

## LEARNING OBJECTIVES

- Recognize that hypertension is a major common chronic disease and that correct and timely treatment significantly reduces morbidity and mortality
- Understand the crucial role played by cardiovascular disease risk assessment
- Describe appropriate choice of agents, including the risk and benefits of different drug classes

# Five steps to more effective treatment of hypertension in primary care

Hypertension should be controlled early and aggressively, to the point where treatment does more good than harm. Follow these steps to streamline management decisions.

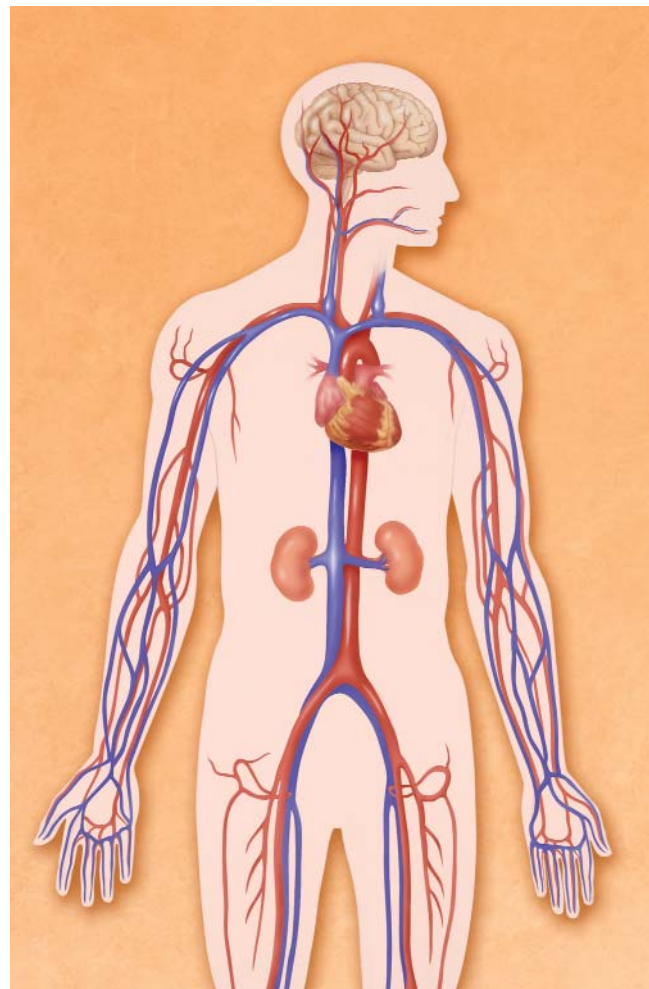
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**H**ypertension is a serious, chronic, and ubiquitous disease that, when left untreated, progresses to cardiovascular disease (CVD). Current recommendations suggest that primary care clinicians evaluate not only the severity of disease but also risk factors for CVD and the willingness of patients to adhere to treatment regimens before initiating pharmacotherapy. Lifestyle modifications are the cornerstone of overall BP management but are often inadequate to achieve control. Thiazide diuretics are recommended for initial treatment of uncomplicated hypertension; however, recent studies suggest clinicians can use greater prescribing flexibility based on patient profile. ACE inhibitors continue to be the first choice for patients with diabetes. Systolic BP (SBP) is the target of most therapies, and many patients will need two or more drugs to bring BP levels to goal. Combination drugs can reduce expense and polypharmacy. An empathetic approach regarding need for lifelong treatment, proper choice of drugs, and regular assessment and titration is important.

Although untreated hypertension inevitably leads to CVD (a diagnostic category that includes stroke, heart disease, and vascular disease) and target organ damage, such as kidney disease and retinopathy, the disease is not optimally managed in millions of people with elevated BP. Inconsistent clinical practices contribute to an avoidable loss of thousands of lives every year and enormous personal and societal burden.<sup>1</sup> This article presents five essential steps to better management of hypertension in nonpregnant adults.

