

AN ARTICLE  
FEATURING**Dr Charles  
Nelson**

# 24-hour ambulatory BP monitor (ABPM)

**The overall prevalence of hypertension is 45% (~50% in ~50 yo and >80% in >75yo). Treatment of hypertension is the most common reason for outpatient visits in rooms and for the use of chronic prescription medications. More than half of hypertensive individuals do not have adequate blood pressure (BP) control.**

For a higher risk population [characterised by atherosclerotic cardiovascular disease (ASCVD), heart failure, diabetes, chronic kidney disease, age  $\geq 65$  yrs or a calculated 10-year risk of an ASCVD event  $\geq 10\%$ ] the ACC/AHA 2017 threshold for the diagnosis of hypertension is a clinic or home BP of  $>130/80$  mm Hg or a 24-hour mean BP of  $>125/75$  or Daytime (awake) mean of  $\geq 130$  / $\geq 80$  mmHg or Nighttime (asleep) mean of  $\geq 110$  / $\geq 65$ .

For a lower-risk population (i.e. without the above risk factors) the threshold is clinic BP of  $>140/90$  or home BP of  $>135/85$  or 24-hour mean of greater than  $130/80$  mm Hg or Daytime (awake) mean of  $\geq 135$  / $\geq 85$  mmHg or Nighttime (asleep) mean of  $\geq 120$  / $\geq 70$ .

For both high and low risk populations the target blood pressure is the same: 24-hour mean BP of  $<125/<75$  or Daytime (awake) mean of  $<130/<80$  mmHg or Nighttime (asleep) mean of  $<110/<65$ . The equivalent clinic and home reading targets are  $<130/<80$ .

Two scenarios impact the diagnosis of hypertension: white coat hypertension and masked hypertension

**White coat hypertension** is defined by the in-clinic BP above diagnostic threshold for hypertension and mean out-of-clinic readings below diagnostic threshold for hypertension. It has a prevalence of up to 20% and is more common in older adults, women and those whose clinic readings are close to the diagnostic threshold. White coat hypertension does not merit pharmacotherapy.

**Masked hypertension** is defined by mean in-clinic BP below diagnostic threshold for hypertension and mean out-of-clinic readings above diagnostic threshold for hypertension.

Another common scenario can occur where the white coat effect makes monitoring the appropriate dosing of blood pressure treatments difficult.

**White coat effect**, also known as treated white coat hypertension, is defined by the following in a treated patient (ie, already being treated with antihypertensive medication)

1. Mean blood pressure at or below the patient's goal based upon out-of-office readings.
2. Mean blood pressures above the patient's goal by office-based readings.

In patients with white coat effect, pharmacotherapy should be guided by Ambulatory Blood Pressure Monitoring (ABPM) and not by other BP measurements.

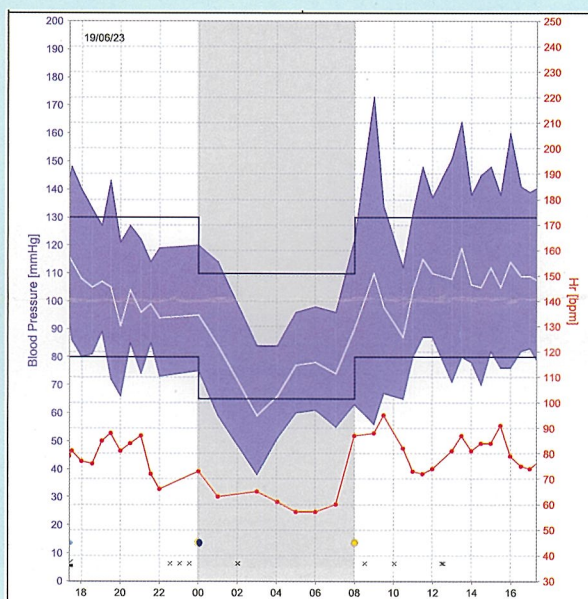
It has a prevalence of up to 30% and is more prominent in men, diabetics, chronic kidney disease patients and obstructive sleep apnoea patients. Patients with masked hypertension require pharmacotherapy guided by ABPM and not by other BP measurements.

