

FDA APPROVED DRUGS FOR TREATMENT OF HYPERTENSION



CLASS	DRUGS	ADVANTAGES	DISADVANTAGES / COMMENTS
FIRST LINE AGENTS			
Thiazide Diuretics	Chlorthalidone Hydrochlorothiazide Indapamide	Proven reduction in bad CV outcomes; synergistic when combined with ACEi Chlorthalidone & indapamide last a full 24 hours	May ↑ uric acid, glucose and calcium, ↓ K ⁺ and magnesium; can cause hyponatremia in elderly and alcoholics; ↓ lithium excretion, increasing Li ⁺ levels Indapamide has similar BP lowering to chlorthalidone , and dosing is more titratable (1.25, 2.5 mg/day)
Angiotensin Converting Enzyme Inhibitors (ACEi)	Lisinopril Benazepril Enalapril Ramipril Fosinopril Quinapril	Reno-protective in diabetes and CKD ↓ bad CV outcomes (↓ mortality in HFrEF) <u>1st line if CKD; consider adding early in patients with DM and HTN</u>	↑ K ⁺ , not critical unless poor renal function or on KCl supplement or spironolactone; angioedema in up to 0.4% (higher risk in African Americans); may ↑ SCr, especially with bilateral renal stenosis or dehydration (SCr ↑ of 30% or less is acceptable); Reversible cough present in ~10% of patients; Teratogenic – avoid in pregnancy
Angiotensin Receptor Blockers (ARB)	Losartan Candesartan Olmesartan Irbesartan Telmisartan	Same benefits as ACEi with less data on bad CV outcomes Lower risk of side effects vs ACEi (↓ angioedema and ↓ cough) <u>1st line if CKD; consider adding early in patients with DM and HTN</u>	Same disadvantages as ACEi Losartan ↓ uric acid Teratogenic – avoid in pregnancy
Calcium Channel Blockers (CCB) – Dihydropyridines (DHP), long acting	Amlodipine Felodipine Nifedipine SR/LA	Proven reduction in bad CV outcomes; <u>no lab monitoring needed</u> ; amlodipine does NOT worsen HFrEF Nifedipine preferred in pregnancy	Peripheral edema; headache; gingival hyperplasia less common than N-DHP CCBs; Can safely be combined with beta blocker, no effect on heart rate; Can use to ↓ angina sx in CAD
ALTERNATIVE AGENTS			
Aldosterone Blockers	Spironolactone Eplerenone	Effective for resistant hypertension ; ↓ mortality in HFrEF Class II-IV <u>Preferred tx for hyperaldosteronism; can ↓ hirsutism in PMOS</u>	May cause ↑ K ⁺ , gynecomastia, breast tenderness, and impotence (<u>minimal risk with eplerenone</u>); avoid use with K ⁺ supplements, other K ⁺ sparing diuretics, if baseline K ⁺ > 5.0 or eGFR < 45 ml/min/1.73m ² ; eplerenone often requires twice-daily dosing for adequate BP lowering Avoid use in pregnancy
Calcium Channel Blockers (CCB) Non-dihydropyridines (N-DHP)	Verapamil Diltiazem	Proven reduction in adverse CV outcomes; <u>no lab monitoring needed</u> ; slow-release ER formulations preferred	Contraindicated in HFrEF ; bradycardia, peripheral edema, constipation, headache and gingival hyperplasia more common than DHP CCBs
Beta Blockers (BB)	Atenolol Metoprolol Propranolol Nadolol Labetalol Carvedilol Bisoprolol	Proven reduction in adverse CV outcomes (all except atenolol) ↓ risk of MI recurrence in those with CAD (up to 3 years post); ↓ mortality in HFrEF (bisoprolol, carvedilol, metoprolol); <u>dual benefits for migraine prophylaxis; ↓ angina sx; rate control in AFib</u> Labetalol preferred in pregnancy	May not be as effective as other hypertensives in reducing bad CV outcomes; may cause bradycardia, sexual dysfunction, cool extremities; ↓ exercise tolerance ; can lead to weight gain ; can mask sx of hypoglycemia; non-selective beta-blockers should be avoided in bronchospastic disease (asthma) ; <u>selective beta-blockers and combo alpha/beta blockers can be used with caution</u> Non-selective: propranolol, nadolol Selective: metoprolol, atenolol, bisoprolol Alpha/beta blockers: carvedilol, labetalol
Alpha-1 Blockers	Doxazosin Prazosin Terazosin	Helpful if patient also has BPH	<u>No impact on CV outcomes</u> ; ↑ orthostatic hypotension; priapism
Centrally Acting Sympatholytic	Clonidine Methyldopa Guanfacine	May be helpful in resistant cases; methyldopa used 3rd line during pregnancy; <u>clonidine available as 7-day patch</u>	No impact on CV outcomes; least tolerated of all antihypertensives; sedation, dry mouth, orthostatic hypotension, sexual dysfunction, rebound HTN , flushing (methyldopa can cause drug-induced lupus)
Direct Vasodilators	Hydralazine	Improves symptoms and ↓ mortality in Class III to IV HFrEF if used in combination with isosorbide dinitrate TID	No impact on CV outcomes; may cause fluid retention, reflex tachycardia, rebound HTN - must take TID-QID for effective BP control ; can cause drug-induced lupus (check anti-histone Ab if concerned)