## 1. RECOGNIZE THE SIGNIFICANCE OF HIGH BP

Hypertension was once defined as BP above which investigation and treatment do more good than harm.<sup>2</sup> Hyper-



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tension is now usually defined as SBP consistently higher than 140 mm Hg and/or diastolic BP (DBP) consistently higher than 90 mm Hg, or use of antihypertensive medication. The disease affected 972 million people worldwide in 2000. This number is predicted to increase to 1.56 billion by 2025.<sup>3</sup>

At least one in three (73 million) adults in the United States has hypertension, making it the most common primary care diagnosis in the country. Prevalence of hypertension in African-Americans (more than 42%) is among the highest in the world,<sup>4</sup> and 75% of people with hypertension are older than 50 years.<sup>5</sup>

Elevated BP is a significant risk factor for CVD, which kills more than 1 million people in the United States every year; this equates to one death every 37 seconds. Even a minimally elevated BP, as low as 115/75 mm Hg, increases CVD risks. Furthermore, mortality doubles for every 20/10 mm Hg BP increment.<sup>1</sup> CVD usually exhibits no clinical manifestations until the onset of organ damage. Screening and control are, therefore, critical.

Failure to adequately treat hypertension has significant economic as well as public health implications. The cost of untreated high BP is estimated to reach \$73.4 billion.<sup>4</sup> Treating patients with SBP higher than 140 mm Hg would reduce stroke prevalence by 35% to 40%<sup>6</sup> and as much as 62% in those younger than 60 years.<sup>7</sup> In addition, acute MI would be reduced by 20% to 25% and heart failure by more than 50% if SBP was treated to goal.<sup>6</sup>

Eighty percent to 85% of patients with chronic kidney disease (CKD) are also hypertensive. Tight BP control is vital to protect against progressive renal failure. Target BP for patients with CKD is less than 130/80 mm Hg, but only 37% of patients with CKD currently reach this goal.<sup>8</sup>

## 2. REVIEW TREATMENT GUIDELINES

An evidence-based approach to managing hypertension is recommended. A number of clinical trials and meta-analyses of treatment recommendations fuel the intense debate on what constitutes optimal therapy. Authoritative international guidelines include *The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment*

**TABLE 1. Classification of BP levels**

Classification	Systolic BP (mm Hg)	Diastolic BP (mm Hg)
Optimal and goal for persons with CV risks	<120	<80
Prehypertension <sup>a</sup>		
• Normal	120-129	80-84
• High normal	130-139	85-89
Grade 1	140-159	90-99
Grade 2	160-179	100-109
Grade 3	≥180	≥110

**Key:** CV, cardiovascular.  
**Note:** When systolic BP and diastolic BP fall into different categories, the higher category should apply.  
<sup>a</sup> These two classifications are combined under the term *prehypertension* in *The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure*. The European Society of Hypertension/European Society of Cardiology guidelines classify BP into normal and high normal as listed.  
 Data from Chobanian AV et al<sup>6</sup> and Mancia G et al.<sup>10</sup>

*of High Blood Pressure* (JNC 7),<sup>6</sup> the British Hypertension Society guidelines for hypertension management,<sup>9</sup> and the European Society of Hypertension/European Society of Cardiology (ESH/ESC) guidelines for the treatment of hypertension.<sup>10</sup> These guidelines are frequently reviewed and updated. Other useful guidelines are issued by the American Diabetes Association,<sup>11</sup> the National Kidney Foundation,<sup>12</sup> and the American Heart Association.<sup>13</sup>

## 3. PROFILE YOUR PATIENT

US Preventive Services Task Force guidelines, along with those of the JNC 7, recommend screening healthy people with SBP lower than 120 mm Hg every 2 years. Those with SBP 120 to 139 mm Hg should be screened annually.<sup>14</sup> Several important assessments should be made before treating a person with hypertension.

