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Implementing a Standardized Protocol for Early Detection of Undiagnosed Hypertension Patients

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Implementing a Standardized Protocol for Early Detection of Undiagnosed Hypertension Patients

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Abstract

Introduction: Hypertension is a preventable disease that frequently goes unrecognized and undertreated. Early diagnosis can prevent further comorbidities such as heart disease, stroke, and chronic kidney disease. Implementation of this protocol aims to decrease the number of patients with undiagnosed hypertension and increase the identification of patients with elevated blood pressure who did not have a pre-existing diagnosis of hypertension. The goal of implementing a standardized protocol would help eliminate the number of patients who go undiagnosed.

Methods: This quality improvement design had clinical staff flag patients with elevated blood pressure. Identified patients without a diagnosis of hypertension were educated by providers, given an education packet, encouraged to monitor their blood pressure at home, and asked to return for a follow-up appointment in two to four weeks.

Results: Prior to the protocol being initiated from June to August 2021, 0 (0%) patients were identified with elevated blood pressure, and 93 (100%) were found to have elevated blood pressure with no pre-existing diagnosis of hypertension. After the protocol was initiated from June to August 2022, however, 49 (13.6%) patients were identified with elevated blood pressure, and 312 (86.4%) were not identified for a total of 361 patients with elevated blood pressure and no current diagnosis of hypertension.

Discussion: Overall, the protocol implementation improved identification of patients with high blood pressure without a previous diagnosis of hypertension. The protocol raised awareness within the clinic regarding hypertension and associated comorbidities. There was a large increase in the number of patients found to have elevated blood pressure from 2021 to 2022. This increase is likely influenced by the change from manual to standardized automatic blood pressure cuffs. Despite protocol implementation, there was still a large volume of patients that had elevated blood pressures that remained unidentified. While staff training was done prior to protocol

implementation, there was no process in place to monitor the fidelity of proper blood pressure technique and protocol adherence. Continued focus on protocol adherence may improve the number of individuals identified with elevated blood pressure.

Introduction

Hypertension affects one out of every two adults in the United States (US) population (Fang et al., 2021) and is one of the most preventable risk factors for heart disease, stroke, myocardial infarction, and chronic kidney disease (Krist et al., 2021). Despite the crucial need for recognizing and treating high blood pressure, hypertension remains largely undiagnosed, untreated, and poorly controlled (Tanabe et al., 2004). Elevated blood pressure in young adults is a predictor for future cardiovascular events that may occur in an individual's life (Johnson et al., 2013). Hypertension continues to be on the rise, especially with the increase in obesity within the US. As one of the leading preventable causes of death, early diagnosis of hypertension is vital.

Screening for hypertension is done in an outpatient setting by using a manual or automatic sphygmomanometer. The process of screening for hypertension is simple, low cost, and pain-free for the patient. The Centers for Disease Control and Prevention have created a Hypertension Control Change Package to help raise awareness and recognize undiagnosed hypertension. Within the Hypertension Change Package, the American College of Cardiology considers a systolic blood pressure (SBP) reading greater than or equal to 130 mmHg and/or diastolic blood pressure (DBP) reading greater than or equal to 80 mmHg to be stage one hypertension and a SBP reading greater than or equal to 140 mmHg and/or DBP reading greater than or equal to 90 mmHg as stage two hypertension (US Department of Health and Human Services, 2020). A randomized clinical trial in Canada shows that the identification of hypertension, followed by educational materials and follow-up visits with clinicians provides health benefits. The results after one year of follow-up showed a 9% reduction in hospital admissions for acute myocardial infarctions, congestive heart failure, or stroke (Krist et al., 2021). Reducing the number of undiagnosed and uncontrolled hypertension cases can

significantly impact the incidence of complex cardiovascular events, stroke, and chronic kidney disease.

Problem Statement

There is a significant amount of uncontrolled hypertension in adults, with a subset being undiagnosed hypertension. The National Health and Nutrition Examination Survey (NHANES), a cross-sectional survey of the noninstitutionalized US population that combined interviews and physical examinations, found that one in three or about 71 million US adults had a high blood pressure reading (Wall et al., 2014). After a closer look, it was determined that 36.2% of the population, about 13 million adults, had undiagnosed blood pressure (Wall et al., 2014). Undiagnosed blood pressure means an individual is not aware of their high blood pressure and is not taking any medications to help control it (Wall et al., 2014). Some may blame the high numbers of undiagnosed hypertension on the fact that individuals are uninsured or do not have adequate access to the healthcare system. However, data from the NHANES survey done in 2009-2012 shows that among the individuals that have undiagnosed hypertension, 81.8% have health insurance, 82.5% have a usual source of care, and 61.7% have even received care two or more times in the past year (Wall et al., 2014). This data indicates millions of individuals in the US have undiagnosed and uncontrolled hypertension and are receiving care from healthcare professionals but remain undiagnosed within the clinical setting (Wall et al., 2014).

Million Hearts, a federal initiative that is being launched by the US Department of Health and Human Services (DHHS), has a goal to prevent one million myocardial infarctions and strokes (US DHHS, 2020). Blood pressure control was determined to be one of the most important preventative measures to help reduce and prevent heart disease and stroke (Wall et al., 2014). The previously noted numbers show the need to have a standardized protocol

implemented to help reach and identify these individuals with undiagnosed hypertension. A collaboration in Lincoln, Nebraska, between the Nebraska Department of Health and Human Services Chronic Disease Prevention and Control Program (CDPCP), Bryan Health Connect, and Hart and Arndt Family Health, P.C. attempted to develop and evaluate innovative approaches in cardiovascular prevention and management that could be shared with the Centers for Disease Control (CDC). Hart and Arndt Family Health, P.C., received the Nebraska Chronic Disease Prevention and Control Program 1817 Grant from Bryan Health Connect, which is funded through the DHHS that provides funds and resources to help recognize undiagnosed hypertension. Hart and Arndt Family Health, P.C., is a Nurse Practitioner (NP) owned family practice outpatient clinic in suburban Lincoln, Nebraska. The cardiovascular disease prevention and management strategies include tracking and monitoring clinical measures that are shown to improve health care quality and identify patients with high blood pressure, implementing team-based care for patients with high blood pressure, including testing innovative ways to include non-physician team members such as nursing staff. One strategy was to implement a protocol to help target patients with undiagnosed hypertension.

Many electronic health data queries have been run at Hart and Arndt Family Health, P.C. using their electronic medical record (EMR), called EClinicalWorks, to help determine the need for this project. The clinic analyzed data from June 1 to August 31, 2021, for a total of 1585 adults aged 18 to 85 that were seen in this time frame who received a blood pressure check. The total number of adults 18 to 85 seen within that same timeframe, who received a blood pressure check but did not currently have a diagnosis of hypertension in their problem list was 1047. Out of those 1047 patients, 105 had a SBP $\geq$ 140 and/or DBP $\geq$ 90 and no diagnosis of hypertension in their problem list. This shows that approximately 10% of patients seen in the clinic during this

time frame had a high blood pressure reading without a diagnosis of hypertension in their problem list, indicating they are not being identified or treated. Based on this data, Hart and Arndt Family Health, P.C. with the help of Bryan Health Connect decided to undertake this project to help reduce the number of undiagnosed hypertensive patients within their practice population.

