The New Hypertension Guidelines From JNC 7: Is the Devil in the Details?

High blood pressure is a common condition, afflicting 29% of the adult population of the United States. It is a major risk factor for myocardial infarction, heart failure, stroke, dementia, kidney disease, and progressive atherosclerosis. In May 2003, the National High Blood Pressure Education Program (NHBPEP) Coordinating Committee published an “express” version of the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7). This report extends an important series of guideline documents that provide the foundation for managing hypertension.

When the first JNC report was published in 1977, awareness was low among both medical practitioners and the public regarding the importance of lowering blood pressure (BP) to reduce mortality due to stroke and cardiovascular disease. The NHBPEP was initiated under the direction of the National Heart, Lung, and Blood Institute of the National Institutes of Health in 1972, specifically to increase awareness of both the risks of hypertension and the benefits of treatment. The NHBPEP Coordinating Committee represents 39 national professional, public, and voluntary organizations and 7 federal agencies. The goals of these groups are to reduce death and disability related to hypertension through educational programs for both professionals and the public. As part of this mission, the NHBPEP periodically organizes a group of experts to reach consensus on practice guidelines for the health care provider that translates the results of current research into clinical practice and provides an evidence-based, practical approach to prevention, diagnosis, and management of hypertension. The authors of each report are known as the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC).

Substantial improvements in the rates of awareness and treatment of hypertension have occurred since the inception of the NHBPEP. These are reflected in the remarkable decline during the past 25 years in mortality due to stroke and coronary heart disease (60% and 53%, respectively). Control of hypertension has become a requirement to lower the risk of cardiovascular disease. The success of the consensus guideline approach led to emulation of this method by several groups intent on improving the management of other common health disorders, including high blood cholesterol, diabetes, and obesity.

The latest JNC report was prompted by accumulation of “a critical mass of information” based on observational and clinical trial data since the last report in 1997. An additional goal of JNC 7 was to simplify practice guidelines for the busy health care provider. Similar to previous reports, some recommendations are controversial. This is not surprising because they are based on interpretation of available evidence and consensus. When one attempts to apply trial data to the management of clinical disorders in practice, “the devil lies in the details.”

Important Features of the JNC 7

Blood Pressure Classification for Adults.—By designating fewer categories, JNC 7 simplifies the classification of BP for adults. Most noteworthy, the new classification shifts the entire range of BP levels considered abnormal to lower levels. The normal BP level is now less than 120/80 mm Hg (previously <130/85 mm Hg). Systolic BP levels between 120 and 139 mm Hg and diastolic between 80 and 89 mm Hg are now designated as prehypertension (previously designated normal and high normal). Hypertension is still defined as a systolic BP level of 140 mm Hg or higher or diastolic BP level of 90 mm Hg or higher, but it is now stratified into 2 (formerly 3) stages (Table 1).

This new classification has caused much confusion among both health care providers and the public. The notion that a BP level of 120/80 mm Hg is a cause of concern has been greeted with surprise and skepticism. Extending the risk to lower BP levels reflects epidemiological observations that many individuals who experience a cardiovascular disease event have a BP that is above normal (120/80 mm Hg) but below the current threshold for active treatment (140/90 mm Hg). Adherence to JNC 7 guidelines extends the potential benefits of lower BP levels to approximately 45 million adults with prehypertension. Blood pressure levels have long been observed to increase with age in industrialized societies. Studies suggest that this age-related increase in BP is explained partly by adverse lifestyles characteristic of modern society (ingestion of a high-salt, low-potassium diet; excess caloric intake; excess alcohol use; and physical inactivity). The designation of prehypertension emphasizes the importance of achieving changes in lifestyle to prevent progression to overt hypertension in this large group of people who presently are unaware of this risk.