**BP measurement and classification** Despite the critical importance of measuring BP, it is one of the most inaccurate-

### KEY POINTS

- Lifestyle modifications are the cornerstone of overall BP management but are often inadequate to achieve control. Thiazide diuretics are recommended for initial treatment of uncomplicated hypertension; however, recent studies suggest clinicians can use greater prescribing flexibility based on patient profile.
- Hypertension was once defined as BP above which investigation and treatment do more good than harm. Hypertension is now usually defined as systolic BP consistently higher than 140 mm Hg and/or diastolic BP consistently higher than 90 mm Hg, or use of antihypertensive medication.
- Authoritative international guidelines include *The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure* (JNC 7), the British Hypertension Society guidelines for hypertension management, and the European Society of Hypertension/European Society of Cardiology guidelines for the treatment of hypertension.
- General recommendations are to augment antihypertensive drug treatment with lifestyle modifications and the use of aspirin and statins. However, caution is advised when prescribing aspirin for patients with uncontrolled hypertension.

**TABLE 2. Particular hypertensive conditions**

Condition	Definition	Comments
Primary	No known cause for elevated BP (90%-95% of cases)	<ul style="list-style-type: none"> <li>Likely to be permanent</li> <li>Lifelong treatment necessary</li> </ul>
Secondary	BP elevated secondary to an underlying disease or condition	<ul style="list-style-type: none"> <li>Causes include adrenal, kidney, or thyroid disease; alcohol; coarctation of aorta; food; medication; pheochromocytoma; pregnancy; recreational drugs; and sleep apnea</li> <li>May be curable</li> </ul>
Prehypertension (also known as normal/high normal)	SBP 120-139 mm Hg or DBP 80-89 mm Hg	<ul style="list-style-type: none"> <li>Prevalence increasing</li> <li>Inexorable progression to frank hypertension</li> </ul>
Isolated systolic hypertension	SBP consistently >140 mm Hg, DBP <90 mm Hg	Most often is age-related arteriosclerosis
Resistant	BP cannot be reduced to <140/90 mm Hg	<ul style="list-style-type: none"> <li>Consider nonadherence</li> <li>Consult specialist</li> </ul>
White coat	Office readings persistently ≥140/90 mm Hg; normal daytime <135/85 mm Hg	<ul style="list-style-type: none"> <li>Usually anxiety-related, 24-h or ambulatory monitoring can confirm</li> <li>Treatment aimed at stress reduction and lifestyle changes</li> </ul>
Hypertensive emergency (malignant)	Grade 3 hypertension with acute impairment of an organ system	<ul style="list-style-type: none"> <li>Can result in permanent target organ damage quickly</li> <li>Needs immediate treatment</li> </ul>
Hypertensive urgency	Grade 3 hypertension without evidence of target organ damage	<ul style="list-style-type: none"> <li>Not an emergent situation</li> <li>Too-rapid BP reduction may result in cardiac, renal, or cerebral hypoperfusion</li> </ul>

Key: DBP, diastolic BP; SBP, systolic BP.  
Data from Chobanian AV et al,<sup>6</sup> and Mancia G et al.<sup>10</sup>

ly performed procedures in clinical medicine.<sup>15</sup> Frequent observer (re-)training and review of equipment, patient positioning, and cuff size selection is recommended. Use of home BP monitors can complement office-based readings, record diurnal variations, reduce the number of office visits, and facilitate treatment adjustments.<sup>16</sup>

Classification of BP level is usually based on the average of two or more seated BP readings taken at each of two office visits (Table 1). JNC 7 classifies an SBP of 120 to 139 mm Hg and/or a DBP of 80 to 89 mm Hg as *prehypertension*;<sup>6</sup> however, the European guidelines divide this into two categories: normal (SBP, 120-129 mm Hg; DBP, 80-84 mm Hg) and high normal (SBP, 130-139 mm Hg; DBP 85-89 mm Hg).<sup>10</sup> Optimal BP for all adults is less than 120/80 mm Hg. Goal BP for people with heart disease, CKD, diabetes, or multiple CVD risk factors is less than 130/80 mm Hg. Current recommendations suggest a target BP of less than 140/90 mm Hg for persons with uncomplicated hypertension and the elderly.<sup>6</sup>

Particular hypertensive conditions are categorized to guide treatment and help with patient education (Table 2). In the United States, 37% of the population has prehypertension.<sup>4</sup>

In persons younger than 50 years, elevated DBP is a strong predictor of CVD and should be treated. However, DBP tends to decrease with age, primarily as a result of large

artery stiffness, and the burden of disease lies mainly on an elevated SBP. Vigorous treatment of systolic hypertension concomitantly lowers DBP; therefore, SBP generally remains the main target for treatment.<sup>5</sup> If pulse pressure is wide (DBP decreases to less than 60 mm Hg), clinicians should carefully assess the patient for signs or symptoms of cerebral or myocardial hypoperfusion.

