

CDNAP 2009

Management of Hypertension

Guide for Health Professionals

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It is recommended that prescribers evaluate their patients' individual circumstances and conditions before any diagnosis is made, procedure followed, or treatment prescribed based on suggestions by this document. Prescribers should consult the product monograph before prescribing any of the medications suggested in this document.

Acknowledgements:

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Table of Contents

Risk Factors for Hypertension	3
Benefits of Treating Hypertension	3
Blood Pressure Targets	3
Management of Hypertension	4
Diagnosis of Hypertension Algorithm	5
Special Concerns for Diagnosis of Hypertension	6
Pharmacologic Management of Hypertension Chart	7
Considerations When Using Combinations of Antihypertensives	9
ACEI and ARB	10
Diuretics	11
CCB	12
B-Blockers	13
Other Antihypertensives	14
Abbreviations	16
Bibliography	17

Risk Factors for Hypertension

- ↑ age
- Family history
- Ethnicity (more common in South Asian, First Nations, Inuit, and Black People)
- Smoking
- Dyslipidemia
- Dysglycemia (IGT, IFG, Diabetes)
- Abdominal obesity
- Unhealthy diet (high in fats, excessive salt)
- Sedentary lifestyle (physical inactivity)

Benefits of Treating

↓ blood pressure by 10/5 mmHg results in:

- 50% ↓ risk of heart failure
- 38% ↓ risk of stroke
- 15% ↓ risk of MI
- 10% ↓ risk of death
- Hypertension is also related to sexual dysfunction and dementia.

Blood Pressure Targets

- Home monitoring: <135/85
- Office monitoring:

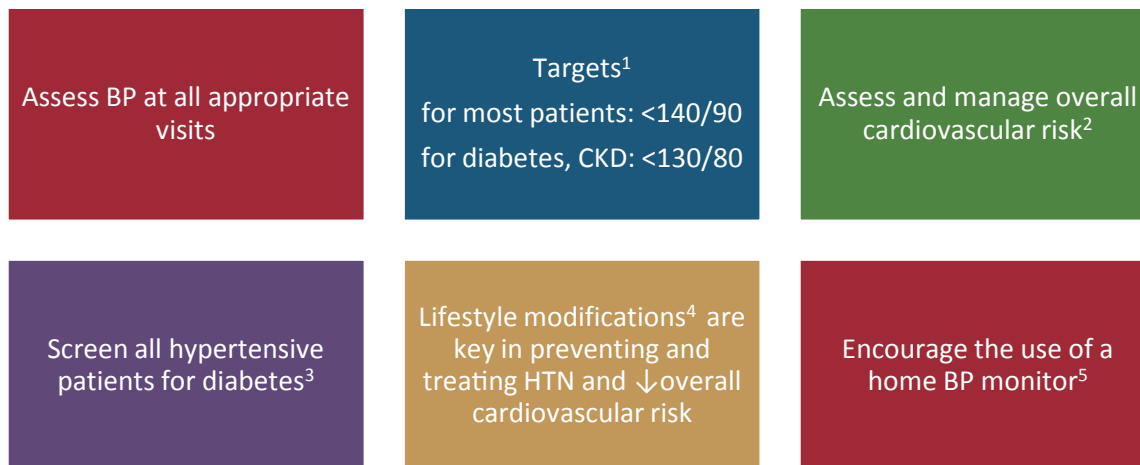
Diastolic +/- systolic: <140/90

Isolated Systolic: <140

Diabetes: <130/80

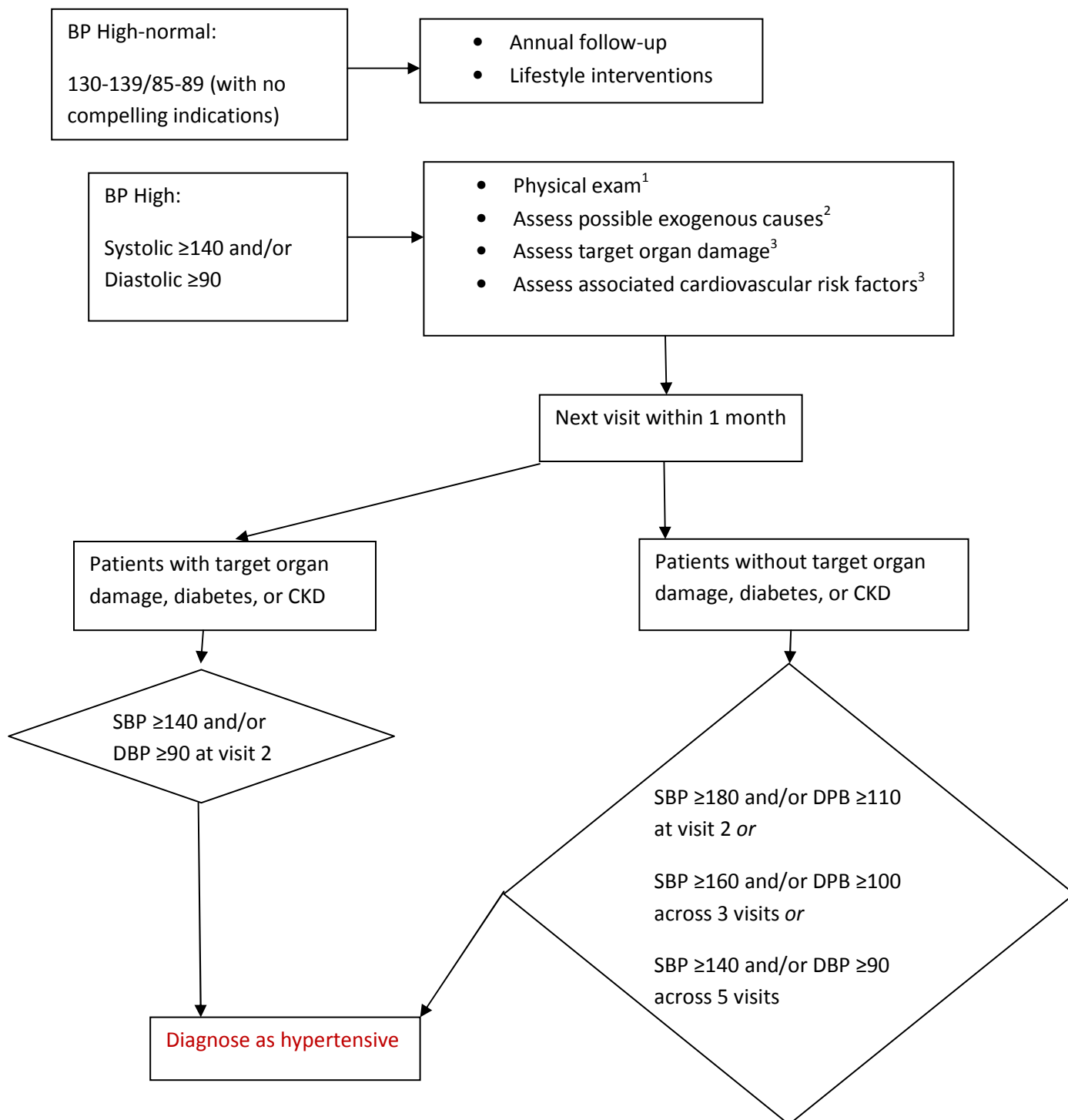
Chronic Kidney Disease <130/80

Management of Hypertension



1. A combination of lifestyle and pharmacologic agents may be required to reach target.
2. Identify and treat dyslipidemia; optimize BG control in IGT, IFG, and diabetes; encourage smoking cessation, regular physical activity, and healthy eating.
3. Yearly if ≥ 40 years.
4. **Lifestyle interventions include:**
 - **achieving and maintaining healthy weight;**
 - **following a healthy diet (high fibre, low fat);**
 - **↓ Na intake to <1500mg/d adults <50yrs, <1300mg/d for 51-70yrs, <1200mg/d for >70yrs of age.**
 - **regular physical activity (30-60minutes of moderate aerobic activity 4-7 days/week);**
 - **limit alcohol intake to ≤ 2 drinks/day (≤ 14 /week for men and ≤ 9 /week for women);**
 - **quit smoking,**
 - **reduce stress.**
5. This will help diagnose HTN, improve BP control and medication compliance, ↓ need for medications, as well as identify white coat HTN and masked HTN. Ensure the monitor is approved by the Canadian Hypertension Society and that the patient knows how to use it properly. Target <135/85

