

# Treatment Protocol for Hypertension

Abnormally elevated blood pressure is a pathological condition which increases the work load on the heart. This condition is termed as high blood pressure or hypertension. Based on the aetiology, high blood pressure is of two types:

**Primary/essential:** Primary or “essential” hypertension has no known cause, however many of the above said lifestyle factors are associated with this condition.

**Secondary:** Secondary hypertension is caused by some other medical conditions/problem or the use of certain medications. Secondary hypertension is seen only in very few individuals in the community. The causes of secondary hypertension include: kidney diseases: reno-vascular disease and chronic renal disease, endocrine disorders: hyperthyroidism, cushing’s syndrome and pheocromocytoma, sleep disorders, coarctation of the aorta and non specific aorto-arteritis. Some of these causes are often curable, and many others treatable.

## Criteria for diagnosing high blood pressure

The table below provides a classification of blood pressure for adults ages 18 and older. The classification is based on consistent elevation during two or more properly measured BP readings in sitting position.

**Table 4.1: Criteria for diagnosing high blood pressure**

Category	Systolic	Diastolic
Normal	Less than 120	Less than 80
Pre-hypertension	120-139	80-89
High Blood Pressure		
Stage 1	140-159	90-99
Stage 2	160 or higher	100 or higher

Source : JNC VIII

### The Risk assessment should cover:

- Assessment of medical history
- Physical Examination
- Laboratory Investigation

**Table 4.2.: Initial Assessment of Hypertensive Patients for history and Physical and laboratory examination**

Assessment of medical history	Physical examination	Laboratory Tests
<b>A. Risk factors</b> <ul style="list-style-type: none"> <li>▪ Lack of physical activity (or sedentary lifestyle)</li> <li>▪ Obesity or being overweight</li> <li>▪ Abdominal obesity</li> <li>▪ High sodium intake/high salt intake</li> <li>▪ Excess alcohol consumption</li> </ul> <b>B. Family history</b> <b>C. Symptoms of consequences of hypertension</b>	<b>A. BP measurement at</b> least in one upper and one lower limb <b>B. Measurement of Body weight and height to obtain BMI</b> <b>C. Measurement of Waist circumference</b>	<b>Essential:</b> <ul style="list-style-type: none"> <li>▪ Blood Sugar</li> <li>▪ Urine analysis for proteinuria</li> </ul> <b>Desirable:</b> (at CHC/sub-district/district level hospitals depending upon the available facilities for laboratory investigations) <ul style="list-style-type: none"> <li>▪ Haemogram</li> </ul>

Assessment of medical history	Physical examination	Laboratory Tests
D. Frequent intake of pain relieving drugs (NSAIDS) E. Steroid intake for asthma F. Breathing difficulty particularly on exertion G. Swelling of feet H. Urinary difficulties, history of passing stones in the past	D. Palpating all peripheral pulses E. Auscultation for bruit (renal, carotid, abdominal and others) F. Eye evaluation if ophthalmology facility is available	<ul style="list-style-type: none"> <li>▪ Serum creatinine</li> <li>▪ Serum sodium and potassium levels</li> <li>▪ Lipid profile</li> <li>▪ Complete Urine analysis</li> <li>▪ Electrocardiogram (ECG)</li> <li>▪ X-Ray chest</li> </ul>

Based on risk assessment, the management of high blood pressure cases can be initiated. The management should include the following:

- Therapeutic life-style management
- Drug Therapy

## Pharmacotherapy

Whether a person requires medicines for his high blood pressure and the choice of medicine best for the patient would depend on:

- The blood pressure reading
- Whether the high blood pressure has already affected target organs in the body such as heart, kidneys, eyes and arteries.
- Concurrent medical conditions such as diabetes, heart disease, kidney disease and other risk factors like use of tobacco, obesity and high blood fat levels(lipid profile) etc.

## Treatment Goals

- Initial aim should be to obtain blood pressure level less than 140/90 mms of Hg
- Don't accept blood pressure levels of 140/90 mms of Hg or more
- Maintain healthy blood pressure throughout the person's lives
- Prevent and control risk factors which could give rise to high blood pressure

In the Indian context, diuretics (chlorthalidon/ Indapamide), calcium channel blockers (amlodipine) and ACE inhibitors (Ramapril/Perindopril) are relatively cheap. Drug therapy should be started in individuals at the time of diagnosis if they have blood pressure more than 140/90mmHg (despite non-pharmacological interventions) or have end organ damage such as protienuria, high blood urea, ECG evidence of left ventricular hypertrophy, presence of heart diseases and evidence of retinopathy.

Therapy can be initiated with any of the three first line drug classes- a Calcium channel blocker (CCB), Angiotensin converting enzyme inhibitors (ACEI) or Angiotensin receptor blocker (ARB) and/or a thiazide (chlorthalidone/ Indapamide). The patient needs to be reviewed after 4 weeks of treatment. In case, his blood pressure is found >140/90mm Hg, one more drug needs to be added. Triple combination therapy (ACEI/ARB+CCB+thiazide) can be given if not controlled. Another drug like beta blocker, aldosterone antagonist or alpha blockers can be added for optimization else a referral to a higher centre may be necessary.

A low dosage combination therapy such as ACEI/ARB + CCB, ACEI/ARB + thiazide, CCB + thiazide can be given for initiation of therapy. Triple combination therapy (ACEI/ARB+CCB+thiazide) can be given if not controlled. Another drug like beta blocker, aldosterone antagonist or alpha blockers can be added for optimization else a referral to a higher center may be necessary.

**Table 4.3: List of Drugs**

	<b>Class of Drug</b>	<b>Drug</b>	<b>Initiation dose</b>	<b>Maximum dose</b>
A	ACE Inhibitors	Enalapril	5 mg once daily (OD)	10 mg twice daily (BD)
		Ramipril	5 mg OD	10 mg OD
		Lisinopril	5mg OD	20mg OD
C	Calcium Channel Blocker	Amlodipine	5mg OD	10 mg OD
D	Diuretic	Indapamide	1.5 mg OD	2.5 mg OD
		Chlorthalidon	12.5 mg OD	25 mg OD
		Aldosterone antagonist		
B	B-Blocker	Atenolol	50 mg OD	100 mg OD
		Metoprolol	25 mg BD	50 mg BD

## Special Situations

- **COPD:** Avoid beta-blockers
- If person is confirmed to be hypertensive and is also having diabetes the preferred drug should be ACE inhibitors for treatment of hypertension.
- **CKD:** ACE-I is recommended if Serum creatinine is <2mg%, however, it should be initiated only if facilities to monitor serum creatinine and potassium are available. If these are not available then initiate with Amlodipine 5 mg.
- **CAD:** Beta-blockers are useful especially if history of angina or recent MI is present
- **Heart failure:** ACE-I are recommended as the initial drug of choice. Beta-blockers are to be added subsequently.