

GUIDELINES OPEN ACCESS

2025 Thai Hypertension Society Guidance for Ambulatory Blood Pressure Monitoring in Adults

Sirisawat Wanthong¹ | Pairoj Chattranukulchai² | Chavalit Chotruangnapa¹ | Praew Kotruchin³ | Weranuj Rousanthisuk¹ | Prin Vathesatogkit⁴ | Apichard Sukonthasarn⁵

¹Division of Hypertension, Department of Medicine, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand | ²Division of Cardiovascular Medicine, Department of Medicine, Faculty of Medicine, Chulalongkorn University, King Chulalongkorn Memorial Hospital, Bangkok, Thailand | ³Department of Emergency Medicine, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand | ⁴Division of Cardiology, Department of Medicine, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand | ⁵Thai Hypertension Society, Bangkok, Thailand

Correspondence: Sirisawat Wanthong (sirisawat.wan@mahidol.ac.th)

Received: 16 May 2025 | **Revised:** 14 July 2025 | **Accepted:** 13 August 2025

ABSTRACT

More than 40 years of research has consolidated ambulatory blood pressure monitoring (ABPM) as a validated choice in out-of-office blood pressure (BP) measurement methods other than home BP measurement (HBPM). ABPM can evaluate 24-h BP and BP variability. ABPM improves the diagnosis of hypertension phenotypes such as white coat hypertension, masked hypertension, dipper or non-dipper. BP values derived from ABPM had better prognostic values than clinic BP. Ambulatory BP devices have been available in Thailand for several years. This recommendation of the Thai Hypertension Society for ABPM was designed to apply this practical knowledge, based on our limited health resource circumstances, to help guide clinical practice and improve the treatment and control of hypertension among the adult Thai population.

1 | Introduction

The interest in using ambulatory blood pressure monitoring (ABPM) in the evaluation of hypertensive patients in clinical practice has shown a marked increase in the past few decades. The first landmark study, reported by Perloff et al. in 1983, showed that there was a significant difference in the occurrence of cardiovascular (CV) events in patients with mild-to-moderate hypertension between subjects with high and low ambulatory blood pressure (BP), irrespective of the baseline office systolic BP (SBP) [1]. After that, the prognostic value of ABPM has been investigated in numerous studies both on the general population and hypertensive patients. More than 40 years of research has consolidated ABPM as a validated choice in out-of-office BP measurement methods other than home BP measurement (HBPM).

Ambulatory BP devices have been available in Thailand for several years. They are mostly available only in university hospitals and tertiary care health centers. A retrospective study

using ABPM in 804 Thai hypertensive population showed that when compared with 1051 Japanese hypertensive patients, the Japanese counterparts had a higher mean 24-h average and higher mean daytime SBP, whereas the Thai patients had higher mean nighttime SBP, despite the similar mean office SBP [2]. In this study, Thai hypertensive patients also had a higher prevalence of non-dipping/rising patterns, which has been reported to pose a higher CV risk [3] and may be a predictor of heart failure [4]. This result suggested that Thai patients with controlled office BP levels may still have disrupted BP circadian rhythm and need to be treated properly to reduce future CV risk. Thus, it is very important to know whether the prescribed antihypertensive medical treatment has restored BP to within the normal range throughout the 24-h period, and the best way to reliably achieve this is by using ABPM. Furthermore, ABPM may help to improve the diagnosis of hypertension subtypes, for example, white coat hypertension (WCH) and masked hypertension (MH), which the data from previous study showed that there were a significant number of patients with WCH and MH in Thailand [5].

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial-NoDerivs](https://creativecommons.org/licenses/by-nc-nd/4.0/) License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2025 The Author(s). *The Journal of Clinical Hypertension* published by Wiley Periodicals LLC.

TABLE 1 | Classes of recommendations and levels of evidence.

Classes of recommendations	
Class I	Evidence and/or general agreement that a given treatment or procedure is beneficial, useful, and effective (is recommended/is indicated)
Class IIa	Weight of evidence/opinion is in favor of usefulness/efficacy (should be considered)
Class IIb	Usefulness/efficacy is less well established by evidence/opinion (may be considered)
Class III	Evidence or general agreement that the given treatment or procedure is not useful/effective, and in some cases may be harmful (is not recommended)
Levels of evidence	
A	Data derived from multiple randomized clinical trials or meta-analyses
B	Data derived from a single randomized clinical trial or large nonrandomized studies
C	Consensus of opinion of the experts and/or small studies, retrospective studies, registries

Role of ABPM and current status of ABPM in Asia were described previously [6, 7]. Recommendations for the application of ABPM in Asian contexts are available [8], but there are no corresponding guidelines specific to Thailand. Health practices in Thailand are still different in many aspects compared to other high-income Asian countries, mainly due to limited access to health technologies and the economic burdens of patients and the government. This recommendation of the Thai Hypertension Society (THS) for ABPM was designed to apply this practical knowledge, based on our limited health resource circumstances, to help guide clinical practice and improve the treatment and control of hypertension among the adult Thai population. This guideline can also be helpful for the population of other low- and middle-income regions in Southeast Asia, which may share the same health challenges as Thailand.