EVIDENCE: 2025 AHA/ACC Guideline for the Prevention, Detection, Evaluation and Management of High Blood Pressure in Adults. Circulation vol. 152,11 (2025) UPDATED: 05/2026

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DIABETES CARE ACADEMY

CARE MODEL: HYPERTENSION MANAGEMENT, ADULTS



DIAGNOSIS

- Consider cause of hypertension, including medication & *secondary causes
- Assess 10-year CVD Risk with PREVENT equation
- Assess CV risk enhancing comorbidities (DM, CKD 3+, established ASCVD)
- A hypertension diagnosis must be confirmed by taking the average ≥ 2 BP measurements obtained on ≥ 2 separate occasions**

*SECONDARY CAUSES OF HYPERTENSION

- S** - Sleep apnea
- C** - Coarctation of aorta
- A** - Adrenal: Cushing's, hyperaldosteronism, pheochromocytoma
- R** - Renal: Artery stenosis, parenchymal disease
- E** - Endocrine: Hypo/hyperthyroidism, hyperparathyroidism, acromegaly
- D** - Drugs: NSAIDs, steroids, BC pills, cocaine, amphetamines, decongestants, alcohol, caffeine, herbals, diet supplements, venlafaxine (>150 mg/day)

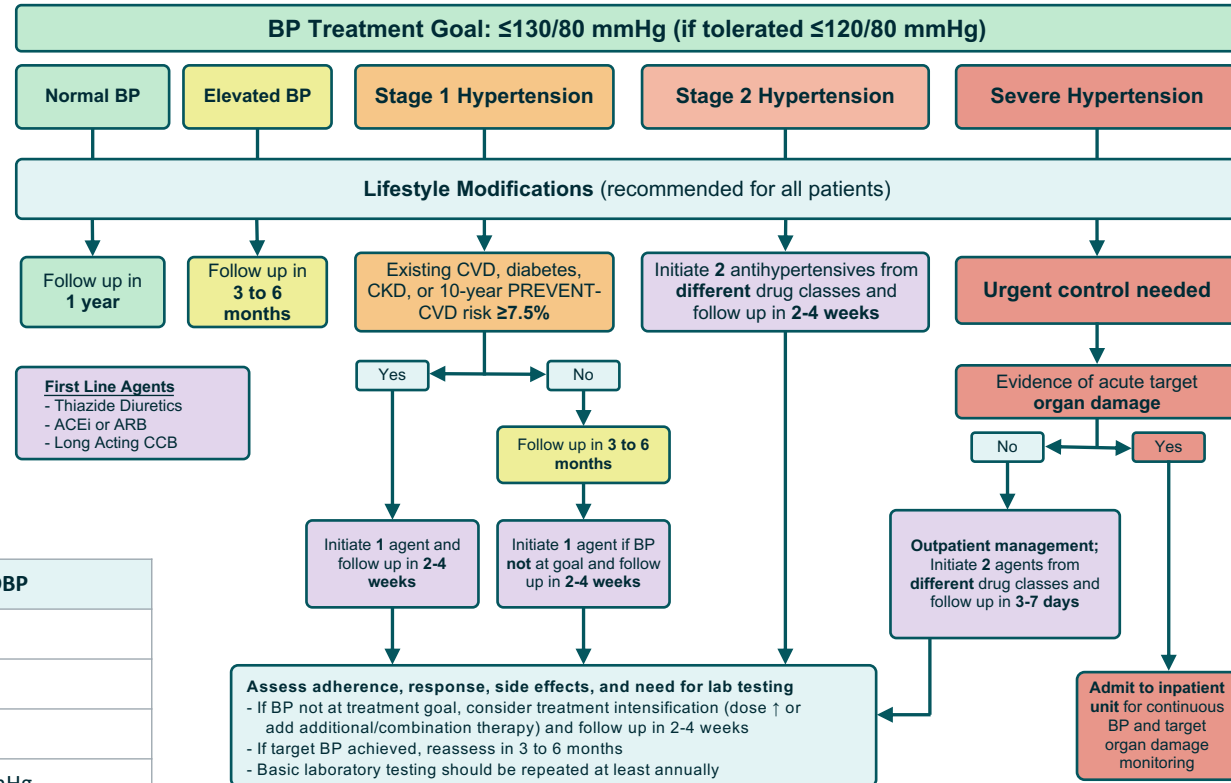
CATEGORIES OF BLOOD PRESSURE IN ADULTS

BP Category	SBP		DBP
Normal	< 120 mmHg	and	< 80 mmHg
Elevated	120 to 129 mmHg	and	< 80 mmHg
Hypertension			
Stage 1	130 to 139 mmHg	or	80 to 89 mmHg
Stage 2	≥ 140 mmHg	or	≥ 90 mmHg
Severe	> 180 mmHg	and/or	> 120 mmHg

RECOMMENDED LABORATORY TESTING FOLLOWING A DIAGNOSIS

- Complete blood count (CBC)
- Sodium, potassium, calcium levels (BMP)
- SCr with eGFR
- Lipid panel
- Fasting blood glucose or A1C
