

HYPERTENSION EVALUATION

CLASSIFICATION OF BLOOD PRESSURE

Category	Systolic BP (mmHg)		Diastolic BP (mmHg)
Normal	<120	AND	<80
Elevated	120–129	AND	<80
Hypertension, Stage 1	130–139	OR	80–89
Hypertension, Stage 2	≥140	OR	≥90

DIAGNOSTIC WORKUP OF HYPERTENSION

- Assess for identifiable causes of hypertension
- Assess for CVD risk factors and comorbidities
- Evaluate for presence of target organ damage
- Conduct history and physical examination
- Obtain laboratory tests: blood glucose, CBC, lipid profile, serum sodium, potassium, calcium, creatinine, TSH, urinalysis
- Perform ECG
- *Optional:* urinary albumin/creatinine ratio, uric acid, echocardiogram

CAUSES OF HYPERTENSION

- Genetic predisposition
- Overweight/obesity
- Excess sodium intake
- Insufficient potassium intake
- Poor diet
- Physical inactivity
- Excess alcohol consumption
- Drug-induced
 - Amphetamines, decongestants, caffeine
 - Antidepressants, atypical antipsychotics
 - Immunosuppressants
 - Oral contraceptives
 - NSAIDs, systemic corticosteroids
 - Angiogenesis inhibitors, tyrosine kinase inhibitors
 - Herbal supplements
 - Recreational drugs
- Secondary to disorders
 - Kidney disease
 - Renal artery stenosis
 - Primary aldosteronism or other mineralocorticoid excess syndromes
 - Obstructive sleep apnea
 - Pheochromocytoma/paraganglioma
 - Cushing's syndrome
 - Hypo- or hyperthyroidism
 - Aortic coarctation
 - Primary hyperparathyroidism
 - Congenital adrenal hyperplasia
 - Acromegaly

CARDIOVASCULAR DISEASE (CVD) RISK FACTORS

Modifiable risk factors:

- Cigarette smoking
- Diabetes mellitus
- Dyslipidemia/ hypercholesterolemia
- Overweight/obesity
- Physical inactivity
- Unhealthy diet

Relatively-fixed risk factors:

- Chronic kidney disease (CKD)
- Family history
- Increased age
- Low socioeconomic/educational status
- Male sex
- Obstructive apnea
- Psychosocial stress

BLOOD PRESSURE MEASUREMENT

Method	Notes
In-office	A single reading is inadequate for clinical decision-making. Use an average of ≥2 BP readings obtained on ≥2 separate occasions. Potential for "white coat hypertension" and "masked hypertension."
Ambulatory BP monitoring (ABPM)	Often used to supplement in-office readings. Monitors obtain BP readings at set intervals, usually over a 24-hr period (while patient performs normal daily activities). Has shown to provide better method to predict long-term CVD outcomes than in-office BPs.
Home BP monitoring (HBPM)	Regular self-monitoring by a patient at home or outside clinical setting. Need to verify use of automated validated devices. Use an average of BP readings on ≥2 occasions for clinical decision-making.

CAUSES OF RESISTANT HYPERTENSION*

- Inaccurate in-office BP measurements
- "White coat hypertension"
- Obesity
- Physical inactivity
- Excessive sodium or alcohol intake
- Secondary causes of hypertension
- Medication
 - Nonadherence
 - Drug-induced (eg, NSAIDs, stimulants, sympathomimetics, oral contraceptives)
 - Over-the-counter drugs and herbal supplements (eg, licorice, ephedra)

NOTES

Key: CBC = complete blood count; ECG = electrocardiogram; TSH = thyroid-stimulating hormone

*Defined as persistent hypertension despite therapy with 3 antihypertensive medications with complementary mechanisms of action, or controlled hypertension requiring 4 or more antihypertensive medications.

REFERENCES

- James PA, Oparil S, et al. 2014 Evidence-Based Guideline for the Management of High Blood Pressure in Adults. Report from the Panel Members Appointed to the Eighth Joint National Committee (JNC 8). *JAMA*. 2014;311(5):507-520. doi:10.1001/jama.2013.284427.
- Whelton PK, Carey RM, Aronow WS, et al. 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Hypertension*. 2017;HYP.0000000000000065. doi:https://doi.org/10.1161/HYP.0000000000000065.