VIII. Ambulatory BP Measurement

DIAGNOSIS AND ASSESSMENT

http://guidelines.hypertension.ca/diagnosis-assessment/ambulatory-measurement/

Subgroup Members: Martin Myers, MD; Lyne Cloutier, RN, PhD; Mark Gelfer, MD; Sheldon Tobe, MD, MSc(HPTE); Maxime Lamarre-Cliche, MD; Peter Bolli, MD; Guy Tremblay, MD; Donna McLean, RN, NP, PhD, Donald W. McKay, PhD; Raj Padwal, MD MSc
Central Review Committee: Doreen M. Rabi, MD, MSc; Stella S. Daskalopoulou, MD, PhD; Kelly B. Zarnke, MD, MSc; Kaberi Dasgupta, MD, MSc; Kara Nerenberg, MD, MSc
Chair: Doreen M. Rabi, MD, MSc
Editor: Raj Padwal, MD, MSc

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Recommendations

1. ABPM can be used in the diagnosis of hypertension (Grade C). ABPM should be considered when an office-induced increase in BP is suspected in treated patients with:
    i. BP that is not below target despite receiving appropriate chronic antihypertensive therapy (Grade C);
    ii. Symptoms suggestive of hypotension (Grade C); or
    iii. Fluctuating office BP readings (Grade D).
2. ABPM upper arm devices that have been validated independently using established protocols must be used (see www.dableducational.org) (Grade D).
3. Therapy adjustment should be considered in patients with a mean 24-hour ambulatory SBP of ≥130 mm Hg or DBP of ≥80 mm Hg, or a mean awake SBP of ≥135 mm Hg and/or DBP of ≥85 mm Hg(Grade D).
4. The magnitude of changes in nocturnal BP should be taken into account in any decision to prescribe or withhold drug therapy based on ABPM (Grade C) because a decrease in nocturnal BP of < 10% is associated with increased risk of cardiovascular events.

Background

1. ABPM can be used in the diagnosis of hypertension (Grade C). ABPM should be considered when an office-induced increase in BP is suspected in treated patients with:

I. BP THAT IS NOT BELOW TARGET DESPITE RECEIVING APPROPRIATE CHRONIC ANTIHYPERTENSIVE THERAPY (GRADE C);

II. SYMPTOMS SUGGESTIVE OF HYPOTENSION (GRADE C); OR

III. FLUCTUATING OFFICE BP READINGS (GRADE D).

ABPM is the gold standard test for diagnosing white coat hypertension and should be performed if this entity is suspected (1,2). Possible clues to the presence of white coat hypertension are apparent resistant or refractory hypertension, symptoms suggestive of hypotension and labile hypertension(2). In cases where mean office readings and mean ABPM readings are discrepant, ABPM should be used to inform treatment modifications or lack thereof. Elevated ABPM readings are a strong predictor of mortality and cardiovascular events independent of office BP, including in patients with treated hypertension (3-6).

In 688 patients followed up for a mean of 9.2 years, Khattar et al (5) found that the mean 24 h, day- time and night-time ambulatory blood pressure significantly predicted cardiovascular morbidity, whereas the clinical systolic and diastolic blood pressure did not. For 808 older patients (60 years or older) with untreated systolic hypertension followed up for a mean of 4.4 years in a substudy of the Systolic Hypertension in Europe (SYST-EUR) trial, ambulatory blood pressure was a significant predictor of cardiovascular risk over and above clinical blood pressure (6).

2. ABPM upper arm devices that have been validated independently using established protocols must be used (see www.dableducational.org) (Grade D).

Published international protocols are used to determine if new ABPM devices can validly assess blood pressure (7,8). An up-to-date list of validated devices can be found at www.dableducational.org. Devices that have not met these validation criteria are not recommended.

3. Therapy adjustment should be considered in patients with a mean 24-hour ambulatory SBP of ≥130 mm Hg or DBP of ≥80 mm Hg, or a mean awake SBP of ≥135 mm Hg and/or DBP of ≥85 mm Hg(Grade D).

These widely accepted 24-hour ambulatory blood pressure thresholds have been derived from prognostic studies examining cardiovascular morbidity and mortality endpoints (9-13).

TABLE 1. STANDARDIZED PROTOCOL FOR AMULATORY BP MONITORING (GRADE D)

The appropriate sized cuff should be applied to the nondominant arm unless the SBP difference between arms is >10 mm Hg, in which case the arm with the highest value obtained should be used.

The device should be set to record for a duration of at least 24 hours with the measurement frequency set at 20 – 30 minute intervals during the day and 30-60 minutes at night.

A patient-reported diary to define daytime (awake), night-time (sleep), activities, symptoms and medication administration is useful for study interpretation.

Daytime and night-time should preferentially be defined using the patient's diary. Alternatively, pre-defined thresholds can be used (e.g. 08:00 to 22:00 for daytime and 22:00 to 8:00 for night-time).

The ABPM report should include all of the individual BP readings (numerically and graphically), the percentage of successful readings, the averages for each time frame (daytime, night-time, 24 hours) and the "dipping" percentage (the percentage the average BP changed from daytime to night-time).

Criteria for a successful ABPM study are:

- At least 70% of the readings are successful AND
- At least 20 daytime readings and 7 night-time readings are successful

4. The magnitude of changes in nocturnal BP should be taken into account in any decision to prescribe or withhold drug therapy based on ABPM (Grade C) because a decrease in nocturnal BP of < 10% is associated with increased risk of cardiovascular events.

Patients who fail to exhibit a nocturnal decline in systolic or diastolic blood pressure of 10% or more during sleep are characterized as 'non-dippers' (14). Non-dipping portends an increased risk of cardiovascular morbidity and mortality (15-18) and is more common in patients with advanced age, obesity, diabetes, high salt intake, secondary hypertension, prior cardiovascular disease and pre-existing chronic kidney disease (19).

This recommendation advises clinicians to consider non-dipping status when assessing risk status and if debating whether or not pharmacotherapy should be initiated. A firmer recommendation to prescribe antihypertensive therapy in all non-dippers or to convert patients from non-dippers to dippers by prescribing antihypertensive therapy at bedtime cannot be made at this time. Although one relatively large RCT (n=2156) from Spain found that bedtime administration of one or more antihypertensive drugs substantially reduced cardiovascular morbidity and mortality, methodological concerns precluded a recommendation based on this study (20). Further confirmation from additional rigorously performed RCTs is needed.

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