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## Improving Collection of Second Blood Pressure for Patients in Primary Care Who Present with an Elevated Reading

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**University of Nebraska Medical Center  
College of Nursing**

**DOCTOR OF NURSING PRACTICE (DNP)**

**FINAL DNP PROJECT**

**Improving Collection of Second Blood Pressure for Patients in Primary Care Who  
Present with an Elevated Reading**

**by**

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APRN- NP**

**The final DNP project presented to the**

**Faculty of the University of Nebraska Medical Center College of Nursing**

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**DOCTOR OF NURSING PRACTICE**

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**DNP Program Faculty Academic Advisor  
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### **Abstract**

**Purpose:** Early diagnosis of hypertension is critical to prevent complications such as renal and cardiovascular diseases. Many healthcare facilities do not have a blood pressure training program educating appropriate staff on importance of accurate blood pressure readings and techniques. The purpose of this project is to improve the number of patients with elevated blood pressure reading at the OneWorld Quick Sick Clinic.

**Methods:** Health aides/Health Assistants/Medical assistants at OneWorld Quick Sick will receive blood pressure training to review proper techniques. During this training they will also be educated on appropriate follow-up blood pressure readings and a new technique to document elevated readings.

**Results:** Pre-data collection was obtained over a four-month period in the Quick Sick Clinic. These results indicated that only 24.1%-56.9% of patients during this time received a second blood pressure reading. Post-data collection after the health aide training showed an increase in the average range from 50%-58.6%.

**Conclusions:** Implementation of the health aide blood pressure training program showed positive results in appropriate follow up blood pressure collection. There were also another two locations that participated after the initiation in Quick Sick. This further showed evidence of the effectiveness of the blood pressure training program.

### **Introduction**

Hypertension is a modifiable risk factor for major diseases such as renal disease and cardiovascular complications. In some practices, elevated blood pressures on intake are discounted as “white coat syndrome” and are not followed-up. To allow for early diagnosis of hypertension, in this project we will provide health associates with enhanced blood pressure training and a procedure for tracking initial elevated blood pressure on intake to assure that a repeat blood pressure is obtained and communicated to the provider. Blood pressure training guidelines will be put into policy to allow for increased accuracy and awareness of high readings. Taking a second blood pressure increases the accuracy of data to allow the provider to make a diagnosis.

### **Problem Statement**

Hypertension is the root cause of many chronic illnesses such as stroke, heart attack and heart failure (Ostchega et al., 2020). If not detected and treated early, hypertension can result in preventable death or disability. These deaths can be decreased by 27% by decreasing the average person's systolic blood pressure by just 10mm Hg (Carey et al., 2018). The prevalence of hypertension among adults aged 18 and older in the United States is 45.4% (Ostchega et al., 2020). Cardiovascular disease (CVD) is the cause for 17.3 million deaths per year and is expected to increase >23.6 million by 2030 (Zhou et al., 2018). Hypertension is a major risk factor for CVD; therefore, it is especially important to prevent, treat and control hypertension to reduce the risk for CVD, premature death, and related healthcare burden.

Health care costs for patients being treated for health conditions related to or directly correlated to hypertension amount to be about \$131 billion a year (Kirkland et

al., 2018). This accounts for the office visits, hospitalizations, medications for treatment and testing.

The causes of elevated blood pressure are multifactorial as is any strategy for addressing hypertension in a population. There are many quality improvement interventions that help with identify and decreasing hypertension. Some of these interventions include patient education, provider reminders, and nursing/health assistant education (Shaikh, Petray, & Wisner, 2020). One strategy for improving blood pressure is to assure all patients with elevated readings get a second reading at the time of the visit.