- TSH
- Urinalysis and UACR
- Electrocardiogram (EKG)

INITIAL PHARMACOTHERAPY



LIFESTYLE MODIFICATIONS FOR PREVENTION & TREATMENT

- Smoking cessation, Weight loss of at least 5-10%
- ≥ 150 minutes of moderate physical activity per week & resistance exercise ≥ 2 days/week
- DASH diet (rich in fruits, vegetables, fiber, low in saturated fats)
- $\downarrow$ dietary sodium to < 2300 mg/day (ideal limit < 1500 mg/day)
 - Potassium-based salt substitutes** (Nu-Salt or similar)
 - Exception:** Avoid or use with caution and monitor closely in CKD3+ or if using drugs that can $\uparrow$ K+ (ACEi, ARB, MRA, etc.)

★ Race/ethnicity-based drug selection no longer recommended. Drug selection should now be based on comorbidities & patient specific factors.

★ Older adults with frailty or limited life expectancy, a less strict target may be reasonable to align with patient care goals.

LEGEND: ASCVD = Atherosclerotic Cardiovascular Disease, BP = Blood Pressure, CAD = Coronary Artery Disease, CKD = Chronic Kidney Disease, CVD = Cardiovascular Disease, DBP = Diastolic Blood Pressure, DM = Diabetes Mellitus, eGFR = estimated Glomerular Filtration Rate, HTN = Hypertension, K+ = Potassium, MI = Myocardial Infarction, PMOS = Polyendocrine Metabolic Ovarian Syndrome, QID = 4 times/day, SBP = Systolic Blood Pressure, SCr = Serum Creatinine, sx = symptoms, TID = 3 times/day, TSH = Thyroid-Stimulating Hormone, tx = treatment, UACR = Urine Albumin-to-Creatinine Ratio

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