

INDIAN HYPERTENSION GUIDELINES-II

MEASUREMENT OF BLOOD PRESSURE

Clinic measurement

- Blood pressure (BP) is characterized by large spontaneous variations, therefore the diagnosis of hypertension should be based on multiple BP measurements taken on several separate occasions.
- Standard mercury sphygmomanometer should be used. Use a standard cuff with a bladder that is 12 cm X 35 cm. Use a large bladder for fat arms and a small bladder for children. The bladder should encircle and cover two-thirds of the length of the arm. Proper maintenance and calibration of the sphygmomanometer should be ensured. Whenever aneroid sphygmomanometer is used, its accuracy should be checked against standard mercury sphygmomanometer at regular intervals.
- For measurement, inflate the bladder quickly to a pressure 20 mm Hg higher than the point of disappearance of the radial pulse. Deflate the bladder slowly by 2 mm Hg every second.
- The first appearance of the sound (Phase I Korotkoff) is the systolic BP. The disappearance of the sound (Phase V Korotkoff) is the diastolic BP. For children and in those with high output states, muffling of the sound (Phase IV Korotkoff) is taken as diastolic pressure.

Precautions

The following precautions are required for correct measurement of blood pressure:

- At the initial visit, an average of three readings, taken at intervals of 2-3 minutes should be recorded.
- For confirmation of diagnosis of hypertension, record at least 3 sets of readings on different occasions, except in Stage III hypertension.
- Patients should be asked to refrain from smoking or drinking tea/coffee, exercise for at least 30 minutes before measuring the BP.
- Allow the patient to sit for at least five minutes in a quiet room before beginning blood pressure measurement.
- Measurement should be done preferably in a sitting or supine position. Patient's arm should be fully bared and supported at the level of the heart.
- Measure the blood pressure in both arms at the first visit and use higher of the two readings.
- In older persons aged 60 years and above, in diabetic subjects and patients on antihypertensive therapy, the BP should be measured in both, supine/sitting and in standing positions to detect postural hypotension.
- If atrial fibrillation is present, additional readings may be required to estimate the average SBP and DBP.
- Occasionally, thigh BP (popliteal) has to be measured with appropriately large cuff, especially in younger persons with hypertension. Normally thigh SBP is higher and DBP a little lower than the arm BP because of the reflected pulse wave. This is important for suspected coarctation and non-specific aortoarteritis.

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Home BP measurement

Measurement of blood pressure outside the clinic may provide valuable information for the initial evaluation of patients with hypertension and for monitoring the response to treatment. Home measurement has the advantage that it distinguishes sustained hypertension from "white-coat hypertension", a condition noted in patients whose blood pressure is elevated in the physician's clinic but normal at other times. There is no universally agreed upper limit of normal home blood pressure, but readings of 135/85 mm Hg or greater should be considered elevated.

In our country, considering the socioeconomic and educational level, this method has limitations and may not be generally advocated.

Although the mercury sphygmomanometer is still the most accurate device for clinical use, it is generally less practical for home use. The electronic devices when used should be periodically checked by simultaneous recordings taken with mercury sphygmomanometer. Finger monitors are inaccurate and are not recommended. The patient should be educated not to change medication without consulting their physician.

Self-measurement although ensures patient compliance due to participation, carries a risk of generating greater anxiety and thereby self-modification of treatment.

Ambulatory blood pressure monitoring

It has been found that at least 20-25% of patients diagnosed with stage I-II hypertension (DBP 90-104 mm Hg) are normotensive outside the physician's clinic. Ambulatory blood pressure monitoring (ABPM) has been found to be clinically useful only in the following settings: to identify non-dippers and white-coat hypertension, evaluate drug resistant hypertension, episodic hypertension, evaluate antihypertensive drugs and in individuals with hypotensive episodes while on antihypertensive medication. However, this procedure should not be used indiscriminately in the routine work-up of a hypertensive patient because of its high cost.

BP has a reproducible circadian profile with higher values while awake and mentally and physically active, whereas, much lower values during rest and sleep. Different values have been suggested for definition of hypertension with ABPM for day time average BP (>140/90 mm Hg) and the night-time average (>125/75 mm Hg). Early morning surge in BP for 3 or more hours during transition from sleep to wakefulness, can be an independent risk factor and needs to be managed effectively.²²

Table 4: Blood pressure thresholds (mm Hg) for definition of hypertension with different types of measurement.²³

	SBP (mm Hg)	DBP (mm Hg)
Office or Clinic	140	90
Home (self)	135	85
ABPM (24-hour average)	125	80

SBP: Systolic Blood Pressure; **DBP:** Diastolic Blood Pressure