CORRECTLY CAPTURING AND DOCUMENTING A SECOND BLOOD PRESSURE IN THE OUTPATIENT SETTING

by

Audrey Elanda Meggitt

A DNP Project Submitted to the Faculty of the

COLLEGE OF NURSING

In Partial Fulfillment of the Requirements

For the Degree of

DOCTOR OF NURSING PRACTICE

In the Graduate College

THE UNIVERSITY OF ARIZONA

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THE UNIVERSITY OF ARIZONA
GRADUATE COLLEGE

As members of the DNP Project Committee, we certify that we have read the DNP project prepared by Audrey Elanda Meggitt, titled Correctly Capturing and Documenting a Second Blood Pressure in the Outpatient Setting, and recommend that it be accepted as fulfilling the DNP project requirement for the Degree of Doctor of Nursing Practice.

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Final approval and acceptance of this DNP project are contingent upon the candidate's submission of the final copies of the DNP project to the Graduate College.

I hereby certify that I have read this DNP project prepared under my direction and recommend that it be accepted as fulfilling the DNP project requirement.

Maria Kenneally
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ABSTRACT

Purpose. This quality improvement project aimed to increase adherence to repeat blood pressure (BP) in an outpatient clinic when the initial reading was equal to or greater than 140/90 mmHg.

Background. Hypertension is among the most substantial risk factors for increased morbidity and mortality from heart disease or cerebrovascular disease in the United States (US) (CDC, 2023). Proper management of hypertension is vital to improving patient outcomes. Every 10 mmHg reduction in BP collectively reduces mortality risk by 13% for major cardiovascular diseases, such as coronary heart disease, stroke, and heart failure (Jensen et al., 2019). It is essential to accurately diagnose hypertension to prevent over or under-treatment, as both can cause patient harm (Butt et al., 2015).

Methods. This QI project focused on educating the medical assistants in an outpatient cardiology clinic to increase the documentation for second BP measurement when the initial reading was equal to or greater than 140/90 mmHg. Verbal education and handouts were provided to medical assistants (MAs) who room and vital patients. These staff members received pre and post-education surveys to gauge knowledge of the topic and retention of information provided. Data was collected two weeks after the intervention and compared to repeat BP documentation two weeks prior to the intervention.

Results. Seventeen MAs completed the pre-survey. Twenty-two MAs attended the education and received handout materials. Twelve MAs completed the post-education survey. Missed repeat BP tasks were decreased by 39 incidences after the educational intervention, which equates to a 15.66% improvement. Common themes for barriers to missed repeat were identified as time, patient cooperation, staffing, and equipment availability.

Conclusions. A short verbal education on the importance of repeat BP and handouts to promote proper measurement and documentation improved medical assistant adherence to protocol.

INTRODUCTION

High blood pressure, known as hypertension, is a common disease frequently treated in primary care. Often referred to as the "silent killer" since many people are unaware of its presence until measured in a healthcare setting. It is estimated that 47% of the population, or 116 million individuals in the United States (US), have hypertension (Centers for Disease Control and Prevention [CDC], 2023). Hypertension affects millions of individuals, and only 54% of the patients treated for this ailment in primary care have controlled blood pressure (Einstadter, Bolen, et al., 2018). The force blood exerts against the inside of arteries defines blood pressure (BP) (American Heart Association [AHA], 2017). Hypertension is classified into two stages: Stage 1 BP is equal to or greater than 130/80 mmHg; Stage 2 BP is equal to or greater than 140/90 mmHg (CDC, 2023). Consistently elevated BP intensifies the heart's workload and increases the risk of heart attack, stroke, kidney failure, and peripheral artery disease (AHA, 2017). Please see Figure 1 for reference.

Figure 1

Blood Pressure Stages

Blood Pressure Specification	Systolic mmHg		Diastolic mmHg
Normal	**<120**	**and**	**<80**
Elevated	**120-129**	**and**	**<80**
Stage 1 Hypertension	**130-139**	**or**	**80-89**
Stage 2 Hypertension	**140 or higher**	**or**	**90 or higher**
Hypertensive Crisis	**>180**	**and/or**	**>120**

Note. From American Heart Association. (n.d).

Background Knowledge and Significance

Hypertension is among the most substantial risk factors for increased morbidity and mortality from heart disease or cerebrovascular disease in the US (CDC, 2023). The large quantity of people with hypertension comes with a tremendous monetary burden for the healthcare system. Between 2003 and 2014, the average yearly cost of high BP was $131 billion per year (CDC, 2023). Sadly, the expense to human lives is even more significant. In 2020, 670,000 deaths were attributed to hypertension as a primary or contributing factor (CDC, 2023).

Proper management of hypertension is vital to improving patient outcomes. Every 10 mmHg reduction in BP collectively reduces mortality risk by 13% for major cardiovascular diseases, such as coronary heart disease, stroke, and heart failure (Jensen et al., 2019). Due to the widespread nature of hypertension, it is one of the most frequently managed conditions in primary care. Given the severity of inadequate BP control, the Centers for Medicare & Medicaid Services (CMS) Core Measures include appropriate hypertension control for patients 18-85 years old diagnosed with hypertension (CMS, 2013). To meet this benchmark, patients with hypertension must have a documented BP of less than 140/90 mmHg while in an outpatient primary care or specialty clinic.

Blood pressure naturally fluctuates throughout the day and is affected by environmental and physiologic factors (Parati et al., 2018). Physiologic stress is a significant factor in causing elevated BP. Stress can be caused by rushing to an appointment or anxiousness about a meeting. When a patient arrives at a doctor's appointment, these factors are often at play, causing increased BP readings. Amongst individuals with a first BP equal to or greater than 140/90 mmHg, 36% had a BP below the threshold on the second reading (Einstadter et al., 2018). It is

essential to accurately diagnose hypertension to prevent over or under-treatment, as both can cause patient harm (Butt et al., 2015).

Local Problem

A large medical facility in southern Arizona fell below CMS guideline standards in its primary care and outpatient specialty clinics for hypertension control. The number of patients with a documented blood pressure less than 140/90 mmHg was only 63% as of May 2023. Their quality improvement team was actively trying to improve accuracy, consistency, and documentation of repeat blood pressure when an initial patient's BP is equal to or greater than 140/90 mmHg. The quality metrics goal was to improve this CMS guideline to a 4-star rating of at least 73%.

Intended Improvement

Project Purpose

Improve compliance of staff taking and documenting a second blood pressure when the first blood pressure was equal to or greater than 140/90 mmHg in the outpatient setting.

Project Question

Would teaching medical personnel at a local health care facility in Southern Arizona about the importance of rechecking blood pressure greater than or equal to 140/90 mmHg after initial reading improve repeat BP documentation?

Project Objectives

Educate staff to accurately take a second blood pressure when the initial reading is greater than or equal to 140/90 mmHg and document appropriately within the patient chart. Thus

improving the documentation of repeat BP when the initial reading is equal to or greater than 140/90 mmHg.

