Hypertension in 2014
Making sense of the guidelines

Abstract: Hypertension, if not appropriately treated, can lead to stroke, kidney failure, myocardial infarction, and death. Substantial evidence from multiple randomized clinical trials demonstrates the benefit of antihypertensive therapy. Healthcare providers seek scientific evidence by which to base treatments. The purpose of this article is to discuss current hypertension guidelines.

By Kristine Anne Scordo, PhD, RN, ACNP-BC, FAANP, and Kim Anne Pickett, MS, APRN, CDE

Hypertension is one of the most common modifiable medical conditions. If it is not detected early and appropriately treated, hypertension can lead to stroke, kidney failure, myocardial infarction, and death. Multiple clinical trials have demonstrated increased risk for cardiovascular disease (CVD) and overall mortality in persons with uncontrolled hypertension. In 2010, CVD was the leading cause of death in the United States, while hypertension was ranked as 13th. From 2003 to 2010, the CDC estimated the overall prevalence of hypertension in U.S. adults 18 years of age or older as 66.9 million, with less than half (47%) of those individuals reporting adequately controlled BPs (defined as systolic BP [SBP] less than 140 mm Hg, a diastolic BP [DBP] less than 90 mm Hg, or currently using BP medication). Among those individuals with hypertension, an estimated 35.8 million had uncontrolled hypertension. In addition, hypertension increases medical costs significantly, with estimated healthcare expenditures for hypertension reaching approximately $131 billion annually.

Healthcare professionals familiar with treatment of hypertension have long anticipated the promulgation of updated Joint National Committee (JNC 8) guidelines. Although JNC 8 guidelines were previously funded by the National Heart Lung and Blood Institute (NHLBI), in June 2013, the NHLBI director announced that the NHLBI would adopt a different approach and would work collaboratively with partner organizations; however, they would not be involved in directly publishing guidelines. The JNC 8 panel members worked independently and did not partner in the endeavor with other organizations, such as the American College of Cardiology (ACC) or American Heart Association (AHA). Unfortunately, this resulted in a fractionated approach in which three documents were subsequently published by different organizations.

As a result, in December 2013, two guidelines, with key differences, were released: the JNC 8 guidelines for the management of high BP in adults and the American Society of Hypertension and the International Society of Hypertension (ASH/ISH). In addition, in November 2013, the AHA, ACC, and CDC published a science advisory that incorporates principles for the development of treatment algorithms for hypertension management. To many clinicians, trying to make sense out of these three documents might seem like a daunting task. Thus, the purpose of this article is to discuss these publications.

Keywords: antihypertensive therapy, guidelines, hypertension, JNC 8 guidelines
Eighth Joint National Committee guidelines

The new JNC 8 guidelines, unlike JNC 7 guidelines, have a narrower focus and are mainly based on evidence obtained from randomized clinical trials. The panel members, instead of addressing the entire range of what is known about diagnosing and treating hypertension, focused on three questions that guided the evidence review:

- "In adults with hypertension, does initiating antihypertensive pharmacologic therapy at specific BP thresholds improve health outcomes?"
- In adults with hypertension, does treatment with antihypertensive pharmacologic therapy to a specified BP goal lead to improvements in health outcomes?
- In adults with hypertension, do various antihypertensive drugs or drug classes differ in comparative benefits and harms on specific health outcomes?"

These questions then form the basis for nine recommendations that are discussed in detail and assigned a score for the strength of the recommendation and the supporting evidence. A recommendation of Grade A implies a strong recommendation that there is a high certainty of evidence, Grade B implies a moderate recommendation, Grade C implies a weak recommendation, Grade D is a recommendation against where there is no benefit or the risks outweigh the benefits, while Grade E is expert opinion where there is insufficient evidence or the evidence is unclear or conflicting.3

The panel members gave a Grade A recommendation to initiate pharmacologic treatment to lower BP in the general population 60 years and older at an SBP of 150 mm Hg or higher or DBP of 90 mm Hg or higher and to treat under those thresholds. In a corollary recommendation, graded expert opinion-Grade E, panel members recommend that if patients are tolerating pharmacologic treatment with no adverse reactions and the BP is lower than 150, no adjustments are necessary. Until more research is available that identifies optimal goals for SBP for hypertensive patients, there were some who recommended to continue the JNC 7 SBP goal of lower than 140 mm Hg in patients over 60 years of age.3

The focus is on DBP for those under 60 years of age. In the general population of ages 30 to 59, the guideline recommends (Grade A) initiating pharmacologic treatment to lower BP at DBP of 90 mm Hg or higher with a goal of less than 90 mm Hg. Since there is little evidence to support treating DBP in adults ages 18 to 29, the expert opinion is to treat DBP to similar levels as those ages 30 through 59 years of age. For SBP, pharmacologic treatment is recommended for 140 mm Hg or higher with a goal of less than 140 mm Hg (expert opinion-Grade E). For patients 18 years or older with chronic kidney disease (CKD) or diabetes, the recommendation is to initiate pharmacologic treatment to lower BP at SBP of 140 mm Hg or DBP of 90 mm Hg and to treat under those thresholds.

