treated by the HTN management team, accounting for the individual differences. A 95% confidence interval for the population BP before and after the trial period was computed.

Initial results for all six sets of BP measurements, except one, were lower when compared to the initial measurement. The final systolic BP had a CI 95% for reduction (16.72 to 42.78). Systolic BP was reduced significantly throughout the project \((p = 0.0067)\). Tukey's Highest Significance Test shows a significant difference between the second and third set of measurements. Diastolic BP was not reduced significantly \((p = 0.1121)\) when all measurements were included. However, if the first set of follow-up measurements are excluded from the analysis, the difference was in fact significantly different from zero \((p = 0.0001)\).

**Discussion and Limitations**

The interprofessional team approach significantly lowered BP in patients that actively participated. Patients were excited to see that a simple change in lifestyles had an effect on their BP readings. However, there is always the possibility of the placebo effect. The patients may have been working hard to change their BPs to please the interprofessional team and may lose interest before the lifestyle change becomes permanent. Eight patients did not complete all the visits, as four did not feel it was necessary to waste the gas to come to the clinic when they had achieved their goal in two visits. A future consideration may be to provide gas cards as an incentive to continue working with the team.
Attrition for the project was related to a percentage of the indigent population that frequents the clinic. The clinic has a no show rate of 25% that affects participation on a day-to-day basis. Rescheduling is common as they have difficulty finding transportation to and from the clinic.

Four patients lowered their BP but did not meet the goal set of <140/90 for this project. The interprofessional team continues to work with the patients in attaining their BP goals. Three of the four patients that were not at goal during the time of data collection have since managed to meet a goal of desired blood pressure.

**Implications for Nursing Practice**

The Institute of Medicine is calling for new models of care (Committee of Quality Healthcare in America, 2001). The interprofessional team design is the perfect model of care for managing HTN. With the lack of primary care physicians, it is only logical for the FNP to coordinate and guide the interprofessional team (Vleet & Paradise, 2015). Evidence supports the nurse practitioner leading the interprofessional teams to provide health care management of primary care, at comparable or better quality, and at a lower cost than provided by other healthcare professionals (Allen, 2014). The American Association of Nurse Practitioners agrees that nurses may fill multiple roles in the interprofessional team: “Advocate, clinician, consultant, educator, evaluator, leader, manager, partner, and transformer (American Association, 2013). Team-based care allows nurses and other healthcare professionals to function in the fullest extent of their education.
Conclusions

Implementation of the interprofessional team in the management of HTN has provided a positive improvement in the BP of the patients participating. This improvement in BP shows the importance of patient-centered team-based care in the management of HTN. This project will continue as the team manages HTN in the clinic and expands its use in the management of other chronic diseases, such as diabetes and obesity.


Go, A. B., Lawrence, W., Williams, K., & Sanchez, E. (2013). *An effective approach to high blood pressure control*. doi:10.1161/HYP.0000000000000003