Theoretical Framework

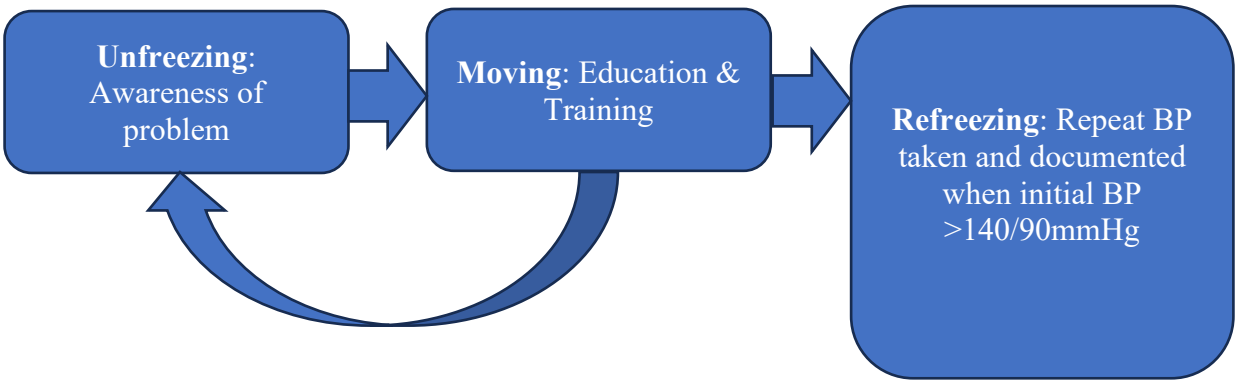
Lewin's Change Theory was selected as the theoretical framework for this quality improvement project. This theory was selected because Kurt Lewin trusted that learning facilitates change by allowing individuals to understand and make changes based on their new knowledge (Burnes, 2004). Without new knowledge and understanding, the current processes will maintain the status quo that affects organizations and individual behaviors (Burnes, 2004). Recognition of the forces that affect the change outcome is known as force-field analysis (Mitchell, 2013). To make changes, one must recognize and manage these forces, known as driving, restraining, and equilibrium (Roussel, 2018). To address these forces, Lewin pioneered three stages to promote change: Unfreezing, moving, and refreezing (Mitchell, 2013). Stage 1, unfreezing, is the recognition that change is required and the awareness of the stakeholders that change is needed (Mitchell, 2013). Stage 2, moving, is the initiation of making the change by gathering data, identifying factors impeding the flow of change, and creating an action plan that is then acted upon (Mitchell, 2013). Stage 3, refreezing, solidifies the change when the balance has been achieved and the new processes have been adopted (Mitchell, 2013).

Since this quality improvement project was centered on changing the process of repeat BP measurements, the Lewin Change Theory was a highly applicable framework to approach staff learning and adaptation to practice. The protocol of repeating blood pressure measurements when the initial reading is elevated was not new. However, the appropriate process had not been consistently followed by staff. As necessitated in Lewin's theory, the staff must first be educated

to understand the importance of this practice in patient care and best practice. Once they have been "unfrozen" they can then be "moved" with the appropriate training on when and how to take a repeat BP and document it correctly. Once this has been reassessed to be a successful process, it can be "refrozen" as the standard workflow. See Figure 2 for a visual reference of Lewin's Change Theory.

Figure 2

Schematic of Theoretical Framework



Literature Synthesis

Evidence Search

Three articles accumulated on this topic throughout the DNP program were selected from the author's personal EndNote library. A systematic literature search was completed in the PubMed electronic database employing keywords and search filters, combined with the Similar Articles feature to find additional literature. Keywords for the search process included "repeat blood pressure," "blood pressure determination," "blood pressure monitoring, ambulatory," and "hypertension." The filter for publication dates within the last 10 years was selected. The search

results were reviewed for applicability to the quality improvement project, and an additional four studies were included.

Comprehensive Appraisal of Evidence

The seven studies gathered for this evidence appraisal exhibited the importance of repeating blood pressure for the appropriate diagnosis and treatment of hypertension. The findings demonstrated that sufficient training on measuring a BP, appropriate timing of this reading, and accounting for environmental factors are necessary for accurate assessment (Appendix E).

The oldest study included was by Becton et al. (2013). This cross-sectional study utilized a complex, stratified, and multistage probability design to identify the prevalence and direction of BP change with repeat measurements. The observational cohort study by Einstader et al. (2018) also found an average reduction of BP by 8 mmHg upon repeat measurement in those initially elevated over 140/90 mmHg. The findings support using repeat BP if the initial reading is elevated to obtain a lower reading, especially in overweight patients.

An observational study in primary care by Sebo et al. (2014) evaluated the accuracy of BP measurements by physicians and whether it improved after concise theoretical training. The study found that a misdiagnosis of hypertension occurred in 15-32%, and written training was insufficient in improving BP measurement technique. This indicates that proper BP measurement training is crucial to the accuracy of readings in the clinical setting. Similarly, Kallioien et al. (2017) conducted a systematic review of studies quantifying the inaccuracy of BP measurement. They found that multiple readings are required to be clinically significant and that repeat readings are necessary for outlier BP readings. These findings endorse the importance of

multiple measurements for accurate BP reporting that accounts for variables, such as patients' environment and emotional state, before recording data.

Boonyasai et al. (2018) completed a quality improvement (QI) project focused on standardized clinical BP measurement. Their project demonstrated improved clinic-based BP measurement, patient care, and clinical efficiency. Similarly, Kravetz et al. (2020) conducted a QI project focused on the impact of BP remeasurement after the clinic visit. They also found that standardizing repeat BP measurements in appropriate positioning and a quiet space screened out falsely elevated BP readings in many patients. These QI projects show the applicability and success of QI projects aimed at improving BP accuracy and efficiency in the outpatient setting.

Lastly, a systematic review by Liu et al. (2022) included 22 studies spanning from 1980 to 2021 that investigated the sources of BP measurement error. They concluded that standard BP protocol is recommended. The preferred patient positioning is seated with both feet flat on the ground and the left arm supported at heart level. Then, the mean of three BP readings after 5 minutes of rest without talking or moving is collected.

Strengths of Evidence

The literature review identified multiple strengths within current evidence about repeat BP and the accuracy of results. The systematic reviews included recommendations for standardizing BP measurement and recognizing BP errors that require multiple readings prior to hypertensive diagnosis (Kallioinen et al., 2017; Liu et al., 2022). The evidence identified a reduction in BP in a significant number of patients in primary care when repeat BP was completed after initially elevated readings (Becton et al., 2013; Einstader et al., 2018).

Consequently, standardization of BP collection that includes repeat BP in initially elevated readings improves hypertensive diagnosis accuracy and management capability.

Weaknesses of Evidence

One of the shortcomings of the literature review was the lack of studies from within the past five years. The included studies span from 2013-2022. Furthermore, they took varied approaches in the standardization of BP measurement or repeat measurements. There were two observational studies which are vulnerable to selection bias and a lower standard of evidence. There were also two quality improvement studies included, which had smaller sample sizes and imperfect process adoption for BP measurement (Boonyasai et al., 2018; Kravetz et al., 2020). Therefore, further research on current practices of BP measurement is warranted.