Purpose Statement Aims and Clinical Question

The overall purpose of this project was to create and implement a standardized protocol to identify and treat undiagnosed hypertension in adults in a family practice setting. Using continuous quality improvement, the clinical research question for this study was: (P) in adults aged 18-85 years old with undiagnosed hypertension (I) does implementing a standardized hypertension and self-monitoring blood pressure (SMBP) protocol (C) compared to the current process (O) help identify and provide early intervention to decrease the number of undiagnosed hypertension cases which currently was 10% from June 1 through August 31, 2021 at Hart and Arndt Family Health, P.C., (T) over a 3-month period?

The project aims to 1) decrease the number of patients with undiagnosed hypertension and 2) increase the identification of patients with elevated blood pressure without the pre-existing diagnosis of hypertension. The goal of implementing a standardized protocol would help eliminate the number of patients who go undiagnosed.

Review of Literature

A review of literature was completed to assess patient education in adults with undiagnosed hypertension. Appendix A contains the evidence-based table of reviewed studies. The review of literature showed that non-severe patients in an emergency department were rarely reassessed and did not receive follow-up referrals to primary care (Tanabe et al., 2004). In addition, the rate of hypertension diagnosis in adults was slower in the younger population

(Johnson et al., 2014). A quick and straightforward protocol can be implemented to screen hypertension and provide interventions and follow-up through primary care (Pirotte et al., 2014).

Key concepts and keywords used for this literature search were undiagnosed, hypertension, and patient education. Limitations to the search included Adults 18-85, English only text, and a publication range from the year 2000-current. Literature databases used in the search included CINAHL, Embase, MEDLINE via EBSCO, and Pubmed. Search terms used for CINAHL and MEDLINE via EBSCO were (hypertension OR hypertensive OR "high blood pressure") AND Undiagnosed OR (not N5 diagnosed)) AND "patient education" OR "patient handout" OR "discharge education". Search terms used for Embase were "hypertension" AND "patient education" AND "undiagnosed disease". Search terms used for PubMed were (hypertension) AND (patient education) AND (undiagnosed). The population used in all of the studies were adults with at least one recorded elevated blood pressure. Each article defines elevated blood pressure as systolic blood pressure ≥140 and/or diastolic blood pressure ≥90. The settings used were a large academic urban emergency department and a large Midwestern multidisciplinary academic group practice. Study outcomes evaluated the frequency of hypertension reassessment during admission, patient and clinician barriers to hypertension follow-up, and rate of diagnosis of hypertension between age groups. Applying the search terms and limitations mentioned above, 6 CINAHL, 3 Embase, 13 MEDLINE via EBSCO, and 13 PubMed articles were found. Using RefWorks duplicates were identified and removed. A total of 14 articles remained. A brief look at the title and abstract removed an additional 7. After a full-text reading of those articles, 3 articles were used for the review. The remaining articles included two case-control studies and one qualitative study.

An article by Johnson et al. (2014) studied the rate of initial diagnosis of hypertension and what affected the rates of diagnosis. To evaluate the time of diagnosis, electronic medical records (EMR) of adults 18 years old or older were assessed. The study used a start time of an initial input into the EMR of a systolic pressure ≥ 140 and/or a diastolic pressure ≥ 90 and used diagnosis of hypertension as the end time. The study found that older adults were diagnosed faster. In addition to age, adults with comorbidities such as diabetes, chronic kidney disease, and obesity were diagnosed faster as well as African Americans and adults using Medicaid. The study also found that patients that were not immediately diagnosed, occasionally had normal blood pressure readings, used tobacco products, and visited urgent care facilities more frequently.

An article by Tanabe et al. (2004) evaluated how many patients with hypertension that came into the emergency department for complaints unrelated to their blood pressure received treatment or referral for follow-up with primary care. Patients were randomly selected through EMR. The study evaluated 37 patients in the given timeframe. They found that blood pressure was rechecked on only 10 patients with hypertension before discharge. None of the patients received treatment or admission to the hospital. Referral for follow-up was only done for a single patient that was at the emergency department for a refill on hypertension medication. In addition, the study found that 10 patients previously had high blood pressure and that 7 patients were already prescribed hypertension medication.

The last article by Pirotte et al. (2014) analyzed how providers in an emergency department setting can best give care and referral for follow-up as well as how to influence patients to receive that care and return for follow-up with primary care. Questionnaires were given to patients, nurses, and physicians. Patients had three questions on what would help and

hinder their ability to return for follow-up. Nurses and physicians had six questions about the causes of hypertension, when a patient should be referred for follow-up for hypertension, and what could hinder a patient to return for follow-up. The study found that patients often either did not believe that they had high blood pressure or that they blamed it on anxiety. Patients listed work, lack of transportation, and forgetfulness as to why they do not go to follow-up appointments. Patients listed untreated hypertension complications, and family support as reasons that would help them return for follow-up appointments. Nurses and physicians often listed pain and anxiety as reasons a patient would have hypertension. Answers to why education and referral for follow-up was not given to patients were due to lack of time, the discharge education was not adequate, patients do not have insurance, or patients were not motivated. Nurses and physicians would be more willing to give education and referral for follow-up with primary care if instructions were prompted at discharge.

Conceptual and/or Theoretical Framework

The theoretical framework used was RE-AIM. RE-AIM has five primary parts: reach, effectiveness, adoption, implementation, and maintenance (Ory et al., 2015). To reach the intended target group, a medical assistant (MA), certified nursing assistant (CNA), licensed practical nurse (LPN), or registered nurse (RN) took the blood pressure of every adult patient seen for evaluation at the clinic. According to current guidelines, a SBP reading greater than or equal to 130 mmHg and/or diastolic blood pressure (DBP) reading greater than or equal to 80 mmHg is stage one hypertension and a SBP reading greater than or equal to 140 mmHg and/or DBP reading greater than or equal to 90 mmHg is stage two hypertension (US DHHS, 2020). For this project and based on facility guidelines, any systolic blood pressure ≥ 140 and/or diastolic blood pressure ≥ 90 received further evaluation and education. Stage two hypertension was used for this protocol as this is when the initiation of medication therapy is typically recommended

(Unger et al., 2020). The effectiveness of the protocol was evaluated by an increase in the number of patients with a diagnosis of hypertension. Hart and Arndt Family Health, P.C., agreed to trial a standardized blood pressure protocol. The entire staff received education on the automated blood pressure machines, demonstrated the correct steps on how to take a patient's blood pressure, knew when to give an education packet to patients, and documented continued follow-up. Proper implementation was evaluated through a tracking log. The patient's blood pressure was checked at the initial visit and entered into the EMR. If the blood pressure was elevated, the patient's name was transcribed on a tracking log and education was provided. Patients were encouraged to follow up in two to four weeks to determine a plan of care regarding their high blood pressure. Long-term use of the protocol was ensured through continued evaluation of each step and feedback from staff. Improvements based on feedback were made to the protocol when needed.

