

Special Populations, Comorbidities, and Preferred Agents<sup>a,b</sup>

	Preferred Agents	Alternate Agents	Other Selected Agents	Comments	
Uncomplicated	thiazide, diuretic, -blocker	ACEI, CCB	-blocker, clonidine,	Short-acting nifedipine should not be used for long-	term management of HTN
African American Race	thiazide diuretic	CCB, -blocker, ACEI	-blocker, clonidine, -blocker	Differences in efficacy among patient populations are not as apparent when diuretics are added to	ACEIs and -blockers
Asthma/COPD	thiazide diuretic	ACEI, CCB	clonidine, -blocker	-blockers generally contraindicated in patients	with bronchospastic disease
BPH-Symptomatic	-blocker	-blocker, ACEI, CCB, thiazide diuretic (low dose)	clonidine	Diuretics may influence symptoms of polyuria and frequency	
Coronary artery disease	-blocker (non-ISApost-MI)	verapamil, diltiazem	DHP SR, ACEI, thiazide, diuretic	Non-ISA -blockers are the drugs of choice post-MI; ACEIs are also indicated post-MI in patients	with systolic dysfunction
LVD-Diastolic	-blocker,diurectic	verapamil, diltiazem	ACEI, -blocker	Diuretics are first-line agents if symptoms of vol-	ume overload exist
LVD-Systolic	<b>ACEI, diuretic</b>	<i>angiotensin II antago - nist, hydralazine/nitrates</i>	amlodipine, felodipine	ACEIs are preferred for their potential improve- ment in morbidity and mortality in this patient pop- ulation; diuretics are first-line agents if symptoms of volume overload exist; angiotensin II antagonists may be used where an ACEI is not tolerated; other	selected agents may be used in conjunction with an ACEI in stable CHF patients; -blockers and CCBs should be used with caution
CRI (CrCl<25 ml/ min or S <sub>cr</sub> >2.5mg/dL)	furosemide, ACEI	-blocker, CCB, -blocker, indapamide, metolazone	clonidine, minoxidil, hydralazine	Potassium (K <sup>+</sup> )-sparing diuretics, K <sup>+</sup> supplements, and/or ACEI may cause K <sup>+</sup> ; use ACEI with caution in patients with S <sub>cr</sub> >3.0 mg/dL; metoprolol is the	preferred -blocker due to hepatic excretion
Depression	thiazide diuretic	ACEI, CCB, -blocker		Clonidine, reserpine, methyldopa, -blockers may	exacerbate depression
DM	ACEI (types 1 & 2 DM with proteinuria)	thiazide diuretic (low dose) CCB, -blocker, -blocker	angiotensin II antagonist	High-dose thiazide diuretics and -blockers may worsen glucose control; -blockers may mask hypoglycemia; use of DHP SR in patients with	HTN and type 2 DM remains controversial
Elderly (>65yrs)	<b>thiazide diuretic</b>	-blocker, CCB, ACEI,	-blocker	Use caution with -blockers in elderly due to first-	dose syncope or dizziness
Gout	-blocker	ACEI, CCB, thiazide diuretic (low dose)	-blocker	Diuretic-induced hyperuricemia does not require treatment in the absence of gout or kidney stones	
Dyslipidemia	thiazide diuretic, (low dose) -blocker	ACEI, CCB, -blocker		Thiazide diuretics may TC and TG and non-ISA -blockers may HDL and TG, although these	effects may be transient
Isolated systolic hypertension	thiazide diuretic	DHPSR, -blocker, ACEI	-blocker	The use of DHP SR as first-line therapy remains controversial, although studies are available to indi-	cate benefit
Left ventricular hypertrophy	ACEI thiazide diuretic, -blocker	CCB	-blocker, clonidine	Direct-acting vasodilators do not reduce left ven- tricular hypertrophy	
Peripheral vascular disease	thiazide diuretic, ACEI	CCB, -blocker	-blocker	Nonselective -blockers without -blockade may worsen resting ischemia or severe claudication	symptoms
Pilots	thiazide diuretic, lisinopril				
Pregnancy (chronic HTN)	methyldopa	labetalol	hydralazine (generally used for preeclampsia)	Except for ACEI and angiotensin II antagonists that are contraindicated during pregnancy, any antihy-	pertensive drug may be continued if taken prior to pregnancy; -blockers may cause growth retardation in 1st trimester