**Assessment of CVD risk** Targeting those at risk for CVD enables effective prevention. Prediction tools based on risk factors, such as BP, age, sex, family and personal history, comorbidities (such as diabetes, dyslipidemia, and obesity), activity levels, and smoking history, can estimate 10-year CVD risk in apparently healthy people and are easily accessed on the Internet. A commonly used tool is the Framingham Risk Model/Adult Treatment Panel III.<sup>17</sup> Judicious use of prediction tools is suggested, however, as some people may be falsely reassured and delay taking steps to reduce risk factors.

After a diagnosis of hypertension is made, secondary causes should be ruled out, presence of subclinical organ damage determined, and baseline measurements established as soon as possible. A careful history that includes a CVD risk assessment should be obtained and a physical examination undertaken. Basic laboratory investigations include urine dipstick for protein and blood, serum creatinine and electrolyte

levels, blood glucose, fasting lipids, and an ECG. More extensive initial testing is generally not warranted.<sup>2</sup>

**Adherence to treatment regimen** Health illiteracy is a problem in the United States, and understanding hypertension is particularly difficult because of the lack of symptoms. A patient's ability or willingness to adhere to treatment suggestions is an important factor to consider when profiling your patient before composing a pharmacotherapy regimen (Table 3).

#### 4. INITIATE AND ENHANCE THERAPY

Lifestyle modifications should be encouraged and supported for all patients with elevated BP. Lifestyle changes may have only limited success in normalizing BP but will help in reducing the amount of pharmacologic therapy needed for optimal control. Smoking cessation, dietary sodium restriction, and reduction of alcohol intake, along with weight control, regular physical activity, a diet high in fruit and vegetables, and stress management are critical to successful BP management. Even small lifestyle changes can result in significant BP reductions<sup>18</sup> (Table 4).

However, a patient's BP is often managed with nonpharmacologic treatments for too long. Clinical inertia delays initiation of drug therapy and tight BP control.<sup>16</sup> The following recommendations, based on ESH/ESC guidelines, define appropriate decision-making processes.<sup>10</sup>

- Patients with grade 3 hypertension, CVD, renal disease, or grade 1 or 2 hypertension with high cardiovascular risks should be started on medication immediately.
- Patients with grade 1 or 2 hypertension with moderate cardiovascular risks should initiate lifestyle modifications with reassessment after 4 to 6 weeks. Pharmacotherapy should be initiated if BP levels do not improve.
- Patients with grade 1 hypertension and no cardiovascular risks should initiate lifestyle modifications. Reassessment of these patients can occur after 4 to 6 months.
- Lifestyle modifications should be discussed with all other patients.

The longer a person has had hypertension, the greater the risk for a cardiovascular event and target organ damage. Time of treatment initiation is important and will likely be defined in the upcoming *Eighth Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure* (JNC 8).

Most antihypertensive medications are equally effective and good responses are achieved in 30% to 50% of cases.<sup>16</sup> If choice of antihypertensive medication is limited by cost or availability, any treatment is better than none. However, interpatient variability and predictable differences in response support some specific choices (Table 5).

An *AB/CD* algorithm based on renin levels is suggested by the European guidelines to help simplify selection of antihypertensive agents. ACE inhibitors or angiotensin receptor blockers (ARBs), *A*, and beta-blockers, *B*, are suggested for people with higher renin concentrations, such as persons younger than 55 years. Calcium channel blockers (CCBs), *C*, and diuretics, *D*, are suggested for persons predicted to

**TABLE 3. Tips to improve patient adherence**

Ascertain literacy level, degree of interest, and likelihood of adherence
Emphasize that many lifestyle modifications are cost-effective
Encourage patients to bring all medications, including OTC and pain medications, to each visit
Explain that essential hypertension is a chronic disease with no symptoms and no cure; hypertension can be controlled, but medication will likely be needed for life
Listen to patients' concerns and clarify misunderstandings
Provide clear instructions about lifestyle changes and the benefits of treatment
Provide positive feedback
Recognize financial and social barriers to success by tailoring regimen to lifestyle and needs and simplifying the regimen
Suggest achievable goals and validate progress; provide a record of BP measurements

