Apathy Towards Ambulatory Blood Pressure Monitoring Use in Hypertension
Is It Due to Cognitive Dissonance, Money, or Both?

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See related article, pp 1258–1265

The most damaging phrase in the language is: “We’ve always done it this way.”

Grace Murray Hopper

The US Preventive Services Task Force has issued a draft recommendation supporting the use of ambulatory blood pressure monitoring (ABPM) to confirm elevated office measurements before diagnosing hypertension based on a meta-analysis funded by the US Agency for Healthcare Research and Quality.1 The analysis revealed that 5% to 65% of patients with elevated office blood pressure could not be diagnosed with hypertension using ABPM. In this issue of the journal, Li et al convincingly demonstrate the perils of depending on office or home measurements of blood pressure for proper diagnosis and classification of hypertension.2 Importantly, home recordings of blood pressure missed the high-risk diagnosis of mild or severe hypertension in >25% of patients.

Even though these recent landmark reports are startling, it has been known for decades that hypertension research and treatment have been the victim of misleading blood pressure data. Office blood pressure measurements have been used as practically the sole parameters for defining hypertension phenotypes ever since the first report of the Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure (JNC I) was published in 1977. At that time, hypertension was primarily seen as a public health problem, and the entire focus was placed on the office visit values (note: the report uses the term High Blood Pressure rather than Hypertension).

Subsequent JNC reports continued to define hypertension based on office data, although the evidence was accumulating that ABPM values are more reliable. ABPM had been introduced in 1962 by Maurice Sokolow after it was observed that patient outcomes did not correlate with blood pressures obtained in the office. Yet, the use of clinic blood pressure has been perpetuated ad nauseam by innumerable clinical trials (both government- and industry-sponsored), JNC reports (including the most recent JNC 8), and other hypertension guidelines. In addition, the use of this misleading technique is being reinforced by the reports of the National Health and Nutritional Evaluation Survey and the approval policies of the US Food and Drug Administration.

Chief concern in using clinic blood pressure instead of ABPM is that, depending on age, sex, and race, 10% to 25% of individuals have a white coat effect large enough to seriously damage the validity of blood pressures recorded in the clinic setting.3 Further, ABPM can reliably identify individuals with so-called masked hypertension, that is, those whose blood pressure is normal in the clinical setting, but elevated outside of that environment. This population includes an important subset of treated patients with hypertension who have nocturnal increases in blood pressure.4 There are also patients with hypertension who are thought to be resistant to antihypertensive treatment but in reality have a persistent white coat effect and have, therefore, much lower levels of blood pressure outside of the doctor’s office setting. Other valuable data derived from ABPM include circadian patterns of blood pressure (nocturnal dippers versus nondippers or risers), periods of hypotension, blood pressure variability, and attenuation of antihypertensive therapies.5 A number of recent cohort studies and registries have demonstrated that 24-hour blood pressure and components of the circadian period are superior to clinic blood pressure for predicting cardiac morbidity and mortality.6,7 In the evaluation of drug regimens, ABPM is superior to both clinic and home recordings of blood pressure.

Why the Apathy?

With so much compelling data, why has the use of ABPM not become the gold standard in hypertension research and treatment? Imagine that the term cancer was substituted for hypertension and one had a cancer biomarker that had a 20% false-positive rate. It is hard to think that a clinician would label all people with the abnormal biomarker as having cancer if a more accurate means of testing was available. Hypertension, the silent killer, is as threatening to an individual as many cancers and usually involves a lifetime of drug therapy. So, why the apathy toward using ABPM for the diagnosis and treatment of hypertension? True, office or home blood pressure measurements are easy, quick, and cheap, but the misdiagnosis rate of ≤65% should disqualify them from being acceptable, especially when a superior, true-and-tested methodology is available.

I propose that the widespread disconnect between best available evidence and clinical practice in hypertension is as a result of cognitive dissonance, concern about money (reimbursement), or both.
**Cognitive Dissonance**

Cognitive dissonance is characterized by a discomfort caused by a clash between evidence and one’s beliefs. Because the disease hypertension was defined by the biomarker of elevated office blood pressure, those measurements have formed the basis on which research and treatment in the field are based. Innumerable clinical trials have been conducted using less than optimal data and then those data were integrated into management guidelines. Moreover, because hypertension has been predominantly regarded as a public health issue, rather than an individual’s illness, little attention has been paid to various hypertension phenotypes. Best available evidence supports the diagnostic superiority of ABPM over office measurements, but a vast majority of (re)sources calls for the primacy of the latter.

Thus, when stakeholders (clinicians, drug companies, trialists, public health officials) are faced with the knowledge that clinic blood pressure measurements are fundamentally flawed, inconsistency (dissonance) is experienced. The stakeholders can become psychologically uncomfortable and motivated to reduce the dissonance by means of denial, rationalization, or active avoidance of situations and information that are likely to increase the discomfort. It seems that strong measures are required to counter this process.

**Monetary Concerns**

Reimbursement for performing ABPM is pitiful. The median amount paid for each Medicare beneficiary’s ABPM in the period 2007 to 2010 was $52. Is it any wonder that only 0.09% to 0.11% of Medicare beneficiaries in 2007 to 2010 filed APBM99.10 Compared with reimbursement for other cardiovascular procedures (eg, echocardiography, electrocardiography), this is embarrassing, particularly because the information gained would have such a major effect on the quality and cost of health care. Some financial incentive is necessary for clinicians to include ABPM in their practice.

**Suggestions for Correcting Apathy Toward ABPM**

The simplest way to resolve dissonance between actions and beliefs is simply to change beliefs. This will not be easy because clinicians have become addicted to a simplistic view of hypertension and may not give up using clinic blood pressure numbers easily. Some steps that might lead to wider use of ABPM in hypertension include the following:

- Medical schools and public health initiatives should educate clinicians about the difference between the disease hypertension and the biomarker blood pressure.
- Third-party payors should require ABPM for validation of the diagnosis of hypertension and provide fair reimbursement.
- The US Food and Drug Administration should not accept registration of any trials of antihypertensives unless the measurements include ABPM.
- The National Health and Nutritional Evaluation Survey should incorporate ABPM as soon as possible in their protocols.
- Guidelines by national professional societies for the diagnosis and management of hypertension should mandate the use of ABPM.

In the United Kingdom, ABPM data were deemed so critical that the National Institute for Clinical Excellence mandated ABPM evaluation for each newly diagnosed person with an elevated blood pressure in the office before the diagnosis of hypertension is confirmed.11 The importance of ABPM is emphasized in the 2013 ESH/ESC Guidelines for the management of arterial hypertension. Technology industry should be engaged to produce accurate, more affordable devices.

Finally, the use of ABPM not only protects an individual from an erroneous diagnosis, but it is good economic policy as well. Relieving 20% of the one billion individuals worldwide currently labeled as having hypertension, that is, 200 million persons, from a lifetime of therapy would constitute a great economic and social benefit, and some of those savings could be used to fund research into better definitions of hypertension phenotypes, which would result in better targeted therapies and strategies for prevention. This would go a long way to correcting what may be one of the greater medical blunders of all time.

**Disclosures**

None.

**References**

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Hypertension. 2015;65:1156-1157; originally published online April 13, 2015; doi: 10.1161/HYPERTENSIONAHA.115.05113

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