<sup>a</sup> Adapted from JNC VI; Bold=compelling indication per outcome data (unless con- tra-indicated); Italics=may have favorable effect on comorbid conditions

<sup>b</sup> ACEI=angiotensin-converting enzyme inhibitor; BUN=blood urea nitrogen; CCB=calcium channel blocker; DHPSR=long-acting dihydropyridine; COPD=chronic obstructive pulmonary disease; BPH=benign prostatic hyperplasia; ISA=intrinsic

sympathomimetic activity; MI=myocardial infarction; LVD=left ventricular dysfunction; CHF=chronic heart failure; CRI=chronic renal insufficiency; DM=diabetes mellitus; TC=total cholesterol; TG=triglyceride; HDL=high-density-lipoprotein cholesterol

<sup>c</sup> Compelling indication in type 1 DM with proteinuria; preferred agent in types 1 and 2 DM with proteinuria

**DISEASE MANAGEMENT:  
PHARMACOLOGIC TREATMENT OF HYPERTENSION**

From the Pharmacy Benefits Management  
Strategic Healthcare Group and Medical Advisory Panel

**SCREENING/PREVENTION:  
UNDIAGNOSED HYPERTENSION**

SCREEN ALL PATIENTS FOR:

*Elevated BP* (remind patients they can check BP at drug stores, health fairs, or other community settings) • *smoking* • *dyslipidemia* • *diabetes mellitus*

Recommendations for Follow-up are Based on the Initial Blood Pressure Measurement:

SBP (mm Hg)	DBP (mm Hg)	Recommended Follow-Up
<130	<85	Recheck in 2 yr.
130 to 139	85 to 89	Recheck in 1 yr.
140 to 159	90 to 99	Confirm within 2 mo.
160 to 179	100 to 109	Evaluate or refer to source of care within 1 mo.
180	110	Evaluate or refer to source of care immediately or within 1 wk. depending on clinical situation

Adapted from the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. The sixth report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure JNC VI. Arch Intern Med 1997;157:2413-46.

**DIAGNOSIS OF HYPERTENSION**

Classify Blood Pressure Upon Follow-Up <sup>a,b</sup>:

STAGE <sup>c</sup>	SBP (mm Hg)	DBP (mm Hg)
Normal	<130	<85
High-normal	130 to 139	85 to 89
Stage 1 HTN	140 to 159	90 to 99
Stage 2 HTN	160 to 179	100 to 109
Stage 3 HTN	180	110

<sup>a</sup>Adapted from JNC VI. <sup>b</sup>Based on the average of 2 or more readings taken at each of 2 or more visits after initial screening in patients not currently on antihypertensive drugs or not acutely ill. Risk classification also depends on presence or absence of target organ damage or clinical CVD and additional risk factors. <sup>c</sup>When SBP and DBP fall into different categories, the higher category should be elected to classify the individual BP status. Isolated systolic hypertension is defined as BP of 140 mm Hg and DBP < 90 mm Hg.

