

HIGH BLOOD PRESSURE GUIDELINES (JNC7)*

SUMMARY

**Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure.*

EVALUATION OF HIGH BLOOD PRESSURE^{1,2}

Classification of Blood Pressure (BP)*

Category	SBP mmHg		DBP mmHg
Normal	<120	and	<80
Prehypertension	120–139	or	80–89
Hypertension, Stage 1	140–159	or	90–99
Hypertension, Stage 2	≥160	or	≥100

Key: SBP = systolic blood pressure DBP = diastolic blood pressure

Diagnostic Workup

- Assess:
 - Risk factors
 - Comorbidities
 - Identifiable causes of hypertension (see below)
 - Target organ damage
- Conduct history and physical examination
- Obtain lab results:
 - Urinalysis; blood glucose, hematocrit, lipids; serum potassium, creatinine, calcium; urinary albumin/creatinine ratio (optional)
- Obtain ECG

Major CVD Risk Factors

- Hypertension
- Obesity (BMI ≥30 kg/m²)
- Dyslipidemia
- Diabetes mellitus
- Cigarette smoking
- Physical inactivity
- Microalbuminuria/estimated GFR <60 mL/min
- Older age (men: >55; women: >65)
- Family history of premature CVD (men: <55; women: <65)

Identifiable Causes of Hypertension

- Sleep apnea
- Medication- and drug-related (see Causes of Resistant Hypertension page 3)
- Chronic kidney disease
- Primary aldosteronism
- Renovascular disease
- Cushing's syndrome or steroid therapy
- Pheochromocytoma
- Coarctation of aorta
- Thyroid/parathyroid disease

BP Measurement Techniques

Method	Notes
In-office	Two readings, 5 minutes apart, sitting in chair. Confirm elevated reading in opposite arm. Practical points: Use device appropriate to arm size; no talking during measurement; arm should be resting, not suspended.
Ambulatory BP monitoring	Indicated for evaluation of "white coat hypertension." Absence of 10% to 20% BP decrease during sleep may indicate increased CVD risk.
Patient self-check	Provides information on response to therapy. May help improve adherence to therapy and is useful for evaluating "white coat hypertension."

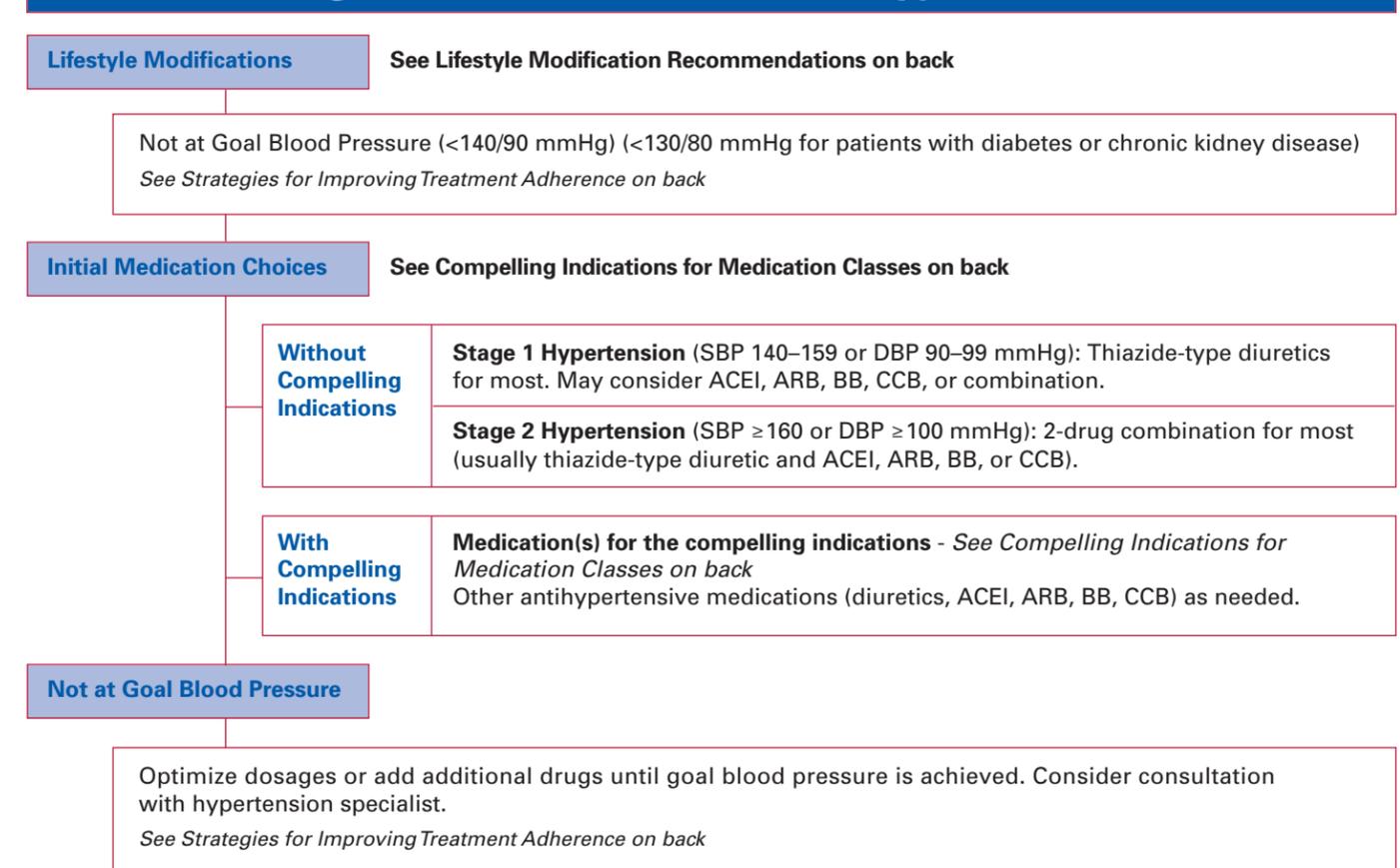
Key:
 BMI = body mass index
 BP = blood pressure
 CVD = cardiovascular disease
 ECG = electrocardiogram
 GFR = glomerular filtration rate