Methodology

Design

The study design for this project was a quality improvement design. This design was chosen because this project will work to standardize a process, achieve predictable results, and improve outcomes for patients as well as health care systems. In this project, patients with undiagnosed hypertension were identified, given an education packet regarding hypertension, encouraged to self-monitor their blood pressure at home, keep a blood pressure log, and then return for a follow-up with the provider (See Appendix B and C). Staff were not expected to discuss or teach anything in the education packet. Education packets include the definition of elevated blood pressure, self-blood pressure monitoring (SMPB) such as when and how to take blood pressure, which monitor to buy versus using a loaner from the clinic, healthy diet and lifestyle modification tip sheet, blood pressure log, and other resources for the patient to utilize.

The staff were educated on hypertension and the importance of identifying and initiating early treatment. They were educated on co-morbidities related to hypertension. The staff were shown the contents of the education packets. There were also instructions given related to which patients qualified to receive an education packet. Once the staff took a patient's blood pressure and the reading was noted to be SBP ≥ 140 and/or DBP ≥ 90 they documented it in the EMR and gave the patient a note card to let the NP know the patient had elevated blood pressure and the blood pressure will need to be rechecked. The NP then completed the office visit, and the patient's blood pressure was rechecked. If the blood pressure was still elevated, the MA, CNA, LPN, or RN got an education packet for the patient, recorded in the tracking log to whom it was given. The key educational points that were addressed with the patient included encouraging them to monitor their blood pressure at home, using the home blood pressure log, and letting the patient know there are additional resources in the packet. The patient then went to check out at the front desk and scheduled the patient with a follow-up appointment in two to four weeks. The front desk was taught the importance of this follow-up appointment and why the patient needed to make one. The Doctor of Nursing Practice (DNP) students also trained the staff on how to take a patient's blood pressure properly. Each staff member completed a competency showing they correctly knew how to take accurate blood pressure (See Appendix D). There was a total of 14 individuals that took a blood pressure (5 NPs and 9 MA or LPNs). Utilizing appropriate training allowed for both consistent blood pressure measurement in the office and patient education to allow for accurate self-measured blood pressure (Murakami and Rakotz, 2015). The patients that received education were documented so that a follow-up with the provider or nurse was ensured. Patients fell into three categories: 1) either not identified therefore not diagnosed, 2) diagnosed and did not follow up with the provider to discuss home blood pressure log, lifestyle

modifications, and possible medications, or 3) patients identified with high blood pressure, given the education packet, and followed up with the provider.

With the implementation of this new process, the goal was to have all patients seen at Hart and Arndt Family Health, P.C. that had a systolic blood pressure (SBP) ≥ 140 or diastolic blood pressure (DBP) ≥ 90 reading on multiple occurrences have the International Classification of Diseases 10th Revision (ICD 10) diagnosis code of hypertension in their chart. This in turn, would result in more individuals having controlled blood pressure. Implementing this process would allow for a standardized process when a patient has an elevated blood pressure, achieve results of having less undiagnosed hypertension, and improve patient and healthcare system outcomes by reducing cardiovascular risks and co-morbidities in the future.

Subject and Settings

The subjects for this study were adults aged 18-85 with high blood pressure readings and no current diagnosis of hypertension. The setting was Hart and Arndt Family Health, P.C. Hart and Arndt Family Health, P.C. is a nurse practitioner-owned family clinic practice in suburban Lincoln, Nebraska. The medical staff is comprised of five family nurse practitioners and nineteen support staff. It was founded in 2016. The organization's focus is to provide the highest quality of care through accessible, uncomplicated, and evidence-based care. They provide a full range of services. The clinic serves about 6,200 patients ranging from ages 0 to 105 years of age.

Inclusion criteria included patients with undiagnosed hypertension or no ICD 10 code of hypertension, both men and women, aged 18-85 years of age, patients of Hart and Arndt Family Health, P.C., and a blood pressure reading with SBP ≥ 140 and/or DBP ≥ 90 when being seen at Hart and Arndt Family Health, P.C. for any type of office visit. Exclusion criteria included a

previous or current diagnosis of hypertension, and adults that are under 18 years of age or over 85 years of age.

Tools, Measures, and Data Collection

Patients aged 18-85 that came in for any type of office visit at Hart and Arndt Family Health, P.C. that had a SBP ≥ 140 and/or DBP ≥ 90 and no current diagnosis of hypertension were given an educational packet and documented on a log. Step 1: Patient checks in for any type of visit. Step 2: The patient's blood pressure is checked using a standardized electronic monitor. Step 3: If the patient has an elevated blood pressure (SBP ≥ 140 and/or DBP ≥ 90) and no current diagnosis of hypertension in their chart, a note will be made in the subjective section of the EMR noting the blood pressure is elevated and needs to be rechecked and a note card will be handed to the patient indicating the individual's blood pressure was high. Step 4: The provider performs the visit. Step 5: The patient's blood pressure is rechecked by the MA, CNA, LPN, or RN. Step 6: If the blood pressure is still elevated the patient receives an education packet and a blood pressure log (see Appendix B and C). Step 7: The patient's name and date of birth are written on the blood pressure tracking log posted in a locked drawer in the provider's office (See Appendix E). Step 8: The patient will be instructed to make a two to four week follow up appointment with the provider to review their home self-monitoring blood pressure log. Step 9: The patient returns in two to four weeks for follow-up to review the blood pressure log with the provider, recheck their blood pressure in the clinic, discuss medications/lifestyle modifications, and steps to continue to monitor their blood pressure. Step 10: The tracking log will be checked monthly, and patients will be tracked. If a follow-up is skipped, patients will be called to encourage them to reschedule. Step 11: The patient will return in three months to determine efficacy of the plan of care. See Appendix F for steps of the hypertension protocol.

Patients will not be expected to sign an informed consent. The study examined if having a set protocol in place will help identify patients that currently have high blood pressure but are being missed when coming into the clinic for office visits. The patients will not turn in their home blood pressure logs, they were a tool to help the providers determine if the patient's blood pressure was running high regularly or if the patient had other factors that may be falsely elevating their blood pressure.

