

New ACC/AHA Guideline for the Prevention, Detection, Evaluation and Management of High Blood Pressure in Adults



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Fourteen years after the previous comprehensive US guideline on management of hypertension (JNC7), and 4 years after the controversial guideline of the 2014 Report from the Panel Members appointed to the Eighth Joint National Committee (JNC8 panel member report), the American Heart Association and the American College of Cardiology have come out with an extensive and novel guideline for management of high blood pressure which was presented at the AHA Scientific Sessions on November 13, 2017 in Anaheim, CA, USA. It was simultaneously published online in the Journal of the American College of Cardiology and in Hypertension, journal of AHA, on the same date. ¹

Importantly, the recommendations in the guideline are accompanied by Class of Recommendation and Level of Evidence applied to Clinical Strategies, Interventions, Treatments, or Diagnostic Testing in Patient Care.

A major novelty of the Guideline is that for the first time it modifies the classical definition of hypertension that used to be blood pressure (BP) $\geq 140/90$ mm Hg. It proposes a category of Elevated blood pressure at a systolic BP (SBP) of 120 to 129 mm Hg. Subjects in this category need to undergo lifestyle changes to prevent progression of their condition to hypertension. The new guideline defines hypertension as BP $\geq 130/80$ mm Hg. At or above this level of BP, when confirmed on a second occasion, individuals need treatment, which can include lifestyle modification or in cases of more elevated BP and greater cardiovascular risk in addition the use of antihypertensive medications. The change in the definition of hypertension means that 46% of US adults are identified as having high BP, compared with 32% under the previous definition according to US National Health and Nutrition Examination Survey (NHANES) 2011-14.² The prevalence of hypertension was higher when defined by the present 2017 ACC/AHA guidelines compared to the JNC7 guidelines within all age, gender, race-ethnicity, and cardiovascular disease (CVD) risk groups.²

Hypertension is classified as stage 1 when BP is $\geq 130/80$ but $< 140/90$ mm Hg, confirmed at a second visit. It is stage 2 when BP is measured $\geq 140/90$ mm Hg and confirmed on a second occasion.

Although the guideline does not specify whether BP should be measured with the auscultatory manual technique or with oscillometric devices, or the so-called automated office blood pressure (AOBP), which may all give different results depending on how they are carried out, it does insist on a standardized and accurate BP measurement technique. It also emphasizes the need to use out of office BP measurements, both ambulatory and home BP monitoring. The importance of diagnosing white coat hypertension and masked hypertension with out of office measurements is underlined.

Recommendations are given for use of validated instruments and proper standardized technique to be used in not only in office but also home BP measurements. Since specific goals are given for thresholds and target BP, it would have been critical to indicate how the BP levels indicated, such as 130/80 mm Hg, are to be obtained: with manual, oscillometric or AOBP measurements, since differences between these may be important, with 10-20 mm Hg higher SBP in usual clinical measurements, if BP is not measured with unattended AOBP, which could result in overtreatment and harm. The controversy regarding the different techniques and lack of enough data on the exact difference in BP results may be a reason why the guideline committee did not aim for the SPRINT goal of SBP < 120 mm Hg, and settled for a target SBP of < 130 mm Hg for most patients aiming to balance potential under and overtreatment.

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Another important novelty is that specific recommendations are given regarding evaluation of global cardiovascular risk to guide management not only based on BP values. Use of an atherosclerotic cardiovascular disease (ASCVD) "[risk calculator](http://www.cvriskcalculator.com)" (<http://www.cvriskcalculator.com>) to determine the patient's risk of heart disease or stroke over the next 10 years is recommended.

For Elevated blood pressure, lifestyle modification is recommended. In the case office BP is $\geq 120/80$ mm Hg and masked hypertension is suspected, it is recommended that out of office BP be evaluated. If out of office BP $\geq 130/80$ mm Hg, lifestyle modification should be continued and antihypertensive drugs initiated.

In those patients in stage 1 (BP at or above 130/80 but below 140/90 mm Hg) with no history of CVD or a cardiovascular risk over the next 10 years of less than 10% of suffering a cardiovascular event, lifestyle modification alone may be recommended and BP reassessed in 3-6 months. If still $\geq 130/80$ mm Hg, antihypertensive drug therapy should be started. If on the other hand, the stage 1 patient has higher CV risk than 10% in 10 years, primary prevention of CVD requires introduction of antihypertensive drugs. Similarly, for the patient with known clinical CVD, diabetes mellitus, or chronic kidney disease (CKD), secondary prevention requires lifestyle changes and BP lowering medication (1 medication). Patients should be reassessed in 1 month for effectiveness of medication therapy. If goal is met after 1 month, BP should be reassessed in 3-6 months. If goal is not met after 1 month, different medication or titration should be considered. Monthly follow-up should be continued until control is achieved.

