Introduction:

This document summarizes evidence from available Indian and International guidelines/ published reviews in clinical journals and medical books. It aids physicians and other caregivers in making appropriate diagnostic and therapeutic decisions in an outpatient setting. It provides a framework for managing patients with particular symptom or condition. It covers diagnosis, clinical assessment, alarm features, clinical management, and investigations at outpatient level and referral management to inpatient facility/ hospital.

Scope and objective:

- To provide evidence backed recommendations for the identification and care of people with Hypertension at outpatient clinic.
- To give physicians a practical approach and guide to the care of patients with Hypertension
- To develop a tool that can be used with medical documentation and therefore promote compliance with best practice to standardize clinical care for patients with Hypertension in an outpatient setting.

Target population:

Adult population with existing or new onset of symptoms of Hypertension

Target Users:

- General Physicians
- Nurses
- Other health care professional
- Outpatient Clinics

The clinical protocol cover critical elements of patient care from patient's first visit to a physician, outpatient management, through to follow up and referral to inpatient facility/ hospital. The Clinical team can refer to these protocols and bibliography for detailed information.

Exclusions:

Person suffering from known underlying pathology and those with gestational hypertension have been excluded from the scope of this tool.

Disclaimer:

The clinical protocol are designed to be used by medical professionals licensed to practice in India as a guide and are not intended to substitute for informed medical decisions or judgment by a licensed medical professional.

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Hypertension: Outpatient Care Protocol

1. Introduction/definition *B1, J4, J8*

Hypertension, commonly known as high blood pressure, is a condition characterized by chronic increase in blood pressure, of at least 140/90 mm of Hg, over the normal level of 120/80 mm of Hg. Persistently high blood pressure increases patient's risk of developing heart disease, kidney disease, eye damage and brain damage.

2. General presentation *B1*

Hypertension sometimes may not have any symptoms and is only discovered when the blood pressure is measured. However in some it may present with:

- Headache
- Dizziness
- Shortness of breath
- Nausea and vomiting
- Blurred vision
- Stroke
- Myocardial infarction
- Kidney failure

3. Alarm features

Uncomplicated hypertension can be managed at outpatient clinic by providing symptomatic treatment. However, hypertension associated with alarm features should be immediately referred to hospital for prompt treatment. The alarm features are:

- Persistent systolic blood pressure recoding of more than 200 mmHg even after medication
- Hypertensive emergencies where severe elevation of blood pressure (SBP> 220 mm of Hg or DBP>130 mm of Hg) is seen
- Patients with severe retinopathy (hemorrhage and papilloedema) or malignant hypertension
- Raised serum creatinine or low plasma potassium in the absence of a diuretic
- Hematuria, proteinuria or cells in urine
- Sudden and severe headaches
- Symptoms of blurred vision or dizziness or nausea and vomiting
- Sudden blackouts
- Complaints of weakness of the limbs, slurred speech or tongue protruding to one side
- Confusion
- Loss of unconsciousness

4. Clinical types of Hypertension *B1*

- Depending on the etiology Hypertension is classified as:
  - **Primary Hypertension:** Hypertension for which the cause is unknown is called primary or essential hypertension. This type of hypertension is uncommon in those below 20 years of age. It is usually seen in those between 25 and 55 years.
  - **Secondary hypertension:** In those where the cause for hypertension is known it is called secondary hypertension. Some of the causes leading to hypertension are genetic, renal disease, renal artery stenosis, primary hyperaldosteronism, Cushing's syndrome, pheochromacytoma, coarctation of aorta, gestational, estrogen use etc.

- Depending on blood pressure measurements and their associated signs the different types of hypertension are:
  - **Labile hypertension:** is considered in those who sometimes but not always have arterial pressures in the hypertensive range. Such individuals usually have borderline hypertension
  - **Malignant hypertension:** A blood pressure above 200/140 along with papilloedema, retinal hemorrhages and exudates is called malignant hypertension.
  - **Accelerated hypertension:** Any recent significant increase in blood pressure over previous levels of blood pressure accompanied with evidence of vascular damage on funduscopic examination but without papilloedema is defined as accelerated hypertension.
  - **Isolated systolic hypertension:** Isolated hypertension is when the diastolic blood pressure is less than 90mmHg and systolic blood pressure is above 140mmHg as seen in thyrotoxicosis, pregnancy, COPD, atherosclerosis and mitral valve disease.