The main sources of data collection were the EMR and the blood pressure tracking log. The tracking log was kept in a locked filing cabinet drawer in a provider's office. The EMR contained all patient demographics, blood pressure readings, topics discussed with the provider, medications that the patient is currently taking or prescribed, and the official diagnosis of hypertension, or ICD 10 code. The tracking log contained the patient's name, date of birth, and date that the education was provided. This log helped determine when a patient needed follow up. Once a patient follows up the date of follow-up was added, or if a patient canceled and was called over the phone that was also documented (see Appendix E). Each month an electronic health data query was run to determine the number of patient encounters that took place at the clinic as well as the number of patients aged 18-85 that had undiagnosed hypertension meaning (no diagnosis of hypertension AND 1) SBP ≥140 AND/OR 2) DBP ≥ 90). The names of these patients that populated during the query search were then compared with the patients' names on the tracking log. The blood pressure tracking log as well as the names from the query search, were entered into Excel spreadsheet to assist in comparing data. When the names were compared from the search and the tracking log it helped determine if more patients with undiagnosed hypertension are being targeted and being made aware of high blood pressure. A spreadsheet was kept determining if patients were 1) still being missed or not identified, therefore no intervention,

2) identified and did not follow up with the provider to discuss home blood pressure log, lifestyle modifications, and possible medications, or 3) patients identified with high blood pressure, given the education packet, and followed up with the provider in two to four weeks. The Excel spreadsheets were kept on a computer at the clinic that has the proper means of protection for personal health information.

Timeline for Implementation

Implementation for the proposed project began in June of 2022. The protocol development started in October of 2021. Weekly meetings were conducted with the DNP students and the stakeholders since October of 2021. Biweekly meetings with Bryan Health Connect, the DNP students, and the stakeholders took place since October 2021. PowerPoint presentations regarding the proposed protocol as well as the education packets that were given to patients when they had a high blood pressure reading were developed in November and December of 2021. Automated blood pressure cuffs and loaner blood pressure machines were ordered in December of 2021 using grant funding from DHHS. Staff training at Hart and Arndt Family Health, P.C. took place in May of 2022. The protocol rollout and identification of patients with undiagnosed hypertension began in June of 2022. The Gantt chart shown in Appendix G depicts the timeline for implementation.

Analysis

To measure the change in the number of patients with undiagnosed hypertension, the number of patients seen from June 1 through August 31, 2021, who had a high blood pressure and did not have a pre-existing diagnosis of hypertension were compared to the number of patients seen from June 1 through August 31, 2022 who had a high blood pressure and did not have a pre-existing diagnosis of hypertension. These numbers were compared with a Pearson chi-square analysis or a Fisher's exact test as appropriate for the data. To evaluate if the

intervention improved staff recognition of high blood pressure, the number of patients identified with hypertension, received education, and returned for follow-up were compared to the number of patients identified with hypertension but did not receive education or return for follow-up.

Findings

The total number of people that had elevated blood pressure from June to August 2021 was 1583. Of those individuals 1190 (75.2%) were female and 393 (24.8%) were male. The total increased to 1859 the following year from June to August 2022. Of those individuals 1386 (74.6%) were female and 473 (25.4%) were male (See Table 1 in Appendix H).

Prior to the protocol being initiated from June to August 2021, 0 (0%) patients were identified with elevated blood pressure and 93 (100%) that were found to have elevated blood pressure with no current diagnosis were not identified. Individuals with elevated blood pressure were not identified due to the lack of a protocol being in place to help detect these patients. There were 34 individuals with an elevated blood pressure in June 2021. There were 24 individuals with an elevated blood pressure in July 2021. There were 35 individuals in August 2021.

After the protocol was initiated from June to August 2022, however, 49 (13.6%) patients were identified with elevated blood pressure and 312 (86.4%) were not identified for a total of 361 patients with elevated blood pressure and no current diagnosis of hypertension. June 2022, a total of 116 patients could have been identified with elevated blood pressure. Out of the 116 individuals, 27 (23.3%) were identified and 89 (76.7%) were not identified. July 2022 a total of 98 patients could have been identified with elevated blood pressure. Out of the 98 individuals, 12 (12.2%) were identified and 86 (87.8%) were not identified. August 2022 a total of 147 patients could have been identified with elevated blood pressure. Out of the 147 individuals, 10 (6.8%) were identified and 137 (93.2%) were not identified (See Table 2 in Appendix H). The minimum

age for the 361 patients with elevated blood pressure from June to August 2022 was 18 and the maximum age was 83. The mean age was 42.27 with a standard deviation of 14.732.

Once identified, each patient was scheduled for a follow-up appointment in two to four weeks to confirm whether the individual had hypertension. The number of patients that returned for follow-up was 27 (55.1%), the number of patients that did not return was 7 (14.3%), and the number of patients that were never scheduled for a follow-up was 15 (30.6%) (See Table 3 in Appendix H). Additionally, patients with initial elevated blood pressure could utilize a loaner blood pressure cuff if they were unable to acquire their own. There were 13 (26.5%) patients that did borrow a blood pressure cuff, and 36 (73.5%) did not (See Table 4 in Appendix H).

Discussion

There was an increase in individuals who had elevated blood pressure with no current diagnosis of hypertension from 93 individuals in 2021 to 361 individuals in 2022 during the months analyzed. During the months of June to August 2021, when no protocol was in place, the staff at Hart and Arndt Family Health, P.C. were using manual blood pressure cuff readings. From June to August 2022, when the hypertension protocol was implemented, the clinic purchased four new automated blood pressure cuffs with grant funds. Current recommendations suggest that automated blood pressure readings may be more accurate in recognizing and diagnosing high blood pressure (Berg, 2019). The change from manual to automatic blood pressure cuffs with the implementation of the project may have influenced the increase of patients with high blood pressure from 2021 to 2022.

The quality of a blood pressure measurement is also important. Staff training was held to educate the staff on the new blood pressure machines and the proper technique to use when taking blood pressure. There was no process in place to monitor the fidelity of the staff on maintaining the proper technique of taking a blood pressure. Studies have shown that many

errors can raise a blood pressure reading and result in inappropriately higher readings (Berg, 2019). Talking to a patient or asking questions was found to raise some individuals' blood pressure by 10 mmHg. In addition, a full bladder, smoking within 30 minutes, and an unsupported arm and back can also increase the blood pressure reading (Berg, 2019).

There was also no method in place to monitor the fidelity of the staff regarding following the new hypertension protocol. In addition, there was no fidelity of the intervention to determine if providers or nurses had any issues with the protocol. Monthly updates and reminders regarding the protocol were sent out. No final surveys or feedback regarding the protocol were sent out or collected. Additionally, there were combined changes that occurred simultaneously for the staff at the clinic. The staff had to adjust to new automated blood pressure cuffs and the start of the new hypertension protocol. The numerous changes may have affected the compliance of the staff following the new protocol, in turn reducing the number of individuals who had high blood pressure but were still not identified. Sending out surveys to collect feedback could help determine if there were issues with the protocol affecting staff compliance with the protocol. Surveys to collect feedback could also help determine if the protocol took too much time or money.