The expert panel was selected and appointed by THS, and all declared their conflicts of interest to THS. The first meeting was on October 20, 2024. The recommendations were based on an extensive review of relevant clinical research publications on ABPM, and data priority was given to information from Asia. Classification of recommendations and level of supporting evidence are shown in Table 1.

2 | ABPM Measurement

Select an ABPM device validated against accepted international standards (e.g., www.stridebp.org, www.validatebp.org), with software providing the data of interest [9]. The use of a nondominant arm with an appropriate cuff size is recommended. During the day, the device should record BP at 15–30-min intervals and at night at 30–60-min intervals. Overall, a minimum of 70% of valid BP recordings throughout the 24 h is required, and there

should be at least 20 valid daytime and at least 7 valid nighttime measurements [10]. Performing ABPM on a regular workday rather than on the weekend will provide better data to reflect an individual's BP profile. A diary of personal activities, meals, medication intake, exercise, sleep, and awake time should be completed to assist in the interpretation of ABPM.

The report of ABPM results should provide, at a minimum, details of all readings, showing daytime and nighttime windows with an indication of the normal BP range. The average 24-h, daytime and nighttime SBP, DBP, pulse rate, and the percentage change in nighttime SBP and DBP from daytime, with standard deviations (SDs) and a number of valid BP readings, should also be provided.

The recommendations on when to repeat ABPM are based on multiple factors including clinical risk factors and availability of ABPM. ABPM repetition should be performed at 1–2-year interval in mild hypertension, low CV risk. In high-risk patients such as in those with resistant hypertension, presence of organ damage, and multiple comorbidities, ABPM may be repeated in shorter interval (3–6 months or less). ABPM repetition in different seasons may show whether there is seasonal BP difference or not and ensure the strict BP control in every season.

3 | Diagnostic Thresholds and Blood Pressure Goals

BP is a continuous variable, and the relationship between CV outcomes and BP is log-linear and continuous, irrespective of the methods of BP measurement. Thresholds only serve the requirement of physicians for the diagnosis and guide treatment decisions.

ABPM thresholds for diagnosing hypertension and defining achievement of BP control during antihypertensive therapy were defined by the HOPE Asia (Hypertension, Brain, cardiovascular and Renal Outcome Prevention and Evidence in Asia) Network expert panel consensus, in which a representative from the THS was in the expert panel [8]. We have reviewed the appropriateness of these definitions and target BP values and have shown the summary in Table 2.

4 | Blood Pressure and Blood Pressure Variability Indexes Derived From ABPM

ABPM provides multiple BP readings in one day. The average 24-h BP, daytime (awake) BP, nighttime (asleep) BP, and morning BP can be evaluated by ABPM. The best way to define day/night is based on the actual activity of the patient (diary-based definition). Clock-based definition (e.g., daytime: 06:00–22:00, nighttime: 22:00–06:00) can be used if the actual going to bed time and awakening time are not available. BP indexes derived from ABPM (i.e., 24-h BP, daytime BP, nighttime BP) showed a better prediction of hypertension-mediated organ damage (HMOD) and a better prediction of CV outcomes and mortality than clinic BP [11, 12].

BP reflects the hemodynamic state, which has short-term and long-term variations. This is referred to as blood pressure vari-

TABLE 2 | ABPM-based definitions of hypertension and target BP values.

