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**Abstract:** *The new hypertension guideline lowers the definition of high BP to 130/80 mm Hg. This means that millions of adults will now be diagnosed with hypertension and that many of those taking antihypertensive drugs are not at goal. The challenge is to communicate the change, the strength of evidence behind the change, and the options available to patients. Healthcare providers must be knowledgeable of the new guideline and must be ready to meet this challenge.*

**A**ccording to the American College of Cardiology (ACC)/American Heart Association (AHA) Task Force on Clinical Practice Guidelines, the 2017 *Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults* is an update from *The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure* (JNC 7) published in 2003.<sup>1,2</sup> Of note, *The 2014 Evidence-Based Guideline for the Management of High Blood Pressure in Adults: Report from the Panel Members Appointed to the Eighth Joint National Committee* (JNC 8) was published in 2014.<sup>3</sup> Compared with the JNC 7 guideline, the JNC 8 guideline is primarily based on evidence obtained from randomized clinical trials and does not discuss the stages of hypertension or provide

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a definition of hypertension. JNC 8 is more narrowly focused and provides nine recommendations for the pharmacologic management of hypertension.<sup>3</sup>

This article discusses the recently published guideline by the ACC along with the AHA and nine other professional health organizations.<sup>1</sup> The 2017 ACC/

occasions to diagnose hypertension. At the first visit, HCPs should record the BP in both arms and then use the arm that gives the higher reading for subsequent recordings. The recommendation states that in addition to office BP readings, out-of-office self-monitoring of BP with automatic BP machines or



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ABPM be used to confirm the diagnosis of hypertension along with titration of medications.<sup>1</sup> The new guideline eliminates the category of prehypertension and establishes new categories (see *Categories of BP in adults*).<sup>1</sup>

AHA Task Force comprehensive guideline incorporates new information from clinical studies related to BP and cardiovascular risk, ambulatory BP monitoring (ABPM), home BP monitoring (HBPM), BP thresholds for treatment measures, and other important information about hypertension.<sup>1</sup>

The 2017 ACC/AHA Task Force guideline is designed to provide a cornerstone for quality cardiovascular care and is applicable to patients with or who are at risk for developing cardiovascular disease (CVD). The new guideline lowers the definition of hypertension to 130/80 mm Hg; therefore, millions of adults will now be diagnosed with hypertension.<sup>1</sup> It is well known that there is an association between hypertension and cardiovascular risk; thus, health-care providers (HCPs) must be cognizant of the new guideline and the impact this new information has on their patients.

For self-monitoring of HBPM, patients should be instructed to remain quiet for 5 or more minutes prior to BP measurement and to avoid smoking, consuming caffeinated beverages, or exercising for at least 30 minutes prior. Cuff size should be appropriate such that the bladder encircles 80% of the arm. Patients should be encouraged to bring their device to an office visit to ensure its proper use. Information for proper HBPM use is available online.<sup>4</sup>

Home BP measurements and ABPM are useful to detect white coat hypertension and masked hypertension. The use of automatic BP machines is recommended in place of the standard sphygmomanometer and stethoscope method to eliminate the white coat effect frequently noted in office settings and to provide more accurate readings.<sup>5</sup> White coat hypertension is defined as untreated office BP in adults as a systolic BP (SBP) over 130 mm Hg but less than 160 mm Hg, and diastolic BP (DBP) greater than 80 mm Hg but less than 100 mm Hg. Masked hypertension in adults is defined by an office BP at goal and elevated levels during home monitoring.<sup>1</sup> The guideline also offer values for clinic as well as out-of-office BP readings.<sup>1</sup>

**■ Diagnosing hypertension**

According to the updated guideline, HCPs need to obtain at least two BP readings measured at least 1 to 2 minutes apart and on at least two separate

Categories of BP in adults		
Category	SBP	DBP
Normal	<120 mm Hg	and <80 mm Hg
Elevated	120-129 mm Hg	and <80 mm Hg
Hypertension		
Stage 1	130-139 mm Hg	or 80-89 mm Hg
Stage 2	≥140 mm Hg	or ≥90 mm Hg

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**■ Screening for secondary causes of hypertension**

It is also important to screen for specific forms of secondary hypertension when clinical indications and physical exam findings are present or in adults with resistant hypertension (on maximal doses of three medications, including a diuretic). For example, resistant hypertension or flash pulmonary edema associated with an abdominal systolic-diastolic bruit may be indicative of renovascular disease and require a magnetic resonance angiography of the renal arteries for diagnosis.