For stage 2 patients (with BP $\geq 140/90$ mm Hg), healthy lifestyle changes and antihypertensive medication (2 medications of different classes) are recommended, either as separate agents or as fixed dose combination. Patients should be reassessed in 1 month for effectiveness, and if goal is met after 1 month, reassessed in 3-6 months. If goal is not met after 1 month, different medications or titration should be considered. Monthly follow-up should be pursued until control is achieved. If patients present with severe BP elevation $\geq 180/120$ mm Hg, antihypertensive drug therapy should be initiated immediately.

Goals of treatment are BP $< 130/80$ for most hypertensive patients, including diabetic, CKD and elderly patients (unless the latter are institutionalized or wheelchair bound, or present orthostatic hypotension, syncope or falls, in which cases individualized adjustment to less intensive treatment is reasonable). This is a major change relative to previous recommendations and other guidelines that recommend target BP $< 140/90$ for diabetic and CKD patients. It should be noted that among

the elderly who are recommended antihypertensive medication according to the 2017 ACC/AHA guideline thresholds but not those from the JNC7 guideline, BP was lower but they had a higher mean 10-year CVD risk.²

Recommendations for lifestyle modification include reducing salt and using the DASH diet and incorporating potassium-rich foods, suggestions for weight loss, smoking cessation, reducing alcohol intake and increasing physical activity.

Specific recommendations are given for choice of antihypertensive drugs, which include first line agents such as angiotensin converting enzyme inhibitors (ACEI), angiotensin receptor blockers (ARB), diuretics and calcium channel blockers (CCB). Recommendations are given according to severity of BP and response to treatment, ethnicity and age, as well as presence of comorbidities (see below).

Patients suffering from hypertensive urgencies (systolic BP > 180 mm Hg and/or DBP > 120 mm Hg) may be non-adherent to antihypertensive therapy. They also do not have new or worsening target organ damage. It is recommended in the guideline that antihypertensive drug therapy be restarted or intensified, and anxiety, that often plays a role, treated. In hypertensive emergencies (systolic BP > 180 mm Hg + target organ damage and/or DBP > 120 mm Hg + target organ damage), the guideline recommends that the patient be admitted to an intensive care unit for monitoring of BP and intravenous administration of appropriate antihypertensive agents if there is worsening target organ damage.

The guideline provides suggestions for screening of secondary forms of hypertension such as primary aldosteronism, renal artery stenosis, pheochromocytoma/paraganglioma, etc., and referral to specialist care.

With respect to management of adults with comorbidities and special patient groups, guidance is provided for stable coronary heart disease, heart failure, CKD or renal transplantation, peripheral vascular disease, diabetes mellitus or metabolic syndrome, and atrial fibrillation, among others. In stable coronary heart disease, beta blockers such as metoprolol and bisoprolol are suggested, to which renin-angiotensin blockers should be added, and if needed, dihydropyridine CCBs, and in addition, diuretics and mineralocorticoid receptor antagonists to control blood pressure. If there is persistent angina, CCBs can be added to beta blockers. Guideline directed beta blockers may be pursued beyond 3 years. In heart failure, use of diuretics to control volume followed by ACEI or ARB and beta blockers to control blood pressure to a goal of $> 130/80$ mm Hg is recommended. ARBs may prevent recurrence of atrial fibrillation and should be considered in these patients. Recommendations are also given for aortic

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stenosis and insufficiency, as well as aortic disease.

In CKD all first line agents are recommended, unless there is albuminuria >300mg/day, in which case ACEI is first choice or, if not tolerated, an ARB may be used. After renal transplantation, a goal of <130/80 mm Hg and use of CCB that may improve GFR and kidney survival are recommended.

Recommendations are given for hypertension associated with stroke. In acute intracerebral haemorrhage, lowering of SBP to <140 mm Hg is not recommended. In acute ischemic stroke, BP should be below 185/110 mm Hg before initiating thrombolytic therapy.

Antihypertensive therapy may be restarted to lower BP that remains >140/90 mm Hg during hospitalization if the patient is neurologically stable. If the patient with acute ischemic stroke does not receive thrombolytic therapy or endovascular treatment and has BP ≤220/110 mm Hg, reinitiating antihypertensive therapy in the first 48-72 hours has not been shown to be effective. If BP is ≥220/110 mm Hg, it is reasonable to lower BP by 15% during the first 24 hours after an acute ischemic stroke. For secondary stroke prevention in previously treated hypertensive patients, treatment to lower BP after a few days of the index event to <130/80 mm Hg with a thiazide diuretic, an ACEI or ARB or ACEI + thiazide diuretic is considered reasonable. Previously untreated hypertensive subjects with BP ≥140/90 mm Hg should be treated after a few days of the index event with antihypertensive agents. However, for those with BP ≤140/90 mm Hg, the benefit of antihypertensive treatment is not established or recommended.

Patients with peripheral artery disease (PAD) should be treated like those without PAD. In diabetes mellitus, all first line agents are recommended to lower BP to <130/80 mm Hg, although in presence of albuminuria, ACEI or ARB may be considered.