There is additional literature that discusses the importance of identifying patients with undiagnosed hypertension. High blood pressure has been found to be one of the leading preventable risk factors for cardiovascular disease (Huguet et al., 2021). Studies have shown that up to 30% of patients have high blood pressure and are hiding in plain sight, meaning they have a documented elevated blood pressure reading, but no diagnosis of hypertension (Huguet et al., 2021). Finding ways to improve access to hypertension care is vital. The Hypertension Control Change Package (HCCP) provides a listing of process improvements that clinical settings can

implement to help reach optimal hypertension control (US DHHS, 2020). The goal of the HCCP is to help healthcare practices implement systems to care for patients with high blood pressure more efficiently and effectively. Within the package, SMBP monitoring is emphasized. SMBP is included in numerous guidelines and recommendation statements for hypertension management and diagnosis (US DHHS, 2020). The goal of the HCCP is to serve as a list of options to help clinics and practices select specific interventions to improve hypertension control (US DHHS, 2020). The current hypertension protocol that was implemented at Hart and Arndt Family Health, P.C. is helping raise awareness about high blood pressure as well as working to identify those individuals with undiagnosed hypertension.

Additionally, within the HCCP it is encouraging and working with health centers to focus on finding patients with undiagnosed hypertension in their patient populations and getting them to return for follow-up to determine if a diagnosis of hypertension needs to be made (US DHHS, 2020). With the project implementation at Hart and Arndt Family Health, P.C., the return for follow-up percentages was low. Working to find a method to increase follow-up visits would benefit the patient population and the outcome of the protocol. In the HCCP, out of the patients that were identified as having undiagnosed hypertension that returned for follow-up, 31.9% received the diagnosis of hypertension (US DHHS, 2020). This shows how important follow-up is. Surveys sent out to the staff to gain feedback on the protocol could help determine what needs to be changed within the protocol to help encourage staff to follow through. Surveying the patients may also be beneficial. Reminder phone calls, texts, or emails may be ways to encourage patients to return for follow-up.

Conclusions

Hypertension continues to be a preventable and largely undiagnosed disease. Establishing a simple and low-cost protocol to identify adults with undiagnosed hypertension is an easy

process to significantly reduce the risk of future cardiovascular events, strokes, and chronic kidney disease. Implementing a hypertension protocol, increased identification of hypertension through staff education and utilizing automated blood pressure cuffs. However, further improvements to the protocol could improve staff fidelity and patient follow-up.

Significance and/or Implications

The proposed hypertension protocol at Hart and Arndt Family Health, P.C., has the potential to increase recognition of adults with a diagnosis of hypertension who were previously undiagnosed, thereby increasing earlier detection and treatment. If the new protocol is deemed successful, then the EMR could be programmed to capture when patients receive education and when they follow-up. This would help with the sustainability of the protocol. Through disease awareness and education of hypertension adult patients have the potential to prevent other long-term comorbidities. In addition to early detection and treatment, patients will have a decreased risk of hospital admissions due to complications related to hypertension.

Recommendations

It is recommended that Hart and Arndt Family Health, P.C. continue to utilize the hypertension protocol to identify and treat hypertension within their adult population. The protocol was able to identify 49 adults with an elevated blood pressure that would have not been identified previously. It is also recommended that the use of automated blood pressure cuffs should be continued. Through the use of automated blood pressure cuffs and the proper technique of taking blood pressure a dramatic increase of adults from 2021 to 2022 were identified. However, further changes to the protocol could be made to further increase identification and patient follow-up. Implementing a process to monitor staff fidelity and receiving feedback from staff can improve staff adherence to the protocol. Additionally, to

ensure that identified patients return for follow-up appointments, further contact through phone calls, texts, and email should be made.

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Tanabe, P., Steinmann, R., Kippenhan, M., Stehman, C., & Beach, C. (2004). Undiagnosed hypertension in the ED setting--an unrecognized opportunity by emergency nurses. *Journal of Emergency Nursing, 30*(3), 225-229. https://doi.org/10.1016/j.jen.2004.01.009

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Appendix A

Evidence Based Table

Citation	Purpose	Population and Setting	Study Design	Intervention	Outcomes	Limitations and lessons learned	Level/ Quality of Evidence
Johnson, H. M., Thorpe, C. T., Bartels, C. M., Schumacher, J. R., Palta, M., Pandhi, N., Sheehy, A. M., & Smith, M. A. (2014). Undiagnosed hypertension among young adults with regular primary care use. *Journal of Hypertension, 32*(1), 65-74. https://doi.org/10.1097/HJH.0000000000000008	The purpose of the study was to determine the rate of initial hypertension diagnosis and predictors that contribute to faster or slower rates of diagnosis among younger and older adults with the regular primary care who meet clinical hypertension criteria.	**Population**: All patients 18 years old or older that were treated for hypertension between January 1, 2018, to December 31, 2011. **Inclusion criteria**: At least two outpatient, nonurgent primary care visits or one primary care and one urgent care visit within the past three years. In addition, at least three SBP ≥140 or DBP ≥90 at least 30 days apart and within two years or two elevated SBP ≥160 or DBP ≥100 at least 30 days apart and within two years. **Exclusion criteria**: Prior hypertension diagnosis, any prescribed antihypertensives or became pregnant during the study. **Setting**: A large Midwestern multidisciplinary academic group practice.	Case-control study	The study evaluated the time from first time they had an elevated blood pressure recorded until they received a hypertension diagnosis, the study ended, or were censored.	Young adults had a lower diagnosis rate than middle-aged and older adults. After 2 years, only 39% of 18–24 y/o compared with 43% (25–31 y/o), 49% (32–39 y/o), and 54% (≥40 y/o) received a diagnosis. After 4 years, 56% of 18–24 y/o compared with 62% (25–31 y/o), 68% (32–39 y/o), 71% (40–59 y/o), and 73% (≥60 y/o) received a diagnosis. 18–39 y/o had a slower rate of receiving an initial hypertension diagnosis. Adults 18–39 years had slower rates of receiving a diagnosis than adults at least 60 y/o. Patients with slower diagnosis rates had higher urgent care use, intermittently normal baseline blood pressures, or currently used tobacco. Patients with faster diagnosis rates had diabetes, chronic kidney disease, a higher BMI, were African American, or received Medicaid. Providers in the third and highest age quartiles (≥46 years) had lower diagnosis rates; female providers had higher rates. Patients with stage 2 hypertension had faster diagnosis rates than patients with stage 1 hypertension.	The potential for misclassification of hypertension and comorbidities using administrative data; however, previously established and published algorithms were utilized to help address this concern. The sample was limited to a single Midwestern healthcare system and predictors may differ among other populations, healthcare systems, and geographic regions.	**Level**: IV **Quality of Evidence**: Moderate Quality
Pirotte, M. J., Buckley, B. A., Lerhmann, J. F., & Tanabe, P. (2014).	The purpose of this study was to determine the characteristics of an	**Population**: 9 physicians, 8 nurses, and 8 patients	Qualitative Study	Patients were asked 3 questions about hypertension and	Clinicians recognized that elevated BP measurements could reflect	This project was conducted at one center, and patients may identify	**Level**: V **Quality of Evidence**: Moderate Quality