Gaps and Limitations

Although CMS recommends BP control of less than 140/90 mmHg in adult patients, it was difficult to find studies on achieving accurate BP measurements for clinical documentation (CMS, 2013). The literature search resulted in only seven applicable studies. These limitations underscore the importance of ongoing guideline review and standardization of BP measurement recommendations based on recent research.

METHODS

Project Design

The QI project was designed to be implemented in an outpatient cardiology clinic to increase the documentation for a second BP measurement when the initial reading is elevated equal to or greater than 140/90 mmHg. Verbal education and handouts were provided to medical

assistants who room and vital patients. Data was collected two weeks after the intervention and compared to repeat BP documentation two weeks prior to the intervention.

Model for Implementation

Plan-Do-Study-Act (PDSA) Cycle

The Plan-Do-Study-Act (PDSA) Cycle is a way to test change by evaluating the effectiveness of the intervention (IHI, n.d.). This cycle addresses what is being accomplished, evidence of improvement, and further changes that will result in improvement (IHI, n.d.).

Plan

The "Plan" constituted the project's developmental process (IHI, n.d.). The timeline for project development can be found in Appendix D. This phase identifies the project objectives and improvement strategy for the proposed change (IHI, n.d.). The Project Coordinator began by meeting with a member of the organization's quality improvement team to investigate key areas of need for quality advancement. The need for improved repeat BP documentation was identified to improve patient outcomes and reporting standards for CMS. The Project Coordinator then conducted a literature review to establish an evidence-based intervention to improve repeat BP consistency and documentation for the outpatient clinic.

Do

The "Do" was when the project was conducted, unexpected issues were documented, and the results were collected (IHI, n.d.). Further details can be found under the *Planning the Intervention* and *Data Collection* sections.

Study

The project coordinator conducted the "Study" phase by analyzing collected data, comparing pre and post-intervention BP documentation to the expected outcome, and summarizing findings (IHI, n.d.). Further details on the evaluation strategy can be found under the *Data Analysis* section.

Act

The "Act" phase was the project's culmination when the project coordinator recommended the following actions based on the findings and relayed this information to the project site (IHI, n.d.).

Setting and Stakeholders

The location of the quality improvement project was a local outpatient cardiology clinic in southern Arizona. This clinic serves adult patients in the surrounding area and includes multiple cardiology departments such as electrophysiology, general, heart failure, interventional, and structural (Banner Health, n.d.). The clinic was comprised of management, healthcare providers, registered nurses, medical assistants, and ancillary staff.

The stakeholders included the management staff, quality improvement team, providers, medical assistants (MAs), nurse educators, and study coordinators. The managerial staff had performance incentives to increase their CMS guideline compliance. The quality improvement team focused on improving quality improvement measures, including repeat BP monitoring that indicates controlled hypertension. Documenting appropriate BP allows providers to accurately treat BP and demonstrates control of hypertension. The MAs were the subjects receiving the education on BP recheck protocol as they were the primary staff members to vital, document,

and room patients in this clinic. There were twenty-two MAs at the time of the QI project, four of whom were senior MAs who served as training resources for their peers.

Planning the Intervention

After speaking with management and the MAs, it was determined that presenting a 10-minute oral presentation on the importance of repeat BP during morning clinic huddles would be the most efficient and effective form of education. Before the education, the MAs were given a pre-survey that can be found in Appendix B. The presented oral education script can be reviewed in Appendix C. The MAs were also provided a handout following the oral presentation on the critical points of BP education for later reference; this can also be found in Appendix C. In addition to this education, the four senior MAs that perform most new hire training were offered the education one-on-one. The oral presentation was provided during a mandatory MA meeting that all MAs attended.

Participants and Recruitment

Participants included MAs. All clinic MAs were verbally invited and encouraged to attend morning huddles and complete project surveys. One-on-one meetings with senior MAs were offered to facilitate training resources for future hires.

Consent and Ethical Considerations

The primary ethical goal was to protect patient privacy and the safety of all participants. No identifiable patient information was collected, and data was stored securely. Although staff participation was encouraged, autonomy was maintained by participant choice to participate or not in project education or intervention. Beneficence was provided in the opportunity to improve

staff knowledge and provide best practices to patients. Justice was achieved by offering educational opportunities to all MAs in the clinic.

Data Collection

Anonymous pre-surveys were provided to the MAs and collected by the project coordinator from the MAs in the clinic the week before the education was provided. The anonymous post-surveys were provided and collected from the MAs one week after the education and intervention. These surveys were provided as hard paper copies and were stored in a locked drawer in the project coordinator's office. A quality improvement team member provided Excel reports of the number of patients who did not receive a repeat BP when indicated. The report included two weeks prior to the intervention and two weeks after the intervention. The data had no patient identifiers and was stored on a secure computer at the QI project site that was only accessible with a password.

Data Analysis

Content analysis was utilized to evaluate the pre and post-surveys completed by the MAs to determine common themes in the qualitative data, including free-text responses. An Excel spreadsheet allowed for a review of the numeric data patterns of survey responses. A frequency table was generated. Qualitative responses were documented word-for-word. The study coordinator completed the content analysis.

The quantitative data on the number of repeat BPs completed was analyzed utilizing descriptive statistics comparing pre and post-intervention second BP rates. The quantitative data was outlined in a histogram to show changes over time in the number of repeat BPs completed.

RESULTS

The pre-surveys were handed out in the clinic during a Thursday morning huddle. Seventeen completed surveys were placed in folders set up at the MAs workstations and were collected by the project coordinator by noon. The following week, during a mandatory MA meeting on Tuesday morning, the project coordinator presented the education and handouts to all 22 MAs. The quality improvement team member emailed the project coordinator a deidentified list of missed repeat BP tasks for the two weeks preceding the education. One week later, the post-education surveys were handed out during the morning huddle. Twelve completed surveys were placed in folders set up at the MAs workstations and were collected by the project coordinator by noon. In the fourth week, the quality improvement team member provided the project coordinator with a deidentified list of missed repeat BP tasks for the two weeks following the education.

Outcomes

Pre-Education Survey

Seventeen MAs completed the pre-education survey. All the MAs reported knowing that a repeat BP is required when the initial reading is equal to or greater than 140/90 mmHg. Fifteen of them were aware that the Centers for Medicare and Medicaid require repeat BP and that it improves patient care. Only two of the MAs were aware that it improves patient care, but not of the guidelines. Six correctly indicated the need to wait 15 minutes after the initial BP to repeat the measurement. The other 11 would only wait five minutes in between readings. All the MAs reported knowing where to correctly document the repeat BP in the EHR. Thirteen reported time as a barrier, 10 reported patient cooperation as a barrier, eight reported staffing as a barrier, six

reported equipment as a barrier, and two reported no barriers to BP repeat. There were only two comments on other barriers, which included "provider preference/within pt normal range" and "correct documentation." Table 1 represents this data.