Recommendations	Class of recommendations	Level of evidence
1. ABPM diagnosis of hypertension is based on one of the followings: • $\geq 130/80$ mmHg for average 24-h BP • $\geq 135/85$ mmHg for average daytime (awake) BP (daytime hypertension) • $\geq 120/70$ mmHg for average nighttime (asleep) BP (nocturnal hypertension) • $\geq 135/85$ mmHg for average morning BP (morning hypertension)	I	A
2. White coat hypertension is defined as • Clinic BP $\geq 140/90$ mmHg AND ABPM values: 24-h BP $< 130/80$ mmHg, and daytime BP $< 135/85$ mmHg, and nighttime BP $< 120/70$ mmHg, and morning BP $< 135/85$ mmHg	I	A
3. Masked hypertension is defined as • Clinic BP $< 140/90$ mmHg AND ABPM values: 24-h BP $\geq 130/80$ mmHg, and/or daytime BP $\geq 135/85$ mmHg (masked daytime hypertension), and/or nighttime BP $\geq 120/70$ mmHg (masked nocturnal hypertension), and/or morning BP $\geq 135/85$ mmHg (masked morning hypertension)	I	A
4. Masked uncontrolled hypertension is defined as masked hypertension (as per the above definitions) in patients receiving antihypertensive therapy	I	A
5. Goal BP values are: • $< 130/80$ mmHg for average 24-h BP • $< 135/85$ mmHg for average daytime BP • $< 120/70$ mmHg for average nighttime BP • $< 135/85$ mmHg for average morning BP	IIa	C

Abbreviations: ABPM, ambulatory blood pressure monitoring; BP, blood pressure.

ability (BPV). Short-term BPV is observed within 24 h, from minute-to-minute or day-to-night variability. Short-term BPV is higher during the day and, to a lesser extent, during the night, and this variability is due to the interplay between central factors, local vasoactive mechanisms, and humoral influences. This short-term BPV was found to be quantitatively related to BP levels and was greater in individuals with higher BP [13]. Short-term BPV has an adverse effect on the development of HMOD [14] and is adversely related to the risk of CV outcomes, independent of the 24-h mean BP value [15–18]. Many short-term BPV indexes can be derived from ABPM such as SD, coefficient of variation, weighted 24-h SD, and average real variability.

Furthermore, other specific BPV patterns that can be derived from ABPM are nocturnal BP fall (dipping of BP) and morning BP surge. Early morning BP surge is associated with an increased risk of CV diseases, especially hemorrhagic stroke [19–28].

To minimize CV disease risk, there was a proposed ideal 24-h BP profile that included (1) normal 24-h BP, (2) normal circadian rhythm (normal dipping status), and (3) normal BPV [8].

BP information that can be derived from ABPM is described in Table 3 and Figure 1.

5 | Specific Features of ABPM Profile in the Asian Population

The Asian population has greater salt sensitivity and lower body mass index than the Western population. The prevalence of masked hypertension, excessive morning BP surge, morning hypertension, and nocturnal hypertension is higher in Asians [29–33]. There are also ethnic variations in the prevalence of complications in Asian hypertensive patients, with higher stroke rates than coronary heart disease and a stronger relationship between increasing BP and the rate of CV events, especially stroke.

6 | The Risk of Masked Hypertension

Masked hypertension is characterized by a normal office BP confirmed at repeated clinic visits, but a raised daytime, nighttime, or 24-h ambulatory BP. The possibility of having masked hypertension increases with an office SBP range of 120–139 mmHg and/or 80–89 mmHg of DBP. Older age, overweight or obesity, alcohol intake, diabetes, smoking, multiple CV risk factors, male sex, and higher heart rate are also risk predictors of having masked hypertension [34].

