**UNDERSTANDING OF THE AMBULATORY ARTERIAL PRESSURE MONITORING**

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Ambulatory blood pressure monitoring (ABPM) is a noninvasive method of obtaining [blood pressure](http://www.patient.co.uk/search.asp?searchterm=BLOOD+PRESSURE+READING&collections=PPsearch) readings over twenty-four hours, 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.

It is believed to be able to reduce the [white coat hypertension](http://en.wikipedia.org/wiki/White_coat_hypertension) effect in which a patient's blood pressure is elevated during the examination process due to nervousness and anxiety caused by being in a clinical setting. Out-of-office measurements are highly recommended as an adjunct to office measurements by almost all hypertension organizations.

**Common terms associated with 24 hours blood pressure measuring.**

* White coat hypertension
* Masked hypertension
* Blood pressure variability
* Nocturnal hypertension (dipper or non dipper)

What is white coat hypertension?

[**White coat**](http://en.wikipedia.org/wiki/White_coat)[**hypertension**](http://en.wikipedia.org/wiki/Hypertension), more commonly known as **white coat syndrome**, is a phenomenon in which patients exhibit elevated [blood pressure](http://en.wikipedia.org/wiki/Blood_pressure) in a clinical setting but not in other settings. It is believed that this is due to the [anxiety](http://en.wikipedia.org/wiki/Anxiety) some people experience during a clinic visit.

**M**[**asked hypertension**](http://en.wikipedia.org/wiki/Masked_hypertension)**?**

The term "[masked hypertension](http://en.wikipedia.org/wiki/Masked_hypertension)" can be used to describe the contrasting phenomenon, where blood pressure is elevated during daily living, but not in an office setting

Blood pressure variability

24-hour, non-invasive ambulatory blood pressure (BP) monitoring allows estimates of cardiac risk factors including excessive BP variability or patterns of circadian variability known to increase risks of cardiovascular event.

Nocturnal hypertension

Ambulatory blood pressure monitoring allows blood pressure to be intermittently monitored during sleep, and is useful to determine whether the patient is a **dipper** or **non-dipper**—that is to say whether or not blood pressure falls at night compared to daytime values. A night time fall is normal and desirable. It correlates with relationship depth but other factors such as sleep quality, age, hypertensive status, marital status, and social network support. Absence of a night time dip is associated with poorer health outcomes, including increased mortality in one recent study. In addition, nocturnal hypertension is associated with end organ damage and is a much better indicator than the daytime blood pressure reading.

**What does ambulatory blood pressure monitoring involve?**

**What !**

Blood pressure is measured over twenty-four hours using auscultatory or oscillometry and requires use of a cuff. The monitor takes blood pressures every 20 minutes (less frequently overnight, eg 1-hourly).

**Why!**

By measuring blood pressure at regular intervals over 24 hours, it’s possible to get clear pictures of how the blood pressure changes throughout the day.

**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.
* 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.[
* Response to treatment.
* Masked hypertension.
* Episodic dysfunction.
* Autonomic dysfunction.
* Hypotensive symptoms whilst on antihypertensive medications.
* It may be more cost-effective in the long-term.

**Who should be referred for ambulatory blood pressure monitoring?**

* Any patient with persistently raised blood pressure readings or labile blood pressure should be considered for ABPM (whether or not on treatment). However, it is not a screening tool.
* Borderline readings in clinic.
* 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 renal transplant recipients.
* Suspicion of white coat hypertension - high blood pressure readings in clinic which are normal at home.
* Suspicion of reversed white coat hypertension, i.e blood pressure readings are normal in clinic but raised in the patient's own environment.
* Postural hypotension.
* Elderly patients with systolic hypertension.

It is important to make sure that the tube to the machine is not twisted or bent. Also, just before the machine is about to take a reading, it will beep. When this happens patient should:

1. sit down, if possible
2. keep the cuff at the same level with heart
3. keep arm steady.

Also a diary of what the patient were doing just before the reading was taken is needed, what time he went bed and got up and if and when he took medications.

**Upper limit of normal ambulatory blood pressure monitoring values**

Normal ambulatory BP during the day is <135/<85 and <120/<70 at night.

Levels above 140/90 during the day, and 125/75 at night should be considered as abnormal.

**Downside to ambulatory blood pressure monitoring**

* It is not widely 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.

**How are the results of ambulatory blood pressure monitoring provided?**

* This varies according to the machines used.
* Night-time mean, daytime mean and overall mean are also provided.
* 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.
* There are lots of other analyses that are possible - they have varied uses.

Day and night blood pressure: there is some evidence that night-time blood pressure gives crucial information, such as higher night-time readings being more associated with risk of developing target end-organ damage.