**TABLE 4. Effects of recommended lifestyle modifications**

Modification	Recommendation	Approximate reduction in BP
DASH eating plan	Diet rich in fruits, vegetables, and low-fat dairy	8-14 mm Hg
Dietary sodium restriction	≤100 mmol/d (2.4 g sodium or 6 g sodium chloride)	2-8 mm Hg
Maintain a healthy weight	Body mass index 18.5-24.9 kg/m <sup>2</sup>	5-10 mm Hg/10 kg
Moderate alcohol consumption	Most men: ≤2 drinks/d Women: ≤1 drink/d	2-4 mm Hg
Physical activity	Brisk walking for ≥30 min, most days of the week	4-9 mm Hg

**Key:** DASH, Dietary Approaches to Stop Hypertension.

**Note:** Tobacco use is a common cause of avoidable cardiovascular disease mortality and leads to more than one in five American deaths every year. Smoking status should be evaluated at every clinic visit.

Adapted from National Heart, Lung, and Blood Institute Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. *The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure*. Bethesda, MD: US Department of Health and Human Services; 2003. NIH publication 03-5233.

**TABLE 5. Compelling indications and contraindications for select drug classes**

Drug class	Compelling indications	Cautions	Contraindications
ACE inhibitors ARBs	Renal preservation	Peripheral vascular disease	<ul style="list-style-type: none"> <li>• Hyperkalemia</li> <li>• Pregnancy</li> <li>• Previous angioneurotic edema</li> <li>• Renal artery stenosis</li> </ul>
Aldosterone antagonists	Heart failure		<ul style="list-style-type: none"> <li>• Hyperkalemia</li> <li>• Renal failure</li> </ul>
Beta-blockers	Ischemic heart disease	<ul style="list-style-type: none"> <li>• Hypoglycemic symptoms may be masked</li> <li>• Sudden discontinuation can result in adrenergically mediated withdrawal symptoms</li> <li>• Glucose intolerance, high risk for diabetes, or metabolic syndrome</li> </ul>	<ul style="list-style-type: none"> <li>• Grade 2/3 heart block</li> <li>• Severe peripheral artery disease</li> <li>• Severe reactive airway disease</li> <li>• Sick sinus syndrome</li> <li>• Use is banned in some sports</li> </ul>
DH CCBs (amlodipine, nifedipine)	Block calcium channels in vascular smooth muscle	<ul style="list-style-type: none"> <li>• Gingival hypertrophy can occur with amlodipine</li> <li>• Lower-extremity edema can occur (no response to diuretics)</li> <li>• Reflex tachycardia can occur</li> </ul>	<ul style="list-style-type: none"> <li>• Heart failure</li> <li>• Short-acting formulas in hypertensive emergencies or urgencies (may lead to rapid vasodilation, reflex tachycardia, or catecholamine surge)</li> <li>• Tachyarrhythmias</li> </ul>
NDH CCBs (verapamil, diltiazem)	Block calcium channels in myocardium	May have antiarrhythmic and antianginal effects	<ul style="list-style-type: none"> <li>• Cardiomyopathy</li> <li>• Grade 2/3 heart block</li> <li>• Heart failure</li> </ul>
Thiazide diuretics	Recommended initial therapy for uncomplicated hypertension in low-renin producers	<ul style="list-style-type: none"> <li>• Gout, glucose intolerance, or metabolic syndrome</li> <li>• Pregnancy</li> </ul>	Hyponatremia

Key: ARBs, angiotensin receptor blockers; DH, dihydropyridine; CCBs, calcium channel blockers; NDH, nondihydropyridine.  
Data from Chobanian A et al,<sup>6</sup> Williams B et al,<sup>9</sup> and Sica DA.<sup>16</sup>

be low renin producers, such as the elderly and people of African descent.<sup>10</sup> Significant synergy of action occurs when a drug from one side of the algorithm is added to one from the other side. If treating with A, add C or D for synergy. If treating with C or D, A is the better choice for a second drug.<sup>10</sup>

Some high-risk conditions have compelling drug indications that should be considered (Table 6). Consultation with a specialist is recommended before making management decisions in these patients, and strict BP control is essential.

