

## 15.8 Hypertension: Diagnosis and Treatment Clinical Practice Guidelines

*This guideline is intended to assist the practitioner in clinical decision-making and attempt to define clinical practices that apply to most patients in most circumstances. The treating practitioner should make the ultimate decision regarding the care of a particular patient.*

Treatment decisions for individual patients should not be based on blood pressure alone, but on an assessment of total cardiovascular risk. Before initiating pharmacological treatment, practitioners should consider several factors:

- the degree of blood pressure elevation
- the presence of target organ damage such as left ventricular hypertrophy, angina, prior Myocardial Infarction (MI), history of CABG/PTCA, nephropathy (proteinuria or elevated serum creatinine) peripheral vascular disease, retinopathy (generalized or focal narrowing of the retinal arteries).
- and the presence of clinical cardiovascular disease or other risk factors

### Evaluation

BP Classification	SBP* mmHg	DBP* mmHg	Lifestyle Modification	Initial Drug Therapy	
				Without Compelling Indications	With Compelling Indications
Normal	<120	and <80	Encourage	No antihypertensive drug indicated.	Drug(s) for compelling indications.‡
Prehypertension	120-139	or 80-89	Yes		
Stage 1 Hypertension**	140-159	or 90-99	Yes	Thiazide-type diuretics for most. May consider ACEI, ARB, BB, CCB, or combination.	Drug(s) for compelling indications.‡ Other antihypertensive drugs (diuretics, ACEI, ARB, BB, CCB) as needed.
Stage 2 Hypertension	≥160	or ≥100	Yes	Two-drug combination for most† (usually thiazide-type diuretic and ACEI or ARB or BB or CCB).	

### *Classification of Blood Pressure (BP) for Adults Aged 18 Years and Older\**

SBP = systolic blood pressure; DBP = diastolic blood pressure.

Drug abbreviations: ACEI, angiotensin converting enzyme inhibitor; ARB, angiotensin receptor blocker; BB, beta-blocker; CCB, calcium channel blocker.

\* Treatment determined by highest BP category.

\*\* Based on the average of two or more readings taken at each of two or more visits after an initial screening.

† Initial combined therapy should be used cautiously in those at risk for orthostatic hypotension.

‡ Treat patients with chronic kidney disease or diabetes to BP goal of <130/80 mmHg.

### ***Blood Pressure Measurement Techniques***

<b>Method</b>	<b>Notes</b>
In-office	Persons should be seated quietly for 5 minutes in a chair. Confirm elevated reading in contralateral arm.
Ambulatory	Indicated for evaluation of “white-coat” hypertension. Absence of 10-20 percent BP decrease during sleep may indicate increased CVD risk.
Patient self-check	Benefits patients by providing information on response to antihypertensive medication, may help improve adherence to therapy and is useful for evaluating “white-coat” hypertension.

### ***Diagnostic Workup of Hypertension***

- Confirmation of hypertension (HTN) based on the initial visit, plus two follow-up visits with at least two blood pressure (BP) measures at each visit.
- Assess lifestyle and identify other cardiovascular risk factors or comorbidities.
- Reveal identifiable causes of hypertension.
- Assess the presence or absence of target organ damage and cardiovascular disease (CVD).
- Conduct history and physical examination.
- Obtain laboratory tests: electrocardiogram, urinalysis, blood glucose, hematocrit and lipid profile after nine to 12 hours fasting, serum potassium, creatinine, and calcium. Optional: urinary albumin/creatinine ratio.

### ***Assess for Major Cardiovascular Disease (CVD) Risk Factors***

- Hypertension
- Obesity (body mass index  $>30$  kg/m<sup>2</sup>), waist circumference  $>40$  inches for men and  $>35$  inches for women.
- Dyslipidemia
- Diabetes mellitus (or impaired glucose tolerance)
- Cigarette smoking
- Physical inactivity
- Microalbuminuria, estimated glomerular filtration rate  $<60$  mL/min
- Age (older than 55 for men, older than 65 for women)
- Family history of premature CVD (men under age 55, women under age 65)

### ***Assess for Identifiable Causes of Hypertension***

- Obstructive sleep apnea
- Drug induced or related causes
- Chronic kidney disease/obstructive uropathy
- Primary aldosteronism
- Renovascular disease
- Cushing’s syndrome or chronic steroid therapy
- Pheochromocytoma
- Coarctation of the aorta
- Thyroid or parathyroid disease
- Obesity

