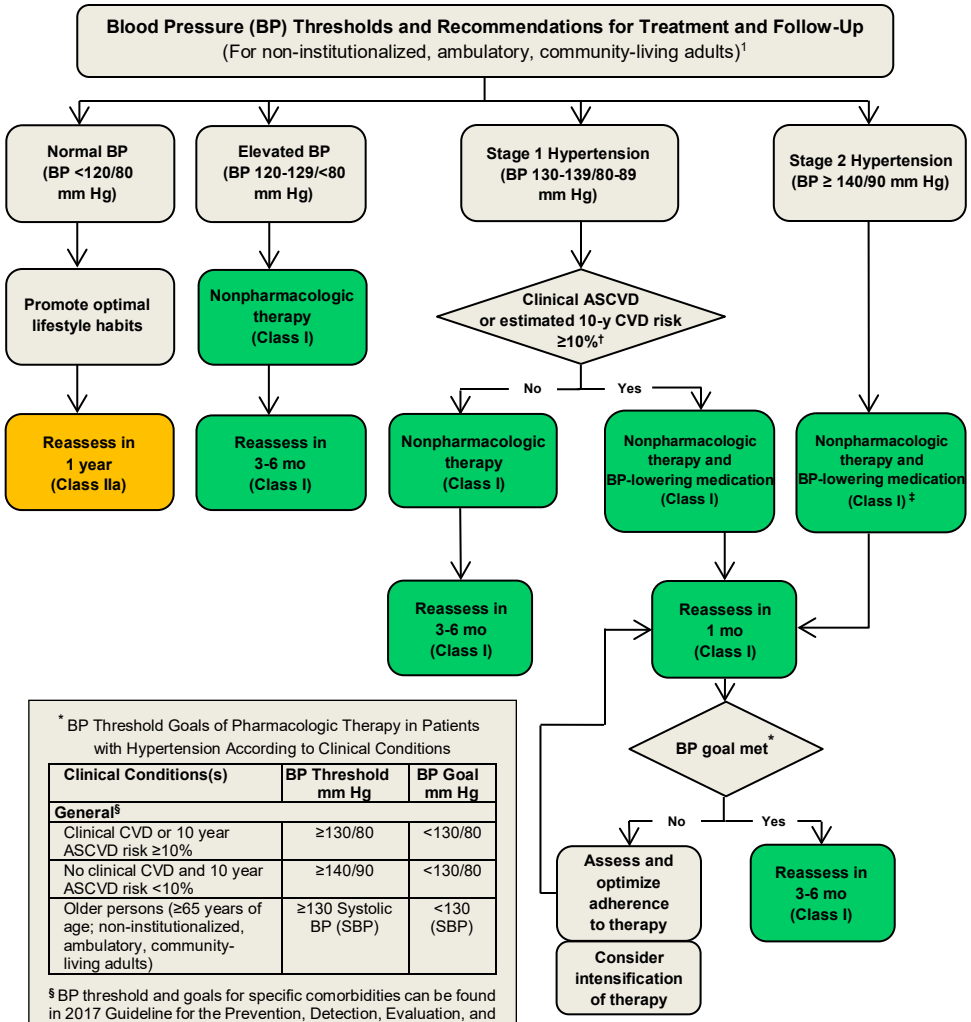
2019 Pocket Card Protocol for Hypertension in Adults



* BP Threshold Goals of Pharmacologic Therapy in Patients with Hypertension According to Clinical Conditions

Clinical Conditions(s)	BP Threshold mm Hg	BP Goal mm Hg
General§		
Clinical CVD or 10 year ASCVD risk ≥10%	≥130/80	<130/80
No clinical CVD and 10 year ASCVD risk <10%	≥140/90	<130/80
Older persons (≥65 years of age; non-institutionalized, ambulatory, community-living adults)	≥130 Systolic BP (SBP)	<130 (SBP)

§ BP threshold and goals for specific comorbidities can be found in 2017 Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults

† Using the Am. College of Cardiology & Am. Heart Assoc. (ACC/AHA) Pooled Cohort Equations (http://tools.acc.org/ASCVD-Risk-Estimator-Plus/). Note that patients with Diabetes Mellitus (DM) or Chronic Kidney Disease (CKD) are automatically placed in the high-risk category. For initiation of renin-angiotensin system (RAS) inhibitor or diuretic therapy, assess blood tests for electrolytes and renal function 2 to 4 weeks after initiating therapy.

‡ Consider initiation of pharmacological therapy for stage 2 hypertension (HTN) with 2 antihypertensive agents of different classes. Patients with stage 2 hypertension and BP ≥160/100 mm Hg should be promptly treated, carefully monitored, and subject to upward medication dose adjustment as necessary to control BP. Reassessment includes BP measurement, detection of orthostatic hypotension in selected patients (e.g., older or with postural symptoms), identification of white coat hypertension or a white coat effect, documentation of adherence, monitoring of the response to therapy, reinforcement of the importance of adherence, reinforcement of the importance of treatment, and assistance with treatment to achieve BP target.