Diagnosis of Hypertension



Diagnosis of Hypertension cont'

1. Lab tests for persons with hypertension: urinalysis; electrolytes and creatinine; FBG; lipid panel; standard 12-lead ECG.
2. Exogenous causes of hypertension: NSAIDs; coxibs; corticosteroids; anabolic steroids; oral contraceptives and sex hormones; decongestants; certain transplant meds; erythropoietin and analogues; MAOIs; sibutramine; midodrine; also licorice root, cocaine and other stimulants, salt excessive alcohol intake, sleep apnea.
3. Target Organ Damage: stroke; dementia; retinopathy; LVD; CAD (MI, angina, CHF); CKD (nephropathy, albuminuria); PAD (intermittent claudication)
4. Cardiovascular Risk Factors: abdominal obesity; IGT; dyslipidemia; left ventricular hypertrophy; microalbuminuria; CKD; smoking; sedentary lifestyle; poor diet (high fat, high salt, low fibre); stress, age; family history of premature CVD (<55 years in men and <65 years in women).

Special Concerns:

Renovascular Hypertension:

- Sudden onset or worsening of HTN in persons >55years or <30 years
- Abdominal bruit
- HTN refractory to ≥ 3 drugs
- \uparrow SCr and taking ACEI or ARB
- Recurrent pulmonary edema

Endocrine Hypertension:

- Spontaneous $\downarrow K^+$ (< 3.5mmol/L)
- Marked diuretic-induced $\downarrow K^+$ (<3.0mmol/L)
- HTN refractory to ≥ 3 drugs
- Adrenal adenoma

Pheochromocytoma:

- Severe sustained BP $\geq 180/110$ refractory to treatment
- Symptoms of catecholamine excess: headache, palpitations, sweating, pallor, panic attacks
- HTN triggered by B-blockers, MAOI, micturition, or changes in abdominal pressure

Hypertensive Urgencies:

- Asymptomatic DBP ≥ 130
- Hypertensive encephalopathy
- Acute aortic dissection
- Acute left ventricular failure
- Acute MI

Pharmacologic Management of Hypertension

Type of HTN	Initial Therapy	Second-line Therapy
Systolic/Diastolic ¹	TZD ² , B-Blocker ³ , ACEI ⁴ , ARB ⁴ , LA-CCB	Combination of 1 st line agents ⁵
Isolated Systolic ¹	TZD ² , ARB ⁴ , DHP-CCB	Combination of 1 st line agents
Diabetes without nephropathy ⁶	ACEI ⁴ , ARB ⁴ , DHP-CCB, TZD ⁷	Combination of 1 st line agents Or addition of cardioselective B-blocker ³ +/- LA non-DHP-CCB if 1 st line agents are not tolerated
Diabetes with nephropathy ⁶	ACEI ⁴ , ARB ⁴	Addition of TZD ⁷ , cardioselective B-blocker ³ , LA-CCB
Coronary Artery Disease ¹	B-blocker ³ for patients with stable angina, ACEI ^{4,8} , ARB ^{4,8}	LA-CCB ²⁰
Prior MI	B-blocker ³ + ACEI ⁴ or ARB ⁴	LA-CCB ¹⁹
Heart Failure ¹¹	ACEI ⁴ or ARB ⁴ , B-blocker, spironolactone ⁹	ARB ^{4,10} , hydralazine/ISDN; TZD or furosemide as additive therapy
Left ventricular hypertrophy ^{1,12}	No specific recommendation	Combination of additional agents
Prior CVA or TIA ^{1,13}	ACEI+diuretic	Combinations of additional agents
Non-diabetic CKD with proteinuria ^{6,14}	ACEI ⁴ or ARB ⁴ , +/- diuretic	Combinations of additional agents
Renovascular disease ^{6,14}	No specific recommendation	Combination of additional agents
PAD ^{1,15}	No specific recommendation	Combination of additional agents
Pregnancy ¹⁶	Labetolol, Methyldopa, Hydralazine	Combination of 1 st line agents
Breast Feeding ¹⁷	As per pregnancy, also certain ACEI, certain B-blockers, TZD, certain CCB	
Children ¹⁸	ACEI ⁴ , ARB ⁴ , or CCB	

