The Seventh Report of the Joint National Committee on Prevention, Evaluation, and Treatment of High Blood Pressure. NIH publication No 03-5233. May 2003.

Classification of Blood Pressure

Category	SBP and/or DBP
Normal	< 120 and < 80
Pre hypertension	120-139 or 80-89
Hypertension Stage 1	140-159 or 90-99
Hypertension Stage 2	>= 160 or >= 100

Recommended Diagnostic Work-Up

Assess risk factors and comorbidities
Reveal identifiable causes of hypertension
Assess presence of target organ damage
Conduct history and physical exam
- bilateral BP measurement
- optic fundi
- BMI calculation
- auscultate carotid, abdominal, and femoral bruit
- palpate thyroid gland
- examine heart and lungs thoroughly
- examine abdomen for enlarged kidneys, masses, and abnormal aortic pulsation
- palpate LE for edema and pulses
- neurological assessment

Obtain lab tests:
- urinalysis
- blood glucose
- hematocrit
- lipid panel
- serum K+, Cr, Ca++

Obtain electrocardiogram

Assess for Major CVD Risk Factors

Hypertension
Obesity (BMI >=30)
Dyslipidemia
Diabetes mellitus
Cigarette smoking
Physical inactivity
Microalbuminuria, estimated GFR < 60 ml/min
Age (> 55 for men, > 65 for women)
Family history of premature CVD (men <55, women < 65)

Assess for Identifiable Causes of Hypertension (if suggested by H&P and initial laboratory)

Sleep apnea
Drug induced/related
Chronic kidney disease
Primary aldosteronism
Renovascular disease
Cushing's syndrome or steroid therapy
Pheochromocytoma
Coarctation of aorta
Thyroid/parathyroid hormone

Treatment Overview

Treat to BP < 140/90 (< 130/80 in patients with diabetes or chronic renal disease)
Most patients will require two medications to reach goal

Lifestyle modification

Principles of Lifestyle Modification

Modification	Recommendation	Average SBP reduction range
Weight reduction	Maintain normal body weight (body mass index 18.5–24.9 kg/m2).	5–20 mmHg/10 kg
DASH eating plan	Adopt a diet rich in fruits, vegetables, and lowfat 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
Aerobic 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

Drug therapy:

Category of Population	First choice	Alternatives/comments
Prehypertension (120-139 mm Hg systolic or 80-89 mm Hg diastolic)		
	No antihypertensive drug indicated except in patients with compelling indications *	
Stage 1 Hypertension (140-159 mm Hg systolic or 90-99 mm Hg diastolic)		
Typical patient without compelling indications *	Thiazide-type diuretic for most	May consider ACE inhibitor, ARB, beta-blocker, calcium channel blocker, or combination
With heart failure	Asymptomatic: beta blocker or ACE inhibitor Symptomatic: Loop diuretic + ACE inhibitor or beta-blocker or ARB or aldosterone blocker	The aldosterone inhibitor spironolactone has been shown to be effective in class III-IV heart failure
Post myocardial infarction	ACE inhibitor or beta-blocker or aldosterone antagonist	
With Ischemic heart disease	Beta-blocker	Long-acting calcium channel blocker
With diabetes	Thiazide-type diuretic or beta-blocker or ACE inhibitor or ARB or calcium channel blocker	Two or more drugs usually necessary to achieve the target goal of <130/<80 mm Hg
With chronic kidney disease	ACE inhibitor or ARB	Goal is <130/<80 mm Hg
With cerebrovascular disease	Thiazide diuretic + ACE inhibitor	
African American patients	Thiazide-type diuretic or calcium channel blocker	Response to beta-blockers, ACE inhibitors, or ARBs is less in this group; rate of angioedema with ACE inhibitors is 2-4 times more frequent in this group.
With left ventricular hypertrophy	Any antihypertensive with the exception of minoxidil and hydralazine	
Elderly patients	Thiazide-type diuretic for	May consider ACE inhibitor, ARB, beta-

	most, including patients with isolated systolic hypertension	blocker, calcium channel blocker, or combination**.** Lower initial doses may be necessary to avoid symptoms.
Pregnant women	Methyldopa or beta-blocker or vasodilators	ACE inhibitors and ARBs should not be used.
Stage 2 hypertension (>160 mmHg systolic or >100 mm Hg diastolic)		
Typical patient without a compelling indication *	Thiazide-type diuretic + ACE inhibitor or ARB or beta-blocker or calcium channel blocker for most	
With a compelling indication *	As for stage 1 hypertension, though most patients will require a two drug combination	

***** Compelling indications: either for treatment based on high-risk conditions or for treatment with a specific drug, based on favorable outcome data from clinical trials. These include heart failure, post-myocardial infarction, high coronary disease risk, diabetes, chronic kidney disease, or cerebrovascular disease

Abbreviations: ACE inhibitor: Angiotensin converting enzyme inhibitor; ARB: angiotensin-receptor blocker

In patients with compelling indications see table below.

Compelling Indication	Initial Tx Option
Heart failure	THIAZ, BB, ACEI, ARB, ALDO ANT
Post MI	BB, ACEI, ALDO ANT
High CVD risk	THIAZ, BB, ACEI, CCB
Diabetes	THIAZ, BB, ACEI, ARB, CCB
Chronic kidney dz	ACEI, ARB
Recurrent CVA prevention	THIAZ, ACEI

Key:
THIAZ = thiazide diuretic
BB = beta blocker
ACEI = angiotensin converting enzyme inhibitor
ARB = angiotensin receptor blocker
ALDO ANT = aldosterone antagonist
CCB = calcium channel blocker

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 (as mentioned before).

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