Table 1

Pre-Survey Results

Question	Correct Answer	Incorrect Answer	Barriers	No Barriers	
1. Repeat BP if =>140/90 mmHg?	**17**	**0**			
2. Why is it important to repeat BP?	**15**	**2**			
3. How long to wait between BPs?	**6**	**11**			
4. Know where to document?	**17**	**0**			
5. Have barriers to completing repeat BP?			**15**	**2**	

Post-Education Survey

Twelve MAs completed the post-education survey. Again, all MAs reported being aware that a repeat BP is required when the initial reading is equal to or greater than 140/90 mmHg. Ten of them were aware that the Centers for Medicare and Medicaid require repeat BP and that it improves patient care. One of the MAs knew it improves patient care but not the guideline requirement. One MA reported it was a guideline requirement of the Centers for Medicare and Medicaid Services (CMS) but did not report it as an aspect of improved patient care. Six correctly indicated the need to wait 15 minutes after the initial BP to repeat the measurement.

The five others would only wait five minutes in between readings, and one would not wait at all. All the MAs reported knowing where to correctly document the repeat BP in the EHR. Eight reported time as a barrier, two reported patient cooperation as a barrier, three reported staffing as a barrier, one reported equipment as a barrier, and four reported no barriers to BP repeat. There was only one comment for other barriers, which included "provider preference." Table 2 represents this data. Of note, although 22 MAs were present for the verbal education, only 12 completed the post-education survey. This could be because the survey was optional, but more likely due to the post-survey being distributed on a busy clinic day and not all MAs being present or available to complete the survey.

Table 2

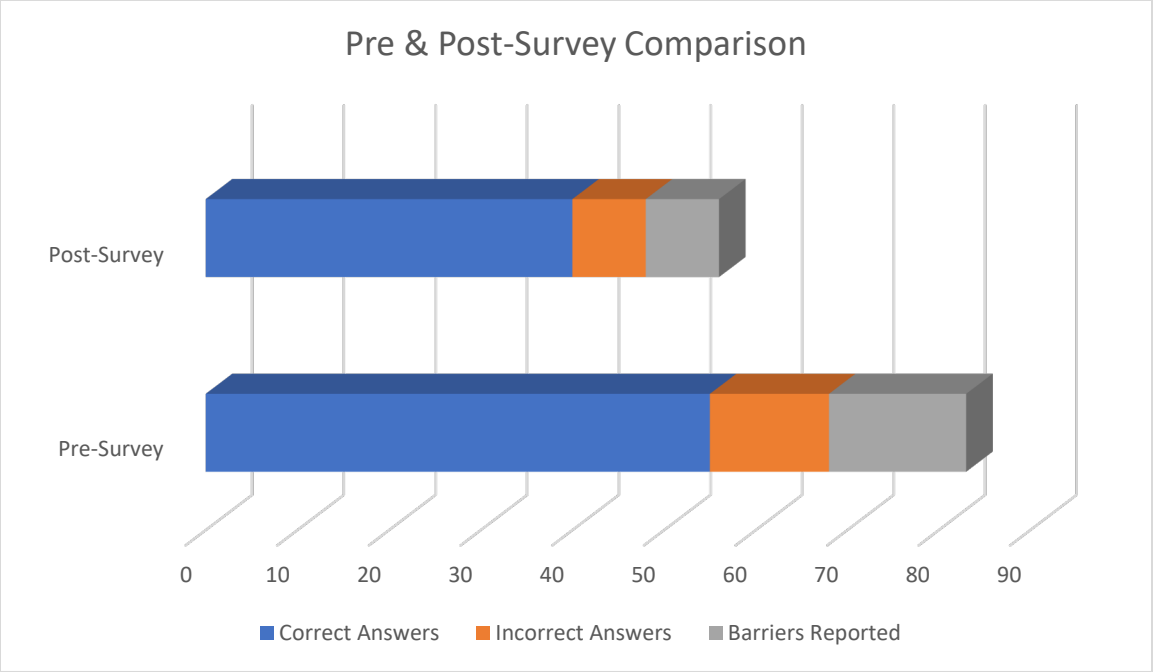
Post-Survey Results

Question	Correct Answer	Incorrect Answer	Barriers	No Barriers	
1. Repeat BP if =>140/90 mmHg?	**12**	**0**			
2. Why is it important to repeat BP?	**10**	**2**			
3. How long to wait between BPs?	**6**	**6**			
4. Know where to document?	**12**	**0**			
5. Have barriers to completing repeat BP?			**8**	**4**	

Five fewer MAs completed the post-survey compared to the pre-survey. Therefore, the overall correct and incorrect survey answers and barriers reported decreased from pre- to post-survey. This is illustrated in Table 3.

Table 3

Pre- and Post-Survey Comparison



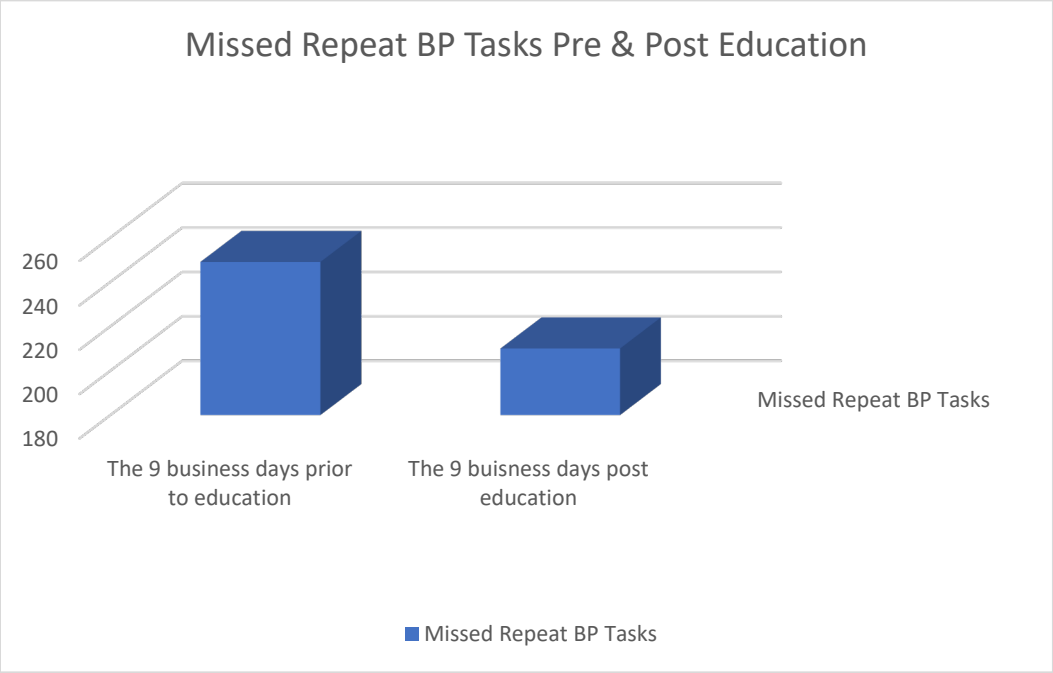
Missed Repeat Blood Pressure Tasks

The QI improvement team member provided Excel sheets to the project coordinator for 9/25/23-10/9/23 and 10/10/23-10/23/23 for all missed EHR tasks for the project site. The project coordinator then filtered the data for only missed repeat BP tasks. To ensure data between pre and post-education was comparable, the data was filtered to include only clinic business days, and this is why the data was limited from the initial two-week period pre and post-education to nine business days. Missed repeat BP tasks within the EHR decreased from 249 in the nine business days before the MA education to 210 in the nine business days following the

intervention. Equating to a 15.66% change or improvement in missed tasks. Table 4 represents a visualization of this data.