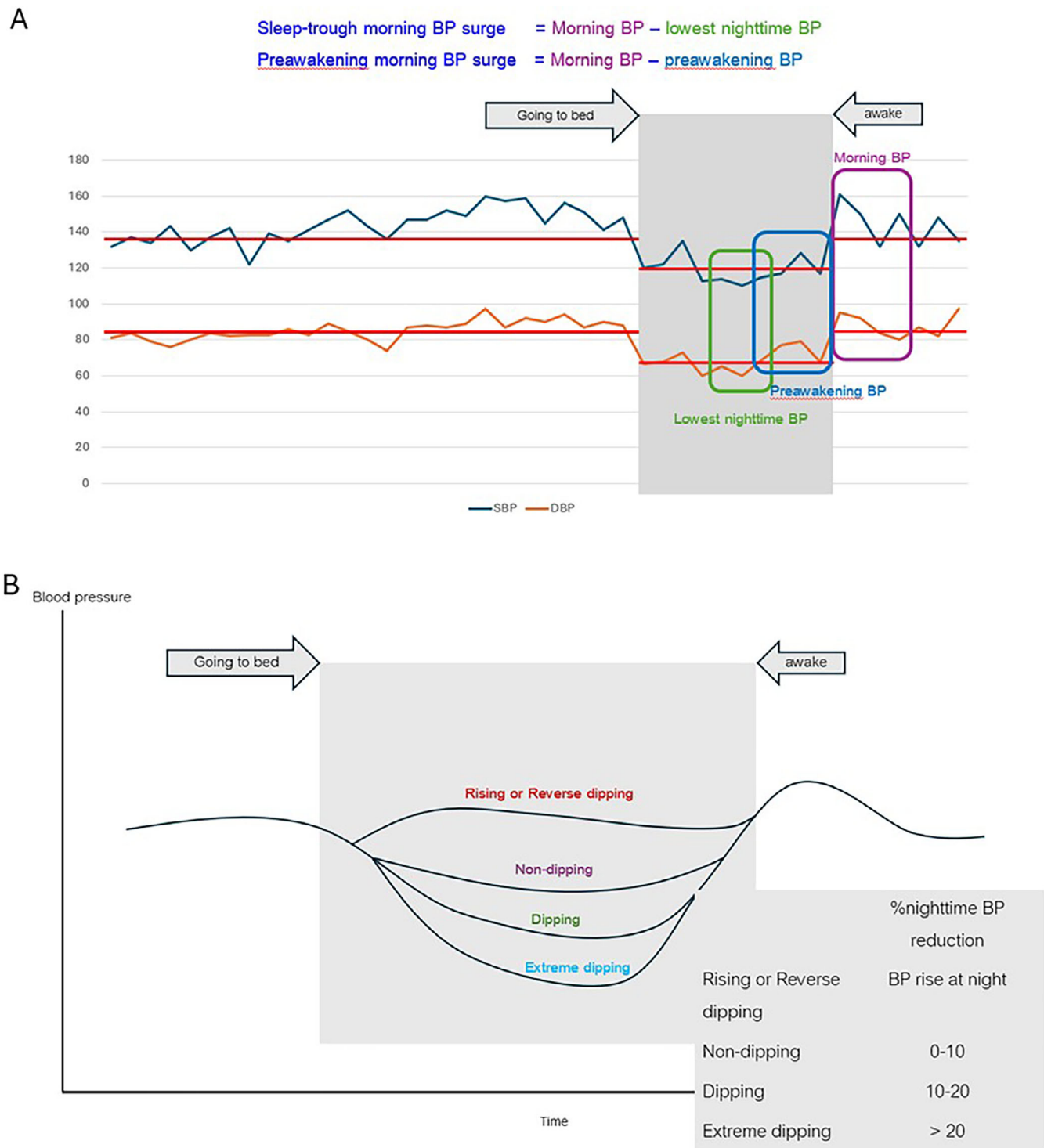


FIGURE 1 | (A) BP information acquired from ABPM. (B) BP information acquired from ABPM.

Masked hypertension has an adjusted risk almost equivalent to sustained hypertension, irrespective of treatment status [35]. In an international ABPM database study, participants with office normotension and prehypertensive patients who had masked hypertension had adjusted hazard ratios for a composite of CV complications and stroke significantly higher than individuals with true normotension [36]. These findings were confirmed in patients with diabetes [37].

7 | Advantages and Limitations of ABPM vs. Office and Home BP Measurement

ABPM provides information that cannot be obtained from the office and home BP measurements. These include a greater number of BP readings, the ability to obtain mean 24-h BP, assessment of nighttime BP, short-term BP variability, and better prediction of HMOD and CV morbidity and mortality. ABPM is

TABLE 3 | BP information acquired from ABPM.

Index	Definition
24-h BP	Mean BP in 24 h
Daytime (awake) BP	Mean BP during awake
Nighttime (asleep) BP	Mean BP during asleep
Preawakening BP	Mean BP in the 2 h before awakening
Morning BP (Postawakening BP)	Mean BP in the 2 h after awakening
Lowest nighttime BP	Mean of the lowest BP during sleep and the values measured before and after lowest BP
Sleep-trough morning BP surge	Difference of morning BP and lowest nighttime BP
Preawakening morning BP surge	Difference of morning BP and postawakening BP
Dipping of BP	Physiologic reduction of BP during sleep, derived from percentage change of nighttime BP from daytime BP

also useful for detecting ambulatory episodes of hypotension and BP response to physical and psychological stress [38]. As HBPM, ABPM has the ability to precisely identify WCH and MH.

Characteristics, advantages, and limitations of ABPM, home BP, and office BP measurements are summarized in Table 4.

There is some overlap between HBPM and ABPM in terms of diagnosis between hypertensive phenotypes. There was a growing evidence of nocturnal home BP monitoring [39, 40]. However, HBPM cannot completely cover what ABPM provides in terms of clinical information, such as BP response to physical and psychological stress [38], the night-to-day BP ratio, and dipping status. The information obtained from ABPM is complementary to that generated by HBPM, and a rational combination of these two measurement techniques is recommended [41–44].