- Depending on the systolic and diastolic ranges *J8*

  The classification has been derived from the Indian Hypertension guidelines and is depicted in the table below based on the average blood pressure readings on each of two or more doctor visits.

Table1. Classification of blood pressure for adults 18 years and older* *J8*

Blood Pressure Classification	Systolic Blood Pressure, mmHg	Diastolic Blood Pressure, mmHg
Optimal**	<120	and <80
Normal	<130	<85
High-normal (Pre hypertension)	130-139	85-89
Hypertension***		
Stage 1 (Mild)	140–159	or 90–99
Stage 2 (Moderate)	160-179	100-109
Stage 3 (Severe)	>180	>110
Isolated systolic hypertension		
Grade 1	140-159	<90
Grade 2	>160	<90

* Not taking antihypertensive drugs and not acutely ill. In addition to classifying stages of hypertension on the basis of average blood pressure levels, clinicians should specify presence or absence of target organ disease and additional risk factors.

** Optimal blood pressure with respect to cardiovascular risk is below 120/80 mm Hg. However unusually low readings should be evaluated for clinical significance.

*** Based on the average of two or more blood pressure readings taken at least on two visits after an initial screening.

5. Risk factors *B2, J1, J2, J3, J8*

- Increasing age (>55 years in men and >65 in women)
- Living in urban areas
- Obesity
- Presence of diabetes mellitus and or hyperlipidemia

- Family history of the disease
- Sedentary lifestyle
- Smoking
- Excessive alcohol consumption

6. Clinical diagnosis: *J1, J4*

The evaluation of Hypertension at an outpatient clinic requires a careful review of blood pressure measurement, medical history, a physical examination and diagnostic testing to determine the underlying cause of the disease which is beneficial for further management.

6.1. Blood pressure measurement *J8*

Blood pressure measurement is of utmost importance in the diagnosis of hypertension. Few points to remember are:

- Standard mercury sphygmomanometer with a standard cuff and bladder should be used. In obese patients a larger bladder should be used. The bladder should encircle and cover two-thirds of the length of the arm.
- So as to come to a diagnosis of hypertension and to avoid variations it is recommended to take multiple blood pressure measurements on at least 3 separate occasions. If on the 3rd visit blood pressure reading is high, a sedative is given and repeat blood pressure is taken after half an hour. If the blood pressure is still high, then it is labeled as hypertension.
- In the initial visit, blood pressure readings should be recorded at an interval of 2-3 minutes
- The patient should be advised to refrain from smoking, drinking coffee and exercising 30 minutes before measuring blood pressure. Blood pressure should be recorded after seating the patient for at least 5 minutes.
- Blood pressure should be measured either in the sitting or the lying down position with the sphygmomanometer placed at the level of the heart.
- Blood pressure readings from both arms should be taken and the higher reading recorded
- In those above 60 years of age blood pressure should be measured in both the sitting and the lying down position so as to detect postural hypertension.
- In young patients with hypertension where coarctation and non-specific aortoarteritis is suspected blood pressure measurement of the thigh is recorded. A larger cuff is required. Normally thigh systolic blood pressure is higher and diastolic blood pressure is a little lower than the arm blood pressure because of the reflected pulse wave.

6.2. History

Physician should include history of following parameters in clinical diagnosis to determine underlying pathology and rule out other causes.