**PROVIDER SHOULD PERFORM:**

- Clinical evaluation (i.e., history and physical exam) focusing on previous HTN diagnosis and management, possible underlying causes of HTN, presence of hypertensive target organ damage, and/or presence of other risk factors for CVD that would influence management, as detailed below
- Laboratory and other diagnostic tests: recommended tests are U/A, CBC, serum chemistries including Scr and BUN, lipids, ECG (refer to VA/DoD Diagnosis and Management of Patients with Hypertension in the Primary Care Setting @ www.va.gov/quality/perf)

**PROVIDER SHOULD ASSESS PATIENT FOR:**

Target Organ Damage/Clinical Cardiovascular Disease (Adapted from JNC VI)

HEART DISEASES: *Left ventricular hypertrophy, angina or prior myocardial infarction, prior coronary revascularization, heart failure* • HISTORY OF TRANSIENT ISCHEMIC ATTACK OR STROKE • PERIPHERAL ARTERIAL DISEASE RENAL DISEASE • RETINOPATHY  
**Major Risk Factors for Cardiovascular Disease** (Adapted from JNC VI)  
SMOKING • DYSLIPIDEMIA • DIABETES MELLITUS • AGE >60 YEARS • GENDER *male, postmenopausal women* • FAMILY HISTORY OF CARDIOVASCULAR DISEASE *men <55 years, women <65 years*

**MANAGEMENT OF HYPERTENSION**

**General Guidelines for Management**

(Adapted from JNC VI):

BP STAGE	RISK GROUP A <sup>c</sup>	RISK GROUP B <sup>d</sup>	RISK GROUP C
High-normal	Advise about lifestyle modifications for reducing BP	Advise about lifestyle modifications for reducing BP	Consider drug therapy for patients with CHF, CRI, or DM
Stage 1	Advise about lifestyle modifications for controlling BP (up to 12 mo.)	Advise about lifestyle modifications for controlling BP (up to 6 mo.)	Begin drug therapy and advise about lifestyle modifications
Stages 2 & 3	Begin drug therapy and advise about lifestyle modifications	Begin drug therapy and advise about lifestyle modifications	Begin drug therapy and advise about lifestyle modifications

<sup>c</sup>For patients with known HTN and for selection of drug therapy, refer to Table on Special Populations, Comorbidities, and Preferred Agents

<sup>b</sup>Acute target organ damage (e.g., papilledema) associated with HTN requires immediate management <sup>a</sup>Risk Group A=no CVD risk factors; no target organ damage or clinical CVD <sup>a</sup>Risk Group B=at least 1 risk factor for CVD (not including DM); no evidence of target organ disease or clinical CVD <sup>a</sup>Risk Group C=evidence of target organ disease or clinical CVD and/or DM with or without other CVD risk factors <sup>c</sup>Consider aggressive lifestyle modification alone in selected patients with Stage 2 HTN in Risk Group A

Lifestyle modifications and goals for the patient:

*Weight reduction* to within 10% IBW • *Limit alcohol intake* • *Sodium intake limited* to not more than 2.4g/day • *Aerobic exercise* 30-45 min 3-5 times/wk, e.g., health club, walking at mall, housework, gardening • *Diet modifications*, i.e., diet high in fruits, vegetables, low-fat dairy products, fiber, potassium, calcium, and magnesium; low in saturated and total fat and cholesterol; and moderately high in protein (e.g., DASH diet) • *Smoking cessation*

Goals for the provider in managing patients with hypertension:

*Attempt BP goal <140/90* (may be lower in patients with DM or renal disease with proteinuria) • *Address cardiovascular risk factors* • *Select appropriate drug therapy and dose* • *Minimize unwanted side effects* • *Evaluate adherence to treatment regimen* • *Perform initial and follow-up BP monitoring* • *Follow-up laboratory parameters as indicated by drug therapy and to assess target organ damage*

**EDUCATIONAL INTERVENTIONS**

Patient education should include the following:

*Reinforcement of diet and lifestyle modifications* • *How to minimize cardiac risk factors* • *Discussion on medication use* • *potential side effects, and adherence to therapy* • *When to notify provider of any chest pain, shortness of breath, signs of stroke, or possible adverse effects of the medication*

**MONITORING OUTCOMES**

Current monitoring parameters include:

*Achievement of BP goal* • *Patient education provided on diet and lifestyle modifications*