Table 4

Missed Repeat Blood Pressure Tasks Pre- and Post-Education



DISCUSSION

Summary

Even though the staff generally understands the Centers for Medicare and Medicaid Services (CMS) Core Measures include appropriate hypertension control for patients 18-85 years old diagnosed with hypertension, many patients still do not receive the appropriate repeat blood pressure (CMS, 2013). The education and increased awareness of the need for repeat BP, when the initial reading is equal to or greater than 140/90 mmHg improved MA compliance with proper policy. The project also recognized the barriers that MAs face in completing this task.

Overall, there was a decrease in missed repeat blood pressure tasks. The author intends to utilize this information to inform stakeholders and increase standardized training within the facility.

Interpretation

The findings indicate that the educational intervention was beneficial in decreasing missed repeat BP when indicated. However, there is a need to reduce barriers such as time, patient cooperation, staffing, equipment, and provider standardization to help improve overall compliance rates. Although the MAs unanimously stated they knew where to chart the repeat BP, education directly focused on this aspect would be beneficial to ensure everyone is on the same page.

Implications

Practice and Education

Regular education and training are essential to keeping staff up-to-date and following appropriate guidelines. Regularly assessing barriers to best patient care must be continually evaluated and addressed. However, the handout developed by the healthcare institution to standardize and educate MAs on the correct location to chart was provided. Many MAs commented that it was difficult to read and understand. An updated instructional handout would help ensure an understanding of the documentation requirements. Furthermore, implementing a checkout process that confirms if repeat BP has been completed along with the delivery of a visit summary could help ensure adherence to protocol.

Research and Policy

Approximately half of the MAs surveyed in the pre- and post-surveys indicated that a five-minute period between BPs was sufficient. The systematic review by Liu et al. (2022) had

successful decreases in BP with a five-minute rest time between readings. This policy change could help improve compliance rates and address the time barrier that MAs reported.

Limitations

Since the primary data point was the reduction of missed BP tasks in the EHR, we cannot know if the project affected the overall rate of repeat BPs. The survey responses were limited to the MAs available that day with the time and desire to complete the survey. In this manner, an electronic survey with a longer window of time to complete may have increased the number of completed surveys. Furthermore, a marked increase in MA turnover could adversely affect the results of this project.

DNP Essentials Addressed

DNP essentials are the foundational competencies for advanced practice degrees (AACN, 2006). This QI project addressed four DNP essentials of practice focusing on science, leadership, improvement, evidence-based practice, and interprofessional collaboration, including essentials I, II, III, and VI (AACN, 2006).

DNP Essential I: Scientific Underpinnings for Practice

This essential focus on the importance of a solid scientific background to draw upon for the practicing DNP (AACN, 2006). The author addressed this essential by integrating science-based theories and guidelines into this QI project. It was further incorporated by developing and evaluating a new practice for implementation.

DNP Essential II: Organizational and Systems Leadership for Quality Improvement and Systems Thinking

This essential requires the DNP to leverage organizational and systems leadership to promote patient safety and excellence in practice (AACN, 2006). The author achieved this by assessing the need for an intervention and facilitating the improvement by combining best practice with systems and leadership that was already in place.

DNP Essential III: Clinical Scholarship and Analytical Methods for Evidence-Based Practice

Essential III underscores the importance of scholarship with analytical methods to integrate research into practice in meaningful ways (AACN, 2006). The author demonstrated this ability by taking the information gleaned from the review of the literature and disseminating it into the clinic in a way that promotes best practices for patients.

DNP Essential IV: Information Systems/Technology and Patient Care Technology for the Improvement and Transformation of Health Care

This essential requires using information and technology to improve healthcare (AACN, 2006). The author collaborated with stakeholders throughout the assessment and implementation of this project. This collaboration addressed this essential by utilizing technology and patient care to improve the health care received by patients in this setting.

Conclusions

Hypertension is still a common disease that many people are unaware of until it is evaluated at a healthcare office. It affects millions of individuals, and only 54% of the patients treated have controlled BP (Bolen et al., 2018). It is essential for best patient outcomes to

evaluate BP appropriately, and training staff on the importance and correct protocol is critical to recognize and control hypertension before it creates or worsens organ damage (CDC, 2023). Quality improvement projects are a way to address the knowledge deficit of healthcare staff. Although there were limitations within this QI project, there were improvements in MA knowledge and application of education provided to reduce the number of missed repeat BPs. Efforts should be continued to create reliable procedures and processes to deliver evidence-based practice.

Plan for Sustainability

Repeat BP education and handouts can be provided to new MAs and offered as an annual re-education to maintain up-to-date skills and policies within the outpatient setting. The training of senior MAs allows for a reliable source to train new hires and help promote adherence to protocol. The engagement of key stakeholders, such as leadership, quality improvement, and nurse educators, helps to promote the endeavor on multiple levels. The original teaching can be improved upon with the PDSA cycle to help address limitations and benefit project goals. Given that the data assessed for success was repeated BP tasks within the EHR, the author recommends further MA education on accurately charting these tasks to help reduce missed tasks.

Plan for Dissemination

The education material will be provided to the nurse clinical educator to incorporate into the training of the outpatient clinics. This could be broadened to include all outpatient clinics to help increase the organization's CMS scores for controlled hypertension. A future QI project addressing provider education on the topic could promote further adherence and improved compliance rates.

APPENDIX A

SITE APPROVAL/AUTHORIZATION LETTER

Banner Health

3838 N Campbell Ave, Bldg 2
Clinic C – Cardiology
Tucson, AZ 85719

Date: 08/03/2023

To: Audrey Meggitt
University of Arizona
College of Nursing

cc: Dean Moritz, PhD
Quality Improvement Specialist, Banner University Medical Group

From: Catharine Nolan-Belanger, Associate Director, Phys Pract Operations

Re: Correctly Capturing and Documenting a Second Blood Pressure in the Outpatient Setting

Our team at Banner University Medical Center-North, Clinic C have assessed the above referenced project proposal for implementation potential and determined that the project is feasible and congruent with Banner Health initiatives: Value Based Care Transformation. It aligns with our goal: to be customer obsessed and relentlessly improve.