**Multiple agents and combination drugs** Titrating single-drug therapy to maximum dosage is generally not recommended. The steepest part of the dose-response curve is usually seen at low doses; high doses produce more side effects.<sup>16</sup> Half of all patients with hypertension will need two or more drugs to achieve good BP control.<sup>16</sup> Combination antihypertensive agents can be effective and have the advantage of fewer side effects, reduced pill burden, and fewer co-payments; however, combination drugs should be prescribed with care, particularly for the elderly and persons at risk for orthostatic hypotension.

The **AccoMPLISH** (Avoiding Cardiovascular Events Through Combination Therapy in Patients Living with Systolic Hypertension) trial challenged the prevailing paradigm that combination therapy should include a diuretic.<sup>19</sup> The trial results showed that an ACE inhibitor plus CCB combination is also safe and, in some cases, more effective.<sup>19</sup> Other combinations, such as valsartan/hydrochlorothiazide, an ARB/diuretic combination, and amlodipine/valsartan, a CCB/ARB combination, are already FDA-approved for the initial treatment of persons who are likely to need multiple drugs to achieve BP goals.

A single pill containing low doses of an antihypertensive, aspirin, a statin, and folate was suggested in 2003. The theory was that its universal use could reduce incidence of stroke and heart attack by 80%. Studies into this potentially revolutionary treatment are under way.<sup>20</sup>

**Caveats to therapy** General recommendations are to augment antihypertensive drug treatment with lifestyle modifications and the use of aspirin and statins.<sup>10</sup> However, caution is advised when prescribing aspirin for patients with uncon-

**TABLE 6. Indications for select drug classes in conditions that require strict BP control**

Condition	AA	ACE-I	ARB	BB	CCB	Diuretic	Comment
Atrial fibrillation			●	●	●		<ul style="list-style-type: none"> <li>• BBs and NDH CCBs help control ventricular rate</li> </ul>
Chronic kidney disease		●	●		●	●	<ul style="list-style-type: none"> <li>• ACE-I/ARB lowers proteinuria; stop treatment if hyperkalemia develops</li> <li>• Seek specialist advice</li> <li>• Serum creatinine increase <math>\leq 35\%</math> is acceptable</li> <li>• Three or more drugs often needed</li> </ul>
Diabetes, metabolic syndrome		●	●	●	●	●	<ul style="list-style-type: none"> <li>• ACE-I/ARB given initially; add NDH CCB if proteinuria or nephropathy present.</li> <li>• Serum potassium and creatinine should be monitored at least 1-2 times/y</li> </ul>
Heart failure	●	●	●	●		●	<ul style="list-style-type: none"> <li>• ACE-I/ARB first choice.</li> <li>• BBs used only if patient is stable</li> <li>• Lipid control essential</li> </ul>
Left ventricular hypertrophy		●	●	●	●	●	<ul style="list-style-type: none"> <li>• AAs may provide additional benefit</li> <li>• Avoid direct vasodilators (minoxidil, hydralazine)</li> <li>• Possible regression of LV mass with ACE-I</li> </ul>
Stable angina and silent ischemia				●	●		<ul style="list-style-type: none"> <li>• Initiate therapy with BB; if BB is contraindicated, use long-acting CCB</li> </ul>
Cerebrovascular disease		●				●	<ul style="list-style-type: none"> <li>• Cautious BP reduction immediately post-stroke</li> <li>• No agent clearly superior for prevention</li> </ul>

Key: AA, aldosterone antagonist; ACE-I, ACE inhibitor; ARB, angiotensin receptor blocker; BB, beta-blocker; CCB, calcium channel blocker; LV, left ventricular; NDH, nondihydropyridine.  
Note: Different stages of the condition may dictate use of different strategies. No indication for use can signify lack of information for a particular drug class.  
Data from Walsh J et al,<sup>1</sup> Williams B et al,<sup>5</sup> Chobanian AV et al,<sup>6</sup> Blood Pressure Lowering Treatment Trialists' Collaboration et al,<sup>7</sup> Williams B et al,<sup>9</sup> and Mancia G et al.<sup>10</sup>

trolled hypertension because the increase in arterial wall shear stress can raise the risk of hemorrhagic stroke.

