



# Measuring Blood Pressure

## Top Ten Tips

- 1 Ensure that only clinically validated equipment is purchased for use and that all sphygmomanometers are regularly checked — mercury devices at least annually and aneroid devices at least twice a year.** Automated devices should only be used if re-calibration is undertaken in accordance with the manufacturer's instructions. It is good practice to delegate the task of ensuring regular calibration checks and maintenance to a designated individual.
- 2 Ensure each consulting room has both large and regular cuffs as this reduces the likelihood of cuffs being inappropriately used.** 'Miscuffing' can introduce large errors in measurement. 'Undercuffing' (either too narrow or too short a bladder) can lead to overestimation of BP, while 'overcuffing' (too wide or too long a bladder) may lead to underestimation.
- 3 Raised blood pressure should not be discounted on the basis of suspected anxiety.** If there is doubt about the relevance of readings during a consultation, the measurements should be repeated on a couple of occasions. The patient should be allowed to rest, sitting for at least 5 minutes before undertaking the initial measurements. While measuring blood pressure, the patient should not be talking or have their legs crossed. Three measurements should usually be taken, discarding the first. If there is still a large discrepancy (>10mmHg systolic) then ambulatory blood pressure monitoring (ABPM) should be considered.
- 4 BP should initially be measured in both arms and the arm with the higher values should be used for subsequent measurements.** A difference in blood pressure between the arms can be expected in about 20 per cent of patients. If the difference between the arms is more than 20mmHg for systolic or 10mmHg for diastolic pressure on three consecutive readings the patient should be considered for referral for further evaluation.
- 5 Arm support is very important.** Muscle contraction in an unsupported arm can raise diastolic BP by as much as 10 per cent while raising the arm above heart level leads to an underestimation by as much as 10mmHg. The arm should be supported in a horizontal position with the cuff at the level of the heart as denoted by the midsternal level.
- 6 Try to measure BP at the same time of day where practically possible.** BP rises with waking and then tends to fall through the day. Current guidelines do not make specific recommendations regarding the time when it should be measured but it seems sensible to try to measure it at a consistent time.
- 7 When interpreting the results of ABPM it should be remembered that average daytime values are approximately 10/5 mmHg lower than surgery measurements.** Thresholds and targets for treatment which are based on clinic values should be adjusted accordingly.
- 8 Be alert to 'white coat effect'.** BP readings can increase in both normotensive and hypertensive patients, (untreated and treated) when the measurement is taken by a healthcare professional.
- 9 Remember BP variability is large and studies have shown it can vary from the mean by a standard deviation of 12/8mmHg in the same patient on different days.** In one study, 15 readings (over five different days, three readings per occasion) were required to reduce variability by 80 per cent.
- 10 Measurement of blood pressure by any method is less reliable in the presence of arrhythmias such as atrial fibrillation.** This is because there can be large beat to beat variation when heart rhythm is irregular. Although current guidelines do not recommend auscultatory endpoints in these situations, using a greater than usual number of readings may not only improve precision but also increase the agreement between oscillometric and mercury measured blood pressures.