The resources needed: Staff time & effort, access to facilities, and quantitative data have been reviewed and determined necessary/acceptable. Further it is my/our understanding that medical assistants and supervisors in Clinic C impacted by the project are in support of the project.

The Banner Health Research Determination Process requires this letter of support along with the project application be uploaded into the IRIS electronic program. The Banner Research Determination Committee (RDC) will then review your initiative. This same committee will provide one final check for HIPPA compliance.

Following a determination of non-research, non-human subjects research, or exempt human subjects research that falls under one of the categories the RDC may grant approval for, you will be notified of approval to begin your project at Banner University Medical Center-North, Clinic C.

However, should the RDC determine your project constitutes human subjects research or involves protected health information (PHI), that requires Institutional Review Board (IRB) review, you will be notified and may begin the IRB review process. If your project will be reviewed by the Banner Health IRB, the Banner Research Regulatory Affairs team will also be notified to assist you with the submission process. You may not initiate the project until the IRB has granted approval.

Should you have any questions during the process, please contact Ambur Lindstrom-Mette DNP, FNP-BC from the University of Arizona, College of Nursing at aml5@arizona.edu or Jane.Hoverson@bannerhealth.com. Upon completion of your project, we request that you disseminate your findings to Banner University Medical Center-North, Clinic C or in another mutually agreed upon forum. Best wishes on the successful completion of your project.

Sincerely,

Catharine Nolan Belanger, Associate Director, Clinic C

☑ By checking this box, I attest to the project feasibility and confirm all necessary department/facility approval have been obtained.

APPENDIX B

EVALUATION INSTRUMENTS (PRE-EDUCATION SURVEY AND POST-EDUCATION SURVEY)

Pre-Education Survey: Repeat Blood Pressures

Completion of the survey and participation in this quality improvement (QI) project is voluntary. If you complete the survey, you are confirming that you voluntarily consent to participate in this QI project and that you understand that participation in this project is not a condition of employment at an outpatient clinic. You may complete this survey at work. If you elect to complete the survey on your own time, you will not be paid for your time spent on completing the survey.

1. Do you know that a repeat blood pressure should be taken if the initial reading is equal to or greater than 140/90 mmHg?
    a. Yes
    b. No
2. Why is it important to take a repeat blood pressure if the first blood pressure is greater than or equal to 140/90 mmHg?
    a. It is a guideline from the Centers for Medicare & Medicaid.
    b. It improves patient care by providing accurate blood pressure results.
    c. All the above.
3. How many minutes should I wait to repeat the blood pressure?
    a. No need to wait.
    b. 5 minutes
    c. 15 minutes
4. I know the correct place to document blood pressure measurements in Cerner?
    a. Yes
    b. No
5. What are the barriers to taking repeat blood pressure when needed? Select all that apply.
    a. Time
    b. Patient cooperation
    c. Staffing
    d. Equipment
    e. Other (Please specify):_____

Post-Education Survey: Repeat Blood Pressures

Please complete this Post-Education survey if you participated in the Education huddle the previous week.

Completion of the survey and participation in this quality improvement (QI) project is voluntary. If you complete the survey, you are confirming that you voluntarily consent to participate in this QI project, and you understand that participation in this project is not a condition of employment at an outpatient clinic. You may complete this survey at work. If you elect to complete the survey on your own time, you will not be paid for your time spent on completing the survey.

1. Do you know that a repeat blood pressure should be taken if the initial reading is equal to or greater than 140/90 mmHg?
    a. Yes
    b. No
2. Why is it important to take a repeat blood pressure if the first blood pressure is greater than or equal to 140/90 mmHg?
    a. It is a guideline from the Centers for Medicare & Medicaid.
    b. It improves patient care by providing accurate blood pressure results.
    c. All the above.
3. How many minutes should I wait to repeat the blood pressure?
    a. No need to wait.
    b. 5 minutes
    c. 15 minutes
4. I know the correct place to document blood pressure measurements in Cerner?
    a. Yes
    b. No
5. What are the barriers to taking repeat blood pressure when needed? Select all that apply.
    a. Time
    b. Patient cooperation
    c. Staffing
    d. Equipment
    e. Other (Please specify)_____

APPENDIX C

PARTICIPANT MATERIAL (ORAL PRESENTATION SCRIPT | BLOOD PRESSURE MEASUREMENT INSTRUCTIONS | TIP SHEET: AMBULATORY ADULT HYPERTENSION WORKFLOW)

Oral Presentation Script

Approximately 10 minutes

Hi, my name is Audrey Meggitt, and I am doing a quality improvement project as part of my doctorate nurse practitioner program with the University of Arizona. The project is *Correctly Capturing and Documenting a Second Blood Pressure in the Outpatient Setting.* The goal of this project is to improve repeat checks of patient blood pressure when indicated and ensure they are properly charted.

As a reminder, it is a requirement from the Centers for Medicare & Medicaid Services that a repeat blood pressure be completed if the initial patient reading is greater than 140/90 mmHg.

Why is this important? 140/90 mmHg blood pressure or greater is considered stage 2 hypertension. Hypertension is one of the greatest risk factors for increased illness and death. In 2020, 670,000 deaths were attributed to hypertension as a primary or contributing factor (CDC, 2023). Therefore, as healthcare professionals, it is our job to make sure patients are being properly screened. We know patients might be rushing to or stressed about their appointment, leading to an elevated BP. That is why we want to give them a chance to settle before rechecking their BP to make sure we accurately assess if they need management of their BP to improve their health.

The preferred BP technique requires the patient to rest comfortably in a chair with their left arm, if not contraindicated, resting on a flat surface. The cuff should be positioned at heart level, with the bottom of the cuff above the elbow bend. Their feet should be uncrossed and flat on the floor. They should not be talking or moving during this process. Per outpatient clinic policy, if the BP is greater than or equal to 140/90 mmHg on the first reading, the BP should be repeated after the patient has rested for 15 minutes.

To receive the credit that this is being completed, it must also be documented in the correct location in Cerner. I will provide a tip sheet on this documentation process and the proper positioning for a BP measurement.

Completion of the survey and participation in this QI project is voluntary. If you complete the survey, you are confirming that you voluntarily consent to participate in this QI project, and you understand that participation in this project is not a condition of employment at an outpatient clinic. You may complete this survey at work. If you elect to complete the survey on your own time, you will not be paid for your time spent on completing the survey.

Does anyone have any questions?

Thank you for your time.

Blood Pressure Measurement Instructions

1. How to position the patient and blood pressure cuff:
    - Patient should be sitting in a chair with back straight and both feet flat on the floor while the cuffed arm rests on a flat surface. The patient should not be talking or moving while blood pressure is being taken.
    - Blood pressure cuff should be around the left bicep, if not contraindicated, at heart level.
2. If the first blood pressure reading is greater than 140/90 mmHg, repeat the reading in 15 minutes after the patient has had time to relax.
3. Document both blood pressure readings in Cerner under vitals and as directed by the Ambulatory Adult Hypertension Workflow handout.

