Module I: Pre-Read

The New Hypertensive in Your OPD

From the First BP Reading to the Right First Pill

Hypertension is one of the most frequently encountered conditions in general practice, yet it remains among the most underdiagnosed and undertreated cardiovascular risk factors.

Globally, an estimated **1.3 to 1.4 billion adults** aged 30–79 live with hypertension, a leading cause of premature death, with nearly 50% (approx. 600 million) unaware of their condition.[1] Recent epidemiological data in India indicate that approximately one in four adults has hypertension.[2]

The rising prevalence of hypertension in younger populations is largely linked to lifestyle and behavioral changes. Major contributing factors include sedentary lifestyle, unhealthy diets with high salt intake, increasing obesity, and psychosocial stress.[3] This means that many patients presenting to the OPD even for unrelated complaints may already have elevated blood pressure or associated cardiovascular risk factors.

Recognizing Hypertension in Everyday Practice

The diagnosis of hypertension usually begins with a single elevated blood pressure reading in the clinic. However, current recommendations emphasize that because of the variability of BP, an elevation of office BP (SBP 140mmHg or DBP 90mmHg) should be confirmed by at least two to three visits, unless the BP values recorded during the first visit are markedly elevated (grade 3 hypertension) or CV risk is high, including the presence of HMOD.

If the blood pressure is ≥160 mmHg or ≥100 mmHg at the first reading, second reading should be taken on the same day to establish the diagnosis.

The **ESH MASTERplan**[4,5] emphasizes that every patient with hypertension should undergo a structured clinical assessment before therapeutic decisions are made.

This assessment serves **three important purposes**:

- Identify cardiovascular risk factors
- Detect hypertension-mediated organ damage (HMOD)
- Identify possible secondary causes of hypertension

In addition to grades of hypertension, which are based on BP values, it is recommended to distinguish stage 1, 2, and 3 hypertensions.

Hypertension disease staging	Other risk factors, HMOD, CVD or CKD	BP (mmHg) grading			
		High-normal SBP 130–139 DBP 85–89	Grade 1 SBP 140–159 DBP 90–99	Grade 2 SBP 160–179 DBP 100–109	Grade 3 SBP ≥ 180 DBP ≥ 110
Stage 1	No other risk factors	Low risk	Low risk	Moderate risk	High risk
	1 or 2 risk factors	Low risk	Moderate risk	Moderate to high risk	High risk
	≥3 risk factors	Low to moderate risk	Moderate to high risk	High risk	High risk
Stage 2	HMOD, CKD grade 3, or diabetes mellitus	Moderate to high risk	High risk	High risk	Very high risk
Stage 3	Established CVD or CKD grade ≥4	Very high risk	Very high risk	Very high risk	Very high risk

Out-of-Office Blood Pressure Monitoring

When feasible, BP assessment should be complemented by out-of-office measurements, which provide better representation of a patient's usual BP.

Two commonly used approaches include:

- Home Blood Pressure Monitoring (HBPM): Regular home measurements using validated devices.
- Ambulatory Blood Pressure Monitoring (ABPM): Automated BP measurement over 24 hours.

Definitions of Hypertension According to the Correspondence of Home and Ambulatory BP Values with Office BP

Method	SBP (mmHg)	DBP (mmHg)
Office BP	≥140	≥90
Ambulatory BP – Awake mean **Ambulatory BP – Asleep mean** **Ambulatory BP – 24-h mean**	≥135 ≥120 ≥130	≥85 ≥70 ≥80
Home BP mean	≥135	≥85

Out-of-office measurement (HBPM & ABPM) is particularly relevant in routine practice because:

- White-coat hypertension may affect 15–30% of patients
- Masked hypertension is common in individuals with diabetes, obesity or high stress environments
- Office readings alone may overestimate or underestimate true blood pressure

For evaluating a new patient, the first step is therefore confirmation of sustained elevation rather than immediate therapeutic escalation.

24-Hour Blood Pressure Phenotypes: The Hidden Risk Layer

Hypertension is not merely defined by absolute BP values, but also by circadian patterns. ABPM reveals distinct BP phenotypes associated with varying cardiovascular risks. Repeated ABPM may be necessary because these phenotypes have a limited reproducibility.

Prognostic Importance	Night-time BP is more predictive of CV events and mortality than daytime BP or even 24-h BP
Isolated Nocturnal Hypertension	Night-time hypertension with normal office and daytime BP; prevalence ≈9.2–12.9%
Higher-Risk Groups	More common in men with high-normal BP, elderly, obese, diabetic patients, CKD patients, African Americans
Circadian BP Phenotypes	▪ **Dipper:** ≥10% night BP fall (night/day ratio ≤0.9) ▪ **Non-dipper:** <10% fall ▪ **Reverse dipper:** night BP higher than daytime ▪ **Extreme dipper:** >20% fall
Risk Association	Non-dipping and reverse dipping associated with increased CV risk; in elderly, extreme dipping may also increase risk
Clinical Recommendation	Assess night-time BP using ABPM; repeat ABPM may be needed due to low reproducibility of patterns

Current evidence indicates that **morning or bedtime dosing of antihypertensive medications results in similar cardiovascular outcomes**, and treatment timing may therefore be individualized.

