June 2021

Pharmacy Pearls

Adult HTN Management Update

2017 Guideline for High Blood Pressure in Adults. JACC 2018.

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BP Measurement/HTN Diagnosis

BP Category	Systolic BP		Diastolic BP
Normal BP	<120	and	<80
Elevated BP	120-129	and	<80
Stage 1 HTN	130-139	or	80-89
Stage 2 HTN	≥140	or	≥90

Diagnosis should be based on an average of ≥2 readings obtained on ≥2 occasions

Tips to Optimize BP Measurement

- Patients should be seated quietly for 5 minutes prior to measurement
- Support patient's back and ensure their feet are flat on the floor
- Support patient's arm at their heart level (arm should ideally be bare)
- Ensure cuff fits patient's arm appropriately
- Avoid talking with patient during measurement

Select Medications that May Interfere with BP Control

- NSAIDs (not aspirin)
- Combined oral contraceptives
- SNRIs
- Oral corticosteroids
- Stimulants
- Pseudoephedrine
- Herbal supplements
- Weight loss drugs/supplements

Detection of White Coat HTN or Masked HTN in Patients Not on Drug Therapy

Office BP ≥130/80 but <160/100 after 3-month trial of lifestyle modifications and suspected white coat HTN

Daytime ABPM or HBPM BP <130/80

Yes

White Coat HTN

- Lifestyle modifications
- Annual ABPM or HBPM to detect progression (Class IIa)

No

HTN

- Continue lifestyle modifications and start antihypertensive drug therapy (Class IIa)

Office BP 120-129/<80 after 3-month trial of lifestyle modifications and suspected masked HTN

Daytime ABPM or HBPM BP ≥130/80

Yes

Masked HTN

- Continue lifestyle modifications and start antihypertensive drug therapy (Class IIa)

No

Elevated BP

- Lifestyle modifications
- Annual ABPM or ABPM to detect masked HTN or progression (Class IIa)

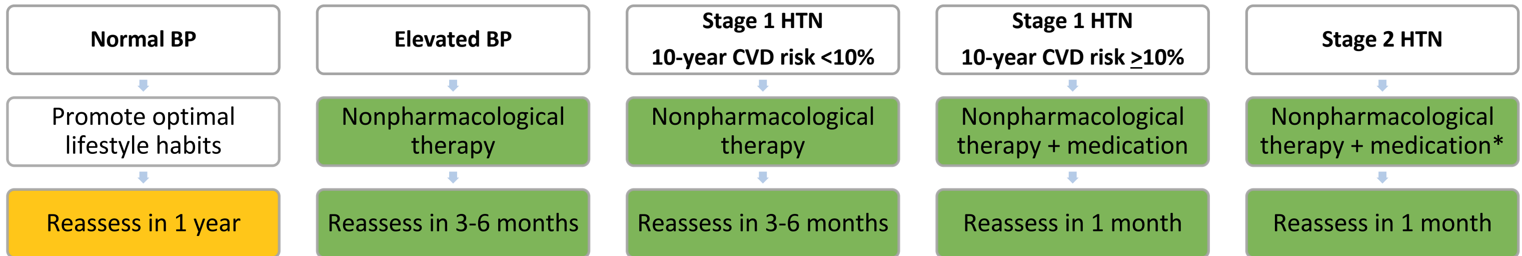
ABPM: ambulatory blood pressure monitoring; HBPM: home blood pressure monitoring

Treatment of High BP

Target BP control is <130/80 for most adult patients

Weak evidence to support <140/90 for patients with no history of CVD and 10-year ASCVD risk score <10%

Avoid delays in treatment - a difference of 20/10 in BP is associated with a 50% decrease in CV risk



**For Stage 2 HTN or when BP >20/10 above goal, consider initiation of 2 antihypertensive agents from different medication classes*
Green box: Class I recommendation; Yellow box: Class IIa recommendation

Always assess and optimize adherence to therapy prior to changing doses or adding additional medications

Nonpharmacological Intervention	Impact on SBP (Normotension)	Impact on SBP (HTN)
Weight Loss Goal: ideal body weight, ~1 mm Hg reduction for every 1 kg lost	-2-3 mm Hg	-5 mm Hg
Healthy Diet (e.g., DASH diet) Fruits, vegetables, whole grains, low-fat dairy products; ↓ saturated/total fat	-3 mm Hg	-11 mm Hg
Salt Reduction Goal: <1500 mg/day	-2-3 mm Hg	-5-6 mm Hg
Aerobic Activity Goal: 90-150 min/week at 65-75% HR reserve + resistance activity	-2-4 mm Hg	-5-8 mm Hg
Alcohol Moderation Men: ≤2 drinks/day; Women: ≤1 drink/day	-3 mm Hg	-4 mm Hg