Hypertension with hypokalemia may be associated with primary aldosteronism, of which plasma aldosterone/renin ratio may aid in the diagnosis. Obesity and/or Mallampati class III-IV (ability to see on direct visualization, the soft palate and uvular base in class III and the hard palate only in class IV) in the setting of hypertension may indicate obstructive sleep apnea and require a sleep study.<sup>1</sup> Depending on the diagnosis, a referral to a specialist is encouraged. Additionally, an elevated BP can be drug- or substance-induced, such as via alcohol, amphetamines, antidepressants, caffeine, systemic corticosteroids, decongestants, nonsteroidal anti-inflammatory drugs, or recreational drugs (such as cocaine or bath salts). As always, a thorough history of medications, both prescribed and over-the-counter, is important.

#### ■ CVD risk factors

In addition to diagnosing hypertension, it is important to screen for and to manage CVD risk factors. Modifiable risk factors such as smoking, dyslipidemia, obesity, physical inactivity, and poor dietary habits need to be addressed. Risk factors such as chronic kidney disease, family history, increased age, low socioeconomic/education status, male gender, and obstructive sleep apnea are difficult to change or cannot be changed and may not reduce CVD risk.<sup>1</sup> Basic lab studies for primary hypertension include fasting blood glucose, complete blood cell count, lipid profile, basic metabolic panel, thyroid-stimulating hormone, and an ECG. Additional testing may include uric acid, urinary albumin-to-creatinine ratio, and a two-dimensional echocardiogram to determine the presence of left ventricular hypertrophy, diastolic dysfunction, valvular heart disease, and wall motion abnormalities.

#### ■ Hypertension treatment

Nonpharmacologic interventions are recommended for all categories of hypertension, including weight management, sodium restriction, a heart-healthy diet, tobacco cessation, increased physical activity, and limited alcohol intake (2 drinks/day or less for men and 1/day or less for women). The average impact of these lifestyle changes is approximately 4 to 5 mm Hg decrease in SBP and approximately 2 to 4 mm Hg

decrease in DBP; however, dietary changes, including increase in fruits, vegetables, and grains, may decrease SBP by 11 mm Hg.<sup>1</sup> Patients with an elevated BP should be reassessed 3 to 6 months after nonpharmacologic therapy. If they are not at a goal of less than 130/80 mm Hg, then pharmacologic treatment should be considered.

The benefit of pharmacologic treatment for BP reduction is related to CVD risk. Therefore, prior to determining the need for pharmacologic therapy, an assessment of clinical atherosclerotic cardiovascular disease (ASCVD) or estimated 10-year CVD risk is recommended. The risk calculator measures risk for individuals 40 to 79 years of age and in those with total cholesterol less than 320 mg/dL.<sup>6</sup> Adults with stage 1 hypertension and a 10-year risk less than 10% should be reassessed 3 to 6 months after nonpharmacologic therapy. Adults with stage 1 hypertension and a 10-year ASCVD risk of 10% or greater are started on BP-lowering medication and reassessed in 1 month. For adults with stage 2 hypertension, BP-lowering medications (using two agents from different classes) are started without a calculation of ASCVD risk and reassessed in 1 month. Adults with a very high average BP (SBP of 180 mm Hg

*Patients with an elevated BP should be reassessed 3 to 6 months after nonpharmacologic therapy.*



or greater or a DBP of 110 mm Hg or greater) need an immediate evaluation with prompt initiation of pharmacologic treatment.<sup>1</sup>

*First-line medications* for the initiation of antihypertensive drug therapy include thiazide diuretics, calcium channel blockers (CCBs), and angiotensin-converting enzyme (ACE) inhibitors or angiotensin II receptor blockers (ARBs).<sup>1</sup> Chlorthalidone is the preferred diuretic because of the drug's long half-life, and it has demonstrated reduction of CVD risk in clinical trials.<sup>1</sup> ACE inhibitors and ARBs should not be used together. Women who are pregnant should not be treated with ACE inhibitors, ARBs, or direct renin inhibitors. Women with hypertension who become pregnant or are planning to become pregnant should be transitioned to methyldopa, nifedipine, and/or labetalol during pregnancy.<sup>1</sup>

*Drug treatment in patients with comorbidities.* Drug therapy also depends upon comorbidities. For example, patients with heart failure with reduced ejection fraction (HFrEF) benefit from either an ACE inhibitor or ARB, whereas the use of nondihydropyridine CCBs that have a negative inotropic effect may worsen patient symptoms and are not recommended.<sup>1</sup> Loop diuretics are preferred in heart failure and when the glomerular filtration rate is less than 30 mL/min/1.73 m<sup>2</sup>. CCBs or beta-blockers may be helpful in patients with atrial fibrillation to help with rate control, whereas an ARB can be useful for prevention of recurrence of atrial fibrillation.