Initial pharmacologic treatment in non-Black hypertensive patients can be a thiazide-type diuretic, calcium channel blocker (CCB), angiotensin converting enzyme inhibitor (ACEI), or angiotensin II receptor blocker (ARB) (Grade B), while in the general Black population, initial therapy should be a thiazide-type diuretic or CCB (Grade B). In all patients with CKD, initial or add-on therapy should include an ACEI or ARB (Grade B). Additional medications should be added to achieve the BP goal. Due to possible early decrease in glomerular filtration rate, hypotension, and hyperkalemia, combination therapy with ACEI and ARB should be avoided.5,8 As always, patients who are unable to achieve BP goals often benefit from a referral to a hypertension specialist.

Lifestyle changes, a healthy diet, weight control, and regular exercise are considered part of hypertension management. These recommendations were discussed in detail in JNC 7. There is limited discussion of these lifestyle changes in the new guidelines. As such, clinicians are referred to the previous recommendations of the 2013 Lifestyle Work Group.9 The panel reminds clinicians that the recommendations are just recommendations and are not a substitute for clinical judgment.

ASH and the ISH guidelines

Compared to JNC 8, the ASH/ISH guidelines are very detailed and are designed to “provide a straight-forward approach to managing hypertension in the community.”6 These guidelines outline the epidemiology of hypertension and its causes, define and classify hypertension, detail the evaluation of the patient, and discuss pharmacologic and nonpharmacologic treatment issues with special attention paid to treatment of Black patients. They also address resistant hypertension, which is not described in JNC 8, and offer a more detailed discussion of lifestyle interventions.

According to the ASH/ISH guidelines, hypertension is defined as a BP of 140/90 mm Hg or higher in adults...
ages 18 to 80 years, whereas in adults over 80 years of age, an SBP of greater than 150 mm Hg is considered hypertension. Patients with SBP between 120 and 139 mm Hg or DBP between 80 to 89 mm Hg can be classified as prehypertension. These patients should be counseled for lifestyle modifications, not treated with medications. Additional definitions are given for Stage I and Stage II hypertension (see Classification of hypertension–ASH/ISH guidelines).

The panel specifies how to diagnose and evaluate the hypertensive patient, including the importance of identifying other comorbidities that can influence pharmacologic treatment. The authors recommend the use of electronic BP devices and, due to inaccuracies, do not recommend wrist cuffs and finger devices. Home BP measurements should be obtained for patients suspected of having white-coat hypertension. Lab testing such as electrolytes, fasting blood glucose, serum creatinine, and blood urea nitrogen, lipids, liver function studies, and hemoglobin/hematocrit, along with urine for albuminuria and red and white cells, should be evaluated. Electrocardiography is helpful to identify myocardial disease and dysrhythmias, which can also influence treatment.

The authors discuss that age, ethnicity/race, comorbidities, availability, affordability, and BP influence the choice of medications. Pharmacologic treatment should be initiated at BP greater than 140/90 mm Hg in patients less than 80 years of age and BP 150/90 mm Hg or higher in patients over 80 years with a treatment goal of less than 140/90 mm Hg (the treatment goal for those over 80 years without diabetes or CKD should be less than 150/90 mm Hg). ACEI or ARB are recommended as initial therapy in non-Black patients less than 60 years, whereas CCB or thiazide diuretics are recommended for those over 60 years of age. CCB or thiazide diuretics are recommended for Black patients. Combination therapy with CCB or thiazide diuretic and ACEI or ARB should be initiated for patients with BP greater than 160/100 mm Hg.

The panel discusses the various classifications of medications, including clinical benefits, monitoring for potential adverse reactions, and helpful hints for beginning these medications. It is recommended to add spironolactone, a beta- or alpha-blocker, or a direct vasodilator for patients with resistant hypertension. If this is not successful, secondary causes of hypertension, such as sleep apnea, aldosterone excess, or renal artery stenosis, should be considered (see JNC 8 and ASH/ISH guidelines).

