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10

STEPS TO ACCURATE MANUAL
BLOOD PRESSURE MEASUREMENT

Working for a company that manufactures blood pressure devices and technology, I deal with blood pressure on some level every day. I make accurate blood pressure measurement my business...literally. So, it only makes sense that I should care about accurate blood pressure measurement from a fundamental perspective, which was the inspiration for this eBook.

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As most readers probably know, the typical method for blood pressure measurement has long been the manual auscultatory technique with a mercury column or mechanical aneroid sphygmomanometer. However, with the benefits that automated BP devices provide with a repeatable standardized technique and removal of observer bias, there has been a shift towards automated devices in clinical practice. As the American Heart Association (AHA) states in their most recent recommendations for blood pressure measurement, "there is a role for (automated) devices in office use, both as a substitute for traditional (manual) readings and as supplements to them."* However, the AHA goes on to recommend that a properly maintained monitor for manual measurement of blood pressure be available for routine office measurement.

Another observation the AHA makes in their statement, is that although the auscultatory method has been the standard for blood pressure measurement for over 50 years, surveys indicate that physicians rarely follow the well published guidelines for their use.* This is where we feel it is important to remind all healthcare professionals of best practices related to blood pressure measurement, so without further ado...

*Recommendations for Blood Pressure Measurement in Humans and Experimental Animals (Hypertension. 2005;45:142.) © 2005 American Heart Association, Inc.

STEP 1 CHOOSE THE RIGHT EQUIPMENT

What you will need:

A quality stethoscope – quality counts with regards to accuracy.

An appropriately sized blood pressure cuff

A blood pressure measurement instrument such as an aneroid or mercury column sphygmomanometer or an automated device with a manual inflate mode. (For the purpose of this guide, our example will focus on the use of a manual mechanical gauge.)

STEP 2 PREPARE THE PATIENT

(allow at least a five minute rest before a reading) and sitting in an upright position with their upper arm positioned so that it is level with their heart.

Make sure that the patient is relaxed (allow at least a five minute rest before a reading) and is sitting in an upright position with their upper arm positioned so that it is level with their heart. You can use a table or armrest to make this more comfortable for your patient. The patient's feet should be flat on the floor, if possible. Talking or chewing gum increases blood pressure so the patient should refrain from talking during the reading. Be sure to remove any excess clothing that might overlap with the BP cuff or constrict blood flow in the arm.

STEP

3

CHOOSE THE PROPER BP CUFF SIZE

measure your patient's arm circumference (typically in centimeters) to determine the appropriate cuff size.

This is one of the most important (and often overlooked) steps in the process for acquiring an accurate blood pressure reading. If possible, measure your patient's arm circumference (typically in centimeters) to determine the appropriate cuff size. Most blood pressure cuffs should have the RANGE measurement on the label. Additionally, most BP cuffs have a range area located on the inside of the cuff. If you do not have a tape measure, you can simply wrap the cuff around the patient's arm and use the INDEX line to determine if your patient's arm circumference falls within the range area.

STEP

4

PLACE THE BP CUFF ON THE PATIENT'S ARM

Another important factor for acquiring an accurate blood pressure reading is proper BP cuff placement. First, palpate/locate the brachial artery. Position the BP cuff so that the ARTERY marker points to the brachial artery. Wrap the BP cuff snugly around the arm making sure that the cuff is a couple of centimeters above the elbow crease and is not in contact with any clothing.



STEP 5 POSITION THE STETHOSCOPE

Check to ensure that the stethoscope ear pieces are angled forward as you are inserting the stethoscope into your ears so that the sound is being transferred for optimal listening. Next, on the same arm that you placed the BP cuff, palpate the arm at the antecubital fossa (crease of the arm) to locate the strongest pulse sounds and place the bell of the stethoscope over the brachial artery at this location.

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STEP 6 INFLATE THE BP CUFF

Before you begin inflation, check that there are no kinks in the cuff hose and make sure that the cuff connectors are properly/tightly fastened. (If you are using a sphygmomanometer, close the air release valve by turning it clockwise.) Begin pumping the cuff bulb as you listen to the pulse sounds. When the BP cuff has inflated enough to stop blood flow you should hear no sounds through the stethoscope. The gauge should read 30 to 40 mmHg above the person's normal BP reading. If this value is unknown you can inflate the cuff to 160 - 180 mmHg. (If pulse sounds are heard right away, inflate to a higher pressure.)

STEP

7

SLOWLY DEFLATE THE BP CUFF

This step is another leading cause of inaccuracies in BP measurement so please be mindful of your deflation rate.

This step is another leading cause of inaccuracies in BP measurement so please be mindful of your deflation rate. Begin deflation (Turn the air release valve counterclockwise if you are using a sphygmomanometer). The AHA recommends that the pressure should fall at 2 – 3 mmHg per second, anything faster may likely result in an inaccurate measurement. *

STEP

8

LISTEN FOR THE SYSTOLIC READING

The first occurrence of rhythmic sounds you hear as blood begins to flow through the artery are the patient's systolic pressure. This may resemble a tapping noise at first.

*Recommendations for Blood Pressure Measurement in Humans and Experimental Animals (Hypertension. 2005;45:142.) © 2005 American Heart Association, Inc.



STEP 9 LISTEN FOR THE DIASTOLIC READING

Continue to listen as the BP cuff pressure drops and the sounds fade. Note the gauge reading when the rhythmic sounds stop. This will be the diastolic reading.

STEP 10 DOUBLE CHECK FOR ACCURACY

Typically blood pressure is higher in the mornings and lower in the evenings.

The AHA recommends taking a reading with both arms and averaging the readings. To check the pressure again for accuracy wait about five minutes between readings. Typically, blood pressure is higher in the mornings and lower in the evenings. If the blood pressure reading is a concern or masked or white coat hypertension is suspected, a 24 hour blood pressure study may be required to assess the patient's overall blood pressure profile.

**About the author:**

Kenneth Andersen, Director of Marketing for SunTech Medical, Inc., holds a Masters degree in Biomedical Engineering from The University of North Carolina at Chapel Hill and a BS in Electrical and Computer Engineering from the University at Buffalo (SUNY Buffalo). Prior to joining SunTech Medical as a Product Manager in 2002, he served as a Research Engineer for Xanthon, Inc. (Research Triangle Park, NC) and as a Physical Design Engineer for IBM (Research Triangle Park, NC). Kenneth has been a guest lecturer for UNC and NC State's joint Biomedical Engineering Department and a featured speaker for the North Carolina Center for Entrepreneurial Development's MedTech series.

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