Ask for

- **Blood pressure details**
  - Blood pressure measurements
  - Duration of symptoms
  - Relieving factors
  - Last blood pressure reading
  - Date when last blood pressure measured

- **History of risk factors for hypertension or cardiovascular disease**
  - Diabetes
  - Dietary history (fat, salt and calorie intake)

- Smoking history, duration and number of cigarettes per day
- Alcohol consumption, amount per day or week
- Lifestyle and exercise

- **Past medical history of:**
  - Stroke / transient ischemic attack
  - Any other cardiovascular or heart disease
  - Renal disease
  - Peripheral vascular disease

- **Drug intake history**
  - Oral contraceptives
  - NSAIDs
  - Steroids
  - Any other medication

- **Family history of:**
  - Hypertension
  - Coronary artery disease
  - Diabetes
  - Stroke
  - Hyperlipidemia
  - Renal disease

6.3. Physical examination *J1, J4, J8*

The purpose for doing a physical examination is to identify organ damage and identify reasons that would indicate secondary hypertension.

- **Check for:**

  - Determine BMI by height and weight measurements
  - Pedal edema
  - Raised jugular venous pulse (JVP)
  - Any abnormal heart sounds
  - Locate apex beat
  - Any abdominal mass or bruit
  - Fundoscopy examination of the eye
  - Signs of anemia
  - Atherosclerosis (history of intermittent leg pain on walking, chest pain etc), tortuous blood vessel, xanthelesma

7. Investigations *B1, J1, J4*

Investigations in hypertension are usually carried out to find out the cause and also to see if there is any target organ damage.

7.1. Routine investigations *J8*

- 12 lead electrocardiography
- Urine R/M
- Blood sugar
- CBC

- Serum creatinine
- Serum electrolytes
- Fasting lipid profile (total cholesterol, HDL-C, LDL-C and triglycerides)

7.1.1. Indications for routine investigations

- 12 lead electrocardiography is usually done to identify presence of any other heart disease
- Urine R/M is primarily done for identifying presence of macroalbuminuria
- 24 hours urinary protein for nephropathy
- Blood sugar to rule out diabetes as a comorbidity
- CBC to rule out anemia and any other systemic infection
- Serum creatinine is indicated to assess functioning of the kidney
- Serum potassium is indicated to rule out any hypokalemia
- Lipid profile is indicated to identify any hyperlipidemia which is one of the causes leading to hypertension

7.2. Additional investigations *J1,J8*

Additional investigations are usually indicated for resistant hypertension, if routine investigation results strongly points to a secondary cause and to assess target organ damage. The tests carried out are:

- Echocardiography to detect left ventricular hypertrophy
- CT Angiography for coarctation of aorta
- Ambulatory blood pressure monitoring to rule out white coat hypertension and also evaluate masked, resistant, and pseudoresistant hypertension
- USG abdomen for high blood pressure due to renal stone. USG might also show change in renal parenchyma and adrenal glands.
- 24-hour urinary metanephrine and normetanephrine for pheochromacytoma
- 24-hour urinary aldosterone level for primary aldosteronism
- GFR or creatinine clearance for chronic kidney disease
- Dexamethasone suppression test for cushings syndrome
- TSH for thyroid disease
- Doppler flow study or magnetic resonance angiography for renovascular hypertension *J6*

8. Differential diagnosis *B2*

Physician should rule out other causes/conditions which are responsible for:

- Coarctation of aorta (arterial hypertension in the right arm with normal or low blood pressure in the lower limbs, MRI confirms the diagnosis)
- Sleep apnea (disturbed sleep, daytime sleepiness and fatigue)
- Pheochromocytoma (paroxysmal elevated blood pressures, orthostatic hypotension)
- Renal artery stenosis(high blood pressure levels not controlled with medications)
- Hyperthyroidism (weight loss, intolerance to heat, tremors, hair loss)
- Gestational hypertension (pregnancy induced)

9. Management of Hypertension *B1, J1, J2, J4, J8*

The aim of management is to maintain blood pressure levels at normal and to prevent complications or target organ damage

9.1. Principles of management

- Drug therapy
- Lifestyle modification
- Education
- Referral management if condition worsens or in presence of alarm features