Currently, Centers for Medicare and Medicaid Services (CMS) data for blood pressure management at One World is not within the goal. More than 71% of patients with hypertension have blood pressures above the recommended blood pressure reading of <140/90. In addition, it has been noted that elevated blood pressure reading is not always addressed at the time of the visit, especially visits for acute minor illnesses at the Quick Sick Clinic (QS). During the pre-intervention period (January-May) the Quick Sick location saw an average of 78 patients per month with an elevated blood pressure reading. The percentage of patients who had elevated blood pressure and received a second blood pressure during this time was 24.1%-56.9% (Table 5). The clinician leadership at OneWorld Community Health Center has identified a need to improve blood pressure with their patient population. A first step in improving blood pressure control is accurate assessment, to include second blood pressures at intake. In this project we will set as a benchmark improving the percentage of patients with an initial blood pressure who get a second blood pressure to 80%.

### **Purpose Statement**

The purpose of this project is to improve the number of patients with elevated blood pressure reading at the OneWorld Quick Sick Clinic who have a second blood pressure at least 5 minutes later and that all elevated blood pressures are communicated to the provider. To achieve this purpose the DNP students will offer education and tools for blood pressure training for health aides and other OneWorld employees who obtain blood pressure measurements at the Quick Sick Clinic. They will also provide them with strategies for remembering to obtain a second blood pressure (YELLOW DOT) and communication of elevated blood pressure to the provider (RED HEART). The goal of this education and these tools are to ensure that all patients with a high blood pressure reading get a second reading documented after at least 5 minutes. Health aides will follow steps to accurately check a patient's blood pressure based on evidence-based recommendations. Health Aides will appropriately identify what a high blood pressure reading is and flag it to be taken again. Health Aides will record both blood pressure readings at the time of measurement in the electronic health record (EHR) for the provider to see and flag the patient's room if both blood pressure readings are greater than 140/90.

The PICO question:

P: In Health Aids at OneWorld

I: would an educational program and updated policy requiring a second blood pressure measurement

C: compared to usual care

O: increase the percentage of patients with an initial elevated blood pressure who have a second blood pressure measurement to 80%.

### **Review of Literature**

Both the U.S. Preventive Task Force and Healthy People 2030 have issued statements/recommendations on the importance of screening for hypertension (*Hypertension in adults: Screening* 2021). An accurate measurement of blood pressure is crucial for diagnosis and medication management. A measurement error of as little as 5 mmHg could lead to incorrect hypertension status classification in 84 million people worldwide (Padwal et al., 2019; Sakhuja et al., 2022). To prevent these measurement errors from occurring, standardized techniques in a healthcare facility should be in place. If no standardized techniques with proper education are in place, blood pressure measurement leads to errors that can inappropriately alter management decisions in 20–45% of cases (Padwal et al., 2019). Standardization in the policy includes providing the patient with a comfortable chair to sit on with their feet touching the floor and their back supported (Morcos et al., 2019; Muntner et al., 2019; Padwal et al., 2019). Research also shows that it is important that the health aides undergo certified training and re-training every 6 months to 1 year to promote ongoing use of standardized measurement techniques and to acquire necessary skills to perform proper blood pressure measurement (Muntner et al., 2019; Padwal et al., 2019; U.S. Department of Health and Human Services, 2020).

Questionnaires are effective for evaluating the knowledge of blood pressure measurement and its importance (Muntner et al., 2019) when training for accurate blood pressure measurement. In a survey of 2302 health care providers, the American Heart

Association and the American Medical Association identified a significant need to improved education in accurate measurement of blood pressure. One finding from this survey was that initial education of blood pressure skills had not been formally assessed; this finding was the same for evaluation of reeducation. Based on these data, an eLearning tool was created reflecting key evidence-based factors in the accurate obtaining of blood pressure. Prior to and following completion of the module, an objective structured clinical examination was completed on 177 participants. The results showed that the eLearning model was effective for organizations to introduce retraining efforts (Hayer et al., 2022). In 2021, the AMA announced their effort for standardized education on blood pressure skills within all health care schools. Their goal is that all personnel obtaining the blood pressure reading should understand how to interpret and how and when to communicate BP (Blood Pressure) readings to healthcare providers and patients (Muntner et al., 2019).

