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BLOOD PRESSURE MONITORING AND MANAGEMENT (J COCKCROFT, SECTION EDITOR)

The Management of Hypertension in 2018: What Should the Targets Be?

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Abstract

Purpose of Review To provide an overview of the different guidelines for hypertension management from around the world.

Recent Findings The guidelines discussed include those from the United States (US), Europe, Canada, and Latin America. All guidelines except the US define hypertension as > 140/90 mmHg, and the US defines it as > 130/80 mmHg. In general, all guidelines except those from the US emphasize lifestyle modification as the cornerstone of initial therapy given blood pressure levels < 140/90 mmHg. The US emphasizes lifestyle modification at all BP levels starting at 130/80 mmHg. Additionally, all guidelines emphasize the need to assess cardiovascular risk with the Canadian guidelines indicating that a high cardiovascular risk person should have a goal of < 130/80 mmHg. All agree on the proper method of blood pressure measurement techniques and importance of home blood pressure. All support use combination therapy with the European guideline emphasizing initial therapy should be a combination pill. All guidelines stress the importance of patient adherence to maintain blood pressure control.

Summary All guidelines emphasize lifestyle modification, need for home blood pressure measurement, as well as use of proper techniques to measure blood pressure. The fundamental difference between US and all other guidelines is the definition of hypertension, > 130/80 mmHg in US and > 140/90 mmHg in the rest of the world.

Keywords Hypertension · Guidelines · Mortality · Outcomes

Introduction

There are numerous new blood pressure guidelines published from around the world, including Canada and Latin America [1•, 2]. The two most prominent are those of the American College of Cardiology/American Heart Association (ACC/AHA) [3•] and the European Society of Hypertension/European Society of Cardiology (ESH/ESC) [4•]. These were written and developed by health professionals including physicians and epidemiologists, and all were based on available data and published studies. Both ACC/AHA and ESH/ESC extended the previous version of the guidelines, incorporating new data and developing them into clinical recommendations.

The ACC/AHA guidelines extended the previous Joint National Committee Report 7 (JNC 7) [5] to include updated information from clinical trials and meta-analyses on optimal BP levels. The goal was to meld a prevention and treatment BP number that could be defended. It also continued to have a goal of increasing hypertension awareness and enforcing early medical management in high-risk individuals. However, this new update has sparked multiple concerns cited by different hypertension societies, arguing that the new updates with risk extrapolation to lower BP levels could have consequences of over treating patients and burdening an already-overworked healthcare system.

In contrast, the ESH/ESC guideline took a more holistic approach based on the same data but expanded to an area not commonly ventured into by guidelines. For example, specific recommendation on hypertension management at high altitudes was discussed and recommendations put forth based on clinical trial evidence [6•]. In contrast to the ACC/AHA guideline, it does not take the approach that "one size fits all." Instead, it adheres to the previous blood pressure goal of < 140/90 mmHg and recommends a discussion with patients at high risk of cardiovascular disease about lowering the BP to 130/

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80 mmHg. The ESH/ESC guidelines also have specific recommendations for people with isolated systolic hypertension, a topic relatively ignored by ACC/AHA guidelines. Table 1 summarizes the differences in BP goals between these guidelines.

The argument for a "one size fits all" approach in the ACC/AHA guidelines was derived in part by the Review Committees Assessment of the Medical Literature. This group carried out a meta-analysis of randomized controlled trials designed to identify the optimal target for BP control [7]. Based on their results, they defined hypertension as BP > 130/80 mmHg and recommended a universal target BP < 130/80 mmHg regardless of age and comorbid conditions. The ACC/AHA guidelines argued that all those with a greater than 10% 10-year risk should have a BP below 130/80 mmHg. This is a bit paradoxical since all the trials quoted had a > 15% 10-year CV risk. The guideline further asserts that patients should have individualized CV risk assessed before defining treatment options, using the atherosclerotic CV disease (ASCVD) risk calculator.

Both guidelines stress that people in the BP range of 130–139/80–89 mmHg must have lifestyle modification as the cornerstone of therapy and do not recommend drugs. However, the ACC/AHA guideline does state that if the 10-year CV risk is > 10% in addition to lifestyle *modification*, monotherapy should be initiated. This approach to the lifestyle in addition to adding a drug in high-risk population is also true in the Canadian guidelines, while the ESH/ESC guidelines recommend initial combination therapy when BP is > 140/90 mmHg. This is primarily driven by the observation of poor medication adherence by patients and physician inertia to increase doses or the number of medications. Moreover, it is clear that single-pill combinations are more efficacious with few side effects when treating hypertension [8, 9].

The ASCVD risk calculator, available in Android and iPhone, uses data from the Pooled Cohort Equation to generate individualized data on CV risk for patients, so they understand their risk and benefits of achieving BP goals [7]. The calculator has limitations and valid only between ages 20 and 79 years. The ESH/ESC uses a different approach to assess risk, the Systematic Coronary Risk Evaluation (SCORE) system, based on large representative European cohort data sets. This estimates the 10-year risk of a first fatal atherosclerotic event in the context of age, sex, smoking habits, total cholesterol level, and SBP. This SCORE system has recently been adapted for patients over the age of 65 years [10].