Pharmacologic Management cont'

1. Target <140/90.
2. If diuretic is prescribed as monotherapy, consider a potassium-sparing agent to avoid ↓K⁺.
3. Not recommended as 1st line in persons >60years without another compelling indication. Questionable efficacy in smokers. Contraindicated in asthmatics. Use with caution in diabetics (may mask symptoms of hypoglycemia).
4. Contraindicated in pregnancy: use with caution in women of child-bearing age. Also contraindicated in bilateral renal artery stenosis, solitary kidney. Combination of ACEI and ARB not recommended except in advanced heart failure or proteinuric nephropathy. ACEI are not recommended as monotherapy in Black persons without another compelling indication.
5. Consider initiating therapy with 2 first-line agents if SBP is ≥20mmHg or ≥10mmHg above target.
6. Target <130/80. Normal ACR <2.0mg/mmol in men and <2.8mg/mmol in women.
7. Furosemide should be used if SCr >150μmol/L and volume control is required.
8. Except in low risk patients.
9. Use Spironolactone in patients with Class III or IV symptoms. Monitor K⁺ closely.
10. Dose antihypertensive as per recommendations for heart failure. Monitor K⁺ and renal function if ACEI and ARB are used in combination.
11. Avoid non-DHP-CCB.
12. Note that hydralazine and minoxidil can ↑ left ventricular hypertrophy.
13. Note this does not apply to acute stroke. ↓BP reduces risk of another cerebrovascular event in stable patients.
14. Avoid ACEI or ARB with bilateral renal artery stenosis or solitary kidney. Monitor K⁺ and renal function when on ACEI or ARB. Do not use a combination of ACEI and ARB in the absence of proteinuria.
15. Avoid B-blockers in severe disease.
16. Nifedipine is an alternative. B-blockers may reduce birth weight and cause persistent beta blockade in the infant.
17. Only ramipril, captopril, enalapril, nifedipine, diltiazem, verapamil, propranolol, and metoprolol are documented to be compatible with breast feeding. Consider breastfeeding 3-4 hours after dose to minimize infant exposure. Monitor infant heart rate, blood pressure, respiration, and blood glucose. Diuretics may ↓ lactation. Risks to infant of being exposed to antihypertensives must be weighed against risks of not being breast fed.
18. HTN in children is defined as having SPB and/or DBP in the ≥95th percentile for gender, age, and height on ≥ 3 visits. Initial treatment involved lifestyle modifications as per the adult population. In the presence of diabetes, target organ damage, symptoms, or inefficacy of non-pharmacologic measures, drug treatment is warranted. ACEI or ARB may be considered first line given their demonstrated benefit in metabolic syndrome. **However, these agents are teratogenic and should be used with an effective contraceptive if prescribed to adolescent girls.** CCB are an alternative (amlodipine has the most evidence in kids). B-blockers can be considered for kids with migraines or tachycardia, but are usually considered 2nd line since they cause exercise intolerance and fatigue. Diuretics are a reasonable choice, especially as add-on therapy. Watch for hypokalemia in kids who eat a lot of salt.
19. If B-blocker is contraindicated or not effective, use LA-DHP-CCB if patient also has heart failure, or any LA-CCB if patient does not have heart failure.
20. Avoid short-acting nifedipine. Where combination therapy is being considered in a high risk patient, ACEI + DHP-CCB is recommended.