### **Conceptual/Theoretical Framework**

For this project, we will be using the Institute for Healthcare Improvement (IHI) Quality Improvement (QI) Model to evaluate the impact of training Health Aides in meeting one standard related to blood pressure measurement, specifically, follow-up reading and communication of findings.

The IHI QI Model starts with the following questions:

What are we trying to accomplish? This is the AIM of the overall project and is usually system focused. In the case of this project, it is to ***improve blood pressure control for patients with hypertension at OneWorld Community Health Center***



How will we know the change is an improvement? In this model this is always based on data and movement from baseline to benchmark goals. In the IHI model, measures may be process, i.e., what are we doing; outcome, i.e., how is the patient doing; or balance, i.e., measures that support the function of the system. In this project the DNP Students will be focused on a Process measure, specifically, ***improvement in the number of follow-up blood pressure measures in patients who present with a BP higher than 140/90.***

What changes can we make that will result in improvement? Changes should be evidence-based. All AIMS are assumed to have a complex set of changes based on the multifactorial nature of most problems encountered in primary care. ***In this project the changes include tailored training of Health Aids and use of reminders. Both strategies have provided to be effective in improving adherence to procedures.***

The standard process in the IHI model is a PDSA cycle. PDSA Cycles include the following:

- Plan – plan for what change you are going to make and what you want the outcome to be.
- Do – do the activity in a small group
- Study – evaluate the impact of the activity for adherence to the proposed change and the effectiveness in achieving the desired outcome

- Act – develop a new PLAN based on the data from the study; this may to move forward to the next step or to repeat the change and/or change the desired outcome.

Problem – Baseline data at OneWorld indicate that 63.5% of patients who present at Quick Sick Clinic intake with a blood pressure of 140/90 or higher have a second blood pressure readings a least 5 minutes recorded in their chart. The Benchmark for this is that 100% of patients with an elevated reading have a second blood pressure measure obtained and recorded in the chart at the time of their visit.

### **Proposed Methodology**

#### **Study Design**

This is a Quality improvement study, using a mixed methods approach, This study will evaluate the impact of a series of PDSA cycles designed to improve adherence to the standards of practice for blood pressure evaluation at the time of intake into the clinic.

#### **Intervention**

Health aides at the OneWorld Quick Sick Clinic will receive focused training to review proper technique (See Appendix A) for obtaining and following up on blood pressure assessment at the time of intake. There are a total of 13 health aides employed at the Quick Sick Clinic. They will also be provided with two tools to assist in obtaining follow-up blood pressures and informing the provider of elevated blood pressures. Tool 1 is a YELLOW DOT (see Appendix 1) that is adhered to the exam room door to remind the Health Aide to take a second blood pressure reading. Both readings are recorded in the patient's EHR. If the reading continues to be elevated over

140/90, Tool 2 is added. Tool 2 is a RED HEART that is adhered to the exam room door to advise the provider that this patient has elevated blood pressure readings.

### **Subjects**

For this project the study participants are the Health Aides who cover the Quick Sick Clinic at OneWorld. If the proposed strategy is effective, in the future, every new employee hired as a health aid will receive this education in addition to their orientation. Because this is a quality improvement project working to implement an established intervention, informed consent is not needed. IRB (Institutional Review Board) letter is attached (Appendix E).

### **Data Collection**

- NextGen computer support will allow the OneWorld providers to query the EHR for the number of patients seen at the Quick Sick Clinic who have elevated blood pressure reading and the percent of those patients who have a second reading at the visit. This data will be obtained monthly for a period of 6 months after the training by Heartland Computer Support at the request of OneWorld leadership.
- A hard copy of the Pre- and Post-Tests (see Appendix B) of the Blood Pressure Training will be obtained by the DNP students. At least two (2) DNP Students will score each test.

### **DNP Project Procedures**

Month 1 – Chart review completed to identify percentage of clients who have an elevated blood pressure reading with and without a follow up blood pressure taken at

the same encounter. The need was identified to train Health aides on the new policy to increase follow up blood pressure measurements.