8 | Clinical Indications for ABPM

ABPM should be considered in individuals with variable BP on office or home measurements because they are more likely to have white coat or masked hypertension [9]. The use of ABPM in patients with resistant hypertension allows the differentiation of true resistance (which is uncontrolled both clinic and out-of-office BP) [45] from white coat resistance (which is controlled out-of-office BP, but uncontrolled clinic BP) [45] and helps guide additional investigations and interventions [46].

We recommend the use of ABPM in the Thai population, as indicated in Table 5.

TABLE 4 | Characteristics, advantages, and limitations of ABPM compared with home BP and office BP measurements.

	Office BP	HBPM	ABPM
Evidence support			
Evidence for association with HMOD and CV outcome	+	++	+++
Evidence for monitoring drug efficacy	+++	++	+++
Evidence for monitoring device efficacy	++	NA	+++
Measurement			
Convenient	+++	++	+
Reproducibility	+	++	++
Frequency	+	++	+++
Identification of white coat effect	—	++	+++
Identification of masked effect	—	++	+++
Evaluation of BPV			
Diurnal	—	+ ^a	++
Short-term BPV	—	—	++

Abbreviations: ABPM, ambulatory blood pressure monitoring; BP, blood pressure; BPV, blood pressure variability; HBPM, home blood pressure monitoring; HMOD, hypertension-mediated organ damage.

^aUsing morning-evening difference.

9 | Cost-Effectiveness

Cost, availability, and accessibility are potential issues that could limit the use of ABPM in Thailand. However, longer term savings in reducing healthcare costs and CV complications are likely to offset the short-term costs and inconvenience of ABPM use [9].

Several studies have addressed the cost-effectiveness of ABPM [47–50]. ABPM would reduce healthcare costs mainly by avoiding antihypertensive drug treatment in WCH [48]. In another cost-effectiveness analysis, ABPM was shown to be the most cost-effective strategy for the diagnosis of hypertension in women and men at all ages [49]. In a more recent study, in a primary care setting, comparing the quality-adjusted life years and lifetime costs associated with clinic, home, and ambulatory BP measurements, ABPM was associated with better cost savings than comparators [50]. In some Asian countries, ABPM can be reimbursed, based on the superiority of ABPM over other forms of BP measurements for predicting the development of CV disease and the cost-effectiveness of this approach.

10 | Novel Methods of Ambulatory BP Measurements

Many emerging BP measurement technologies that include wearable, wrist-based or finger-based devices, and cuff-less devices implementing plethysmography or other technologies have been developed [51, 52]. However, there is still insufficient scientific

TABLE 5 | Clinical indications for ABPM.

Recommendations	Class of recommendations	Level of evidence
1. ABPM should be considered in suspected white coat hypertension, e.g.: grade 1 hypertension on office BP measurement, or markedly elevated office BP without HMOD, a. if HBPM is unavailable or unreliable	IIa IIb	B B
b. if HBPM is available		
2. ABPM should be considered in suspected masked hypertension, e.g.: BP at risk (130–139 and/or 80–89 mmHg) on office BP measurement, or normal office BP in individuals with HMOD or at high CV risk, a. if HBPM is unavailable or unreliable	IIa IIb	B B
b. if HBPM is available		
3. ABPM is recommended to evaluate BP in patients with autonomic dysfunction	I	C
4. ABPM should be considered for hypertensive patients with suspected nocturnal hypertension, e.g.: diabetes, sleep apnea, chronic kidney disease, obesity, multiple cardiovascular risk factors or clinical CVD.	IIa	C
5. ABPM should be considered in patients with apparent resistant hypertension.	IIa	C
6. ABPM is recommended in patients with refractory hypertension, or patients with high-risk resistant hypertension, in whom renal denervation is considered.	I	B
7. ABPM may be considered in treated hypertensive patients with suspected postural or postprandial or treatment-induced hypotension.	IIb	C
8. ABPM may be considered in individuals with exaggerated BP response to exercise and/or have considerable BP variability in office or home BP measurements.	IIb	C
9. ABPM may be considered to assess short-term blood pressure variability to provide additional clinical information on cardiovascular risk.	IIb	C
10. ABPM may be considered to confirm diagnosis of hypertension when there is marked discordance between office and home BP measurements.	IIb	C

Abbreviations: ABPM, ambulatory blood pressure monitoring; BP, blood pressure; HBPM, home blood pressure monitoring; HMOD, hypertension-mediated organ damage.

consensus on the accuracy standards and validation procedures to recommend these devices for clinical use.