9.1.1. Drug therapy *B1, J1, J2, J4, J8, J9*

9.1.1.1. Principles of therapy

Any individual whose diastolic blood pressure persistently is > 90mmHg or any one above 35 years with a systolic pressure of > 160mmHg is a candidate for treatment. The principles of drug therapy include:

- In patients above 55 years the first choice for initial therapy should be either a calcium-channel blocker or a thiazide-type diuretic.
- In hypertensive patients younger than 55, the first choice for initial therapy should be an angiotensin-converting enzyme (ACE) inhibitor (or an angiotensin-II receptor blocker if an ACE inhibitor is not tolerated).
- Thiazide diuretics are recommended as first line therapy for hypertension either as a single drug or in combination with other supplemental drugs *J5*
- New onset hypertension < 140mmHg without compelling indications (refer to table 5) are advised lifestyle modifications initially and observed for 3 months. Pre existing or known hypertension should be evaluated thoroughly and treatment decided based on response to ongoing medication.
- In those where BP is ≥140mmHg or with DBP ≥90 mmHg or ≥ 80 mmHg with diabetes or compelling indications then investigate as indicated. Advice ACE (or ARB in those where ACE is not tolerated) if BP < 150/90 mmHG and if BP > 150/90 mmHg advise ACE (or ARB in those where ACE is not tolerated) and a Thiazide diuretic.
- Blood pressure 130- 139 mmHg (Pre hypertension) and without compelling indications is usually managed with lifestyle modifications (see section 9.1.2.) and observed for 3 months. If no improvements are seen then drug therapy is initiated often with a single drug, Thiazide being most preferred. However depending on response other drugs such as ACE inhibitors, Angiotensin receptor blockers, calcium channel blockers or combinations may be used
- Stage I hypertension usually requires lifestyle management along with a single drug therapy. Thiazide or calcium channel blocker is advised
- Stage II hypertension usually requires two drug combination.
- Stage III hypertension will require assessing presence or absence of end organ damage; identifying causes of an elevated blood pressure, such as non-adherence to medication or diet and referral to a hospital. Drugs used are ACE inhibitors and anti adrenergic such as clonidine or labetolol.
- Therapy should always start with a lower dose so as to reduce adverse effects. If the drug is well tolerated and BP is still not controlled, dose of the same drug can be increased.
- Combination drugs can be used to maximize hypotensive efficacy while minimizing side effect. A small dose of a second drug should be added rather than increasing the dosage of the previous drug used (Fig.1)
- Poor response to a drug warrants a change in the class of the drug prior to increasing the dosage or adding a second drug class.
- The table below summarizes the management of high blood pressure in adults.

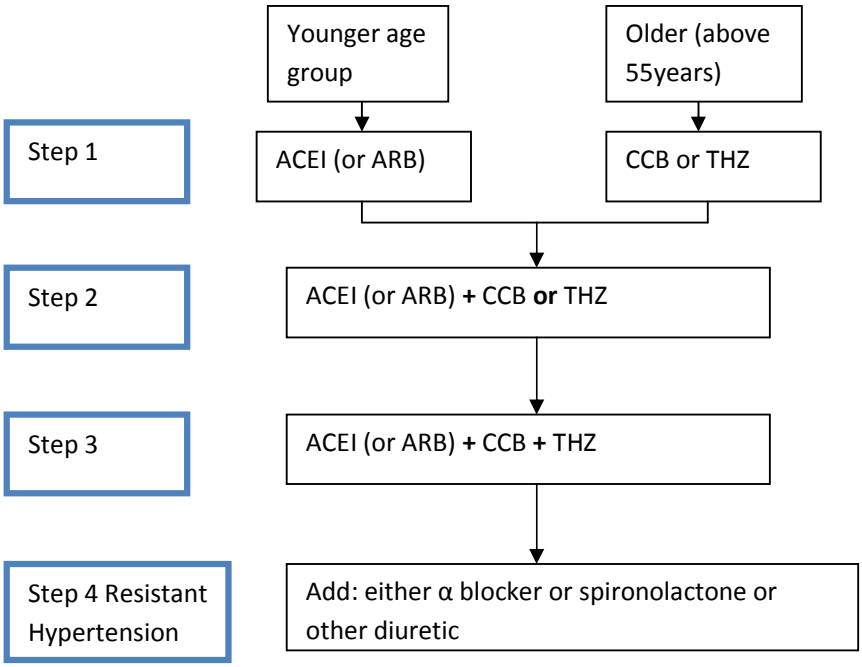
Table2. Management of high blood pressure in adults *J1, J8*

