

The New 2017 ACC/AHA Guidelines “Up the Pressure” on Diagnosis and Treatment of Hypertension

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Hypertension, the world’s most common and modifiable cardiovascular risk factor,¹ has been the focus of multiple clinical practice guidelines dating back to the first Joint National Committee in 1977. In 2014, a writing group commissioned by the National Heart, Lung, and Blood Institute focused on a few key treatment questions and used data only from randomized clinical trials (RCTs) to inform their recommendations.²

Based on a lack of RCT evidence, the writing group recommended relaxing some of the treatment goals for several subgroups, including patients aged 60 years or older and those with diabetes or kidney disease. Even before publication, these somewhat conservative recommendations were criticized and ultimately not endorsed either by major professional societies or by some of the original guideline writing group.³

To address the ensuing controversies and to account for new evidence from recent RCTs that focused on hypertension, the American College of Cardiology and the American Heart Association (ACC/AHA) have now produced the 2017 Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults.^{4,5} The new guideline is summarized in a Clinical Guidelines Synopsis in this issue of *JAMA*.⁶ The scope of this guideline is much more extensive than its 2014 predecessor, examining a broad range of topics including the definition of hypertension, diagnostic workup and evaluation, lifestyle management strategies both for prevention and for treatment, blood pressure (BP) treatment thresholds and initial drug choices, and long-term monitoring. The ACC/AHA 2017 guideline also considers a broader range of evidence in forming the recommendations, including epidemiological studies and, in selected cases, expert opinion. Summarizing the full list of these recommendations in an Editorial would be impractical. Instead, we focus on those most likely to affect current clinical practice.

The first noteworthy change in the 2017 guideline relates to the definition of hypertension and treatment targets. This guideline now categorizes BP as normal (systolic BP [SBP] <120 mm Hg AND diastolic BP [DBP] <80 mm Hg); elevated (SBP 120-129 mm Hg AND DBP <80 mm Hg); stage 1 hypertension (SBP 130-139 mm Hg OR DBP 80-89 mm Hg); and stage 2 hypertension (SBP ≥140 mm Hg OR DBP ≥90 mm Hg). Although the exact cut points for each of these classifications are somewhat arbitrary, there is well characterized and strong epidemiological evidence to support a generally linear association between lower SBP and DBP and cardiovascular risk.⁷ From a clinical perspective, lowering the diagnostic thresholds for

“hypertension” beyond previous guidelines will significantly increase the number of individuals with this diagnosis. Importantly, this guideline uses a uniform BP definition for elevated BP and hypertension for all individuals, without regard to patient age or comorbid illness status.

The 2017 ACC/AHA guideline also proposes more aggressive thresholds and goals for treatment relative to prior guidelines. Treatment recommendations are now based on an individual’s underlying cardiovascular disease (CVD) risk. For those with known CVD or diabetes, the guideline recommends intervention (both lifestyle and pharmacological treatment) for stage 1 hypertension (SBP ≥130 mm Hg or DBP ≥80 mm Hg). For all others, the guideline proposes use of BP-lowering medications in stage 1 hypertension only if a patient’s estimated 10-year atherosclerotic CVD (ASCVD) risk is 10% or higher. For those with lower ASCVD risk, lifestyle modification is recommended until the individual reaches stage 2 hypertension (140/90 mm Hg), above which drug therapy is recommended. In terms of treatment targets, for high-risk adults with known CVD or a 10-year ASCVD risk estimate greater than 10%, the BP targets are less than 130/80 mm Hg. For adults without CVD and an estimated 10-year ASCVD risk estimate less than 10%, BP less than 130/80 mm Hg is still targeted but received a softer recommendation (IIb). These recommendations are the same for patients of all ages.

The 2017 guideline strategy of tailoring treatment to a combination of both BP and underlying 10-year estimated risk of ASCVD is a huge step forward for hypertension management. This change reflects epidemiologic data showing that both underlying risk and change in BP while receiving treatment determine one’s absolute benefit from BP lowering.⁸ Furthermore, this risk-based approach is now more consistent with the recent cholesterol guidelines.⁹ The use of a risk-based approach as well as more aggressive BP targets reflect a strong influence in these guidelines from the SPRINT trial. SPRINT demonstrated that an SBP goal of less than 120 mm Hg was superior to a goal of less than 140 mm Hg among adults with SBP greater than 130 mm Hg.^{10,11} SPRINT enrolled adults who had either pre-existing CVD or a 10-year Framingham ASCVD risk of greater than 15%. The SPRINT results likely influenced the 2017 guideline authors to limit the 130/80-mm Hg medication threshold to only those with known disease or higher predicted CVD risk.

Yet the application of SPRINT results in the new guideline also required compromise. First, while SPRINT treated patients to an SBP goal of less than 120 mm Hg, because repeated BP measurements in SPRINT are likely lower than what is seen in clinical practice, the guideline recommended a target of less than 130 mm Hg, not 120 mm Hg. Second, despite the negative results

of the ACCORD trial¹² showing no benefit to intensive SBP lowering in those with diabetes, the guideline authors extended the goal of less than 130/80 mm Hg to all high-risk adults, regardless of diabetes status and age.