Classifications of hypertension–ASH/ISH guidelines

<table>
<thead>
<tr>
<th>Staging criteria (adults ages 18-80 years*)</th>
<th>BP</th>
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<tbody>
<tr>
<td>Prehypertension</td>
<td>SBP 120-139 mm Hg or DBP 80-89 mm Hg</td>
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<tr>
<td>Stage I hypertension</td>
<td>SBP 140-159 mm Hg or DBP 90-99 mm Hg*</td>
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<tr>
<td>Stage II hypertension</td>
<td>SBP ≥ 160 mm Hg or DBP ≥ 100 mm Hg</td>
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*For patients age ≥ 80 years, SBP up to 150 mm Hg acceptable.

AHA/ACC/CDC science advisory

These three organizations collaborated to write a scientific advisory on effective approaches to manage hypertension. This advisory is intended to complement and support clinical guidelines and “establish a common platform for the development and implementation of hypertension management algorithms tailored to different practice settings and populations.” The advisory serves as a call to action to improve awareness and treatment of hypertension and to increase the number of patients who achieve goals of therapy. Nurse practitioners (NPs) are in an excellent position to provide early recognition and treatment of hypertension in the primary and acute care settings using validated tools, algorithms, strategies, and programs.

The ASH/ISH guidelines provide a straight-forward approach to managing hypertension.

The authors discuss the importance of the development, dissemination, and implementation of evidence-based algorithms. As such, eight principles for creating an effective hypertension management algorithm are recommended. These key principles include the following:

- Base algorithm components and processes on the best available science.
- Keep the format simple so updates can easily be made when better information becomes available.
- Create a feasible and easy implementation strategy.
- Include a patient version at appropriate scientific and language literacy level.
- Consider costs of diagnosis, monitoring, and treatment.
- Develop an algorithm in a format that easily adapts to a team approach to healthcare.
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These eight principles help to establish a common platform to develop and implement hypertension management strategies. The advisory includes a template that outlines a general approach to develop an effective, evidence-based treatment algorithm and provides an example of such an algorithm for controlling hypertension in adults. The overriding message is for practices—large or small—to use evidence-based treatment algorithms to get patients to their BP goals. Algorithms are available at the Million Hearts website at millionhearts.hhs.gov/resources.html.

### Improving outcomes

Although there are distinct differences in the newest hypertension guidelines, the main emphasis is on the identification and treatment of this common medical

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**JNC 8 and ASH/ISH guidelines**

<table>
<thead>
<tr>
<th>JNC 8</th>
<th>ASH/ISH</th>
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<tbody>
<tr>
<td><strong>Definition of HTN</strong></td>
<td>Not defined-only treatment goals defined</td>
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<tr>
<td><strong>Initiate drug therapy</strong></td>
<td>General population</td>
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<tr>
<td>CKD, DM</td>
<td>≥ 18 years initiate pharmacologic treatment of SBP ≥ 140 mm Hg or DBP ≥ 90 mm Hg; Treat to goal SBP &lt; 140 mm Hg and DBP &lt; 90 mm Hg</td>
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<td><strong>Drug treatment</strong></td>
<td>Non-Black population</td>
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<td>Black population</td>
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<td></td>
<td>Drug treatment in HTN plus other associated conditions (CKD, DM, CVD)</td>
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SBP–systolic BP; DBP–diastolic BP; CAD–coronary artery disease; HF heart failure; CKD–chronic kidney disease; HTN–hypertension; CVD–cardiovascular disease; DM–diabetes mellitus; CCB–calcium channel blocker; ACEI–ACE inhibitor; ARB–angiotensin II receptor blocker

- Develop an algorithm in a format able to be incorporated into electronic health records for use as clinical decision support.
- Include a disclaimer to ensure that the algorithm is not used to counter the healthcare provider’s best clinical judgment.

These eight principles help to establish a common platform to develop and implement hypertension management strategies. The advisory includes a template that outlines a general approach to develop an effective, evidence-based treatment algorithm and provides an example of such an algorithm for controlling hypertension in adults. The overriding message is for practices—large or small—to use evidence-based treatment algorithms to get patients to their BP goals. Algorithms are available at the Million Hearts website at millionhearts.hhs.gov/resources.html.
condition. Management of hypertension is "multifactorial and requires engagement of patients, families, providers, healthcare delivery systems, and communities." Comprehensive hypertension management programs that coordinate care through the use of multiple resources have the potential for better overall BP control with resultant reduced mortality, morbidity, and cardiovascular outcomes.

REFERENCES


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