Hypertension-Mediated Organ Damage: Why Early Assessment Matters

Hypertension frequently coexists with other cardiometabolic conditions that significantly influence both risk stratification and treatment strategy.

During the initial evaluation of a newly hypertensive patient, general physicians should assess for common comorbidities including:

- Diabetes mellitus
- Chronic kidney disease (CKD)
- Coronary artery disease
- Heart failure
- Obesity or metabolic syndrome
- Obstructive sleep apnea

These conditions **increase the risk of hypertension-mediated organ damage (HMOD)** and future cardiovascular events.

Practical Comorbidity Screening in Primary Care

Focused assessment in the OPD should include elements from history, physical examination, and basic investigations.

Extended assessment of hypertension mediated organ damage (HMOD) can be executed as deemed necessary and available to physicians to identify patients who require earlier and more intensive treatment.

Key screening tests include:

Electrocardiography

Sokolow–Lyon index >35 mm

Cornell voltage-duration product >2440 mm·ms

Cornell voltage: Men **>28 mm;** Women **>20 mm**

Echocardiography

LV mass index

Men >50 g/m$^{2.7}$

Women >47 g/m$^{2.7}$

Renal markers

Moderate albuminuria: 30–300 mg/24 h

Urinary albumin–creatinine ratio (UACR): 30–300 mg/g (preferably morning spot urine)

CKD Stage 3:

eGFR 30–59 ml/min/1.73 m^2

Vascular stiffness

Pulse pressure ≥60 mmHg (in older people)

Carotid–femoral pulse wave velocity (PWV) >10 m/s

Linking Diagnosis to the First Therapeutic Decision

After confirming hypertension and evaluating comorbidities and target-organ damage, the clinician should select an appropriate initial treatment strategy. The guidelines recommend early intervention and the use of combination therapy to achieve faster blood pressure control and improve patient adherence.

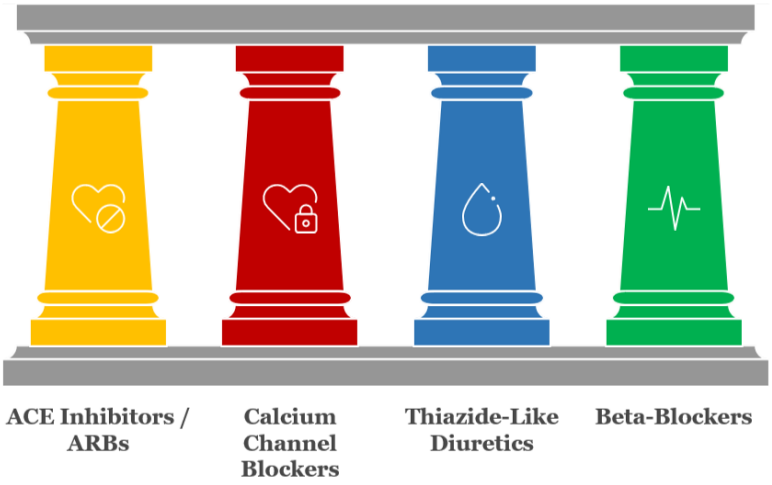
Treatment threshold:

- In patients 18 to 79 years, the recommended office threshold for initiation of drug treatment is 140 mmHg for SBP and/or 90 mmHg for DBP.
- In patients ≥80 years a lower SBP threshold in the range 140 - 159 mmHg may be considered.
- In adult patients with a history of CVD, predominantly CAD, drug treatment should be initiated in the high-normal BP range (SBP ≥130 or DBP ≥80 mmHg).

BP Targets in Recent Guidelines

Guideline	BP Target	Comments
KDIGO 2021	SBP <120 mmHg	using *standardized BP measurement*
ESH ERA 2023	SBP <140 mmHg DBP <80 mmHg	Additional cardiovascular benefit at SBP 120–129 mmHg (DBP target **70–79 mmHg**)
ESC 2024	BP 120–129 mmHg DBP 70–79 mmHg	SBP 120 mmHg is optimal if tolerated
American Heart Association. 2025	SBP <130 mmHg	

The choice of therapy should consider - Blood pressure level, Cardiovascular risk profile, Presence of comorbidities, Patient age and tolerance.



Additional Drug Classes
General antihypertensive therapy:
- Steroidal MRA
- Loop diuretic
- Alpha-1 blocker
- Centrally acting agent
- Vasodilator

Special comorbidities:
- Angiotensin receptor–neprilysin inhibitor (ARNi)
- Sodium–glucose cotransporter-2 inhibitor (SGLT2i)
- Non-steroidal mineralocorticoid receptor antagonist (MRA)

Selection of initial antihypertensive therapy often depends on the patient's clinical phenotype and associated comorbidities.

Diabetes or CKD
Renin angiotensin system (RAS) blockade with **ACE inhibitors or ARBs** is generally preferred because of their renoprotective effects.

Coronary artery disease
Beta-blockers and ACE inhibitors are frequently used.

Elderly patients with isolated systolic hypertension
Calcium channel blockers or thiazide-like diuretics may be effective.

Most patients should be initiated on a **single-pill combination therapy**, preferably an ACE inhibitor or ARB combined with a calcium channel blocker or thiazide-like diuretic.

Reference

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