TREATMENT OF HIGH BLOOD PRESSURE

Treatment Principles

- Goal of treatment is to reduce CVD and renal morbidity and mortality
- BP goal is <140/90 mmHg; <130/80 in patients with diabetes or chronic kidney disease
- SBP is focus in patients ≥50 years of age
- Healthy lifestyle is critical to prevent and manage hypertension; specific lifestyle changes are essential for all patients with prehypertension and hypertension
- Most patients will require at least 2 medications to reach BP goal

Algorithm for Treatment of Hypertension



Causes of Resistant Hypertension

- Improper BP measurement (See BP Measurement Techniques page 2)
- Excess sodium intake
- Inadequate diuretic therapy
- Excess alcohol intake
- Identifiable causes (See page 2)
- Medications/drugs
 - Inadequate doses
 - Drug actions/interactions (eg, NSAIDs, illicit drugs, sympathomimetics, OCs)
 - OTC drugs, herbal supplements

Key:
 ACEI = angiotensin-converting enzyme inhibitor
 ARB = angiotensin receptor blocker
 BB = beta blocker
 CCB = calcium channel blocker
 NSAIDs = nonsteroidal anti-inflammatory drugs
 OCs = oral contraceptives
 OTC = over the counter

TREATMENT OF HIGH BLOOD PRESSURE (continued)^{1,2}

Compelling Indications for Medication Classes

Compelling Indication	Initial Therapy Options					
	Diuretic	BB	ACEI	ARB	CCB	ALDO ANT
Heart failure	*	*	*	*		*
Post-myocardial infarction		*	*			*
High CVD risk	*	*	*		*	
Diabetes	*	*	*	*	*	
Chronic kidney disease			*	*		
Recurrent stroke prevention	*		*			

Key:

ACEI = angiotensin-converting enzyme inhibitor
ALDO ANT = aldosterone antagonist

ARB = angiotensin receptor blocker
BB = beta blocker

CCB = calcium channel blocker

Lifestyle Modification Recommendations

Modification	Recommendations	Avg. SBP Reduction (mmHg)*
Weight	Maintain normal body weight (BMI 18.5–24.9 kg/m ²).	5–20/10 kg
DASH eating plan	Eat a diet rich in fruits, vegetables, and low-fat dairy products; reduce saturated and total fat.	8–14
Sodium reduction	Reduce dietary sodium intake to <2.4 g (6 g sodium chloride) per day.	2–8
Aerobic exercise	Get ~30 min of regular aerobic physical activity, most days of the week.	4–9
Moderation of alcohol consumption	Men: limit to ≤2 drinks/day. Women and lighter-weight persons: limit to ≤1 drink/day. (1 drink=12 oz beer; 1.5 oz 80 proof whiskey).	2–4

*Effects are dose- and time-dependent.

Strategies for Improving Treatment Adherence

- Provide empathy and reinforcement
- Individualize treatment and involve patients in decision making
- Consider patients' cultural beliefs and individual attitudes in formulating therapy
- Develop systems to monitor adherence to appointments and therapy
- Provide written information and records of BP readings
- Involve family and other support systems

References: 1. National Heart, Lung, and Blood Institute. *Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure—Complete Report*. <http://www.nhlbi.nih.gov/guidelines/hypertension/jnc7full.htm>. Published August 2004. Accessed February 17, 2009. 2. National Heart, Lung, and Blood Institute. Reference Card from the *Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC7)*. <http://www.nhlbi.nih.gov/guidelines/hypertension/jnc7card.htm>. Published May 2003. Accessed February 17, 2009.