Development of a screening and brief intervention and referral for treatment for ED patients at risk for undiagnosed hypertension: A qualitative study. *JEN: Journal of Emergency Nursing, 40*(1), e1-9. https://doi.org/10.1016/j.jen.2012.05.004	intervention that would be most likely to (1) persuade patients to follow up with a primary care physician for further BP evaluation (2) encourage emergency clinicians (physicians and nurses) to provide SBIRT (Screening Brief Intervention and Referral for Treatment) for patients with 2 elevated BP readings with no known previous history of HTN.	**Inclusion Criteria**: Patients- Adults with 2 or more systolic BP readings ≥ 140 or diastolic BP readings ≥ 90 without a previous history of HTN who were discharged home and willing to stay for a brief interview immediately after discharge. Physicians and nurses- Used a stratified sampling technique based on years of experience (<5, 6 to 10, and >10). **Setting**: A large, urban academic emergency department		motivations or barriers to follow-up appointments Nurses and Physicians were asked 6 questions about the cause of hypertension, at what point should follow-up with a patient hypertension happen, and possible barriers to follow-up	underlying HTN, although many still considered factors such as pain and anxiety as playing a role. Multiple barriers to providing counseling that encouraged follow-up were identified, including time constraints and patient-specific factors such as lack of insurance and lack of motivation. Interestingly, several clinicians believed that the current ED discharge instructions used were a barrier to follow-up. Facilitators to counseling follow-up for nurses included working in the triage area and a belief that education was a part of their role as a nurse in the emergency department. Several physicians and nurses suggested incorporating some degree of automation into the process via automatically populated discharge instructions or a computer prompt. Many more clinicians were prompted to	different facilitators and barriers to follow-up for definitive evaluation of possible undiagnosed HTN. Clinicians also may identify different facilitators and barriers to providing a SBIRT for HTN.	

					counsel for referral to follow-up at a BP higher than recommend by the JNC Guidelines. Several clinicians reported they would undertake further assessment of the hypertensive patient by inquiring into symptoms, history, and medical use/noncompliance or by obtaining repeat vital signs. All but one clinician believed it was within their scope of practice to counsel patients about elevated BP readings. Patients were more likely to ascribe elevated BP readings to lifestyle and anxiety or to disbelieve them entirely. Patients identified the following barriers to follow-up: work, transportation, wait times, and forgetfulness. Motivators for patient follow-up included descriptions of complications of untreated HTN by the ED clinician and reminders provided by family.		
Tanabe, P., Steinmann, R., Kippenhan, M., Stehman,	The purpose of this study was to (1) identify the	**Population**: 88 low-acuity ED patients from May to October 2001.	Case-control study	The investigators reviewed the record of each	Thirty-seven patients (45%) presented with either an	A significant limitation of this study was the	**Level**: IV **Quality of Evidence**:

C., & Beach, C. (2004). Undiagnosed hypertension in the ED setting--an unrecognized opportunity by emergency nurses. Journal of Emergency Nursing, 30(3), 225-229. https://doi.org/10.1016/j.jen.2004.01.009	prevalence of patients with elevated blood pressures during an unrelated ED visit, and (2) describe the existing practice of reassessment, treatment, and referral for these patients.	**Inclusion criteria**: All low-acuity patients (Emergency Severity Index 4 and 5). **Setting**: A large academic urban emergency department.		patient with an elevated blood pressure upon presentation and determined the following: injury-related versus illness-related complaint, need for ED treatment of blood pressure, actual treatment of the elevated blood pressure, need for referral after discharge from the emergency department, and actual referral for blood pressure check follow-up. Blood pressures that were not rechecked and found to be abnormal initially were considered to need outpatient referral. Actual referral was considered to have occurred only if documentation was noted in the medical record. Consensus of the need for treatment was reached by individual case-by-case discussion by the investigators as a group.	elevated systolic or diastolic blood pressure. There were 34 incidences of elevated systolic blood pressure and 15 incidences of elevated diastolic blood pressure. Twenty-nine of the patients (78%) presented with a chief complaint that was injury related. Reassessment practices were poor in our sample. Ten (27%) of the patients with elevated blood pressures had documented rechecks prior to discharge from the emergency department. Only 10 of the 37 patients with elevated blood pressures had a previous history of hypertension. However, patients with a history of hypertension were 5.93 times more likely to have blood pressure ≥ 140/90 in the emergency department (OR = 5.93; P = .037). Only 7 of the 37 patients with elevated blood pressure were currently taking antihypertensive medications. These patients had a prior history of hypertension. No patients	retrospective collection of data; we relied only on what was documented in the medical record. The physician or nurse may have noted and discussed the elevated blood pressure with the patient and instructed them to recheck their blood pressure or to seek follow-up with their primary care physician. Our data may exaggerate the lack of referral because it was not charted. A second limitation is our small sample size and the limited generalizability because data were collected only at one site.	Low Quality

					were treated or admitted for their blood pressure while in the emergency department. One patient who specifically presented to the emergency department for a refill of his blood pressure medicine was given a follow-up appointment and a prescription. There was no evidence of referral for blood pressure recheck or any follow-up instructions in any discharge instructions for any other patient.		

Appendix B

Contents of Education Packet

JAMA PATIENT PAGE | Cardiovascular Medicine

Checking Blood Pressure at Home

If you have high blood pressure, knowing how to check your own blood pressure is both useful and important.

Why Check Blood Pressure at Home?

Checking your blood pressure at home does not replace going to the doctor. But because people are generally more relaxed at home than at the doctor's office, their blood pressure may be lower at home. Therefore, when deciding on treatment options, it may be helpful to have information about both home and office blood pressure measurements available.

It is also helpful to bring your blood pressure monitor to your doctor's appointments with you. Your doctor can make sure that you are checking your blood pressure correctly. Your machine can be checked against the office machine to look for any differences in readings.

Choosing a Blood Pressure Monitor

Blood pressure monitors with an inflatable cuff that goes over the **bicep** (upper arm) tend to be more accurate than those that go over the wrist or finger. It is important that you use a cuff that is the right size for your arm; cuffs that are too big or too small can result in readings that are not accurate. Before buying a machine, measure around your upper arm and check to make sure that the measurement you get is included in the range of the cuff. There is no particular brand that is best.

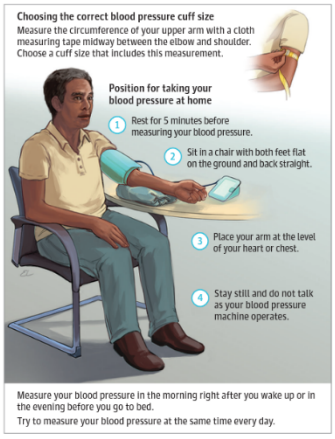
When to Check Blood Pressure

A person's blood pressure varies throughout the day, so it is normal to get different readings at different times and on different days. The best times to check your blood pressure are in the morning after you wake up or in the evening before you go to bed. If you take blood pressure medication, it is okay to check your blood pressure either before or after you take the medication.