Oral Antihypertensive Drugs[1]

Class	Drug	Usual Dose, Range (mg per day) *	Daily Frequency	Comments
Primary Agents				
Thiazide or thiazide-type diuretics	Chlorthalidone	12.5-25	1	• Chlorthalidone preferred based on prolonged half-life and proven trial reduction of cardiovascular disease (CVD). • Monitor for hyponatremia and hypokalemia, uric acid and calcium levels. • Use with caution in patients with history of acute gout unless patient is on uric acid-lowering therapy.
	Hydro-chlorothiazide	25-50	1	
	Indapamide	1.25-2.5	1	
	Metolazone	2.5-10	1	
Angiotensin Converting Enzyme Inhibitors (ACEi)	Benazepril	10-40	1 or 2	• Do not use in combination with ARBs or direct renin inhibitor. • Increased risk of hyperkalemia, especially in patients with CKD or in those on Potassium (K+) supplements or K+-sparing drugs. • May cause acute renal failure in patients with severe bilateral renal artery stenosis. • Do not use if history of angioedema with ACE inhibitors. • Avoid in pregnancy.
	Captopril	12.5-150	2 or 3	
	Enalapril	5-40	1 or 2	
	Fosinopril	10-40	1	
	Lisinopril	10-40	1	
	Moexipril	7.5-30	1 or 2	
	Perindopril	4-16	1	
	Quinapril	10-80	1 or 2	
	Ramipril	2.5-10	1 or 2	
	Trandolapril	1-4	1	
Angiotensin Receptor Blocker (ARB)	Azilsartan	40-80	1	• Do not use in combination with ACE inhibitors or direct renin inhibitor. • Increased risk of hyperkalemia in CKD or in those on K+ supplements or K+-sparing drugs. • May cause acute renal failure in patients with severe bilateral renal artery stenosis. • Do not use if history of angioedema with ARBs. Patients with a history of angioedema with an ACEi can receive an ARB beginning 6 weeks after ACEi discontinued. • Avoid in pregnancy.
	Candesartan	8-32	1	
	Eprosartan	600-800	1 or 2	
	Irbesartan	150-300	1	
	Losartan	50-100	1 or 2	
	Olmesartan	20-40	1	
	Telmisartan	20-80	1	
	Valsartan	80-320	1	
Calcium Channel Blocker–dihydropyridines	Amlodipine	2.5-10	1	• Avoid use in patients with Heart Failure with reduced ejection fraction (HFrEF); amlodipine or felodipine may be used if required. • Associated with dose-related pedal edema, which is more common in women than men.
	Felodipine	5-10	1	
	Isradipine	5-10	2	
	Nicardipine SR	5-20	1	
	Nifedipine LA	60-120	1	
	Nisoldipine	30-90	1	
Calcium Channel Blocker–nondihydropyridines	Diltiazem SR	180-360	2	• Avoid routine use with beta blockers due to increased risk of bradycardia and heart block. • Do not use in patients with HFrEF. • Drug interactions with diltiazem and verapamil (CYP3A4 major substrate and moderate inhibitor).
	Diltiazem ER	120-480	1	
	Verapamil IR	40-80	3	
	Verapamil SR	120-480	1 or 2	
	Verapamil-delayed onset ER (various forms)	100-480	1 (in the evening)	
Diuretics–Aldosterone Antagonists	Eplerenone	50-100	1 or 2	• These are preferred agents in primary aldosteronism and resistant HTN. Spironolactone is associated with greater risk of gynecomastia and impotence as compared with eplerenone. This is common add-on therapy in resistant HTN. Avoid use with K+ supplements, other K+-sparing diuretics, or significant renal dysfunction. Eplerenone often requires twice-daily dosing for adequate BP lowering.
	Spironolactone	25-100	1	

Nonpharmacologic interventions to reduce BP include: weight loss for overweight or obese patients with a heart healthy diet, sodium restriction, and potassium supplementation within the diet; and increased physical activity with a structured exercise program. Men should be limited to no more than 2 and women no more than 1 standard alcohol drinks per day. The usual impact of each lifestyle change is a 4-5 mmHg decrease in SBP and 2-4 mmHg in diastolic BP (DBP): but diet low in sodium, saturated fat, and total fat and increase in fruits, vegetables, and grains may decrease SBP by approximately 11 mmHg.

[1] Whelton et al. 2017 Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults. J Am Coll Cardiol. Sep 2017, 23976; DOI: 10.1016/j.jacc.2017.07.745

For more information on nonpharmacologic therapy, including recommended lifestyle changes for hypertension management visit: http://rightcare.berkeley.edu/wp-content/uploads/2018/02/RCI-HTN-Lifestyle-Guidelines-2017.pdf

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