References

1. D. Perloff, M. Sokolow, and R. Cowan, "The Prognostic Value of Ambulatory Blood Pressure," *JAMA* 249 (1983): 2792–2798.
2. N. Tomitani, S. Wanthong, W. Roubanthisuk, P. Buranakitjaroen, S. Hoshide, and K. Kario, "Differences in Ambulatory Pressure Profiles Between Japanese and Thai Patients With Hypertension/Suspected Hypertension," *Journal of Clinical Hypertension* 23 (2021): 614–620.
3. K. Kario, S. Hoshide, H. Mizuno, et al., "Nighttime Blood Pressure Phenotype and Cardiovascular Prognosis," *Circulation* 142 (2020): 1810–1820.
4. E. Ingelsson, K. Bjorklund-Bodegard, L. Lind, J. Arnlov, and J. Sundstrom, "Diurnal Blood Pressure Patterns and Risk of Congestive Heart Failure," *JAMA* 295 (2006): 2859–2866.
5. S. Montrivade, P. Chattranukulchai, S. Siwamogsatham, et al., "Hypertension Subtypes Among Thai Hypertensives: An Analysis of Telehealth-Assisted Instrument in Home Blood Pressure Monitoring Nationwide Pilot Project," *International Journal of Hypertension* 2020 (2020): 3261408, <https://doi.org/10.1155/2020/3261408>.
6. S. Hoshide, H. M. Cheng, Q. Huang, et al., "Role of Ambulatory Blood Pressure Monitoring for the Management of Hypertension in Asian Populations," *Journal of Clinical Hypertension* 19 (2017): 1240–1245.
7. J. Shin, K. Kario, Y. C. Chia, et al., "Current Status of Ambulatory Blood Pressure Monitoring in Asian Countries: A Report From the HOPE Asia Network," *Journal of Clinical Hypertension* 22 (2020): 384–390.