Blood Pressure Classification	Systolic Blood Pressure,	Diastolic Blood Pressure,	Lifestyle modifications	Initial Drug Therapy

	mmHg	mmHg		
Pre hypertension	120–139	or 80–89	Yes	Consider in those with diabetes when BP is 140/80 or more
Stage 1 Hypertension	140–159	or 90–99	Yes	Thiazide-type diuretic unless contraindicated or not tolerated (Consider ACEI, ARBs, BB, CCB) For comorbidities see Table 5.
Stage 2 Hypertension	160-179	100-109	Yes	2 drug therapy which includes a thiazide-type diuretic unless contraindicated or not tolerated and ACEIs* or ARBs** or BB*** or CCB**** For comorbidities see Table 5.
Stage 3 Hypertension	>180	>110	Yes	ACE inhibitors and anti adrenergics such as clonidine or labetolol

* ACEIs – Angiotensin converting enzyme inhibitors
** ARBS – Angiotensin receptor blocker
***BB – Beta blockers
****CCB – Calcium channel blockers

Fig1. Algorithm for recommended drug combination *J8*



ACEI- Angiotension converting enzyme inhibitor, ARB-Angiotensin receptor blocker, CCB- Calcium channel blocker, THZ- Thiazide

9.1.1.2. Antihypertensive drugs

The commonly used anti hypertensive drugs are listed in the table below along with their indication and contraindications.

Table 3. Drug therapy in Hypertension				
Indications	**Therapeutic class**	**Drug (Generic)**	**Dosage**	**Contraindications**
Systolic hypertension Heart failure Elderly patients and Diabetes(in combination with other drugs)	Thiazide Diuretics	hydrochlorothiazide http://www.mims.com/Page.aspx?menuid=mng&name=hydrochlorothiazide&brief=true&CTRY=IN&searchstring=hydrochlorothiazide+	Initially, 12.5 mg daily. Usual dose: 25-50 mg daily, either alone or combined with other antihypertensives, up to 100 mg daily, if necessary. Should be taken with food.	Severe hepatic and renal impairment, Addison's disease, preexisting hypercalcaemia, anuria, sulphonamide allergy. Pregnancy, lactation. Special precautions needed in those with existing electrolyte disturbances.
		Indapamide http://www.mims.com/Page.aspx?menuid=mng&name=indapamide&brief=true&CTRY=IN&searchstring=Indapamide	1.25-2.5 mg orally once daily with food.	Anuria, severe hepatic impairment. Special precaution in pregnancy, lactation and electrolyte imbalance
		Metolazone *Correct electrolyte disturbances prior to therapy* http://www.mims.com/Page.aspx?menuid=mng&name=metolazone&brief=true&CTRY=IN&searchstring=Metolazone+	Initial: 1.25 mg/day to be taken after breakfast. *Adjust dose after 3-4 weeks*	Anuria; hepatic coma or pre-coma. Pregnancy.
Hypertension Angina Post-myocardial infarct Tachyarrhythmias	Beta-blockers	Atenolol http://www.mims.com/Page.aspx?menuid=mng&name=atenolol&brief=true&CTRY=IN&searchstring=Atenolol+	25-100 mg daily as a single dose. May be taken with or without food.	Asthma and chronic obstructive pulmonary disease Athletes and physically active patients Peripheral vascular disease Pregnancy. To be used with caution in lactation.
		Metoprolol http://www.mims.com/Page.aspx?menuid=	Initially, 50-100 mg daily in single or 2 divided doses; may	2nd or 3rd degree AV block; sick sinus syndrome; decompensated heart