First-Line Pharmacological Intervention

Medication Class	Examples	Comments
Thiazide/thiazide-like diuretics	Chlorthalidone, hydrochlorothiazide, indapamide	• Chlorthalidone preferred because of its longer half-life and proven CVD reduction • Monitor for hyponatremia and hypokalemia, hypercalcemia and hyperuricemia • Caution in patients with gout not on uric acid-lowering therapy • Minimally effective with GFR <30 mL/min
ACE Inhibitors	Lisinopril, enalapril, ramipril	• Do not use in combination with ARBs or direct renin inhibitors • Monitor potassium and renal function • Avoid in pregnancy
ARBS	Losartan, irbesartan, valsartan	• Do not use in combination with ACEI or direct renin inhibitors • Monitor potassium and renal function • Patients with h/o angioedema to an ACEI can receive an ARB ≥6 weeks after D/C the ACEI • Avoid in pregnancy
Dihydropyridine CCBs	Amlodipine, felodipine, nifedipine	• Associated with dose-related pedal edema (more common in women) • Caution in HFrEF; if necessary, use amlodipine
Nondihydropyridine CCBs	Diltiazem, verapamil	• Avoid routine use with beta blockers (risk of bradycardia and heart block) • Avoid use in HFrEF • Clinically significant drug interaction potential

Secondary Pharmacological Agents

Medication Class	Examples	Comments
Loop Diuretics	Furosemide, torsemide	• Preferred diuretics in patients with symptomatic HF or in patients with GFR <30 mL/min
Potassium-Sparing Diuretics	Triamterene, amiloride	• Minimally effective antihypertensive agents • Avoid in patients with GFR <45 mL/min
Aldosterone Antagonists	Spironolactone, eplerenone	• Preferred agents for resistant HTN • Risk of gynecomastia and impotence: spironolactone > eplerenone • Avoid if potassium is ≥5 mmol/L
Beta Blockers	Metoprolol, propranolol, carvedilol	• Avoid abrupt discontinuation • Cardioselective agents (metoprolol, atenolol, bisoprolol) are preferred in patients with bronchospastic airway disease
Direct Renin Inhibitor	Aliskiren	• Do not use in combination with ACEI or ARBs • Monitor potassium • Avoid in pregnancy
Alpha-1 Blockers	Doxazosin, terazosin	• Consider as second-line agents for patients with concomitant BPH • Associated with orthostatic hypotension, especially in older adults
Central Alpha-2 Agonists	Clonidine, methyldopa	• Abrupt discontinuation of clonidine can induce hypertensive crisis • Generally reserved for last line because of CNS adverse effects
Direct Vasodilators	Hydralazine, minoxidil	• Associated with sodium and water retention, tachycardia, drug-induced lupus (hydralazine), and hirsutism (minoxidil)

Resistant HTN

Office BP ≥130/80 on 3 antihypertensives at optimal doses (including a diuretic if possible) OR
Office BP <130/80 on 4 antihypertensives

Exclude pseudoresistance

- Ensure accurate office BP measurements
- Assess for nonadherence to prescribed regimen
- Obtain home, work, or ambulatory BP readings to exclude white coat HTN

Identify and reverse contributing factors

- Obesity
- Physical inactivity
- Excessive alcohol ingestion
- High-salt, low-fiber diet

Discontinue or minimize interfering substances

- NSAIDs
- Sympathomimetics (decongestants, amphetamines)
- Stimulants
- Oral contraceptives

Screen for secondary causes of HTN

- Primary aldosteronism (elevated aldosterone/renin ratio)
- CKD (eGFR <60 mL/min)
- Renal artery stenosis
- Obstructive sleep apnea

Pharmacological treatment

- Maximize diuretic therapy
- Add a mineralocorticoid receptor antagonist
- Add other agents with different mechanisms of action
- Use loop diuretics in patients with CKD and/or patients receiving vasodilators

Refer to HTN specialist if BP remains uncontrolled after 6 months of treatment
Consider referral to HTN specialist or endocrinologist if known or suspected primary aldosteronism

Strategies to Improve Adherence

- Dose medications once daily rather than multiple times daily whenever possible
- Use combination pills rather than free individual components, if available
- Identify and address patient concerns regarding medications
- Utilize team-based care to assist patients with disease state education and compliance packaging