

Hypertension

The risk of cardiovascular diseases such as stroke and CAD is closely related to levels of BP.

The cardiovascular risks associated with high BP depend on the combination of risk factors such as age, sex, weight, physical activity, smoking, family history, serum cholesterol, diabetes mellitus and pre-existing vascular disease

Definition of hypertension

Category	Systolic blood pressure (mmHg)	Diastolic blood pressure (mmHg)
Blood pressure		
Optimal	<120	< 80
Normal	<130	85
High normal	130–139	85–89
Hypertension		
Grade 1 (mild)	140–159	90–99
Grade 2 (moderate)	160–179	100–109
Grade 3 (severe)	≥ 180	> 110
Isolated systolic hypertension		
Grade 1	140–159	< 90
Grade 2	≥ 160	< 90

Pathogenesis

Many factors may contribute to the regulation of BP :

Renal function , peripheral resistance , vessel tone , endothelial dysfunction , autonomic tone , insulin resistance , neurohumoral factors

Risk factors

Age , high salt intake , heavy consumption of alcohol , obesity and lack of exercise , Impaired intrauterine growth and low birth weight

In about 5% of cases, hypertension is secondary to a specific disease

Cause of secondary hypertension

Alcohol

Obesity

Pregnancy

Renal disease

- Parenchymal renal disease, particularly glomerulonephritis

- Renal vascular disease
- Polycystic kidney disease

Endocrine disease

- Pheochromocytoma
- Cushing's syndrome
- Primary hyperaldosteronism (Conn syndrome)
- Glucocorticoid-suppressible hyperaldosteronism
- Hyperparathyroidism
- Acromegaly

- Primary hypothyroidism
- Thyrotoxicosis
- Congenital adrenal hyperplasia due to 11 β -hydroxylase or 17 α -hydroxylase deficiency
- Liddle syndrome
- 11 β -hydroxysteroid dehydrogenase deficiency

Drugs

Coarctation of the aorta

How to measure blood pressure

- Use a machine that has been validated, well maintained and properly calibrated
- Measure sitting BP routinely, with additional standing BP in older and diabetic patients and those with possible postural hypotension; rest the patient for 2 minutes
- Remove tight clothing from the arm
- Support the arm at the level of the heart
- Use a cuff of appropriate size (the bladder must encompass more than two-thirds of the arm)
- Lower the pressure slowly (2 mmHg per second)
- Read the BP to the nearest 2 mmHg
- Use phase V (disappearance of sounds) to measure diastolic BP
- Take two measurements at each visit

Clinical features

Hypertension is usually **asymptomatic** until the diagnosis is made at a routine physical examination or when a complication arises.

1 .Sometimes clinical features may be observed that can give a clue to the **underlying cause** of hypertension . These include

Radio-femoral delay in patients with coarctation of the aorta.

Enlarged kidneys in patients with polycystic kidney disease.

Abdominal bruits that may suggest renal artery stenosis .

The characteristic facies and habitus of Cushing's syndrome .

2.Examination may also reveal evidence of **risk factors** for hypertension, such as central obesity and hyperlipidemia.

3.Other signs may be observed that are due to the **complications of hypertension** . These include signs of left ventricular hypertrophy, accentuation of the aortic component of the second heart sound, and a fourth heart sound.

Investigations

The objectives of investigations :

Confirm diagnosis

Identify contributing factors & any underlying cause

Assess other risk factors & quantify CV risk

Detect any complications that are already present

Identify comorbidity that may influence choice of antihypertensive therapy

Investigations (to all patients)

Urinalysis for blood , protein & glucose .

Blood urea , creatinine & electrolytes.

(Hypokalemia in hyperaldosteronism & diuretics).

Blood glucose

Serum total & HDL cholesterol .

Thyroid function tests .

12 lead ECG (Left vent. hypertrophy LVH , CAD) .

Specialized investigations (NOT for all patients)

Chest X ray : cardiomegaly , heart failure , coarctation of the aorta .

Echocardiography : (?LVH)

Renal ultrasound

Renal angiography : ? Renal artery stenosis .

Urine chromatography : ? Pheochromocytoma .

Urine cortisol & dexamethasone suppression test : ? Cushing syndrome .

Plasma renin activity & aldosterone : Aldosteronism



Buffalo hump in cushing syndrome



Xanthelasma in hyperlipidemia



Chronic Kidney Disease (Uremia)



ECG of LVH – Deep S in V 1 , Tall R in V 6 // st depression & T inversion in Lead I , aVL , V 5 & V6