Considerations when using Combinations of Antihypertensives

- **Lower doses of multiple drugs may be preferable to higher doses of fewer drugs (better tolerated and more effective).**
- **Use fixed-dose combination therapy where possible to reduce pill-load and improve compliance.**
- **Patients with uncontrolled hypertension should be reassessed at least every 2 months.**
- **Refer to specialist if treatment with 3 antihypertensives is not effective.**

ACEI + ARB	Not recommended except in severe heart failure or proteinuria
Non-DHP-CCB + B-blocker	Increased risk of bradycardia or heart block (not recommended)
ACEI or ARB + K ⁺ -sparing diuretic	Monitor Scr and K ⁺
Diuretic	If not used 1 st or 2 nd line, it should be added if triple therapy is warranted
Selected high-risk patients	ACEI+DHP-CCB is preferred to ACEI+diuretic
Systolic BP 20mmHg above target or Diastolic BP 10mmHg above target at diagnosis	Consider combination of 2 first-line agents as initial therapy
Preferred Combinations	ACEI or ARB + thiazide (less risk of hypokalemia) ACEI or ARB + DHP-CCB (less risk of edema)
Acceptable Combinations	CCB + thiazide Thiazide + K ⁺ sparing diuretic Aliskiren + thiazide or CCB B-blocker + diuretic or DHP-CCB
Other combinations <i>not</i> recommended	B-blocker + ACEI or ARB B-blocker + centrally acting agent (clonidine)

ACEI = Angiotensin Converting Enzyme Inhibitor

ARB = Angiotensin Receptor Blocker

Drug	Trade Name	Dosing Range	Usual Dose
	<i>ACEI^{1,3,4,5,6}</i>		
Benazepril	Lotensin	10-40mg OD or BID	20mg/day
Captopril	-	25-150mg/day BID or TID	25mg TID Empty stomach
Cilazapril	Inhibace	2.5- 10mg/day OD orBID	2.5-5mg OD
Enalapril	Vasotec	5-40mg/day OD or BID	10-40mg/day
Fosinopril	Monopril	10-40mg/day OD or BID	20mg/day
Lisinopril	<i>Prinivil, Zestril</i>	10-40mg OD	20mg OD
Perindopril	<i>Coversyl</i>	4mg OD or BID	-
Quinapril	<i>Accupril</i>	10-20mg OD or BID	-
Ramipril	<i>Altace</i>	2.5-10mg OD or BID	10mg/day
Trandolapril	<i>Mavik</i>	1-4mg OD	-
	<i>ARB^{2,3,4,6}</i>		
Candesartan	Atacand	8-32 mg OD	8-16mg OD
Eprosartan	Tevetin	300-400mg OD or BID	-
Irbesartan	Avapro	150-300mg OD	-
Losartan	Cozaar	25-50mg OD or BID	50-100mg/day
Olmesartan	Olmotec	20-40mg OD	-
Telmisartan	Micardis	80mg OD	-
Valsartan	Diovan	80-320mg OD	-

Source: Therapeutic Choices, RxFiles

1. Side Effects of ACEI: Dry cough; Hyperkalemia (especially with renal insufficiency, K⁺ sparing diuretics, K⁺ supplements, NSAIDs; angioedema, hypotension (especially if volume depleted or with diuretics); acute renal failure with bilateral renal stenosis; headache; dizziness; fatigue; rash; loss of taste; hepatotoxicity; dysgeusia; pancreatitis; blood dyscrasias
2. Side Effects of ARBS: same as ACE except no cough and less dizziness and headache.
3. Drug Interactions: K⁺ supplements; K⁺ sparing diuretics (assess K⁺ and SCr regularly); NSAIDs; Lithium (possible toxicity)
4. Contraindications: pregnancy, history of angioedema, renal artery stenosis (solitary kidney or bilateral)
5. Use lower dose in renal impairment.
6. **Renal function and K⁺ must be monitored. Check BUN, CrCl, electrolytes before starting, after 7 days, then regularly thereafter, including when dose ↑ or when a diuretic is added or ↑.**