## The role of ABPM

Ambulatory Blood Pressure Monitoring is superior to both clinic blood pressure measurements and home blood pressure measurements for prediction of future cardiovascular events and is the widely recognised (including American College of cardiology) reference standard for the diagnosis of hypertension and the titration of antihypertensive medication. Compared with ABPM, the sensitivity and specificity of clinic BP are poor (both 75 percent).

ABPM is performed using a device worn by the patient that automatically takes blood pressure measurements over a 24-to-48-hour period. This usually occurs in fixed 15-to-30-minute intervals during the daytime, and 30-to-60-minute intervals during sleep. These blood pressures are recorded on the device, and the average day (diurnal) or night (nocturnal) pressures are calculated by a computer.





Graph of 24 hr ABPM

A reasonable argument can be made that ABPM would be superior to and value add if used for all outpatient BP done to diagnose or monitor hypertension. In particular, the reasons to evaluate a patient for masked or white coat hypertension using ABPM are:

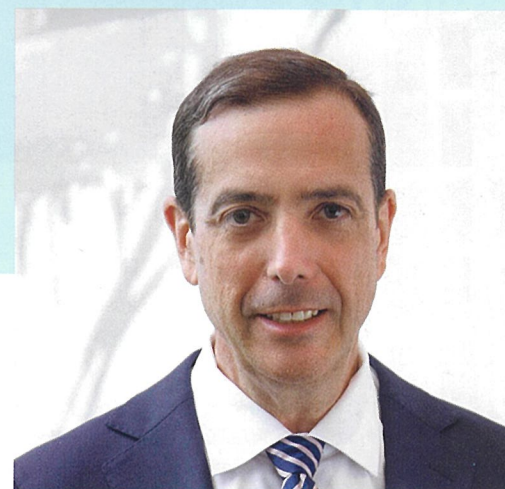
- Office-based BPs 10 or less below the patient's goal (eg, systolic pressure 120 to 129)
- Office-based BPs below the patient's goal plus any of the following:
  - Elevated atherosclerotic cardiovascular disease risk (eg, 10-year atherosclerotic cardiovascular disease risk >10%)
  - Chronic kidney disease
  - Diabetes mellitus
  - Evidence of new or worsening end-organ damage (eg, prior atherosclerotic cardiovascular event, heart failure, left ventricular hypertrophy, hypertensive retinopathy)
- Office-based BPs above the patient's goal (but <180/120) despite a 3-month trial of lifestyle modifications, and no evidence of hypertensive end-organ damage
- Office-based BPs at or above the patient's goal with symptoms of hypotension (eg, lightheadedness, falls) at home or work
- Labile office-based BPs

There are significant cost savings when ABPM diagnoses white coat hypertension eliminating with the need for medication and intensive follow-up.

Home BP has several disadvantages including: Less than 15 percent of commercially available blood pressure devices worldwide have published information on device accuracy; in addition, a multinational study found that only about 20 percent of the most commonly purchased devices have been validated.

In November 2023, Medicare introduced an item number for ABPM, 11607, (unfortunately restricted to patients in whom a diagnosis of Hypertension has not already been made). This test is available through cardiologists' rooms and pathology services.

*N.B. In this article all BP readings are in mmHg.  
Reference: Up to Date Journal December 2023*



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Dr Nelson is a General Cardiologist with a subspecialty interest in Imaging. He graduated from the University of New South Wales in 1989 and has trained at St Vincent's, St George and Prince of Wales hospitals in Sydney. He completed a Clinical Research Fellowship and Master of Philosophy in Cardiac Imaging Science at University of Queensland / Princess Alexandra Hospital / The Wesley Hospital in Brisbane and a 2 year Clinical Echocardiography Fellowship at Hearts 1st Laboratory at Greenslopes Private Hospital in Brisbane. He is also certified in Cardiac / Coronary CT.

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