### ***Causes of Resistant Hypertension***

- Improper BP measurement
- Excess sodium intake
- Inadequate diuretic therapy
- Medication
  - Inadequate doses
  - Drug actions and interactions (e.g., nonsteroidal anti-inflammatory drugs (NSAIDs),

- illicit drugs, sympathomimetics, oral contraceptives)
- Over-the-counter (OTC) drugs and herbal supplements
- Excess alcohol intake
- Identifiable causes of hypertension

***Characteristics Associated with Resistant Hypertension***

- Older age
- Female gender
- African American race
- Obesity
- Presence of chronic kidney disease, diabetes, or left ventricular hypertrophy

**Treatment**

***\* Check the health plan formulary listing for currently available medications by accessing [www.passporthealthplan.com](http://www.passporthealthplan.com) or the ePocrates drug listing.***

***Principles of Hypertension Treatment (See “Algorithm for Treatment of Hypertension”)***

- Treat to a BP <140/90 mmHg or BP <130/80 mmHg in patients with diabetes or chronic kidney disease.
- Majority of patients will require two medications to reach goal.
- Low dose Aspirin therapy should be considered ONLY when BP is controlled due to the risk of hemorrhagic stroke in patients with uncontrolled hypertension.

***Compelling Indications for Individual Drug Classes***

- A thiazide-type diuretic should be considered as initial therapy in most patients with uncomplicated hypertension.
- Monotherapy starts with one drug that is long acting, at a lowest possible dose, administered once daily (when feasible). If tolerated, dose can be increased or additional medications added to achieve goal BP.
- Alpha blockers for symptomatic BPH.
- Isolated systolic hypertension (older person) Diuretics preferred. Long acting dihydropyridine calcium antagonists.

<b>Compelling Indication</b>	<b>Initial Therapy Options</b>
Heart Failure	Diuretic, BB, ACEI, ARB, Aldo ANT
Post myocardial infarction	BB, ACEI, Aldo ANT
High coronary disease risk	Diuretic, BB, ACEI, CCB
Diabetes	Diuretic, BB, ACEI, ARB, CCB
Chronic kidney disease	ACEI, ARB
Recurrent stroke prevention	Diuretic, ACEI

Drug abbreviations: ACEI, angiotensin converting enzyme inhibitor; ARB, angiotensin receptor blocker; BB, beta-blocker; CCB, calcium channel blocker.

***Strategies for Improving Adherence to Therapy***

- Clinician empathy increases patient trust, motivation, and adherence to therapy.
- Consider the patient’s cultural beliefs and individual attitudes in formulating therapy.
- Provide education about the medication and how it fits into the treatment plan.
- Encourage accurate use of home monitoring systems for assessing BP control.
- Simplify the regimen and use patient’s adherence aids (e.g. pill boxes, alarms).
- Actively involve family members and significant others.

### ***Monitoring after Initiation of Drug Therapy***

	<b>Frequency*</b>
Until BP goal is reached	Monthly
After BP goal is reached & stable	Every 3-6 months
Serum Potassium & Creatinine level	1-2 times a year

\* Comorbidities & the need for lab tests will influence the frequency of visits

### ***Medical Record Documentation***

- Record BP, current treatment, any changes in treatment, patient counseling/education and follow-up visit instructions in the medical record for each visit.

### ***Principles of Lifestyle Modification***

- Encourage healthy lifestyles for all individuals.
- Prescribe lifestyle modifications for all patients with prehypertension and hypertension.
- Components of lifestyle modifications include weight reduction, DASH eating plan, dietary sodium reduction, aerobic physical activity, and moderation of alcohol consumption.
- Tobacco use cessation.

### ***Lifestyle Modification Recommendations***

<b>Modification</b>	<b>Recommendation</b>	<b>Avg. SBP Reduction **</b>
Weight reduction	Maintain normal body weight (body mass index 18.5-24.9 kg/m <sup>2</sup> ).	5-20 mmHg/10 kg weight loss
Adopt DASH eating plan	Consume a diet rich in fruits, vegetables, and low fat dairy products with reduced content of saturated and total fat.	8-14 mmHg
Dietary sodium reduction	Reduce dietary sodium intake to $\leq$ 100 mmol per day (2.4 g sodium or 6 g sodium chloride).	2-8 mmHg
Engage in physical activity	Regular aerobic physical activity (e.g., brisk walking) at least 30-45 minutes per day, most days of the week.	4-9 mmHg
Moderation of alcohol consumption	Men: limit to no more than 2 drinks (e.g., 24 oz. beer, 10 oz. wine, or 3 oz. 80 proof whiskey) per day. Women and lighter weight persons: no more than one drink* per day.	2-4 mmHg

† For overall cardiovascular risk reduction, stop smoking.

