# UK Guidelines Call for Routine 24-Hour Ambulatory Blood Pressure Monitoring in All Patients to Make the Diagnosis of Hypertension—Not Ready for Prime Time in the United States

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In May 2011, the UK National Clinical Guideline Centre (NCGC) published their most recent guideline for the clinical management of primary hypertension in adults.[1] As an update to the National Institute for Clinical Excellence (NICE) guideline report, this 332-page document covers a wide range of issues worthy of discussion. However, the main subject that caught our attention was the recommendation calling for routine use of ambulatory blood pressure monitoring (ABPM) to make the initial diagnosis of hypertension.

According to these guidelines, clinic blood pressure (BP) measurement is recommended as a screening tool, and if the mean clinic BP is $\geq$140/90 mm Hg, the clinician is instructed to "offer ABPM to confirm the diagnosis of hypertension." Specifically, the guidelines recommend that ABPM be performed by measuring at least 2 readings per hour during usual waking hours and that a minimum of 14 readings be obtained. A diagnosis of hypertension is thereby made in patients with mean daytime ambulatory BP of at least 135/85 mm Hg. Of note, this means that patients do not necessarily need to wear the ABPM monitor for a full 24 hours or in the evenings. Home BP self-monitoring is only recommended as an alternative method for making the diagnosis of hypertension when ABPM is not tolerated. In the setting of "severe" clinic hypertension, antihypertensive medications can be started while waiting for the results of ABPM, but in other cases, the clinician is instructed to await the results of ABPM (as well as screening for target organ damage) prior to initiating antihypertensive therapy.

ABPM is not widely available in primary care practice and in the United States is usually offered only by centers that specialize in hypertension or cardiovascular medicine. Advantages of ABPM include the ability to detect white-coat or masked hypertension, determine the presence or absence of normal nocturnal dipping status, and assess the adequacy BP control in patients taking complex antihypertensive medication regimens. While it makes intuitive sense to use ABPM in these situations, it has been hard to obtain evidence of improved clinical outcome to support these indications. While numerous observational studies have demonstrated ABPM to be superior to clinic measurements in predicting target organ damage and other clinical outcomes associated with hypertension, definitive evidence that this is a superior management strategy is still lacking. To date, ABPM is most commonly used to determine the presence or absence of an exaggerated alerting response (white-coat effect), and this is generally the only indication for which it is covered by payers in the United States. Now, the NCGC is recommending ABPM in *all* patients suspected of having hypertension.

As part of the basis for its recommendation, the NCGC performed a rigorous cost-effective analysis that demonstrated that ABPM would not only be a more effective means of making the diagnosis of hypertension, but also would provide a more cost-effective approach than either the current approach (clinic BP) or use of home BP monitoring. Compared with making the diagnosis with clinic or home BP monitoring, not only was ABPM determined to be the most cost-effective approach in all age and sex subgroups, it also led to an improvement in quality health outcomes and was cost-saving when long-term costs were taken into account. The key driver of cost savings in this analysis was the cost of hypertension treatment that would be avoided due to improved specificity in making an accurate diagnosis with ABPM. The model suggested that antihypertensive therapy would be required in about 25% fewer patients than if the diagnosis was made based on clinic BPs alone. The pharmacy cost savings overwhelmed the cost increases associated with ABPM itself.

According to the NICE publication, the conclusions of this analysis were generally stable regardless of a wide range of sensitivity analyses that were performed. But, cost-effective analyses require that the investigators make important assumptions about the future. Even with the best of intentions, these assumptions may prove inaccurate. We believe that while such analyses may play a *supportive* role in developing guidelines, they should not be the primary driver in determining clinical utility. Unfortunately, it can be very difficult for outside observers to confirm the methodology of a cost-effective analysis, and they are probably most helpful when they can be independently externally validated. In any event, the assumptions made in the NCGC cost-effective analysis are based on the UK model of health care delivery and should not be considered valid for use in the United States or other countries.

Regardless of the validity of the UK cost-effective analysis, the requirement for routine ABPM in order

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to make the diagnosis of hypertension is simply not practical, particularly in the United States. While the NCGC did recognize and discuss the considerable challenges for implementation of this novel recommendation regarding ABPM, they did not provide specific advice as to how they would or should be addressed. Sufficient numbers of validated ABPM devices would need to be procured and adequately maintained. Additionally, office staff would need to be trained in the use of the devices and clinicians in the interpretation of the data generated by the ABPM reports. In the United States, the vast majority of hypertension is diagnosed by an increasingly overburdened force of primary care providers (PCPs). Without appropriate reimbursement from 3rd-party payers in the United States, the equipment, staffing, and training costs to implement a similar recommendation for ABPM would be overwhelming. Given our current fragmented reimbursement system, it is difficult to imagine our current payers will opt to divert already limited resources to make a more specific diagnosis of hypertension using ABPM. Even if we believe that routine use of ABPM will better secure the diagnosis of hypertension and save money in the long-run, in our system there is simply no group that is appropriately incentivized to make the needed short-term investment required to make it practical.

Even with a single-payer system in the United Kingdom, we believe that implementation of this recommendation will be problematic. Implementation of this recommendation in the United Kingdom will help to determine whether this recommendation is practical enough to be considered in other countries. At present, we feel that the Eighth Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC 8) should not adopt a position recommending routine use of ABPM to make the diagnosis of hypertension in the United States. Rather, we suggest that JNC 8 call for increased use of home BP monitoring (using validated devices) in making the diagnosis of hypertension, with 24-hour ABPM encouraged when there is a discrepancy between home and clinic readings, when accurate home readings cannot be obtained, or when white-coat hypertension is suspected. With appropriate reimbursement, PCPs should be encouraged to either purchase an ABPM device or seek out specialists who have a device available for use. Such a recommendation would expand its availability without overburdening our primary care delivery system or drastically increasing short-term health care costs. Finally, we question the practical utility of publishing recommendations that cover more than 300 pages of text, which will never be fully digested by the vast majority of providers of clinical care. Without appropriate availability and reimbursement, routine adoption of ABPM for the diagnosis of hypertension is not ready for prime time.

## Reference

1. National Institution for Health and Clinical Excellence (NICE). *Hypertension: The Clinical Management of Primary Hypertension in Adults: Clinical guidelines: Methods, evidence and recommendations*. NICE. London, UK; 2011.