Address reprint requests and correspondence to Stephen C. Textor, MD, Division of Hypertension, Mayo Clinic, 200 First St SW, Rochester, MN 55905.
Table 1. Classification and Management of Blood Pressure in Adults*

<table>
<thead>
<tr>
<th>Classification</th>
<th>Blood pressure (mm Hg)</th>
<th>Lifestyle modification</th>
<th>Initial drug therapy Without compelling indication</th>
<th>With compelling indications‡</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>120-139 or &lt;80</td>
<td>Encourage</td>
<td>No antihypertensive drug indicated</td>
<td>Drug(s) for compelling indications§</td>
</tr>
<tr>
<td>Prehypertension</td>
<td>120-139 or 80-89</td>
<td></td>
<td>Thiazide-type diuretics for most patients; may consider ACEI, ARB, BB, CCB, or combination Two-drug combination for most patients(usually thiazide-type diuretic and ACEI, ARB, BB, or CCB) as needed</td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td>140-159 or 90-99</td>
<td>Yes</td>
<td>Drug(s) for compelling indications§; other antihypertensive drugs (diuretics, ACEI, ARB, BB, CCB) as needed</td>
<td></td>
</tr>
<tr>
<td>Stage 1</td>
<td>≥160 or ≥100</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ACEI = angiotensin-converting enzyme inhibitor; ARB = angiotensin receptor blocker; BB = β-blocker; CCB = calcium channel blocker. Data from the National High Blood Pressure Education Program Coordinating Committee. *

†Treatment determined by highest blood pressure category.
‡Heart failure, post–myocardial infarction, high risk of coronary disease, diabetes, chronic kidney disease, prevention of recurrent stroke.
§Treat patients with chronic kidney disease or diabetes to blood pressure goal of <130/80 mm Hg.
∥Initial combined therapy should be used cautiously in those at risk for orthostatic hypotension.

However, the term prehypertension raises concerns that the absolute risks are overstated and that unnecessary alarm has been created for many people with a BP level in the prehypertensive range. For example, data from the Framingham Heart Study show that BP risk is not only related to pressure level but also to the presence or absence of other recognized cardiovascular risk factors (eg, smoking, dyslipidemia, diabetes) and target organ injury (eg, hypertrophy of the left ventricle). These important details allow more accurate discussion with an individual patient about the risks posed by his or her BP level and emphasize the importance of comprehensive modification of all risk factors. The JNC VI report incorporated “stratification” of disease risk similar to schemes now accepted by other national guideline groups. JNC 7 retreats from formal risk stratification with the goal of simplifying the guidelines, which is shortsighted in our view.

An additional concern is that the prehypertensive designation applies to nearly all adults in the United States. Individuals with normal BP levels at midlife face a “90% lifetime risk” of developing hypertension. It is important to recognize and deal with specific subgroups at particularly high risk, including African Americans, people with diabetes, and those with family histories of hypertension or cardiovascular disease. The limited version of “context-dependent” risk resurfaces in JNC 7 with the recommendation for lower thresholds for those receiving antihypertensive drug therapy and lower BP goals for patients with diabetes or chronic kidney disease.

Emphasis on Systolic BP.—Clearly, JNC 7 emphasizes that for persons older than 50 years systolic BP poses greater cardiovascular disease risk than does diastolic BP. Many studies support this view, including treatment trials in older individuals with isolated systolic hypertension. Much of the “uncontrolled” hypertension in the United States is concentrated in older individuals and is related to inadequately treated systolic BP. Reluctance to initiate or increase drug therapy for older persons with a systolic BP level between 140 and 160 mm Hg reflects in part the lack of prospective trials showing benefits of drug therapy for such persons. This is an important issue for future clinical trials.