Diuretics

Drug	Trade Name	Dose Range	Usual Dose
	<i>Thiazides^{2,3,4,12} (TZD)</i>		
Hydrochlorothiazide	HCTZ	6.25-100mg OD ¹	12.5-25MG OD
Chlorthalidone ⁵	-	12.5-25mg OD ¹	12.5-25mg OD Or 25mg EOD
Indapamide ⁶	Lozide	1.25mg-5mg OD ¹	1.25-5mg OD
Metolazone ⁸	Zaroxolyn	2.5mg-10mg OD	5mg OD
	<i>Loop Diuretics^{3,4,7,12}</i>		
Furosemide	Lasix	20-240mg/day OD or BID	
	<i>K⁺sparing^{9,10,11,12}</i>		
Spironolactone	Aldactone	12.5-200mg/day ¹ OD or BID	25-50mg OD
Triamterene	Not available as single-agent		
Amiloride ¹³			
	<i>Combination Diuretics</i>		
HCTZ/Amiloride	Amilzide, Moduret		½-1 tablet OD
HCTZ/Triamterene	Diazide, Triazide		½-1 tablet OD
HCTZ/Spironolactone	Aldactazide		1/2-1 tablet OD

Source: RxFiles, Therapeutic Choices

1. Lower dose in renal impairment. Use furosemide if CrCl ≤30mL/min (SCr > 150mmol/L)
2. Side Effects: lower doses are well-tolerated; rash; allergic reaction; photosensitivity; ↑calcium; ↑uric acid; ↑cholesterol; ↑glucose; ↓sodium; ↓potassium; ↓magnesium; ↓zinc; pancreatitis; sexual dysfunction.
3. Drug Interactions: Digoxin (toxicity if K⁺ is low); ↑lithium; NSAIDs (loss of BP control), corticosteroids (↓K⁺)
4. Contraindications: symptomatic hyperuricemia (gout); sulfa allergy; anuria; hyponatremia
5. More potent and longer acting than HCTZ. Minimal lipid/electrolyte changes.
6. Other side effects: headache, dizziness. Less effect on lipids and glucose.
7. Side Effects: dehydration; ↓(K⁺, magnesium, calcium); ↑(glucose, uric acid, glucose, lipids); azotemia; nausea; anorexia; weakness; fatigue; rash; ototoxicity at high doses
8. Is effective in patients with mild to moderate renal dysfunction; beneficial in CHF +/- furosemide
9. Effective in CHF, hyperaldosteronism, edema, cirrhosis, systolic dysfunction (alternative first line)
10. Side Effects: ↑K⁺ (especially in renal failure, diabetes; avoid if K⁺ >5mmol/L); ↓Na; dehydration; rash; gynecomastia; abnormal menstruation; GI ulcers
11. Drug Interactions: ↑K⁺ with ACEI, ARB, potassium supplements; ↓diuretic effect, worsening renal function with NSAIDs
12. **Electrolyte disturbances can be life-threatening. Electrolytes and renal function must be monitored regularly.**
13. Not used as single-agent for hypertension. Used to treat ascites, edema, and hypokalemia.

CCB = Calcium Channel Blockers

Drug	Trade Name	Dose Range	Usual Dose
	<i>DHP (long acting)^{1,2,3,4}</i>		
Amlodipine ⁵	Norvasc	2.5-10mg OD	5-10mg OD
Felodipine ⁶	Renedil, Plendil	2.5-20mg OD ⁷	5-10mg OD
Nifedipine	Adalat XL ⁸	30-120mg OD	30-60mg OD
	<i>Non-DHP^{9,10,11}</i>		
Diltiazem ¹³	Cardizem reg	120-420mg/day ¹²	240-360mg/day
	Cardizem CD,ER,SR	(reg TID; SR give BID;	Reg TID; SR- give BID;
	Tiazac reg, XC	CD, ER, XC give OD)	CD,ER,XC give OD)
Verapamil ¹⁴	Isoptin reg, SR	120-480mg/day	180-240mg/day
	Chronovera (SR)	(reg TID; SR give OD)	(reg TID; SR give OD)

