

Manual blood pressure measurement to screen and confirm BP

What is manual blood pressure measurement?

Measuring blood pressure with an *aneroid* or *mercury sphygmomanometer*.



Why is manual blood pressure measurement important?

Although automated blood pressure measurement devices are highly accurate, you will still need to manually check a blood pressure from time to time. When you do, it is very important to use good technique in order to avoid getting falsely high or low blood pressure readings that could lead to incorrect care or harm.

When do we use manual blood pressure measurement?

When patients have upper arms that are too large for the largest automated blood pressure cuff, or when they have an irregular heart rhythm (*active* atrial fibrillation or when they have frequent premature ventricular contractions (PVCs)).

How should we perform manual blood pressure measurement?

The steps for performing manual blood pressure measurement are similar to those for automated devices but may require more attention from you. It is very important that you take the time to perform these steps carefully:

1. Prepare you patient just like you would for any BP measurement

- Seated quietly
- Back supported
- Correct cuff size on bare upper arm
- Arm supported
- Cuff at heart level
- Legs uncrossed
- Feet supported



the cuff
(near the

2. Determine how much you will need to inflate

- Locate and monitor the radial pulse (near the thumb)
- Inflate the cuff until the radial pulse disappears

disappears

– this is the *minimum inflation level*. (MIL). Remember this number because you will use it in step 4.

3. Put on your stethoscope and place the bell over the brachial artery (in the crease of the elbow)

4. Inflate the cuff until the pressure on the dial is 30 mmHg higher than the MIL.

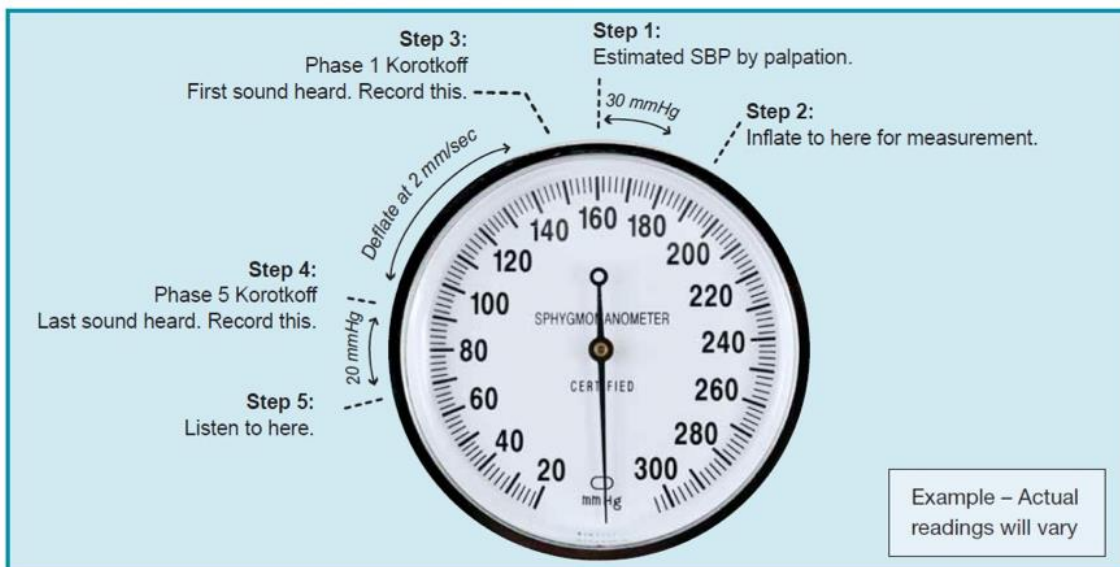
5. Release the valve so that the cuff deflates slowly. The cuff should deflate no faster than 2 mmHg/sec.



Rule of thumb:

If it takes you less than 45 seconds to deflate the cuff, you are deflating it too fast!

6. As you deflate the cuff, watch the needle as it passes each tic mark on the dial. The point where you begin to hear heart sounds is the systolic blood pressure. Remember this number.
7. Keep watching the needle until you hear the heart sounds disappear. The point where the heart sounds disappear is *probably* the diastolic blood pressure. Remember this number.
8. Sometimes, the heart sounds disappear and then re-appear, leading us to mistakenly record the wrong point where heart sounds disappear. It is important to keep watching the needle until it is at least 20 mmHg lower than the point where the heart sounds first disappeared.
 - a. If heart sounds do *not* reappear, the point where the sounds first disappeared (in step 7) is the true diastolic blood pressure.
 - b. If the heart sounds reappear, keep listening until the heart sounds disappear completely again. The point where the heart sounds disappear again is the true diastolic blood pressure.
9. Deflate the cuff completely.



- If you are obtaining a *screening* blood pressure measurement, you are done.
- If you are obtaining a *confirmatory* blood pressure measurement, then repeat steps 3-9 two more times and calculate the average of all three blood pressure readings.

Helpful tips

- The most common mistake health care workers make when measuring blood pressure manually is to deflate the cuff too quickly. Remember to take your time, so that you detect *exactly* when pulse sounds appear and disappear.

Manual blood pressure devices are calibrated to be precise within 2 mmHg; record the exact systolic and diastolic blood pressures – do not round the number up or down.

For more information

- Beevers, G., et al. (2001). "ABC of hypertension: Blood pressure measurement. Part II-conventional sphygmomanometry: technique of auscultatory blood pressure measurement." *BMJ* **322**(7293): 1043-1047.
- Williams, J. S., et al. (2009). "Videos in clinical medicine. Blood-pressure measurement." *N Engl J Med* **360**(5): e6.

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