



## Review Article

## Ambulatory blood pressure monitoring in daily practice



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## ABSTRACT

Ambulatory blood pressure monitoring is a useful diagnostic tool that still underutilized by community physicians. It is a cost effective, diagnostic and prognostic tool that had been emphasized by the guidelines.

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Ambulatory blood pressure monitoring (ABPM) is the gold standard for diagnosis of hypertension to identify white coat hypertension, masked hypertension and nocturnal hypertension.<sup>1–3</sup>

European society of hypertension practice guidelines for ambulatory blood pressure monitoring, define that hypertension is diagnosed when a 24-h ABP > 130/80 mmHg, awake ABP > 135/85 mmHg and/or sleep ABP > 120/70 mmHg.<sup>1,4,5</sup>

The prevalence of white-coat hypertension in the community had been estimated in the range of 20–25%, it is important to make an accurate diagnosis before prescribing life long antihypertensive treatment.<sup>2</sup> White coat hypertension is linked to later development of sustained hypertension and has been associated with an increased risk of stroke.<sup>3,6</sup>

On the other hand, the risk of cardiovascular complications associated with masked hypertension is similar to that seen in persistent hypertension.<sup>7</sup>

Night time blood pressure, which may present in 7% of hypertensive patients, is more predictive for total, cardiovascular, and non-cardiovascular mortality than day time hypertension.

Other indications include: labile hypertension, diagnosis of true resistant hypertension,<sup>8</sup> hypotensive symptoms while taking medications,<sup>9</sup> suspicion of autonomic dysfunction on demonstration of postprandial hypotension and heart rate variability<sup>10</sup> and screening for obstructive sleep apnoea.<sup>2</sup> It has also been shown to be valuable for identifying the circadian time of hypertension treatment, which demonstrates benefit on cardiovascular risk.<sup>11</sup>

ABPM not only identifies resistant hypertension but has been suggested to replace the current definition that is based on office blood pressure and to use ABPM instead.<sup>12</sup> The rationale based on ABPM is a better, independent predictor of cardiovascular morbidity. In addition ABP recognizes the white-coat resistant hypertension (uncontrolled office with normal ambulatory blood pressure), which is present in 30–40% of patients who have been labeled resistant hypertension.

ABPM also helps to exclude the masked resistant hypertension (controlled office with elevated ambulatory blood pressure), which is seen in one-third of patients with controlled office blood pressure and in whom maximizing treatment is warranted.<sup>13</sup>

ABPM provides a much larger number of readings and demonstrates nocturnal hypertension, dipping patterns, and the efficacy of antihypertensive medication.<sup>14,15</sup>

In order to give a valid assessment, ABPM should have 70% valid measurements or 20 valid readings during the day and 7 valid readings during night. Although the cost of the unit is ~\$2000 and

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the software is ~\$2500, it has been shown to be cost effective.<sup>16</sup> ABPM can achieve potential savings of 3–14% for cost of care for hypertension and 10–23% reduction in treatment days when ABPM is incorporated into the diagnostic process.<sup>17,18</sup>

The limitation is the availability in general practice, cost implications, possibility of inaccurate readings during activity.<sup>19,20</sup> Another suggested reason is restriction of daily activity during ABPM, especially interference with sleep. However, some reports mentioned that these problems are not so serious as stated by subject.

When ABPM is not readily available, out of office assessment of BP with self-home monitoring has been recommended by guidelines as an alternative. It is recommended to measure morning and evening, twice at each time for 7 days and calculates the average after discarding measurements on the first day. The sensitivity of office BP was 74.6% (95% CI, 60.7–84.8) and the specificity was 74.6% (95% CI, 47.9–90.4).<sup>21</sup>

ABPM is a reimbursable procedure, medicare will reimburse an ABPM test for suspected white-coat hypertension, while private insurance carriers may reimburse for additional indications including: evaluation of antihypertensive therapy, resistant hypertension, nocturnal angina, episodic hypertension, autonomic dysfunction, masked hypertension and failed home BP management.<sup>22</sup>

In summary ABPM is a cost effective tool in blood pressure management in general practice and it has both diagnostic and prognostic value. Multiple indications for its use have been validated and there is growing evidence for its use as a solo or combined tool for blood pressure management in daily practice.

#### Conflict of interest

None declared.

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