The ACC/AHA guideline authors argue that a focus on calculating the absolute risk to guide prescribing pharmacological therapy has yielded mixed results and by recommending a universal BP goal, decision making regarding therapy can be simplified. This assertion is understandable. However, the concept of "one size fits all" for a BP goal, implied with a single value goal, is a major problem. Data from trials such as the Heart Outcomes Prevention Evaluation (HOPE3) trial demonstrated no benefit of BP is lowering if initial BP is below 140/90 mmHg in people with low to intermediate CV risk [11]. Additionally, in many studies of patients with diabetes, data demonstrate increased CV risk if BP is lowered to levels of 120/80 mmHg [12••].

While there is a clear rationale to assess ASCVD risk, there is no clear rationale to change the BP thresholds used to define hypertension as > 140/90 mmHg other than to eliminate the term prehypertension and mandate more aggressive therapy. The JNC 7 report defined the current stage 1 hypertension by ACC/AHA as prehypertension. The designation of prehypertension was a patient-sanctioned term to alert physicians that patients needed help to prevent or delay the development of primary hypertension. Some of the ACC/AHA guideline authors argue that prehypertension is not scientific and failed to achieve its goal of improving BP goals. Unfortunately, the data fail to support this assertion since BP control rates following JNC 7 increased from 37 to 54% based on NHANES data [13].

To further amplify the point of "one size not fitting all," the ACC/AHA guideline lowered the BP goal for older individuals and suggested that a 30-year-old and an 80-year-old have the same BP goal, i.e., < 130/80 mmHg. They point to data from SPRINT to support this assertion. While this goal may be possible for some older individuals, it is not for all, particularly for those with poor vascular compliance, which the guideline did not address since such patients were not in

Table 1 Differences in BP goals between ACC/AHA and ESH/ESC guidelines

ESC/ESH				AHA/ACC			
Category	Systolic (mmHg)		Diastolic	Category	Systolic (mmHg)		Diastolic
Office BP	≥ 140	And/or	≥ 90	Clinic BP	≥ 130	And/or	≥ 80
Ambulatory BP				Ambulatory BP			
Daytime mean	≥ 135	And/or	≥ 85	Daytime mean	≥ 130	And/or	≥ 80
Night time mean	≥ 120	And/or	≥ 70	Night time mean	≥ 110	And/or	≥ 65
24-h mean	≥ 130	And/or	≥ 80	24-h mean	≥ 125	And/or	≥ 75
Home BP mean	≥ 135	And/or	≥ 85	Home BP mean	≥ 130	And/or	≥ 80

SPRINT. Numerous trials assessed BP lowering in older people with predominant or isolated systolic hypertension [14]. Many people in these trials were unable to tolerate BP levels < 140 mmHg, let alone < 130 mmHg. Moreover, a recent meta-analysis of people with isolated systolic hypertension in Japan showed that the lowest event rate was seen between 130 and 144 mmHg [15••]. Thus, the totality of the data for those with isolated systolic hypertension argues for a systolic BP between 130 and 145 mmHg to achieve a clear reduction in CV events compared to the placebo groups.

The ESH/ESC guidelines have a specific section dealing with older people and those with isolated systolic hypertension and have a broader view of the data and advocate working with the patient to see best what BP they can tolerate after discussing their CV risks with them. Table 1 lists differences in BP goals between ACC/AHA and ESH/ESC guidelines. Note that there is concern that the guidelines may increase the risk of overtreatment, particularly, in the older adults over the age of 75 who are vulnerable to dehydration, hypotension, and overall worst outcomes. This harm was overlooked by the guidelines which were heavily based on the SPRINT results and ignoring earlier large trials in this subset like the Systolic Hypertension in the Elderly Program and others [14].

An additional implication of this new definition of hypertension identifies about 14% more US adults as having primary hypertension. In other words, almost 50% of the US adults are labeled as being hypertensive. This translates into great insurance costs for patients. Nevertheless, the ACC/AHA guideline authors argue that most newly diagnosed hypertensives using the new criteria can be managed with *lifestyle modification*. While we agree, most physicians fail to properly counsel patients on *lifestyle modification* due to time constraints related to patient loads and no compensation for extra time. A table summarizing lifestyle modification approaches, which has been expanded from the JNC 7, is in the ACC/AHA guideline.

Additionally, the current guidelines provided a therapeutic algorithm that applies to many patients[1]. However, an individualized approach for the spectrum of all patients with hypertension, while not in the purview of general guidelines, can help determine the best choice for first-line therapy to lower BP in most people. One major change in pharmacological therapy is the elimination of beta-blockers from the first-line therapy of those with primary hypertension and no comorbidities requiring beta-blockers.

Conclusions

In summary, there are many positives in the ACC/AHA guidelines. Perhaps, the only drawback was changing the definition of hypertension to ≥ 130/80 mmHg, based on results largely derived from the SPRINT and epidemiological databases of people with high CV risk. Although the guidelines generally agree that subgroups of people who have a > 15% 10-year CV risk will benefit from earlier intervention, labeling everyone with a broad brush, may be okay from a public health prevention perspective but this adds excessive burden to an already-overworked primary care physician workforce.

Compliance with Ethical Standards

Conflict of Interest Neither author declares any conflicts of interest relevant to this manuscript. However, Dr. Bakris is a principal investigator—FIDELIO trial (Bayer); Steering Committee CREDENCE (Janssen); CALM-2 (Vascular Dynamics). He is a consultant—Merck; Novo Nordisk; KBP; Relypsa. These are largely focused on diabetic nephropathy and not guidelines.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

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- • Of importance
- •• Of major importance

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