Elderly persons with high BP are at particularly high risk for stroke and cognitive decline. Even though BP lowering is well-tolerated and effective, statistics show that hypertension remains untreated or poorly controlled in up to 60% of elderly patients.<sup>21</sup> Therapy should not be withheld on the basis of age, and treatment goals are generally the same as for younger persons. Studies are ongoing, and risk reduction appears to continue into older age.<sup>7</sup> Initial drug doses should be low and titration gradual. BP should be measured in the elderly with the person seated and then after standing for 3 minutes because of an increased risk for postural hypotension.

**On the horizon** Recent additions to the pharmaceutical armamentarium include aliskiren, an oral renin inhibitor, and eplerenone, an aldosterone receptor blocker. These medications show promise but are not yet in general use. Anticipated in summer 2010, the JNC will undoubtedly update and refine current management guidelines.

## 5. MONITOR, MOTIVATE, AND FOLLOW UP

An interval of at least 4 weeks should be allowed for observation after pharmacotherapy is started, unless BP needs to be lowered more urgently.<sup>9</sup> Medications should be titrated as needed and other drugs added for synergistic effect. After BP is under control, patients at low risk for CVD or who have grade 1 hypertension may have follow-up visits every 6 months. High-risk patients should be followed up more frequently.<sup>6</sup>

Hypertension treatment should continue for the rest of the patient's life. A cautious downward titration of medication may be attempted in patients at low risk of CVD after 1 year of good BP control, particularly if healthy lifestyle changes have been successfully implemented.<sup>16</sup>

Only 35% of people with hypertension have good BP control.<sup>4</sup> JNC 7 emphasizes that even the most effective therapy requires patient motivation to successfully control hypertension.<sup>6</sup> In a recent study, researchers found that among persons who were prescribed a once-a-day antihypertensive, approximately 50% stopped taking the medication within

“Health care providers should take every opportunity to measure patients’ BP and initiate treatment when appropriate.”

1 year; on any given day, approximately 10% of scheduled doses were omitted; almost 50% of patients taking antihypertensive medications took at least one drug “holiday” a year; and alternative therapies were frequently added to prescribed medications.<sup>22</sup>

Organizational support, especially from health-promotion personnel dedicated to identifying and following up with high-risk patients, has been shown to improve all quality improvement strategies by 3.3%.<sup>1</sup> Recommending and following up on home-based BP self-monitoring increases adherence and can also improve patient self-efficacy regarding medication effects and benefits of lifestyle changes.<sup>23</sup>

**CONCLUSION**

Hypertension is asymptomatic and requires lifelong management, which makes the disease difficult to treat. Therapeutic recommendations change periodically, and patients require individualized treatment. This is often burdensome for clinicians. Furthermore, fewer than 40% of persons with hypertension achieve target BP goals, regardless of receiving treatment.<sup>1</sup>

Treatment goals emphasize maximum possible reduction in total cardiovascular risk. A decrease of as little as 2 mm Hg can produce a significant reduction in risk.<sup>18</sup> Health care providers should take every opportunity to check patients’ BP and initiate treatment when appropriate. Lifestyle modification and fastidious BP control are the primary preventive measures for persons with hypertension who are at risk for cardiovascular events. Clinicians who assess BP properly, evaluate CVD risks and comorbidities accurately, and treat early and appropriately can save lives and ensure better quality of life for their patients. **JAAPA**

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**DRUGS MENTIONED**

Aliskiren (Tekturna)	Hydralazine
Amlodipine (Norvasc, generics)	Minoxidil (Loniten, generics)
Amlodipine/valsartan (Exforge)	Nifedipine
Aspirin	Valsartan/hydrochlorothiazide (Diovan HCT)
Diltiazem	Verapamil
Eplerenone (Inspra)	

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