Although all first line agents may be used, diuretics and CCBs are to be used first in African American patients, and the same in non-institutionalized elderly individuals to a goal of <130/80 mm Hg. In the latter, clinical judgment, patient preference and a team-based approach to assess benefit should be used to decide on therapy and intensity of treatment. In pregnancy, methyldopa, nifedipine or labetalol are recommended.

There are recommendations for preoperative and perioperative management of hypertension. Among them, beta blockers should not be initiated before major surgery in beta blocker naïve patients, and medical therapy for hypertension should be continued until surgery. However, discontinuing ACEI or ARB before major surgery should be considered.

For patients with resistant hypertension, that is

hypertension uncontrolled on full doses of 3 different classes of first line agents that can be used as combination therapy, or requiring a fourth agent for control of blood pressure, it is recommended first to ensure that the patient is adherent to treatment and is taking as prescribed ≥3 antihypertensive medications at optimal doses, including a diuretic. Pseudoresistance should be excluded by ensuring accurate office BP measurements, assessing nonadherence with the prescribed regimen, and obtaining home, work, or ambulatory BP readings to exclude the white coat effect. Contributing lifestyle factors need to be identified, such as alcohol intake, and interfering substances such as NSAIDs, amphetamines, decongestants, etc., discontinued. Secondary causes of hypertension such as primary aldosteronism, CKD and renal artery stenosis, pheochromocytoma and obstructive sleep apnea should be ruled out. Once this is ensured, diuretic therapy should be maximized, a mineralocorticoid receptor antagonist added, and if needed, other agents with different mechanisms of actions, including loop diuretics in patients with CKD or those receiving potent vasodilators like minoxidil. Eventually if BP remains uncontrolled after 6 months of treatment, the patient should be referred to an appropriate specialist for known or suspected secondary causes of hypertension.

Strategies to improve adherence and control of BP, to promote lifestyle modification and improving quality of care for low resource populations are addressed. As well, structured, team-based care interventions for hypertension control are recommended. Strategies based on health information technology and use of telehealth to improve hypertension control are suggested. Use of performance measures and other quality improvement strategies at the level of patients, providers, and systems is suggested to facilitate hypertension control. Finally, it is recommended that all hypertensive patients should have "clear, detailed, and evidence-based plans of care allowing achievement of treatment and self-management goals, encouraging effective management of comorbidities, with timely follow-up with the healthcare team, and adhering to CVD guideline directed management and therapy."¹

The 2017 ACC/AHA Guideline for the Prevention, Detection, Evaluation and Management of High Blood Pressure in Adults is comprehensive, innovative, in part evidence-based but with significant expert opinion-based recommendations. It introduces the category of Elevated blood pressure, a new definition of hypertension and new thresholds and goals of treatment. The guideline insists on the accurate and standardized measurement of blood pressure and the use of out of the office BP measurement. However, as pointed out, it does not address the problem of differences in BP measurement with different approaches (auscultatory vs. oscillometric, vs. AOBP) and devices in the office. It stresses the importance of global CVD risk assessment for

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decision-making relative to treatment. Lifestyle modification and choice of antihypertensive agents are detailed, secondary hypertension screening and comorbidities are addressed, urgencies and emergencies as well as resistant hypertension are considered. Adherence, communication technology and health services and community involvement are also discussed and recommendations are made regarding their application to improve BP control.

I believe that one of the main consequences of the dissemination and implementation of this new guideline will be the intensification of therapy for most hypertensive patients, hopefully without unintended consequences, and leading to improved CV outcomes.

- Ernesto Schiffrin

REFERENCES

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With over a billion people with raised blood pressure, how do we set our priorities straight? Alta Schutte and Peter M Nilsson



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Comment 1

In the previous issue of ISH Hypertension News, Drs. Alta Schutte and Peter Nilsson (1) address a problem that is overlooked by clinicians and scientists, including those active in cardiovascular prevention. Namely, that although large scale epidemiological studies show hypertension to be the first cause of death and burden of disease worldwide (2,3), the adverse effect of this condition for public health and people's survival is underestimated.

As Schutte and Nilsson emphasize, one of the reasons is that epidemiological studies do not (and cannot) take into account masked hypertension, i.e. a condition in which office blood pressure (BP) is normal whereas home and (or) ambulatory BP are elevated (4). The resulting underestimation of the

hypertension-related cardiovascular risk is by no means trivial because 1) in samples representative of the entire population, masked hypertension has been detected in about 1 out of 7 individuals with a normal office BP, which means that, globally, a huge number of people are affected and 2) the adverse consequences of this condition for vital organ function and structure as well as for the risk of a clinical event are substantially greater than in normotensive people, approaching in some studies those of individuals with an in- and out-of-office BP elevation (4,5).

Recalculation of the risk of death and disease attributable to hypertension should of course also take into account that in a large fraction of hypertensive patients (probably 30-40% globally, and up to 50% in the elderly) out-of-office BP normality, i.e. white coat hypertension, makes the risk less than that calculated

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