Michigan Department of Community Health

MDCH

PROCEDURE FOR MEASUREMENT OF BLOOD PRESSURE

1. CHECK THE EQUIPMENT. Do not use if any problems are found.
    a. Look to see that the gauge needle is at zero.
    b. Check the cuff for any breaks in stitching or tears in the fabric.
    c. Check the rubber tubing for cracks or leaks, especially at connections.
    d. Be sure three sizes of cuffs are accessible (small, regular, and adult large).
    e. Recommend 12-15 inch stethoscope tubing **and bell/diaphragm stethoscope head.**

2. PLACE THE MANOMETER so it can be viewed straight on and within 15 inches of the viewer.

3. RIGHT ARM will be used when possible. Upper arm should be bare and unconstricted by clothing.

4. SELECT THE APPROPRIATE SIZE CUFF. The bladder width should equal at least 40% of the circumference of the upper arm, and the length of the bladder should be 80% of the circumference of the arm, but no more than 100%. A large size cuff should be use on an arm 33 -40.9 cm in circumference.

5. PALPATE the location of the brachial artery (on the upper arm's inner aspect).

6. POSITION the center of the cuff's bladder over the brachial artery.

7. APPLY THE CUFF evenly and snugly one-inch (2.5 cm) above the antecubital fossa (bend of arm). CHECK SNUGNESS at both top and bottom of the cuff.

8. POSITION THE ARM so the cuff is at heart level. The arm should rest firmly supported on a table, slightly abducted and bent, with palm up. Readings should not be taken on an exam table.

9. For the first reading only, **OBTAIN ESTIMATED SYSTOLIC PRESSURE**.
    a. Palpate the radial artery pulse.
    b. Inflate the cuff to the point where the pulse can no longer be felt.
    c. Slowly deflate the cuff, noting on the gauge the point where the pulse reappears/can again be felt. This is the estimated systolic pressure.

    Rapidly deflate the cuff. Wait at least 15-30 seconds before re-inflating the cuff to begin the first auscultatory measurement. (This allows good circulation to be reestablished.)

10. CALCULATE the maximum inflation level (MIL) by adding 30 mm Hg to the estimated systolic pressure. (This figure will be utilized in Step #14.)

11. CHECK THE CLIENT'S POSITION. Legs should be uncrossed, feet resting firmly on the floor and the back supported while blood pressure is being measured. (Clients may need to be reminded to uncross their legs each time you are ready to take a blood pressure reading.)

12. INSERT the stethoscope earpieces, angled forward to fit snugly.

13. PLACE THE BELL OR THE DIAPHRAGM HEAD of the stethoscope lightly over brachial artery at the bend of the elbow, but with good skin contact. Avoid too much pressure, which can close off the vessel and distort the sounds, therefore altering the reading. (The bell head is preferred because it permits more accurate auscultation of the Korotkoff sounds than the diaphragm, especially in the interpretation of diastolic readings.)

14. INFLATE the cuff as rapidly as possible to maximum inflation level (MIL), calculated in Step #10 (30 mm above estimated systolic pressure).

15. DEFLATE THE CUFF SLOWLY and CONSISTENTLY at the rate of 2 mm per pulse beat. The rate of deflation should be slow enough to accurately evaluate the exact millimeter marking of the Korotkoff sounds. Once deflation has begun, never reinflate.

16. NOTE where the first of two consecutive beats appears in relation to the number or markings on the gauge. This is the systolic pressure.

17. CONTINUE DEFLATION at the established rate. NOTE on the gauge where the last sound is heard. This is the diastolic pressure (5th Korotkoff phase) in adults.

18. CONTINUE DEFLATION for 10 mm Hg past the last sound. (This assures that the absence of sound is not a "skipped" beat but is the true end of the sound.) Then deflate the cuff rapidly and completely.

19. RECORD the readings to the nearest 2 mm (round off upward). This means all readings taken with non-electronic equipment will be stated and written in even numbers.

20. MAKE NOTATIONS of cuff, arm and position only if there are variations from the standard procedure of seated, regular cuff, right arm and fifth Korotkoff phase.

21. When an auscultatory gap is heard (at least 2 initial beats, then absence of regular REPEAT the measurement 30 seconds or more after the cuff is completely deflated.

22. Reporting for READINGS where examiner has questions:
    a. This allows for circulation to adequately return and permits a true reading.
    beats), do not record the first disappearance of sound as the diastolic reading. The sound will soon return as decompression of the vessel continues. The sound will finally disappear, indicating true diastolic.
    b. When sounds are too soft to be certain of either systolic or diastolic readings, "discard" this reading. Institute augmentation procedures on the next attempt. Always inflate the cuff to the MIL as rapidly as possible.

AUGMENTATION PROCEDURES:

Have the client raise the arm prior to inflation to drain the blood from forearm. Inflate the cuff rapidly and then have the client lower his/her arm to the standard position. Apply the stethoscope immediately and begin deflation.

After inflation, keep the valve closed and have the client open and close her/his fist 5-6 times. Then apply the stethoscope immediately and begin deflation.

If the arm size is larger than a “large adult or thigh cuff size” on few occasions, the screener may consider using the lower arm blood pressure measurement procedure. This procedure is available from MDCH.

NOTE: Mercury manometers cannot be used in Michigan for routine screening. They can be used to evaluate accuracy of aneroid or automatic devices. Aneroid manometers should be properly maintained and accuracy evaluated every 6 months, at a minimum.

Source: (1) "Recommendations for Blood Pressure Measurement in Humans and Experimental Animals: Part 1 BP Measurement in Humans.” AHA Medical/Scientific Statement: *Hypertension*. Vol. 45, 2005. pp 142-16; (2) The Seventh Report of the Joint Committee on Detection, Evaluation and Treatment of High Blood Pressure (NIH Publication No. 04-5230, *Hypertension.* 2003:42; 1206-1252.