Month 2 – Development of new policy

Month 3 - meet with the Health Aides once to review the plan, obtain feedback, and revise as needed. (PDSA Cycle #1).

- Plan – schedule a meeting with each health aide and request input on the policy and the YELLOW DOT strategy to remind Health Aides to obtain a second BP
- Do – meet with each health aide and obtain feedback
- Study – incorporate any feedback into the policy or plan re: YELLOW DOTS
- Act- repeat with revisions as needed

Month 4 – Implement the training of the Health Aides at the Quick Sick Clinic (PDSA Cycle #2).

- Plan – schedule a time, location and identify participants for Training. Assure all materials are present including copies of the Policy, Yellow Dots and the Pre and Post-tests
- Do – provide training
- Study – determine how training went; specifically, 1) did everyone show up, 2) did they ask questions, 3) were the DNP students able to obtain the pre- and post-test at the time of the training. Does the training need to be revised and repeated?
- Act – review and repeat if needed

Two weeks after initiation of the project, the DNP students will meet with the Health Aides one on one to determine compliance with the policy and make revisions as needed (PDSA Cycle #3)

- Plan – using a tracking Form (appendix D) to track adherence to policy through observation and chart audits. At least 10 observations will be obtained to include all Health Aides and a variety of clinic times.
- Do – Implement
- Study – review tracking forms and identify % of successful, % unsuccessful, barriers, problems
- Act- revise plan for new PDSA

At Months 3, 4, and 6.

- Obtain computer printout reporting number of Urgent care patients at intake, the % of those who had second blood pressure reading recorded at the visit.
- Revise plan as needed.

Month 4-6 - In addition to obtaining follow-up data, work on writing up results and completion of the project.

### **Proposed Analysis**

Overall, the data will be analyzed using a mixed method approach to gather both qualitative and quantitative data throughout the study.

Month 3 – (PDSA Cycle #1).

Qualitative data analysis. Meet with the Health Aides once to review the plan and gather qualitative data to identify common themes within this theoretical framework to apply to a larger sample size. Revise intervention and education as needed.

- Plan – Within the scheduled meeting with each health aide, request input on the policy and yellow dot strategy while gathering common themes and concerns.
- Do – meet with each health aide and obtain feedback after trial continuing to gather ideas for further education needs.
- Study – incorporate any feedback gathered into the policy or plan re:  
YELLOW DOTS
- Act- repeat with revisions as needed

Month 4 - Implement the training of the Health Aides at the Quick Sick Clinic (PDSA Cycle #2)

- Determine success of Health Aid training; specifically, 1) percentage of Health aides in attendance and who participated, 2) qualitative data collection and thematic analysis for further education needs, 3) descriptive statistics of pre-test and post-test scores, 4) Training will be repeated and/or revised if individual scores do not reach 80%

Two weeks after the initiation of the study within months 4,5 and 6, the DNP students will meet with the Health Aides to determine compliance with the policy and make revisions as needed (PDSA Cycle #3)

- A Chart Audit Form (appendix D) will be used to track adherence to policy through observation and chart audits. At least 10 total observations will be obtained to include all Health Aides and a variety of clinic times. Data included for these observations are qualitative including whether the Health Aide complied with policy and if not, what the obstacles were.
  - Quantitative Data set from a yes or no category of use of yellow dot, second blood pressure reading in chart, and use of red heart.
  - The NextGen EHR system will be used to obtain a computer printout reporting the number of Urgent care patients with an elevated blood pressure reading  $>140/90$ mmHg, and the percentage of those who had a second blood pressure reading recorded at the time of the visit.
    - Independent t tests will be used to calculate the difference in percentages of those who have a second blood pressure reading before the policy and after the data collection with the new policy in place.
  - Qualitative data set will be gathered for a rationale from Health Aide of why something was not completed.

Month 4-6 - In addition to obtaining follow-up data, work on writing up results and completion of the project. To understand the data, we will use descriptive statistics to describe the data and measurements. In these months, we will continue to obtain follow up data from Health Aides to aid in the completion of this project. Following the results of

this study, the new blood pressure measurement policy will then be used at the other One World outpatient clinics.