Blood Pressure Treatment Goals.—According to JNC 7, the general BP goal is to lower systolic BP to less than 140 mm Hg and diastolic BP to less than 90 mm Hg. This recommendation is supported by many clinical trials. A more aggressive goal of less than 130/80 mm Hg is advised for patients with diabetes or chronic kidney disease. Although information from epidemiological and observational studies supports these lower goals (the diastolic BP goal of <80 mm Hg in diabetic patients is also supported by clinical trials), few data are available from clinical trials to support a systolic BP goal lower than 140 mm Hg in either group. Many patients with diabetes or chronic kidney disease are elderly and are taking many medications for comorbid conditions. The additional medications required to achieve a goal systolic BP level lower than 130 mm Hg can be substantial, and the risks of such an aggressive goal in these frail patients have not been studied adequately. Some clinicians propose that an additional category of “acceptable BP control,” short of reaching “goal,” be added to the current list of treatment goals. This category would...
acknowledge a partial benefit from “reasonable” BP therapy in settings in which persuasive data for more intensive control from clinical trials are lacking. In truth, results of prospective trials on the benefits of more aggressive BP goal in slowing the progression of chronic kidney disease have been disappointing, with little support for a more aggressive goal for patients with kidney diseases without proteinuria.16

Initial Antihypertensive Therapy.— Appropriately, JNC 7 advises both lifestyle changes and medication to achieve BP goals. Supported by results from the recently completed Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT) and previous trials, thiazide diuretics are recommended as the initial drug of choice for most patients with uncomplicated hypertension. Although this is reasonable, some argue that more emphasis should be placed on individual-specific factors for initial drug selection. For example, several studies including ALLHAT indicate a risk of glucose intolerance and diabetes associated with thiazide diuretics, a risk that is actually reduced for angiotensin-converting enzyme inhibitors. Hence, the latter agent may be preferred in an overweight young patient who is at risk for developing diabetes. Appropriately, JNC 7 points out that achieving goal BP and treating other modifiable cardiovascular disease risk factors are more important than the specific drugs used. For specific comorbid conditions, such as congestive cardiac failure, JNC 7 identifies “compelling” indications for specific antihypertensive drug selection.

Combination Drug Therapy as Initial Treatment.— In a departure from previous reports, emphasis has been placed on using 2 drugs, rather than 1, as initial therapy for hypertension. JNC 7 proposes this option for people whose BP level is more than 20/10 mm Hg above goal. This recommendation seems to be motivated by the observation that “most patients who are hypertensive will require two or more antihypertensive medications to achieve their BP goals,”13 and as such this strategy would improve control rates. Although it is true that subsets of patients with hypertension who are targeted to lower BP goals (<130/80 mm Hg), especially those with chronic kidney disease, often require 2 or more medications to achieve control, this is less certain for the general hypertensive population. For example, in the recently completed ALLHAT, most patients’ hypertension was controlled with monotherapy.17 Potential hazards of excessive BP level decreases due to “routine” use of combination therapy have not been studied. Appropriately, JNC 7 cautions use of this strategy in older patients or those with diabetes in whom orthostatic hypotension is common. JNC 7 provides a table of available “combination products” for consideration as an alternative method of delivering combination therapy. Of importance, most of these are not approved by the Food and Drug Administration as initial therapy for hypertension.

Conclusion
Taken together, the express version of JNC 7 provides concise guidelines for the prevention, diagnosis, evaluation, and treatment of hypertension. Suggestions for evaluation and management of resistant hypertension and hypertension in specific situations or populations (ischemic heart disease, heart failure, diabetes, chronic kidney disease, cerebrovascular disease, obesity, left ventricular hypertrophy, peripheral arterial disease, and the elderly) are reviewed only briefly in the express document. Overall, this report parallels previous versions of JNC reports and should be a useful document to help health care providers deliver state-of-the-art care to patients with hypertension. Improvement in prevention and control of hypertension is critical to the health of the US population. As with all consensus documents, the recommendations depend on thoughtful application by responsible clinicians. We eagerly await the full report slated for publication in late 2003.

Stephen C. Textor, MD
Gary L. Schwartz, MD
Division of Hypertension and Internal Medicine
Robert L. Frye, MD
Division of Cardiovascular Diseases and Internal Medicine
Mayo Clinic
Rochester, Minn