8. K. Kario, J. Shin, C. H. Chen, et al., "Expert Panel Consensus Recommendations for Ambulatory Blood Pressure Monitoring in Asia: The HOPE Asia Network," *Journal of Clinical Hypertension* 21 (2019): 1250–1283.
9. E. O'Brien, G. Parati, G. Stergiou, et al., "European Society of Hypertension Position Paper on Ambulatory Blood Pressure Monitoring," *Journal of Hypertension* 31 (2013): 1731–1768.
10. E. Grossman, "Ambulatory Blood Pressure Monitoring in the Diagnosis and Management of Hypertension," *Diabetes Care* 36, no. S2 (2013): S307–S311.
11. N. Staplin, A. de la Sierra, L. M. Ruilope, et al., "Relationship Between Clinic and Ambulatory Blood Pressure and Mortality: An Observational Cohort Study in 59,124 Patients," *Lancet* 401 (2023): 2041–2050.
12. D. L. Clement, M. L. De Buysere, D. A. De Bacquer, et al.; Office Versus Ambulatory Pressure Study Investigators, "Prognostic Value of Ambulatory Blood-Pressure Recordings in Patients With Treated Hypertension," *New England Journal of Medicine* 348 (2003): 2407–2415.
13. G. Mancia, A. Ferrari, L. Gregorini, et al., "Blood Pressure and Heart Rate Variabilities in Normotensive and Hypertensive Human Beings," *Circulation Research* 53 (1983): 96–104.
14. A. Frattola, G. Parati, C. Cuspidi, F. Alбини, and G. Mancia, "Prognostic Value of 24-h Blood Pressure Variability," *Journal of Hypertension* 11 (1993): 1133–1137.
15. P. Palatini, F. Saladini, L. Mos, et al., "Short-Term Blood Pressure Variability Outweighs Average 24-h Blood Pressure in the Prediction of Cardiovascular Events in Hypertension of the Young," *Journal of Hypertension* 37 (2019): 1419–1426.
16. G. Parati, G. Bilo, A. Kollias, et al., "Blood Pressure Variability: Methodological Aspects, Clinical Relevance and Practical Indications for Management—A European Society of Hypertension Position Paper," *Journal of Hypertension* 41 (2023): 527–544.
17. G. Bilo, E. Dolan, E. O'Brien, et al., "The Impact of Systolic and Diastolic Blood Pressure Variability on Mortality Is Age Dependent: Data From the Dublin Outcome Study," *European Journal of Preventive Cardiology* 27 (2020): 355–364.
18. G. Mancia, M. Bombelli, R. Facchetti, et al., "Long-Term Prognostic Value of Blood Pressure Variability in the General Population: Results of the Pressioni Arteriose Monitorate E Loro Associazioni Study," *Hypertension* 49 (2007): 1265–1270.
19. H. Metoki, T. Ohkubo, M. Kikuya, et al., "Prognostic Significance for Stroke of a Morning Pressor Surge and a Nocturnal Blood Pressure Decline: The Ohasama Study," *Hypertension* 47 (2006): 149–154.
20. K. Kario, T. G. Pickering, Y. Umeda, et al., "Morning Surge in Blood Pressure as a Predictor of Silent and Clinical Cerebrovascular Disease in Elderly Hypertensives: A Prospective Study," *Circulation* 107 (2003): 1401–1406.
21. S. D. Pierdomenico, A. M. Pierdomenico, and F. Cuccurullo, "Morning Blood Pressure Surge, Dipping, and Risk of Ischemic Stroke in Elderly Patients Treated for Hypertension," *American Journal of Hypertension* 27 (2014): 564–570.
22. M. Bombelli, D. Fodri, E. Toso, et al., "Relationship Among Morning Blood Pressure Surge, 24-hour Blood Pressure Variability, and Cardiovascular Outcome in a White Population," *Hypertension* 64 (2014): 943–950.
23. S. Israel, A. Israel, I. Z. Ben-Dov, and M. Bursztyn, "The Morning Blood Pressure Surge and All-Cause Mortality in Patients Referred for Ambulatory Blood Pressure Monitoring," *American Journal of Hypertension* 24 (2011): 796–801.
24. P. Verdecchia, F. Angeli, G. Mazzotta, et al., "Day-Night Dip and Early-Morning Surge in Blood Pressure in Hypertension: Prognostic Implications," *Hypertension* 60 (2012): 34–42.
25. Y. Luo, Y. L. Wang, Y. B. Wu, et al., "Association Between the Rate of the Morning Surge in Blood Pressure and Cardiovascular Events and Stroke," *Chinese Medical Journal* 126 (2013): 510–514.
26. Y. Li, L. Thijs, T. W. Hansen, et al., "Prognostic Value of the Morning Blood Pressure Surge in 5645 Subjects From 8 Populations," *Hypertension* 55 (2010): 1040–1048.
27. J. P. Sheppard, J. Hodgkinson, R. Riley, U. Martin, S. Bayliss, and R. J. McManus, "Prognostic Significance of the Morning Blood Pressure Surge in Clinical Practice: A Systemic Review," *American Journal of Hypertension* 28 (2015): 30–41.
28. S. Hoshide and K. Kario, "Morning Surge in Blood Pressure and Stroke Events in a Large Modern Ambulatory Blood Pressure Cohort: Results of the JAMP Study," *Hypertension* 78 (2021): 894–896.
29. K. Kario, D. L. Bhatt, S. Brar, and G. L. Bakris, "Differences in Dynamic Diurnal Blood Pressure Variability Between Japanese and American Treatment-Resistant Hypertensive Populations," *Circulation Journal* 81 (2017): 1337–1345.
30. Y. Li and J. G. Wang, "Isolated Nocturnal Hypertension: A Disease Masked in the Dark," *Hypertension* 61 (2013): 278–283.
31. S. Omboni, D. Aristizabal, A. De la Sierra, et al., "Hypertension Types Defined by Clinic and Ambulatory Blood Pressure in 14 143 Patients Referred to Hypertension Clinics Worldwide. Data From the ARTEMIS Study," *Journal of Hypertension* 34 (2016): 2187–2198.
32. Y. Li, J. A. Staessen, L. Lu, L. H. Li, G. L. Wang, and J. G. Wang, "Is Isolated Nocturnal Hypertension a Novel Clinical Entity? Findings From a Chinese Population Study," *Hypertension* 50 (2007): 333–339.
33. S. Hoshide, K. Kario, A. de la Sierra, et al., "Ethnic Differences in the Degree of Morning Blood Pressure Surge and in Its Determinants Between Japanese and European Hypertensive Subjects: Data From the ARTEMIS Study," *Hypertension* 66 (2015): 750–756.
34. Q. F. Huang, W. Y. Yang, K. Asayama, et al., "Ambulatory Blood Pressure Monitoring to Diagnose and Manage Hypertension," *Hypertension* 77 (2021): 254–264.
35. T. W. Hansen, M. Kikuya, L. Thijs, et al., "Prognostic Superiority of Daytime Ambulatory Over Conventional Blood Pressure in Four Populations: A Meta-analysis of 7,030 Individuals," *Journal of Hypertension* 25 (2007): 1554–1564.
36. J. Brguljan-Hitij, L. Thijs, Y. Li, et al.; International Database on Ambulatory Blood Pressure in Relation to Cardiovascular Outcome Investigators, "Risk Stratification by Ambulatory Blood Pressure Monitoring Across JNC Classes of Conventional Blood Pressure," *American Journal of Hypertension* 27 (2014): 956–965.
37. S. S. Franklin, L. Thijs, Y. Li, et al.; International Database on Ambulatory Blood Pressure in Relation to Cardiovascular Outcomes Investigators, "Masked Hypertension in Diabetes Mellitus: Treatment Implications for Clinical Practice," *Hypertension* 61 (2013): 964–971.
38. N. Tomitani, H. Kanegae, and K. Kario, "The Effect of Psychological Stress and Physical Activity on Ambulatory Blood Pressure Variability Detected by a Multisensor Ambulatory Blood Pressure Monitoring Device," *Hypertension Research* 46 (2023): 916–921.
39. K. Asayama, T. Fujiwara, S. Hoshide, et al.; International Expert Group of Nocturnal Home Blood Pressure, "Nocturnal Blood Pressure Measured by Home Devices: Evidence and Perspective for Clinical Application," *Journal of Hypertension* 37 (2019): 905–916.
40. N. Tomitani, S. Hoshide, and K. Kario, "Comparison of Nocturnal Blood Pressure Dipping Status Detected by Home vs. Ambulatory Blood Pressure Monitoring: Analysis of J-HOP Nocturnal BP Study Data," *Hypertension Research* 48 (2025): 1163–1168.
41. G. Parati, G. Stergiou, E. O'Brien, et al., "European Society of Hypertension Practice Guidelines for Ambulatory Blood Pressure Monitoring," *Journal of Hypertension* 32 (2014): 1359–1366.