Questions #1: What is the impact of knowledge re: blood pressure measurement before and after a focused training.

A pretest and posttest (See Appendix B) will be completed to test the Health Aides knowledge before and after the focused training.

Questions #2: What is the impact of the focused training re: blood pressure measurement and the addition of the YELLOW DOT reminder on the percent of patients with initial blood pressures over 140/90 who have a second blood pressure reading obtained and recorded at the time of their visit?

1. A run chart will demonstrate the change in adherence to the policy of obtaining second blood pressure reading over time after the training and initiation of the YELLOW DOT reminder.
2. DNP Students will observe health aids and audit charts weekly to document adherence to the policy. (See Audit Tool, Appendix D)

### **Potential Significance and Implications**

By working as a team with health aids, our DNP project at OneWorld will improve the percentage of patients who have an elevated blood pressure at intake and have a follow-up blood pressure at the time of the visit. This evaluation of blood pressure is an essential first step in identifying patients with elevated blood pressure and can decrease the percentage of patients with uncontrolled blood pressure and improve health outcomes including prevention of disease progression. If this intervention is successful at the Quick Sick Clinic, it will be spread to the general medicine clinics for



implementation. Current data from OneWorld demonstrates the need for and importance of implementing this project. Through a new policy and continued education for health aids, patients who have elevated blood pressures at the time of visit, regardless of hypertension diagnosis, will have their blood pressure rechecked 5 minutes later and addressed with their provider.

### **Findings**

Upon initiating our proposed project, we had other locations show interest in participating. Data were collected at three different locations within organization: Livestock Exchange (LSX), Quick Sick, and Women's Health Clinic (WHC). During the post-collection period (August-October) the LSX location saw a total of 845 patients with an elevated blood pressure >140/90. A total of only 462 patients in this location had a hypertension diagnosis. The Quick Sick location saw a total of 234 patients with an elevated blood pressure reading >140/90. Only 86 patients at this location had a hypertension diagnosis. The WHC location saw a total of 219 patients with an elevated blood pressure of >140/90. Only a total of 126 patients at this location had a hypertension diagnosis. This data helps demonstrate that at least 20% or more patients go undiagnosed with hypertension.

For the duration of the pre-intervention period (January-May) the LSX location saw an average of 282 patients per month with an elevated blood pressure reading. The percentage of patients who had elevated blood pressure and got a second blood pressure during this time was 33.5%-43.2% (Table 3). Following the health aid training and initiation of the red heart protocol the average ranged from

42.4% to 51.27%, a consistent increase in the average. In addition, the trend demonstrated an increasing average with the last month measured average 51.27%.

During the pre-intervention period (January-May) the Quick Sick location saw an average of 78 patients per month with an elevated blood pressure reading. The percentage of patients who had elevated blood pressure and received a second blood pressure during this time was 24.1%-56.9% (Table 5). Following the health aid training and initiation of the red heart protocol the average ranged from 50%-58.6%, a consistent increase in the average. In addition, the trend demonstrated an increasing average with the last month measured average 58.6%.

Through the pre-intervention period (January-May) the WHC location saw an average of 73 patients per month with an elevated blood pressure reading. The percentage of patients who had elevated blood pressure and received a second blood pressure during this time was 15%-45.3% (Table 7). Following the health aid training and initiation of the red heart protocol the average ranged from 34.1% in August with a decrease of 32.8% in October.

Data from all three clinics support the assumption that too few people presenting with elevated blood pressure are getting the standard second reading. In addition, a brief intervention with the health aids and initiation of a red heart protocol consistently increased the percentage of patients who received a second blood pressure reading. Although the intervention did not move any of the clinic sites to an acceptable benchmark, it did improve the number of patients receiving a standard of care. Like other quality improvement projects, next steps would be to add additional brief intervention while continuing to monitor the percent of patients who receive the standard

care, i.e., a second blood pressure reading and adherence to use the red heart protocol.