Factors such as caffeine, exercise, alcohol, stress level, and time of day can affect blood pressure. Try to measure your blood pressure at the same time every day. You should keep a record of all your blood pressure readings and the time of day you took them, and bring this log with you when you see your doctor.

How to Check Blood Pressure

1. Sit in a chair with both feet flat on the ground and your back straight. It is recommended you sit for about 5 minutes before measuring your blood pressure.
2. Rest your arm on a surface (such as a table) around the level of your heart or chest.



Measure your blood pressure in the morning right after you wake up or in the evening before you go to bed.
Try to measure your blood pressure at the same time every day.

3. Take your blood pressure according to the instructions of your machine. Stay still and do not talk as the machine is working.
4. It can sometimes be helpful to repeat another blood pressure reading 1 to 2 minutes later and use the average of the 2 readings.

FOR MORE INFORMATION
American Heart Association
www.heart.org/HEARTORG/Conditions/HighBloodPressure/KnowYourNumbers/Monitoring-Your-Blood-Pressure-at-Home_UCM_301874_Article.jsp#.WUI5w-vyvDA

To find this and other JAMA Patient Pages, go to the For Patients collection at *jamanetworkpatientpages.com*.

Author: Jill Jin, MD, MPH

Source: Celis H, Den Hond E, Staessen JA. Self-measurement of blood pressure at home in the management of hypertension. *Clin Med Res*. 2005;3(1):19-26.

Correction: This article was corrected online on July 20, 2017, to update the image.

American Heart Association.

ANSWERS by heart | Lifestyle + Risk Reduction High Blood Pressure

What is High Blood Pressure?

Blood pressure is the force of blood pushing against blood vessel walls. It's measured in millimeters of mercury (mm Hg).

High blood pressure (HBP) means the pressure in your arteries is higher than it should be. Another name for high blood pressure is hypertension.

BLOOD PRESSURE CATEGORY	SYSTOLIC mm Hg (upper number)		DIASTOLIC mm Hg (lower number)
NORMAL	LESS THAN 120	and	LESS THAN 80
ELEVATED	120-129	and	LESS THAN 80
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 1	130-139	or	80-89
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 2	140 OR HIGHER	or	90 OR HIGHER
HYPERTENSIVE CRISIS (consult your doctor immediately)	HIGHER THAN 180	and/ or	HIGHER THAN 120

Blood pressure is written as two numbers, such as 112/78 mm Hg. The top, or larger, number (called systolic pressure) is the pressure when the heart beats. The bottom, or smaller, number (called diastolic pressure) is the pressure when the heart rests between beats.

Normal blood pressure is below 120/80 mm Hg. If you're an adult and your systolic pressure is 120 to 129, and your diastolic pressure is less than 80, you have **elevated blood pressure**. **High blood pressure** is a systolic pressure of 130 or higher,or a diastolic pressure of 80 or higher, that stays high over time.

High blood pressure usually has no signs or symptoms. That's why it is so dangerous. But it can be managed.

Nearly half of the American population over age 20, has HBP, and many don't even know it. Not treating high blood pressure is dangerous. High blood pressure increases the risk of heart attack and stroke.

Make sure you get your blood pressure checked regularly and treat it the way your health care professional advises.

Am I at higher risk of developing HBP?

There are risk factors that increase your chances of developing HBP. Some you can control, and some you can't.

Those that can be controlled are:

- Cigarette smoking and exposure to secondhand smoke
- Diabetes
- Being obese or overweight
- High cholesterol
- Unhealthy diet (high in sodium, low in potassium, and drinking too much alcohol)
- Physical inactivity

Factors that can't be modified or are difficult to control are:

- Family history of high blood pressure
- Race/ethnicity
- Increasing age
- Gender (males)
- Chronic kidney disease
- Obstructive sleep apnea

Socioeconomic status and psychosocial stress are also risk factors for HBP. These can affect access to basic living needs, medication, health care professionals, and the ability to adopt lifestyle changes.

(continued)

American Heart Association.

What is High Blood Pressure?

How can I tell I have it?

The only way to know if you have high blood pressure is to get it checked regularly.

For proper diagnosis of HBP, your health care professional will use an average based on two or more readings obtained on two or more visits.

What can I do about HBP?

- Don't smoke and avoid secondhand smoke.
- Reach and maintain a healthy weight.
- Eat a healthy diet that is low in saturated and trans fats and rich in fruits, vegetables, whole grains and low-fat dairy products. Aim to consume less than 1,500 mg/day of sodium (salt). Even reducing your daily intake by 1,000 mg can help.
- Eat foods rich in potassium. Aim for 3,500 – 5,000 mg of dietary potassium per day.
- Limit alcohol to no more than one drink per day if you're a woman or two drinks a day if you're a man.
- Be more physically active. Aim for 150 minutes of moderate-intensity physical activity or at least 75 minutes of vigorous physical activity per week, or a combination of both, spread throughout the week. Add muscle-strengthening activity at least two days per week for more health benefits.
- Take medicine the way your health care professional tells you.
- Know what your blood pressure should be and work to keep it at that level.

HOW CAN I LEARN MORE?

1. Call **1-800-AHA-USA1** (1-800-242-8721), or visit **heart.org** to learn more about heart disease and stroke.
2. Sign up for our monthly *Heart Insight* e-news for heart patients and their families at **HeartInsight.org**.
3. Connect with others sharing similar journeys with heart disease and stroke by joining our Support Network at **heart.org/SupportNetwork**.

Do you have questions for your doctor or nurse?

Take a few minutes to write down your questions for the next time you see your health care professional.

For example:

Will I always have to take medicine?

What should my blood pressure be?

MY QUESTIONS:

We have many other fact sheets to help you make healthier choices to reduce your risk for heart disease, manage your condition or care for a loved one. Visit **heart.org/AnswersByHeart** to learn more.

Additional Resources

How to Take Blood Pressure

- 7 Simple Tips to Get an Accurate Blood Pressure Reading

https://targetbp.org/wp-content/uploads/2017/11/Measuring_Blood_Pressure_In-Office_Poster.pdf

Describing and Management of Hypertension

- CardioSmart Know Your Numbers Fact Sheet

https://www.cardiosmart.org/docs/default-source/assets/infographic/blood-pressure.pdf?sfvrsn=dfcd6c1_1

- CardioSmart Blood Pressure Fact Sheet

https://www.cardiosmart.org/docs/default-source/assets/fact-sheet/high-blood-pressure.pdf?sfvrsn=26db45dc_2

- How Do I Follow a Healthy Diet Pattern?

https://www.heart.org/-/media/Files/Health-Topics/Answers-by-Heart/How-Do-I-Follow-a-Healthy-Diet.pdf

Risks of Hypertension

- What's the BIG DEAL about controlling my blood pressure?

https://www.doh.wa.gov/Portals/1/Documents/8380/345-288-BPbgPst-en-L.pdf

- Consequences of High Blood Pressure

https://targetbp.org/tools_downloads/avoid-the-consequences-of-high-blood-pressure/

Appendix C

Self-Blood Pressure Monitoring Log

Blood Pressure Log

Name: _____

Blood pressure in office: _____/_____mmHg

Blood pressure goal: _____/_____mmHg

Instructions:

1. Take your blood pressure once per day at different times/in the morning after waking up or in the evening right before bed.
2. Rest for at least 5 minutes.
3. Be seated comfortably with back supported, legs uncrossed, feet flat on floor, and arm supported at level of heart.
4. Record each blood pressure reading on this sheet and bring to each provider visit

Date	Time	Blood Pressure
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Continue on back

Appendix D

Staff Blood Pressure Check Off Form

Staff Blood Pressure Check Off Form

Name: _____

Instructions: Once a month each individual that takes a patient's blood pressure needs to be evaluated. Watch the staff member take a blood pressure of a patient. Check off each section that the individual completes. Return completed form to "Complete" folder in the provider's office.