42. B. Williams, G. Mancia, W. Spiering, et al., “2018 ESC/ESH Guidelines for the Management of Arterial Hypertension,” *European Heart Journal* 39 (2018): 3021–3104.
43. S. Park, P. Buranakitjaroen, C.-H. Chen, et al., “Expert Panel Consensus Recommendations for Home Blood Pressure Monitoring in Asia: The Hope Asia Network,” *Journal of Human Hypertension* 32 (2018): 249–258.
44. M. Cepeda, P. Pham, and D. Shimbo, “Status of Ambulatory Blood Pressure Monitoring and Home Blood Pressure Monitoring for the Diagnosis and Management of Hypertension in the US: An Up-to-Date Review,” *Hypertension Research* 46 (2023): 620–629.
45. P. Chattranukulchai, W. Roubsanthisuk, S. Kunanon, et al., “Resistant Hypertension: Diagnosis, Evaluation, and Treatment a Clinical Consensus Statement From the Thai Hypertension Society,” *Hypertension Research* 47 (2024): 2447–2455.
46. K. Kario, S. Hoshide, K. Narita, Y. Okawara, and H. Kanegae, “Cardiovascular Prognosis in Drug-Resistant Hypertension Stratified by 24-Hour Ambulatory Blood Pressure: The JAMP Study,” *Hypertension* 78 (2021): 1781–1790.
47. L. R. Krakoff, H. Eison, R. H. Phillips, S. J. Leiman, and S. Lev, “Effect of Ambulatory Blood Pressure Monitoring on the Diagnosis and Cost of Treatment for Mild Hypertension,” *American Heart Journal* 116 (1988): 1152–1154.
48. L. R. Krakoff, “Cost-Effectiveness of Ambulatory Blood Pressure: A Re-Analysis,” *Hypertension* 47 (2006): 29–34.
49. K. Lovibond, S. Jowett, P. Barton, et al., “Cost Effectiveness of Options for the Diagnosis of High Blood Pressure in Primary Care: A Modeling Study,” *Lancet* 378 (2011): 1219–1230.
50. H. Beyhaghi and A. J. Viera, “Comparative Cost-Effectiveness of Clinic, Home, or Ambulatory Blood Pressure Measurement for Hypertension Diagnosis in US Adults,” *Hypertension* 73 (2019): 121–131.
51. S. Kim, X. Xiao, and J. Chen, “Advances in Photoplethysmography for Personalized Cardiovascular Monitoring,” *Biosensors (Basel)* 12 (2022): 863.
52. A. Dagamseh, Q. Qananwah, H. Al Quran, and K. S. Ibrahim, “Towards a Portable-Noninvasive Blood Pressure Monitoring System Utilizing the Photoplethysmogram Signal,” *Biomedical Optics Express* 12 (2021): 7732–7751.