### **Discussions**

Awareness of hypertension is closely linked to access to healthcare visits. Any chief complaint at a provider visit should include a proper assessment of blood pressure, including two measurements if indicated. Obtaining a second blood pressure when indicated will allow for accurate assessment, evaluation, and diagnosis by the provider (Lee et al., 2022). The rate of improvement within these clinics will allow for better awareness and hypertension management.

Strengths of this QI project included implementation across three different clinic types with a standardized policy, many patients with elevated blood pressures, and health aides involved in the intervention.

Limitations of the project included significant turnover and relocation of health aides. New health aides were hired after the project began, and some were no longer employed during the data collection phase. The same policy was implemented at each location; however, there are different health aids among the different locations.

### **Conclusion**

Overall, there was an improvement in repeat blood pressure taken by health aides when indicated in the Data Section. Using tools, including the yellow dot and red heart, increased compliance as a visual reminder. In addition, the development of structured blood pressure measurement education for those obtaining vitals at the various clinics results in more accurate measurements. A policy to format the structure

of obtaining blood pressure streamlines this process throughout the clinic so elevated blood pressure readings are being addressed.

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## Appendix A

### Blood Pressure Training Guidelines Policy and Procedure

**POLICY:** OneWorld Community Health Center will offer education and tools for blood pressure training for health aides/health assistants/medical assistants and other OneWorld Community Health Center employees who will obtain blood pressure measurements.

**PURPOSE:** For health aides/health assistants/medical assistants to perform proper blood pressure techniques for medical providers to accurately assess patient's blood pressure measurements.

**PROCEDURE:**

- Standard Guidelines for Blood Pressure Check
  - Assess blood pressure in a quiet area.
  - Make sure client is seated with feet flat on the floor and back supported
  - Use the proper cuff size. (See attachment A for specific directions)
  - Make sure arm is at heart level and supported. Palm should be open and facing upward
  - Record the blood pressure measurement in the patient's electronic health record (EHR).
  - Manual or automatic blood pressure monitoring may be utilized. (See attachment A for specific directions)
  - After taking the 1<sup>st</sup> blood pressure place a yellow dot magnet outside the door **IF** the blood pressure reading **is** **>140/90**. This will be used as a reminder to recheck BP in 5 minutes. (Use the blood pressure reading chart below as needed)



- Take a 2<sup>nd</sup> blood pressure reading at least 5 minutes after the initial one. It is important to take two blood pressure readings. Once the 2<sup>nd</sup> blood pressure reading has been taken remove the yellow dot.
  - **IF** the 2<sup>nd</sup> blood pressure remains **≥140/90** place the red heart outside of the door to remind the provider to address the BP.





To interpret Blood Pressure reading use the following chart:

**HYPERTENSION (HIGH BLOOD PRESSURE)**

**Goal Blood Pressure is less than 140/90**

\*NOTE: DIABETICS BLOOD PRESSURE GOAL IS LESS THAN 130/80

American Heart Association recommended blood pressure levels			
Blood Pressure Category	Systolic (mmHg)		Diastolic (mmHg)
Normal	Less than 120	and or	Less than 80
Prehypertension	120-139		80-89
<b>High</b>			
Stage 1	140-159	or	90-99
Stage 2	160 or higher	or	100 or higher

