Ambulatory Blood Pressure Monitoring

What is this?
Ambulatory blood pressure monitoring (ABPM) is a non-invasive method of obtaining blood pressure readings over a 24-hour period, whilst the patient is in their own environment, representing a true reflection of their blood pressure.

Many studies have now confirmed that blood pressure measured over a 24-hour period is superior to clinic blood pressure in predicting future cardiovascular events and target organ damage.\(^1,2\)

See also related separate article Hypertension.

What does ambulatory blood pressure monitoring involve?
Blood pressure is measured over a 24-hour period, using auscultatory or oscillometry devices, and requires use of a cuff. The monitor takes blood pressures every 20 minutes (less frequently overnight - eg, one-hourly).

What are the uses of ambulatory blood pressure monitoring?
- To obtain a twenty-four hour record - more reliable than one-off measurements. Studies have shown that increased blood pressure readings on ABPM are more strongly correlated to end-organ damage than one-off measurements - eg, left ventricular hypertrophy.\(^3\)
- To detect white coat hypertension.
- It has use in hypertension research - eg, reviewing 24-hour profile of antihypertensive medication.
- It may have prognostic use - higher readings on ABPM are associated with increased mortality.\(^4\)
- Response to treatment.\(^3\)
- Masked hypertension.\(^2\)
- Episodic dysfunction.\(^2\)
- Autonomic dysfunction.\(^2\)
- Hypotensive symptoms whilst on antihypertensive medications.\(^2\)
- It may be more cost-effective in the long term than office blood pressure measurement.

Who should be referred for ambulatory blood pressure monitoring?
- The National Institute for Health and Care Excellence (NICE) recommends that if a clinic blood pressure is 140/90 mm Hg or higher, ABPM should be offered to confirm the diagnosis of hypertension. If a person is unable to tolerate ABPM, home blood pressure monitoring (HBPM) is a suitable alternative to confirm the diagnosis of hypertension.\(^5\)
- Poorly controlled hypertension - eg, suspected drug resistance.
- Patients who have developed target organ damage despite control of blood pressure.
- Patients who develop hypertension during pregnancy.
- High-risk patients - eg, those with diabetes mellitus, those with cerebrovascular disease, and kidney transplant recipients.\(^6,7\)
- Suspicion of white coat hypertension - high blood pressure readings in clinic which are normal at home.
- Suspicion of reversed white coat hypertension, ie blood pressure readings are normal in clinic but raised in the patient's own environment.
- Postural hypotension.
- Elderly patients with systolic hypertension.\(^8\)
Upper limit of normal ambulatory blood pressure monitoring values

Normal ambulatory blood pressure during the day is <135/<85 mm Hg and <120/<70 mm Hg at night. Levels above 140/90 mm Hg during the day and 125/75 mm Hg at night should be considered as abnormal.\[9\]

Downside to ambulatory blood pressure monitoring

- It is not universally available although this is improving.
- It requires specialist training.
- Some patients find inflation of the cuff unbearable.
- Sleep disturbance.
- Bruising where the cuff is located.
- Background noise may lead to interference (less with oscillometric methods).
- Poor technique and arrhythmias may cause poor readings.\[3\]
- There is some evidence that HBPM may be better than ABPM for predicting cardiovascular risk at every level below severe hypertension (≥160/≥100 mm Hg). However, these findings need to be confirmed by larger trials.\[10\]

How are the results of ambulatory blood pressure monitoring provided?

- This varies according to the machines used.
- Usually, they have individual systolic and diastolic pressures. These may also be represented in a graphic form.
- Blood pressure load - the percentage or proportion of readings that are higher than a predetermined level in twenty-four hours.
- NICE recommends ensuring that at least two measurements per hour are taken during the person's usual waking hours (for example, between 08:00 and 22:00 hours). Use the average value of at least 14 measurements taken during the person's usual waking hours to confirm a diagnosis of hypertension.\[5\]

Dippers and non-dippers

- Blood pressure will fall at night in normotensive individuals. People who undergo this normal physiological change are described as ‘dippers’.\[11\]
- In 'non-dippers' the blood pressure remains high, ie less than 10% lower than daytime average. There is also the phenomenon of 'reverse dippers' whose blood pressure actually rises at night. Both these conditions have also been reported to be associated with a poor outcome.\[11\]

Further reading & references

5. Hypertension: management of hypertension in adults in primary care; NICE Clinical Guideline (August 2011)
9. Ambulatory blood pressure monitoring; British Heart Foundation, 2011


Disclaimer: This article is for information only and should not be used for the diagnosis or treatment of medical conditions. EMIS has used all reasonable care in compiling the information but makes no warranty as to its accuracy. Consult a doctor or other healthcare professional for diagnosis and treatment of medical conditions. For details see our conditions.

Original Author: Dr Gurvinder Rull
Current Version: Dr Laurence Knott
Peer Reviewer: Dr Jacqueline Payne

Document ID: 1792 (v22)
Last Checked: 15/07/2014
Next Review: 14/07/2019

View this article online at: patient.info/doctor/ambulatory-blood-pressure-monitoring
Discuss Ambulatory Blood Pressure Monitoring and find more trusted resources at Patient.

Ask your doctor about Patient Access
- Book appointments
- Order repeat prescriptions
- View your medical record
- Create a personal health record (iOS only)

© Patient Platform Limited - All rights reserved.