



## Clinical Practice Guideline for the Prevention and Management of Hypertension

Source: 7<sup>th</sup> Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC7), August 2004.

**Introduction:** Hypertension is an increasingly important medical and public health issue. As many as 65 million Americans age 6 and older have hypertension. Approximately 30 percent of adults are still unaware of their hypertension, > 40 percent of individuals with hypertension are not on treatment, and two-thirds of hypertensive patients are not controlled to blood pressure levels <140/90 mmHg. Hypertension killed 49,707 Americans in 2002. It was listed as a primary or contributing cause of death in about 261,000 U.S. deaths in 2002.

### Classification of Blood Pressure for Adults (18 years and older):

Blood Pressure Classification	Systolic Blood Pressure (mmHg)	Diastolic Blood Pressure (mmHg)
Normal	<120	And <80
Prehypertension	120-139	or 80-89
Stage 1 Hypertension	140-159	or 90-99
Stage 2 Hypertension	≥160	or ≥100

### Blood Pressure Measurement Techniques:

Method	Notes
In-office	Two readings, 5 minutes apart, sitting in chair. Confirm elevated reading in contralateral arm.
Ambulatory BP monitoring	Indicated for evaluation of “white coat hypertension.” Absence of 10-20 percent 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.”

### Diagnostic Workup of Hypertension:

- Assess risk factors and co-morbidities.
- Assess identifiable causes of hypertension.
- Assess presence of target organ damage.
- Conduct history and physical examination.
  - Two or more blood pressure measurements with the appropriate sized cuff and separated by at least 2 minutes, verification in contralateral arm, fundoscopic exam, neck exam (bruits), heart and lung exam, abdominal exam for bruits or aortic aneurysm, extremity pulses.
- Obtain laboratory tests.
  - Urinalysis, blood glucose, hematocrit and lipid panel, serum potassium, creatinine, and calcium.
  - Urinary albumin/creatinine ratio (Optional).

### Assess Risk Factors:

- Hypertension
- Obesity (body mass index  $\geq 30$  kg/m<sup>2</sup>)
- Dyslipidemia
- Diabetes mellitus
- Cigarette smoking

- Physical inactivity
- Microalbuminuria, estimated glomerular filtration rate <60 mL/min
- Age (>55 for men, >65 for women)
- Family history of premature CVD (men age <55, women age <65)

**Assess for Identifiable Causes of Hypertension:**

- Drug induced/related
- Chronic kidney disease
- Primary aldosteronism
- Cushing’s syndrome or steroid therapy
- Pheochromocytoma
- Sleep Apnea
- Renovascular disease
- Coarctation of aorta
- Thyroid/parathyroid disease

**Assess Presence of Target Organ Damage:**

- Heart
  - LVH
  - Angina/prior MI
  - Prior coronary revascularization
  - Heart failure
- CKD
- Brain
  - Stroke or transient ischemic attack
  - Dementia
- Peripheral arterial disease
- Retinopathy

**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

**Goals of Therapy:**

The ultimate goal of antihypertensive therapy is to reduce cardiovascular and renal morbidity and mortality. Since most persons with hypertension, especially those >50 years of age, will reach the diastolic blood (DBP) pressure goal once the systolic blood pressure (SBP) goal is achieved, the primary focus should be on attaining the SBP goal. Treating SBP and DBP to targets that are 140/90 mmHg is associated with a decrease in CVD complications. In patients with hypertension and diabetes or renal disease, the blood pressure goal is < 130/80 mmHg.

**Principles of Hypertension Treatment:**

- 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.

**Lifestyle Modifications:**

<b>Modification</b>	<b>Recommendation</b>	<b>Approximate SBP Reduction</b>
Weight reduction	Maintain normal body weight (BMI 18.5-24.9-24.9 24.9 kg/m <sup>2</sup> )	5-20 mmHg/10kg
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 ≤ 100 mmol per day (2.4 g sodium or 6 g sodium chloride)	2-8 mmHg
Physical activity	Regular aerobic physical activity (e.g., brisk walking) at least 30 Minutes per day, most days of the week	4-9 mmHg
Moderation of alcohol consumption	Men: limit to ≤ 2 drinks* per day. Women and lighter weight persons: limit to ≤ 1 drink* per day.	2-4 mmHg

\* 1 drink = ½ oz. or 15 mil ethanol (e.g., 12 oz beer, 5 oz wine, 1.5 oz 80-proof whiskey)

**Pharmacologic Treatment:**

**Classes of Antihypertensive Drugs:**

- Diuretics
- Alpha Blockers/Inhibitors
- Beta Blockers
- ACE Inhibitors
- Angiotensin II Receptor Blockers (Use ACE Inhibitors First)
- Calcium Channel Blocking Agents
- Vasodilators

**Compelling Indications for Individual Drug Classes:**

- Monotherapy, start with one drug that is long acting, at a low dose, administered once daily (when feasible).
- Alpha blockers for symptomatic BHP.
- Isolated systolic hypertension (older person) Diuretics preferred. Long acting dihydropyridine calcium antagonists.

<b>Compelling Indication</b>	<b>Recommended Drugs</b>
Heart Failure	Diuretic, BB, ACEI, ARB, Aldo ANT
Postmyocardial 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: ACE, angiotensin converting enzyme inhibitor; ARB, angiotensin receptor blocker; BB, beta-blocker; CCB, calcium channel blocker*

**Monitoring after Initiation of Drug Therapy:**

- 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

**Measurement of Provider Compliance with Guidelines:**

Members aged 46 – 85 years of age who had a diagnosis of hypertension prior to June 30<sup>th</sup> of the measurement year and whose blood pressure was adequately controlled (< 140/90) during the measurement year.

**Medical Record Documentation:**

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

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