		mng&name=metoprolol&brief=true&CTRY=IN&searchstring=Metoprolol	increase wkly to 400 mg daily depending on response. Maintenance: 100-200 mg daily; up to 400 mg daily. May be taken with or without food.	failure; clinically relevant sinus bradycardia. Severe peripheral arterial circulatory disorders. Cardiogenic shock. Asthma. Phaeochromocytoma (without α-blockade), systolic BP <100 mmHg. Metabolic acidosis. Pregnancy (2nd and 3rd trimesters).
		Propranolol http://www.mims.com/Page.aspx?menuid=mng&name=propranolol&brief=true&CTRY=IN&searchstring=Propranolol	Initially, 40-80 mg bid. Usual range: 160-320 mg daily. Tabs should be taken on an empty stomach whereas cap can be taken with or without food.	Sinus bradycardia, cardiogenic shock, pulmonary oedema, severe hyperactive airway disease, compensated cardiac failure, Raynaud's disease, hypoglycaemia, severe haemorrhage, metabolic acidosis, severe peripheral arterial disease, 2nd or 3rd degree heart block. Pregnancy (2nd and 3rd trimesters).
		Betaxolol http://www.mims.com/Page.aspx?menuid=mng&name=betaxolol&brief=true&CTRY=IN&searchstring=Betaxolol	10-20 mg once daily. May increase dose to 40 mg/day if necessary after 7-14 days depending on the patient's response. **Elderly**: Initial dose of 5-10 mg/day. May be taken with or without food.	Sinus bradycardia, cardiogenic shock, overt cardiac failure, pregnancy.
Heart failure Coronary artery disease Post-myocardial infarct Diabetic nephropathy	ACE-Inhibitors	Lisinopril http://www.mims.com/Page.aspx?menuid=mng&name=lisinopril&brief=true&CTRY=IN&searchstring=Lisinopril	5-10 mg/day at bedtime. May be taken with or without food.	Pregnancy Hyperkalaemia Bilateral renal artery stenosis
		Enalapril http://www.mims.com/Page.aspx?menuid=	Initially, 5 mg at bedtime. Maintenance: 10-20 mg once daily	Hypersensitivity, bilateral renal artery stenosis and pregnancy.

		mng&name=enalapril&brief=true&CTRY=IN&searchstring=Enalapril	increased up to 40 mg in divided doses in severe hypertension. Max: 40 mg/day.	
		Ramipril http://www.mims.com/Page.aspx?menuid=mng&name=ramipril&brief=true&CTRY=IN&searchstring=Ramipril	Initial: 1.25 mg at bedtime. Maintenance: 2.5-5 mg/day as a single dose, up to 10 mg/day if needed. May be taken with or without food	Hypersensitivity, bilateral renal artery stenosis, or a single kidney with unilateral renal artery stenosis. Aortic stenosis or outflow tract obstruction. Pregnancy and lactation
		Captopril http://www.mims.com/Page.aspx?menuid=mng&name=captopril&brief=true&CTRY=IN&searchstring=Captopril	Initial: 12.5 mg twice daily. Maintenance: 25-50 mg twice daily. Max: 50 mg 3 times /day.	Known hypersensitivity to the drug, bilateral renal artery stenosis, hereditary angioedema, renal impairment and pregnancy
Angina Elderly patients Systolic hypertension Peripheral vascular disease	Calcium channel blockers (calcium antagonists)	Nifidipine http://www.mims.com/Page.aspx?menuid=mng&name=nifedipine&brief=true&CTRY=IN&searchstring=nifedipine	Extended release 10-40 mg twice daily or 20-90 mg once daily. May be taken with or without food. *Avoid grapefruit juice.*	Heart block Congestive heart failure. Caution when taken with pregnancy.
		Diltiazem http://www.mims.com/Page.aspx?menuid=mng&name=diltiazem+hydrochloride&brief=true&CTRY=IN&searchstring=Diltiazem	Initial: 60-120 mg twice daily. Max: 360 mg/day. May be taken with or without food.	Sick-sinus syndrome; 2nd or 3rd ° AV block; porphyria, severe congestive cardiac failure; marked bradycardia, pregnancy and lactation.
		Verapamil http://www.mims.com/Page.aspx?menuid=mng&name=v	240 mg/day in 2-3 divided doses. Max: 480 mg/day. Should	Cardiogenic shock, severe bradycardia, severe left ventricular dysfunction, uncompensated heart