***Spironolactone is preferred for the treatment of primary aldosteronism and as an additional drug in resistant hypertension.***

Spironolactone is preferred for the treatment of primary aldosteronism and as an additional drug in resistant hypertension. Beta-blockers are not used as first-line therapy except in ischemic heart disease and HFrEF as guideline-directed management and therapy.<sup>1</sup> For patients with aortic insufficiency, medications that slow heart rate, such as beta-blockers and nondihydropyridines CCBs, should be avoided. Standard treatment guidelines should be followed for various comorbidities when controlling BP.<sup>1</sup>

Initiation of antihypertensive therapy with a single agent is reasonable with stage 1 hypertension. However, in patients with stage 2 hypertension with BPs more than 20/10 mm Hg above their target, two first-line therapies of different classes are recommended.

*Hypertensive urgency/crises.* With respect to hypertensive crises/emergencies (SBP greater than 180 mm Hg and/or DBP greater than 120 mm Hg) with new or worsening target organ damage (TOD) in patients with a compelling condition (aortic dissection, severe preeclampsia or eclampsia, or pheochromocytoma crisis), SBP should be reduced to less than 140 mm Hg during the first hour and to less than 120 mm Hg in aortic dissection. For patients without a compelling condition, SBP should be reduced by no more than 25% within the first hour; if the patient is stable, SBP should then be reduced to 160 mm Hg and DBP to 100 to 110 mm Hg within the next 2 to 6 hours followed

by a reduction in the BP to the normal range over 24 to 48 hours.<sup>1</sup> The type of I.V. medication used will depend upon the comorbidity associated with the hypertension. For patients with hypertensive urgency without TOD, the recommendation is to reinstitute and/or intensify oral antihypertensive therapy with appropriate follow-up.

*Older adult patients.* With respect to the older adult population, the guidelines state that lowering BP is reasonable to prevent cognitive decline and dementia. Treatment of hypertension is recommended in noninstitutionalized community-dwelling older adults age 65 and older who are ambulatory and have

an average SBP of 130 mm Hg or higher. The treatment goal is a SBP less than 130 mm Hg.<sup>1</sup>

As always, it is recommended to start low and go slow; BP should be gradually lowered. Initiating two drugs when baseline BP is greater

than 20 mm Hg above goal should usually be avoided due to an increased risk of hypotension.<sup>7</sup> Older adult patients, as compared with younger patients, have lower cardiac output, higher peripheral resistance, wider pulse pressure, lower intravascular volume, and lower renal blood flow.<sup>7</sup>

*Follow-up.* Patients should be reassessed at approximately 1 month after the initiation of treatment and thereafter depending upon their response to medication. Strategies to help obtain a goal of less than 130/80 mm Hg include, but are not limited to, once-daily and/or combination therapy, education of patient and families, and the use of HBPM and telehealth. Team-based care is also important. Team-based healthcare involves the provision of health services to the patient and significant others by at least two HCPs to accomplish shared goals across settings.<sup>8</sup> There are many examples of excellent outcomes in controlling BP in teams that include advanced practice registered nurses (APRNs) along with physician assistants, physicians, pharmacists, and social workers.<sup>9</sup>

## ■ Summary

Although the 2017 ACC/AHA hypertension guideline has major implications for APRNs, not all organizations endorse the new guideline. The American Academy of Family Physicians (AAFP), a group that was not involved in the development of the 2017 ACC/AHA Task Force guideline, continues to endorse the 2014

*Evidence-Based Guideline for the Management of High Blood Pressure in Adults*, developed by panel members appointed to the Eighth Joint National Committee (JNC-8).<sup>3,10</sup> The AAFP contends that the bulk of the 2017 ACC/AHA Task Force guideline was not based on a systematic evidence review.<sup>10</sup>

Patients with hypertension should have a clear evidence-based approach to management and treatment of not only their BP, but also any associated comorbidities. A team-based approach is essential in securing safe, cost-effective care. 

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