**ATTACHMENT A****Steps for taking Manual Blood Pressure**

- a. Positioning the Patient
  - (1) The patient should be resting for at least 5 minutes before the blood pressure is taken.
  - (2) Legs should not be crossed- this may falsely elevate the blood pressure.
  - (3) The patient should not be talking during blood pressure measurement. This may falsely elevate the blood pressure.
- b. Choose the appropriate cuff size
  - (1) Cuff size is determined by the circumference of the arm.
  - (2) Cuff sizes are marked on the inside by a measuring line and a size: Pediatric, Adult Regular, Adult Large
  - (3) Measure the cuff on the arm to make sure it is appropriately sized for the person.
  - (4) If the cuff is too small—the blood pressure will be falsely high.
  - (5) If the cuff is too large- the blood pressure may be falsely low.
- c. Choose the appropriate arm.
  - (1) You should not use an arm:
    - (a) That has a dialysis shunt placed
    - (b) On the same side as a mastectomy
    - (c) On the side affected by a stroke
  - (2) You should try to use the same arm each time the blood pressure is taken.
- d. Remove any obstructive clothing from between the blood pressure cuff and the arm. A shirt sleeve can decrease the ability to hear the pulse sounds and may lead to inaccurate measurement.
- e. Place the cuff on the arm, checking the size and placement by use of the arrow or symbol on the cuff that should be over the artery.
- f. Loosen the stopcock on the bulb by turning it several times before tightening closed. This is to be sure you can loosen the stopcock easily with one hand.
- g. Place the blood pressure gauge in good view.
- h. The patient's arm should be placed at level even with his or her heart. If the patient is seated, rest the arm on the table.
  - (1) If the arm is left below the heart, particularly if the patient is standing, the blood pressure can be elevated by as much as 20 mmHg.
- i. The cuff should be pumped to 10 to 20 mmHg above the usual blood pressure or, if no previous blood pressures are recorded, pump to 160 to 180 mmHg.
- j. Loosen the stopcock on the bulb so that the pressure decreases by 2-3 mmHg per second. Listen carefully for the first sound.
  - (1) If sounds are heard right away, deflate the cuff immediately.
  - (2) Let the arm rest for at least 2 minutes or switch arms if possible.
  - (3) Repeat at step J but increase the inflation target to 220 mmHg.
- k. Note the pressure at which the first sound is heard. This is the systolic pressure.
- l. Continue to deflate the cuff at 2–3 mmHg per second.
- m. Note the point at which the sounds disappear. This is the diastolic pressure.

(1) In some patients the diastolic pressure never completely disappears.

(2) In these patients note the point at which the sounds muffle.

n. Record in the chart as systolic/diastolic and position of patient and which arm was used.

### **Steps to taking an Automatic Blood Pressure**

a. Positioning the Patient

(1) The patient should be resting for at least 5 minutes before the blood pressure is taken.

(2) Legs should not be crossed- this may falsely elevate the blood pressure.

(3) The patient should not be talking during blood pressure measurement. This may falsely elevate the blood pressure.

b. Choose the appropriate cuff size

(1) Cuff size is determined by the circumference of the arm.

(2) Cuff sizes are marked on the inside by a measuring line and a size: Pediatric, Adult Regular, Adult Large, and Thigh Cuff.

(3) Measure the cuff on the arm to make sure it is appropriately sized for the person.

(4) If the cuff is too small—the blood pressure will be falsely high.

(5) If the cuff is too large- the blood pressure may be falsely low.

c. Choose the appropriate arm.

(1) You should not use an arm:

(a) That has a dialysis shunt placed

(b) On the same side as a mastectomy

(c) On the side affected by a stroke

(2) You should try to use the same arm each time the blood pressure is taken.

d. Remove any obstructive clothing from between the blood pressure cuff and the arm. A shirt sleeve can decrease the ability to hear the pulse sounds and may lead to inaccurate measurement.

e. Place the cuff on the arm, checking the size and placement by use of the arrow or symbol on the cuff that should be over the artery.

f. The patient's arm should be placed at level even with his or her heart. If the patient is seated, rest the arm on the table.

(1) If the arm is left below the heart, particularly if the patient is standing, the blood pressure can be elevated by as much as 20 mmHg.

g. Press start on the automatic blood pressure monitor.

h. Record in the chart as systolic/diastolic and position of patient and which arm was used.