		erapamil&brief=true&CTRY=IN&searchstring=Verapamil	be taken with food.	failure, and hypotension. Caution with pregnancy and lactation.
		Amlodipine http://www.mims.com/Page.aspx?menuid=mng&name=amlodipine&brief=true&CTRY=IN&searchstring=Amlodipine	5 mg once daily; up to 10 mg once daily if needed. May be taken with or without food.	Known hypersensitivity to dihydropyridines.
Hypertensive patients with type II diabetes	Angiotensin II receptor blockers	Losartan http://www.mims.com/Page.aspx?menuid=mng&name=losartan&brief=true&CTRY=IN&searchstring=Losartan	50 mg once daily, increased to 100 mg daily as a single dose or in 2 divided doses if needed. May be taken with or without food.	Pregnancy and lactation.
		Valsartan http://www.mims.com/Page.aspx?menuid=mng&name=valsartan&brief=true&CTRY=IN&searchstring=Valsartan	Initial: 80 mg once daily, up to 160 mg once daily. Max: 320 mg/day. May be taken with or without food.	Hypersensitivity; severe hepatic impairment, cirrhosis or biliary obstruction; primary hyperaldosteronism. Pregnancy (2nd and 3rd trimesters) and lactation.

9.1.1.2. Adverse Reactions

Table 4. Adverse reactions of antihypertensive drugs

Drugs	Adverse reactions
Hydrochlorothiazide	Electrolyte imbalance, dry mouth, thirst and muscle cramps
Indapamide	Headache, dizziness, palpitations, orthostatic hypotension, hypokalemia, hyponatremia
Metolazone	Chest pain, palpitation, electrolyte disturbances
Atenolol	Bronchospasm, cold extremities, nausea, diarrhea, constipation
Metoprolol	Heartburn, musculoskeletal pain, blurred vision, dry eyes
Propranolol	Cold extremities, insomnia, fatigue, nausea, constipation or diarrhea, vomiting, anorexia, stomach discomfort, bronchospasm
Betaxolol	GI upsets, bradycardia especially in elderly
Lisinopril	Severe hypotension, angioedema, dizziness, headache, fatigue; cough, diarrhoea
Enalapril	Hypotension may be severe and prolonged, persistent dry cough, abnormal taste
Ramipril	Nausea, vomiting, diarrhea, headache, abdominal pain, cough
Captopril	Neutropenia, usually occurs within 3 month of starting therapy in patients with renal dysfunction or collagen diseases
Nifidipine	Peripheral oedema, palpitations, hypotension, flushing, dizziness, increased micturition frequency

Diltiazem	AV block, bradycardia, asystole, sinus arrest, GI discomfort, headache
Verapamil	Heart block and cardiac failure in patients with preexisting cardiac disease, hepatotoxicity
Amlodipine	Hypotension, bradycardia, CCF, abdominal pain, flushing, dyspepsia
Losartan	Headache, dizziness, myalgia, taste disturbances and hyperkalaemia
Valsartan	Blood dyscrasias, dizziness; headache, dry cough; LFT elevations

9.1.1.3. Drug therapy for hypertension with compelling indications *B1, J1, J2*

When other comorbidity coexists with hypertension there are compelling indications for using a particular drug type. These specific therapies have been found to be effective on the basis of several clinical trials conducted. They are also recommended by WHO.