____ Patient has rested for 5 minutes

____ Patient is sitting with both feet flat on the floor

____ The arm being utilized is supported at heart level

____ Cuff is applied to bare arm

____ Correct size of BP cuff used

____ Patient is quiet while blood pressure is being taken

____ BP is correctly entered into EMR

____ Protocol correctly initiated with hypertension

Appendix E

Blood Pressure Tracking Log

SMBP Tracking Form												
Name	DOB	PCP	Most Recent BP	Goal BP (Provider Recommendation)	Diagnosis of HTN Y or N	Date Received Training	Loaner Program Y or N	Date of Next PCP Visit	Came to Appointment Y or N	Medication Change Y or N	At Goal BP Y or N (Add current BP reading)

Appendix F

Steps of the Hypertension Protocol

1) The patient checks in for any type of visit (Front desk assistant)

2) Check the patient's blood pressure using a standardized electronic blood pressure monitor (CNA, MA, LPN, RN)

3) If the patient has an elevated blood pressure (systolic ≥ 140 or diastolic ≥ 90) and no diagnosis of hypertension in their chart

   -Make a note in the subjective section of the EMR noting the blood pressure is elevated and needs to be rechecked (CNA, MA, LPN, RN)

   -A note card will be handed to the patient indicating that the individual's blood pressure was elevated (CNA, MA, LPN, RN)

4) Perform visit (Provider)

5) Recheck blood pressure (CNA, MA, LPN, RN)

6) If blood pressure is still elevated, the patient receives an education packet (CNA, MA, LPN, RN)

7) Write the name and date of birth of the patient on the log posted by the education packets (CNA, MA, LPN, RN)

   -The education packet will include definition of elevated blood pressure, SMBP monitoring-when/how to take blood pressure, which monitor to buy versus using a loaner from the clinic, healthy diet/lifestyle modification tip sheet, blood pressure log, and resources for the patient to utilize

8) Make a 2-4week follow up with the provider to review blood pressure log (Front desk assistant)

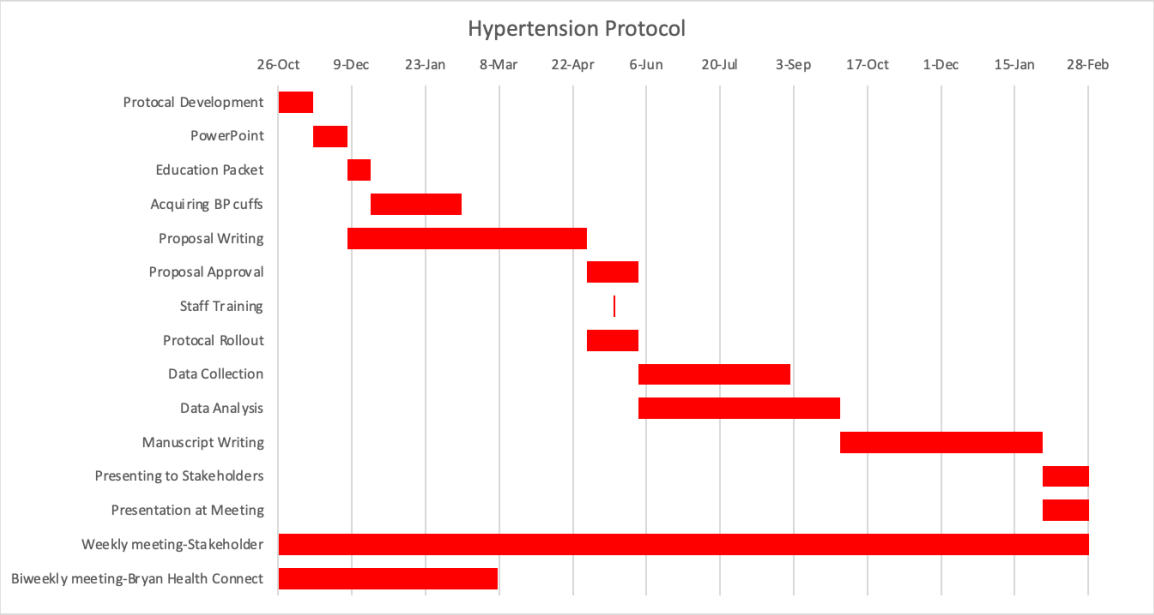
9) The patient returns for 2-4 weeks for follow up - review blood pressure log with provider, recheck blood pressure in the clinic, discuss medications/lifestyle modifications, and steps to take to monitor and control blood pressure (Provider)

10) The log will be checked monthly, and patients will be tracked. If follow-up was skipped, call to encourage them to reschedule (CNA, MA, LPN, RN)

11) Patient returns in three months to determine efficacy of plan of care

Appendix G

Timeline for Hypertension Protocol



Appendix H

Table 1: Gender

Gender		
	2021	2022
	# of Patients (%)	# of Patients (%)
Female	1190 (75.2%)	1386 (74.6%)
Male	393 (24.8%)	473 (25.4%)
Total	1583 (100%)	1859 (100%)

Table 2: Patients Identified with Elevated Blood Pressure

Patients Identified with Elevated Blood Pressure						
	2021			2022		
	June	July	August	June	July	August
	# of Patients (%)	# of Patients (%)	# of Patients (%)	# of Patients (%)	# of Patients (%)	# of Patients (%)
Yes	0 (0%)	0 (0%)	0 (0%)	27 (23.3%)	12 (12.2%)	10 (6.8%)
No	34 (100%)	24 (100%)	35 (100%)	89 (76.7%)	86 (87.8%)	137 (93.2%)
Total	34 (100%)	24 (100%)	35 (100%)	116 (100%)	98 (100%)	147 (100%)

Table 3: Follow-up Appointments

Follow-up Appointments	
Yes	27 (55.1%)
No	7 (14.3%)
Not Scheduled	15 (30.6%)
Total	49 (100%)

Table 4: Loaner Blood Pressure Cuff Program

Loaner Blood Pressure Cuff Program	
Yes	13 (26.5%)
No	36 (73.5%)
Total	49 (100%)