**Appendix B**

Pre-test/Post test questions for Health aides/Health Assistants/Medical Assistants

1. Diastolic blood pressure is determined when:
  - a. All sounds disappear
  - b. The sounds become muffled
  - c. The last sound is heard through the stethoscope
2. A cuff that is too small for the patient's arm will result in:
  - a. An inaccurately low reading
  - b. An inaccurately high reading
  - c. Sounds heard down to zero
3. Common causes of errors in blood pressure measurement include:
  - a. Cuff applied over clothing
  - b. Leaks in the tubing
  - c. Arm above or below heart level
  - d. Cuff deflated too rapidly
  - e. All the above
  - f. F. B and D only
4. Blood pressure should be taken again when the measurement reads:
  - a. 120/89
  - b. 146/62
  - c. 155/80
  - d. 108/72
  - e. B & C
  - f. All the above
5. What is the minimum length of time you want someone to be sitting before measuring a blood pressure?
  - a. 1 minute
  - b. 2 minutes
  - c. 5 minutes
  - d. 10 minutes
6. What is the minimum length of time you should wait to measure the first and second blood pressure reading?
  - a. 1 minute
  - b. 2 minutes
  - c. 5 minutes
  - d. 10 minutes
7. What should all be documented in the patient's chart?
  - a. Record in the chart as systolic/diastolic
  - b. position of patient
  - c. which arm was used.
  - d. All the above
8. What could increase the patient's blood pressure? Select all that apply.
  - a. Strong emotions

- b. pain
  - c. exercise
  - d. some diseases
  - e. medication intake
9. Which of the following statements is correct about measuring blood pressure?
- a. a noisy room is NOT a problem when taking a BP
  - b. the diastolic reading is the first sound you hear
  - c. the arm should be above the heart for an accurate reading

**Table 1.** Total of patients seen with an elevated blood pressure reading of >140/90mmHg.

	<b>Number of patients seen with elevated blood pressure &gt;140/90</b>
<b>LSX</b>	<b>282</b>
August	291
September	278
October	276
<b>Quick Sick</b>	<b>78</b>
August	74
September	61
October	99
<b>WHC</b>	<b>73</b>
August	85
September	70
October	64

**Table 2.** Number of patients seen with an elevated blood pressure reading of >140/90mmHg with Hypertension on their diagnosis list.

	<b>Patients with HTN diagnosis</b>
<b>LSX</b>	

August	97
September	182
October	183
<b>Quick Sick</b>	
August	28
September	19
October	39
<b>WHC</b>	
August	50
September	42
October	34

**Table 3.** Percent of patients with an elevated blood pressure reading who received a second blood pressure after 5 minutes at the same encounter. (Pre-data for LSX)

Month of testing at LSX	% follow-up BPs completed
January	33.5%
February	34.7%
March	33.2%
April	43.2%
May	42.3%
<b>Average</b>	<b>37.38%</b>

**Table 4.** Post-data for LSX

Month of testing at LSX	% of follow up BP taken
August	42.4%
September	43.68%
October	51.27%
<b>Average</b>	<b>45.78%</b>

**Table 5.** Pre-data for Quick Sick Clinic

Month of testing at Quick Sick	% follow-up BPs completed
January	24.1%

February	25.9%
March	39%
April	57%
May	56.9%
<b>Average</b>	<b>40.6%</b>

**Table 6.** Post-data for Quick Sick Clinic

Month of testing at Quick Sick	% of follow up BP taken
August	50%
September	57.4%
October	58.6%
<b>Average</b>	<b>55.3%</b>

**Table 7.** Pre-data for WHC

Month of testing at WHC	% follow-up BPs completed
January	15%
February	33.3%
March	27.7%
April	33.8%%
May	45.3%%
<b>Average</b>	<b>31.02%</b>

**Table 8.** Post-data for WHC

Month of testing at WHC	% of follow up BP taken
August	34.1%
September	31.4%
October	32.8%
<b>Average</b>	<b>32.8%</b>

**Table 9.** Number of patients with a second blood pressure reading taken

	Number of Second reading taken
<b>LSX</b>	
August	124
September	122
October	124

<b>Quick Sick</b>	
August	37
September	35
October	58
<b>WHC</b>	
August	29
September	22
October	21