The selection of a 10% ASCVD risk threshold appears also to have been a compromise, being higher than the threshold used to classify high risk in the lipid guidelines (7.5%) and different from that used in SPRINT (15% Framingham risk). In contrast to the 2014 guideline, by focusing on 10-year risk, which is largely driven by age, the new guideline recommends more aggressive pharmacologic treatment of older individuals and less aggressive treatment in younger individuals. How to best treat younger individuals remains unclear. As there is evidence that hypertension also conveys a cumulative CVD risk, clinicians and patients should also consider lifetime risk when making their treatment decisions.¹³

The new guideline also provides a new and much more intensive recommendation concerning out-of-office and self-monitored BP. This guideline reiterates previous recommendations concerning office BP measurement and detection of white-coat hypertension. On the other hand, the guideline recommends a newer approach to out-of-office BP measurements using ambulatory or home BP monitoring to both confirm the diagnosis of hypertension and to titrate BP-lowering medication. This is a welcome change, as there is clearly strong evidence to suggest that knowing the BP of an individual outside the clinic setting is more predictive of outcomes than their clinic BP and brings the US guidelines more in line with those

used already in Europe.¹⁴ For many patients and clinicians, however, these recommendations will be new and will require a substantial change in patient education, practice organization, performance measurement, and follow-up approaches.

The new guideline provides strong recommendations concerning first-line medications and use of monotherapy compared with multidrug therapy. For first-line drugs, this guideline reiterates previous assessment that initiation of antihypertensive drug therapy can include thiazide diuretics, calcium channel blockers, angiotensin-converting enzyme inhibitors, or angiotensin II receptor blockers. This guideline also recommends initiation of 2 first-line agents of different classes in adults when their BP is more than 20/10 mm Hg above their BP target, a strategy with increasing clinical evidence.

In summary, the new 2017 ACC/AHA consensus BP guideline recommends many substantial changes for the field of hypertension and hypertension management. The guideline provides clinicians with more than 200 pages of encyclopedic reference, providing a great deal of useful information for clinicians. The majority of the recommendations support a more aggressive diagnostic and treatment approach and are consistent with growing evidence from clinical trials and epidemiological studies. A huge challenge for clinicians will be to translate these guidelines into clinical practice. Only approximately half of patients classified as having hypertension under the previous guidelines had their BP controlled,¹⁵ and the proportion at the new goals will be even lower. Thus, the “pressure” is on to more effectively treat BP at individual and population levels.

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REFERENCES

- Forouzanfar MH, Liu P, Roth GA, et al. Global burden of hypertension and systolic blood pressure of at least 110 to 115 mm Hg, 1990-2015. *JAMA*. 2017;317(2):165-182.
- James PA, Oparil S, Carter BL, et al. 2014 evidence-based guideline for the management of high blood pressure in adults. *JAMA*. 2014;311(5):507-520.
- Wright JT Jr, Fine LJ, Lackland DT, et al. Evidence supporting a systolic blood pressure goal of less than 150 mm Hg in patients aged 60 years or older. *Ann Intern Med*. 2014;160(7):499-503.
- Whelton PK, Carey RM, Aronow WS, et al. 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines [published online November 13, 2017]. *Hypertension*. doi:10.1161/HYP.000000000000065
- Whelton PK, Carey RM, Aronow WS, et al. 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines [published online November 13, 2017]. *J Am Coll Cardiol*. doi:10.1016/j.jacc.2017.11.006
- Cifu AS, Davis AM. Prevention, detection, evaluation, and management of high blood pressure in adults. *JAMA*. doi:10.1001/jama.2017.18706
- Bundy JD, Li C, Stuchlik P, et al. Systolic blood pressure reduction and risk of cardiovascular disease and mortality. *JAMA Cardiol*. 2017;2(7):775-781.
- Navar AM, Pencina MJ, Peterson ED. Assessing cardiovascular risk to guide hypertension diagnosis and treatment. *JAMA Cardiol*. 2016;1(8):864-871.
- Stone NJ, Robinson JG, Lichtenstein AH, et al. 2013 ACC/AHA guideline on the treatment of blood cholesterol to reduce atherosclerotic cardiovascular risk in adults. *Circulation*. 2014;129(25)(suppl 2):S1-S45.
- Wright JT Jr, Williamson JD, Whelton PK, et al. A randomized trial of intensive vs standard blood-pressure control. *N Engl J Med*. 2015;373(22):2103-2116.
- Williamson JD, Supiano MA, Applegate WB, et al. Intensive vs standard blood pressure control and cardiovascular disease outcomes in adults aged ≥75 years. *JAMA*. 2016;315(24):2673-2682.
- Cushman WC, Evans GW, Byington RP, et al. Effects of intensive blood-pressure control in type 2 diabetes mellitus. *N Engl J Med*. 2010;362(17):1575-1585.
- Vasan RS, Beiser A, Seshadri S, et al. Residual lifetime risk for developing hypertension in middle-aged women and men. *JAMA*. 2002;287(8):1003-1010.
- Mancia G, Fagard R, Narkiewicz K, et al. 2013 ESH/ESC guidelines for the management of arterial hypertension. *Eur Heart J*. 2013;34(28):2159-2219.
- Merai R, Siegel C, Rakotz M, et al. CDC Grand Rounds: a public health approach to detect and control hypertension. *MMWR Morb Mortal Wkly Rep*. 2016;65(45):1261-1264.