Tip Sheet:
Ambulatory Adult Hypertension Workflow

Introduction:

▪ Hypertension clinical practice has been updated

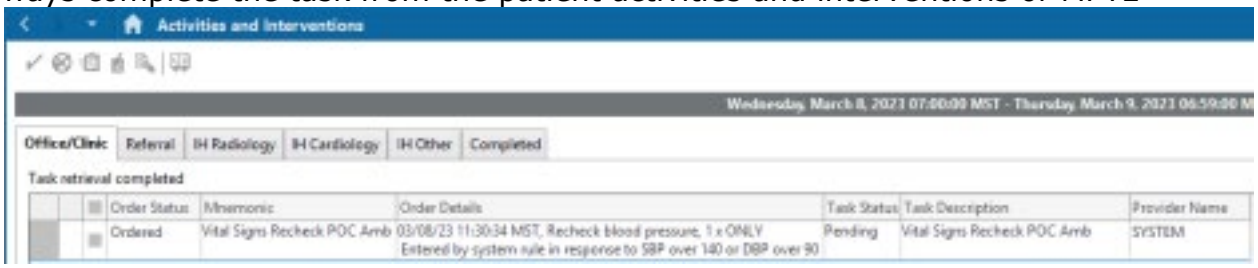
▪ If initial Blood Pressure is outside of the normal range, follow policy #4609, Clinics Encounter Process and Procedure Policy, then blood pressure must be repeated after the patient has rested for 15 minutes ▪ In Cerner, the following supports the policy and clinical practice

Blood Pressure Monitoring - MA/Nurse:

▪ An automated task: "Vital Signs Recheck POC AMB" fires a blood pressure recheck for adult patients 18 years or older and have a first systolic BP greater or equal to 140 or diastolic greater or equal to 90.

- Any vitals out of normal range, need to be reported to the provider ▪ The task overdue time is set to 20 minutes

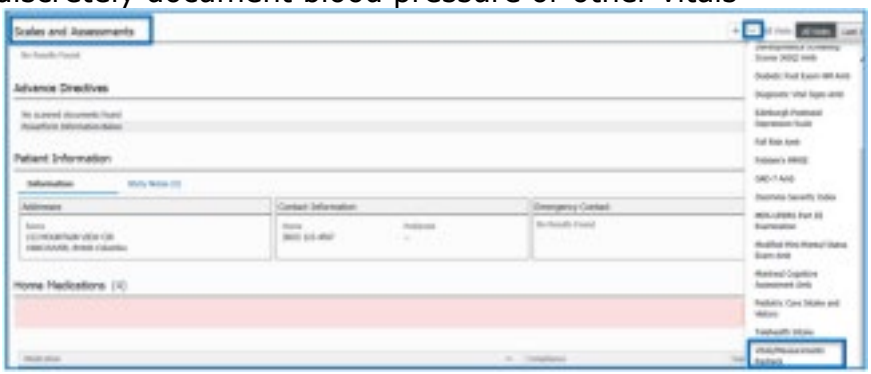
▪ Always complete the task from the patient activities and interventions or MPTL



▪ Task is attached to "Vitals/Measurement Recheck" PowerForm

Blood Pressure Monitoring - Providers:

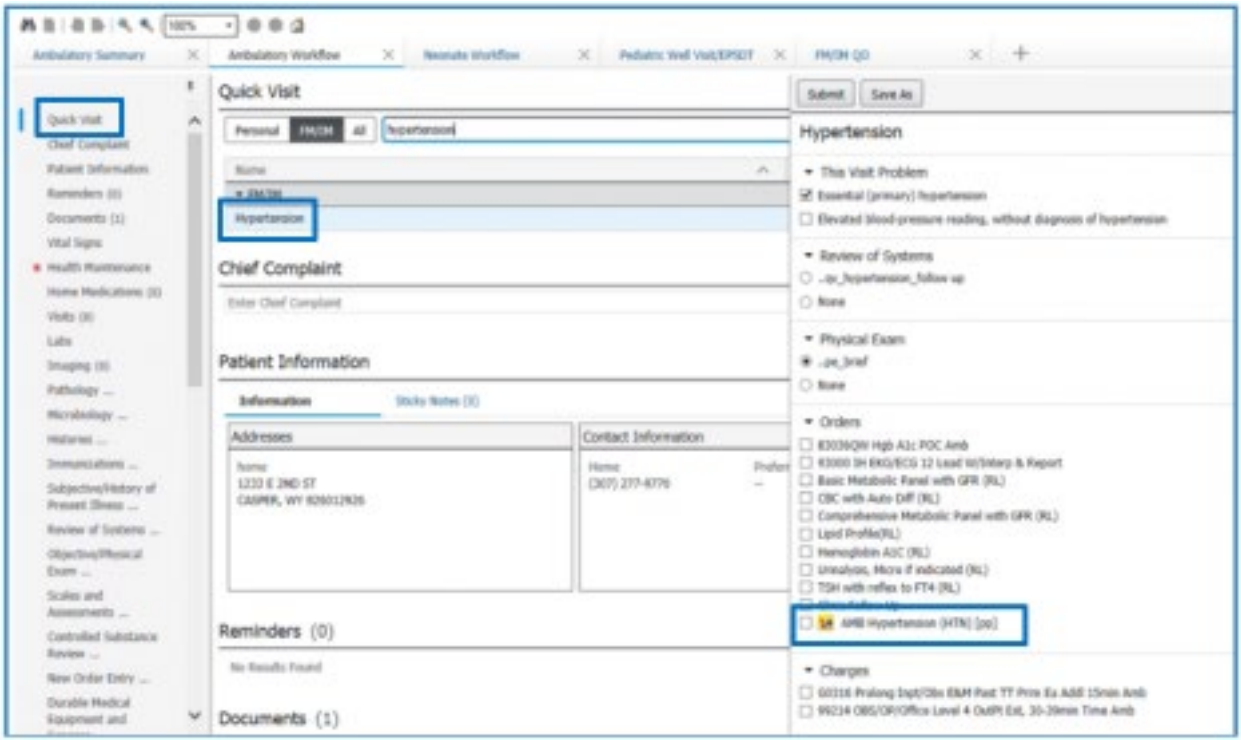
- On the Ambulatory Workflow mPage, in the Scales and Assessments drop-down access the "Vitals Signs Recheck POC AMB" power form to discretely document blood pressure or other vitals



Provider Hypertension Workflow:

- In Ambulatory Workflow the Quick Visit component "Hypertension" has been updated & includes AMB Hypertension(HTN) PowerPlan (PP)
- The AMB Hypertension (HTN) PP can be used for treating a patient with a new hypertension diagnosis or to adjust medication for patients with an existing hypertension diagnosis
- The PowerPlan includes guidance for orders, medications, labs, EKG, and home blood pressure cuff

Hypertension Quick Visit:

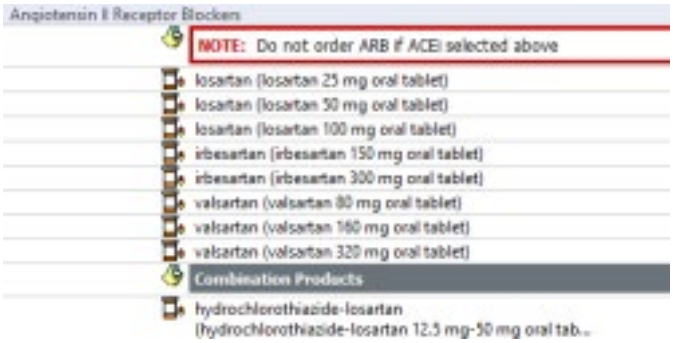


AMB Hypertension (HTN) [pp]:

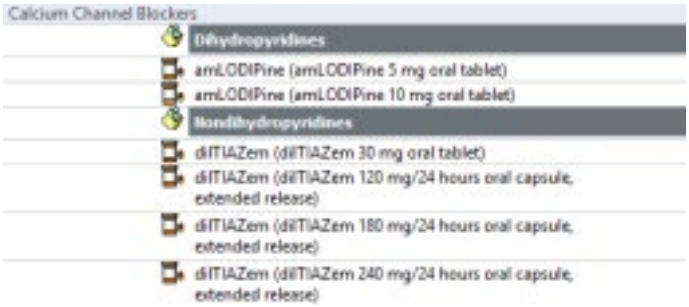
- Includes Medication Classes with Indications

Indications:	Medication Classes (Choose ONE):
• Adult patient without Diabetes or Chronic Kidney Disease with blood pressure >= 140/90 mmHg • Consider for adults with blood pressure >130/80 mmHg + ASCVD risk greater than or equal to 10%	• Angiotensin-Converting Enzyme (ACE) Inhibitors • Angiotensin Receptor Blockers (ARB) • Thiazide Diuretics • Calcium Channel Blockers (CCB)
• Chronic Kidney Disease (stage 1 or 2 with albuminuria, or stage 3) • Diabetes with albuminuria	• Angiotensin-Converting Enzyme (ACE) Inhibitors • Angiotensin Receptor Blockers (ARB)
• Heart Failure with Reduced Ejection Fraction (HFrEF)	• Angiotensin Converting Enzyme (ACE) Inhibitors • Angiotensin Receptor Blockers (ARB) • Diuretics • Beta-Blockers (carvedilol, metoprolol succinate or bisoprolol)
• Stable Ischemic Heart Disease (SIHD)	• Beta-Blockers (carvedilol, metoprolol tartrate/succinate, nadolol, bisoprolol, propranolol)
• Atrial Fibrillation	• Angiotensin Receptor Blockers (ARB)

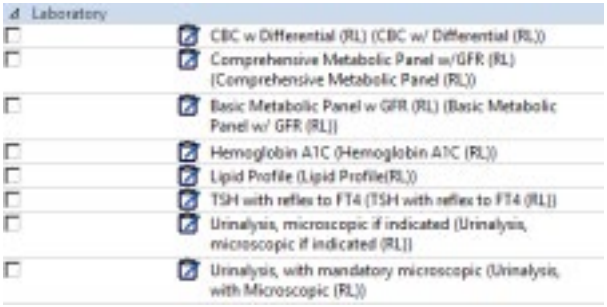
- Medication orders are grouped by medication classes and may contain notes to help guide ordering



- Medication order sentences are grouped by medication classes and may include sub-classes, for example



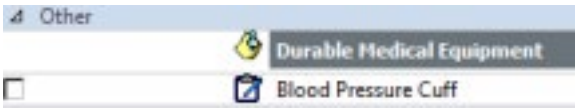
- Lab Orders



-

EKG Order

- Home Blood Pressure Cuff Order



APPENDIX D

PROJECT TIMELINE

Section	Initiation Date	Completion Date
Needs Assessment	January 30th, 2023	March 1st, 2023
Project Proposal Drafting	March 2nd, 2023	August 3rd, 2023
Project Proposal Defense	August 4th, 2023	August 4th, 2023
IRB Approval	August 5th, 2023	October 3rd, 2023
Project Implementation	October 5th, 2023	October 24, 2023
Final Project Drafting	October 25th, 2023	November 2023
Final Project Defense	November 15th, 2023	November 15th, 2023

APPENDIX E

LITERATURE REVIEW GRID

Pub. Year; Author's Last Name	Title of Publication	Type of Study	Main Outcomes of Findings	Support for and or Link to Project
2013; Becton et al.	Blood Pressure Reclassification in Adolescents Based on Repeat Clinic Blood Pressure Measurements	Retrospective cross-sectional study	Increased BMI was significantly linked with a decrease in BP upon repeat measurement.	Repeating BP if the initial reading is an outlier is more likely to produce a decreased measurement in overweight patients. The National Health Survey from 2017- March 2020 found obesity is prevalent in 41.9% of adults over 20 years of age in the U.S (Stierman et al., 2021)
2014; Sebo et al.	Blood pressure measurements are unreliable to diagnose hypertension in primary care.	Observational Study	In-office BP measurements were inaccurate in assessing HTN regardless of written training when taken by a physician before a research assistant.	Indicated that misdiagnosis of HTN occurred in 15-32% of patients. However, it revealed that written material alone did not adequately train staff on BP measurement techniques.
2017; Kallioinen et al.	Sources of inaccuracy in the measurement of adult patients' resting blood pressure in clinical settings	Systematic Review	A single BP value outside the expected range should be interpreted cautiously and not considered a definitive clinical deterioration indicator.	Sound interpretations of BP require consideration of variables that can affect BP and require multiple data points to infer a meaningful clinical indicator.
2018; Boonyasai et al.	A bundled quality improvement program to standardize clinical blood pressure measurement in primary care	Quality Improvement Study	Bundling automated BP measurement with system redesign is readily adaptable in the outpatient setting and improves the quality of BP measurements.	Demonstrates improvement of clinic BP measurement quality and efficiency with workflow re-design.
2018; Einstader et al.	Association of Repeated Measurements with Blood Pressure Control in Primary Care	Observational Cohort Study	Repeated BP measurement of initially elevated reading greater than 140/90 mmHg was correlated with a median decrease of 8 mmHg in systolic BP.	Implementing routine repeated measurements for an initially elevated BP may improve decision-making around HTN management. It should be considered a standard component of programs to improve BP control.
2020; Kravetz et al.	Flipping the Visit: Impact of Blood Pressure Remeasurement after the Visit	Quality Improvement Study	Repeat BP in the appropriate position and setting can screen out falsely elevated BP in many patients.	Repeat BP in the appropriate position in a quiet room screened out falsely elevated BP in many patients.

Pub. Year; Author's Last Name	Title of Publication	Type of Study	Main Outcomes of Findings	Support for and or Link to Project
2022; Liu et al.	Sources of automatic office blood pressure measurement error: a systematic review	Systematic Review	Standardized BP measurements and awareness of possible variables when interpreting clinical readings are recommended.	Standardization of BP protocol includes seated, feet on the ground, and left arm supported at heart level. Mean of 3 BP readings after 5 mins of rest without talking or moving.

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