Table 5. Antihypertensive drug combinations for compelling indications *J1, J2*

Compelling Indications	Preferred drugs
Elderly with isolated systolic hypertension	Calcium channel blocker / Thiazide Diuretic
Chronic kidney disease	ACE inhibitor Angiotensin receptor blocker
Diabetes	Thiazide diuretic β blocker ACE inhibitor Angiotensin receptor blocker Calcium channel blocker
Cardiac disease Post Myocardial infarction Left ventricular dysfunction Heart failure	 ACE inhibitor β blocker ACE inhibitor Thiazide diuretic, β blocker, ACE inhibitor, Angiotensin receptor blocker
Left ventricular hypertrophy	Angiotensin receptor blocker
High coronary disease risk	Thiazide diuretic β blocker ACE inhibitor Calcium channel blocker
Recurrent stroke prevention	ACE inhibitor + Thiazide diuretic

9.1.2. Lifestyle modification *J1, J2, J4, J8, J9*

Along with drug therapy it is important for a physician to also emphasize on lifestyle changes as these have been known to lower Blood pressure and prevent hypertension. Lifestyle changes can bring about a reduction in both the systolic and diastolic pressure. These changes include:

Table 6. Lifestyle changes

Intervention	Recommendation	Expected Systolic blood pressure reduction (range)
Weight reduction	Maintain ideal body mass index (ideal 18.5-24.9). Reduce weight if overweight by adopting healthy eating habits and exercising.	5-20 mmHg per 10 kg weight loss
Adopt DASH (Dietary Approaches to Stop	Consume diet rich in fruit, vegetables, and low-fat dairy	8-14 mmHg

Hypertension) eating plan	products with reduced content of saturated and total fat. Avoid meat and caffeine.	
Salt restricted diet	Reduce salt intake in the diet to < 100 mmol/day (< 2.4 g sodium or < 6 g sodium chloride). Advice to avoid added salt, processed foods, and salt-containing foods such as pickles, papads, chips, chutneys and preparations containing baking powder.	2-8 mmHg
Physical activity	Engage in regular aerobic physical activity for example, brisk walking for at least 30 min most days or yoga and meditation.	4-9 mmHg
Alcohol consumption reduction	Men < 60 ml per day, twice a week Women < 30 ml per day, twice a week. Abstinence is preferred	2-4 mmHg
Tobacco use	Should be stopped	Prevents cardiovascular and non cardiovascular disease in hypertensives

Note- Please refer to the advisory for food with low salt content.

9.1.3. Education *J1, J8*

Educating the patient on the importance of BP monitoring, regular medication intake, adherence to lifestyle changes and regular follow up is essential in preventing the complications of hypertension.

9.1.4. Referral management *J1, J4*

In the presence of any one of the alarm features mentioned in the previous section referral management should be initiated. Depending on the condition of the patient supportive management should be started.
In those with hypertensive emergencies immediate referral should be initiated along with supportive therapy of sublingual captopril

10. Follow up

- Regular follow up especially after start of antihypertensive drugs to assess for drug effectiveness or adverse effects
  - If goal blood pressure achieved, follow up every 3 months. Reinforce life style measures.
  - If goal blood pressure not achieved after 3 months, substitute the drug or low dose combination from other classes. If partial response, either increase dose, add a drug from another class or change to low dose combination.
  - If patient shows side effects, reduce dosage or change the medicine
- Blood pressure to be monitored at least once daily until stabilized and then once a week and later once fortnight
- CHD risk factors as well as co-existing diseases/conditions to be monitored. The overall risk category of a patient and the level of blood pressure decide the frequency of follow up visits.

The frequency can be reduced once blood pressure is stabilized and other risk factors are controlled

11. Quality indicators

The quality indicators that are important in documenting the adherence to policy in the management of hypertension are:

- Lifestyle modifications advised for new onset stage I hypertension
- Regular monitoring of blood pressure advice given
- Education given
- Referral management for alarm features

12. Patient advice: *J1*

Patient education should include information about the disease, its causes, alarm features, prevention, and treatment and when to seek help. Patient advice should reinforce that hypertension is a lifelong condition and that medications should not be stopped without consulting the doctor. Regular follow up is necessary to monitor and prevent target organ damage.

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