Source: RxFiles, Therapeutic Choices

1. DHP = dihydropyridine. Relatively more peripheral vasodilation and less heart effect than non-DHP.
2. Side Effects: dizziness; headache; flushing (dose-related); rash; peripheral edema; gingival hyperplasia; gynecomastia; dyspnea and pulmonary edema in LV dysfunction (may worsen HF); ↑heart rate.
3. Drug Interactions: carbamazepine; cyclosporine; azole antifungals; macrolides; HIV meds; many other potential
4. Contraindications: SBP <90mmHg; recent MI; AV block; sick sinus syndrome; pulmonary edema
5. ↑toxicity with grapefruit. May be effective in diastolic dysfunction.
6. ↑toxicity with grapefruit. Less negative inotropic effects than nifedipine. Safe in heart failure
7. Do not crush or chew tablets.
8. Do not use short-acting formulations for essential hypertension. Can be used in pregnancy. Potential negative inotropic effects
9. Side Effects: as per DHP except ↓heart rate, AV block, HF
10. Drug Interactions: ↑negative inotropic effects with amiodarone, B-blockers, digoxin; ↑level of carbamazepine, cyclosporine, digoxin; ↑myopathy with simvastatin, lovastatin; ↑level with HIV meds, cimetidine; ↓level with rifampin; many other potential
11. Contraindications: as per DHP plus systolic dysfunction, CHF; use with caution in 2nd or 3rd degree heart block without pacemaker
12. Can sprinkle contents of capsule but do not crush tablets.
13. May also cause lupus-like rash.
14. May also cause constipation. Most negative inotropic and chronotropic

B-Blockers (“oprolols”)

Drug	Trade Name	Dose Range	Usual Dose
	<i>Cardioselective</i> ^{4,5,6}		
Acebutolol ³	Sectral	100-800mg/day ¹ OD or BID	400mg/day
Atenolol	Tenormin	25-100mg/day ¹ OD or BID	50mg/day
Bisoprolol	Monacor	2.5-20mg OD ^{1,2}	5-10mg OD
Metoprolol	Lopressor	12.5mg-400mg/day ² (reg BID, SR give OD)	100-200mg/day
	<i>Non-Cardioselective</i> ^{4,5,6}		
Nadolol	-	20-320mg/day ¹	160mg/day
Pindolol ³	Viskin	5-30mg BID ²	15mg BID
Propranolol ⁷	Inderal	80-320mg/day ² (reg BID, LA give OD)	160-320mg/day
Timolol	-	5-30mg BID ²	20mg BID

Source: Therapeutic Choices

1. Lower dose in renal impairment.
2. Lower dose in liver impairment.
3. Also ISA (intrinsic sympathomimetic activity) IE less bradycardia, lipid changes and cold extremities; NOT recommended in angina or with history of MI
4. Side effects: fatigue, ↓HR; ↓exercise capacity; headache; impotence; vivid dreams; hallucinations; worsens PAD, CHF, Reynauds syndrome; cold extremities; dyslipidemia (↑TG, ↓HDL); may mask/delay symptoms of hypoglycemia; less common: hyperglycemia, depression, heart failure, heart block; acebutolol may cause +ve antinuclear antibody test and Lupus
5. Drug Interactions: ↓HR with digoxin, nonDHP-CCB; ↑effect of amiodarone; ↑toxicity with cimetidine; clonidine (hypertensive crisis); insulins, NSAIDs (↓hypotensive effect); ↓level of B-Blocker with phenobarb
6. Contraindications: severe or poorly controlled asthma/COPD; 2nd or 3rd degree heart block; uncompensated heart failure; severe peripheral artery disease
Use with caution in persons >60 years. Sudden withdrawal may exacerbate angina/MI: taper dose before discontinuing.
7. Possibly more CNS effects and lipid effects. Also used for anxiety; migraine prophylaxis; thyrotoxicosis; GI bleed.

Other Antihypertensive Agents

Drug	Trade Name	Dose Range	Usual Dose
	<i>B&α Blockers</i>		
Labetolol ⁴	Trandate	100mg BID-400mg TID ²	200mg BID
	<i>α Blockers^{5,7}</i>		
Doxazosin	Cardural	2-8mg HS	8mg HS
Prazosin	Minipress	0.5-5mg BID	2mg BID
Terazosin ⁶	Hytrin	1mg HS-10mg BID	5mg HS
	<i>Centrally Acting⁸</i>		
Clonidine ⁹	Catapres, Dixarit	0.1mg BID-0.2mg TID	0.1-0.2mg BID
Methyldopa ¹⁰	Aldomet	125mg BID-500mg QID ²	250mg BID
	<i>Vasodilators¹¹</i>		
Hydralazine ¹²	Apresoline	10-50mg QID ¹	25mg QID
Minoxidil ¹³	Loniten	2.5-50mg BID ¹	10mg BID
ISDN ¹⁴	Isordil	20-40mg TID	20-40mg TID
	<i>Renin Inhibitor</i>		
Aliskiren ¹⁵	Rasilez	150-300mg OD ³	-