\*\* Effects are dose and time dependent and could be greater for some individuals.

‡ Dietary Approaches to Stop Hypertension

Based on the 7th Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC7), December 2003, and ICSI Hypertension Diagnosis and Treatment, Twelfth Edition, October 2008.

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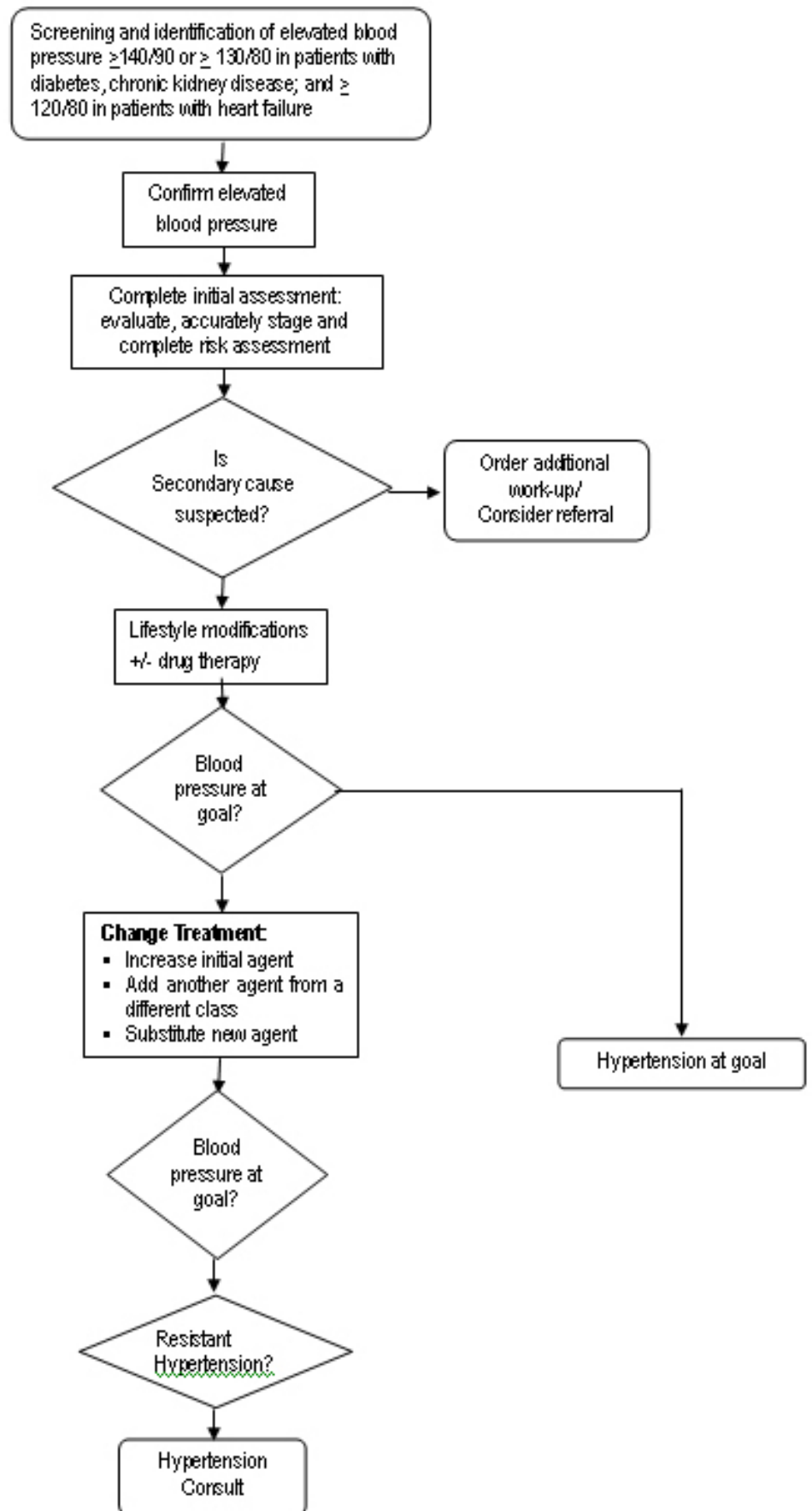
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## Algorithm for Treatment of Hypertension



Based on the 7th Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC7), December 2003.