Source: Therapeutic Choices, RxFiles

Other Antihypertensive Agents cont'

1. Lower dose in renal impairment.
2. Lower dose in liver impairment.
3. Absorption decreased by high fat meal.
4. Side Effects: see non-selective B- Blockers but no effect on lipids; also: edema, dizziness, nasal congestion, postural hypotension
Drug Interactions: see non-selective B- Blockers
Contra Indications: see non-selective B- Blockers
Used in pregnancy.
5. Side Effects: orthostatic hypotension; headache; drowsiness; palpitations; nasal congestion;
Drug Interactions: Add other hypotensives with caution (syncope).
6. ↑level with verapamil
7. Do not use for initial treatment (3rd line agent). Not recommended for hypertension in diabetes. May be beneficial in pheochromocytoma or prostatism.
8. 2nd or 3rd line agents (if alternatives are contraindicated or in refractory hypertension). May worsen depression, impotence. An option for pheochromocytoma or prostatism
9. Causes rebound hypertension if abruptly stopped. Has a greater role in psychological conditions (ADHD)
Side Effects: sedation; dry mouth; ↓HR
Drug Interactions: cyclosporine, mirtazapine, TCAs
Contraindications: CHF, heart block, diabetes (neuropathy)
10. First line for hypertension in pregnancy
Side Effects: sedation; dry mouth; depression; nasal congestion; orthostatic hypotension; palpitations; sexual dysfunction; sodium and water retention; drug fever; hepatotoxicity;
Drug Interactions: ↓absorption with iron (separate by 2 hours); ↓BP with levodopa; ↑BP with TCAs; ↑side effects of lithium
11. 2nd or 3rd line. Consider adding a B-blocker or centrally acting agent to minimize reflex tachycardia and a diuretic to prevent sodium and water retention.
12. Side Effects: reflex tachycardia; headache; edema; Lupus syndrome (at high doses); aggravate angina; dizziness; hepatitis
Contraindications: left ventricular hypertrophy
13. Side Effects: reflex tachycardia; edema; pericardial effusion; lupus; rash; ↑facial hair
14. Side Effect: headache, hypotension, ↑HR, dizziness, flushing, methemoglobinemia
Drug Interactions: PDE5 inhibitors (Viagra, etc)
Contraindications: concomitant use with PDE5 inhibitors, severe anemia, shock
15. Side Effects: diarrhea; headache; ↑K⁺; rash; allergy; sore throat; rare: cough, angioedema, gout
Drug Interactions: cyclosporine; furosemide; irbesartan; ketoconazole
Contraindications: pregnancy

Abbreviations

ACEI – angiotensin converting enzyme inhibitors
ADHD – attention deficit hyperactivity disorder
ARB – angiotensin receptor blocker
AV – atrioventricular
BP – blood pressure
CAD – coronary artery disease
CCB – calcium channel blocker
CHF – congestive heart failure
CKD – chronic kidney disease
CNS – central nervous system
CrCl – creatinine clearance
CV – cardiovascular
CVD – cardiovascular disease
DBP – diastolic blood pressure
DHP-dihydropyridine
HCTZ – hydrochlorothiazide
HF – heart failure
HR – heart rate
HTN – hypertension
IFG – impaired fasting glucose
IGT – impaired glucose tolerance
INR – international normalized ratio
ISDN – isosorbide dinitrate
K⁺ - potassium
MAOI – monoamine oxidase inhibitor
MI – myocardial infarction
Na – sodium
NSAID – non-steroidal anti-inflammatory drug
PAD – peripheral artery disease
SBP – systolic blood pressure
SCr – serum creatinine
TCA – tricyclic antidepressant
TG – triglycerides
TIA – transient ischemic attack
TZD – thiazide diuretic

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