From Guidelines to Practice:
An Update on High Blood Pressure Management

FROM GUIDELINES TO PRACTICE:
An Update on High Blood Pressure Management

Presented by Abby Frye, PharmD, BCACP, FOSHP

LEARNING OBJECTIVES *for pharmacists*

- Summarize the 2025 ACC/AHA High Blood Pressure Guideline
- Review the PREVENT Risk Calculator to estimate cardiovascular risk and guide treatment decisions
- Apply new recommendations regarding treatment goals, initiation of therapy, laboratory monitoring, and non-pharmacologic interventions in case-based scenarios

LEARNING OBJECTIVES *for technicians*

- Summarize the 2025 ACC/AHA High Blood Pressure Guideline
- Recognize the PREVENT Risk Calculator as a tool to estimate cardiovascular risk
- Identify single-pill combinations (SPCs) that can be used to optimize pharmacologic treatment of hypertension

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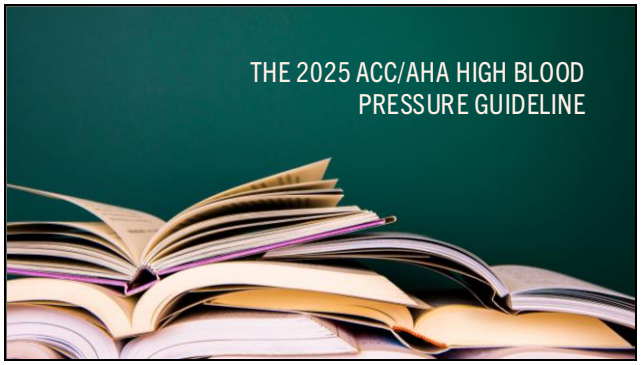

CATEGORIES OF BLOOD PRESSURE IN ADULTS

	Systolic (mmHg)		Diastolic (mmHg)
Normal	<120	&	<80
Elevated	120-129	&	<80
Stage 1	130-139	or	80-89
Stage 2	140+	or	90+

J Am Coll Cardiol. 2025; 86:18: 1567-1678.

OUT-OF-OFFICE MONITORING

- Both 24-hour ambulatory BP monitoring (ABPM) and home BP monitoring (HBPM) are stronger predictors of CVD outcomes as compared to office BP.
- Out-of-office measurements are recommended to confirm the diagnosis of hypertension.
- For individuals taking antihypertensive medication, the use of HBPM along with cointerventions has been associated with improved office BP control.

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TEAM-BASED CARE

Studies evaluating team-based hypertension care including either nurse or pharmacist intervention showed greater reductions in blood pressure and/or greater achievement of BP goals when compared with usual care.

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SOCIAL DETERMINANTS OF HEALTH

Assessing adverse social determinants of health (SDOH) and identifying solutions or resources to overcome these barriers is an important part of a hypertension care plan.

J Am Coll Cardiol. 2025; 86:18: 1567-1678.

BP TREATMENT GOAL

At least < 130/80
with encouragement to achieve < 120/80

for community-dwelling,
non-pregnant adults

?

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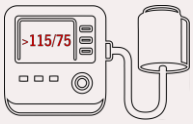
LOWER IS BETTER



Increases risk of…

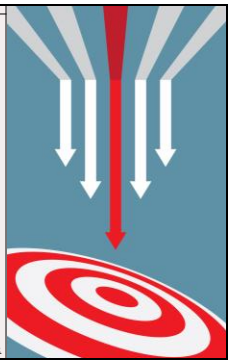
- Coronary heart disease
- Myocardial infarction
- Heart failure
- Atrial fibrillation
- Peripheral artery disease
- Stroke
- Cognitive impairment
- Chronic Kidney Disease

Hypertension. 2019 Dec 23;75(1):285-292.

IT'S NOT JUST SPRINT ANYMORE…

Several studies have demonstrated that targeting a lower BP goal is associated with reductions in cardiovascular disease, all-cause mortality, and dementia

- SPRINT, STEP, BPROAD, ESPRIT, CRHCP
- Across age, sex, and race/ethnicity



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BUT, WHAT ABOUT GRANDMA?

Shared decision-making should be used to adjust the treatment goal for individuals who are institutionalized due to a high burden of frailty and comorbidity or those with limited life expectancy.

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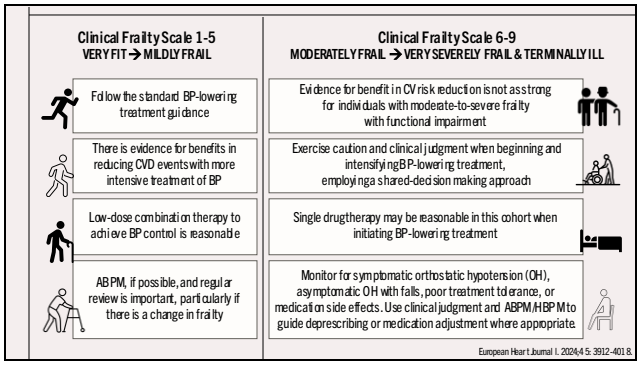

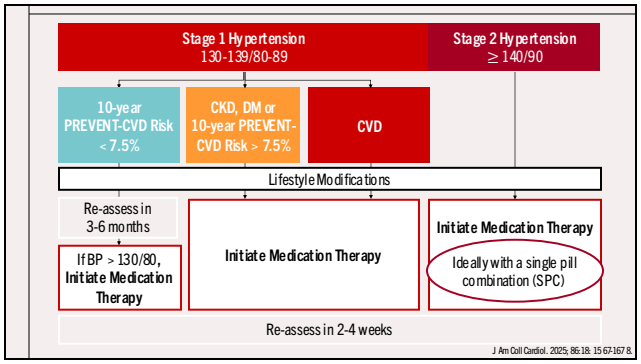

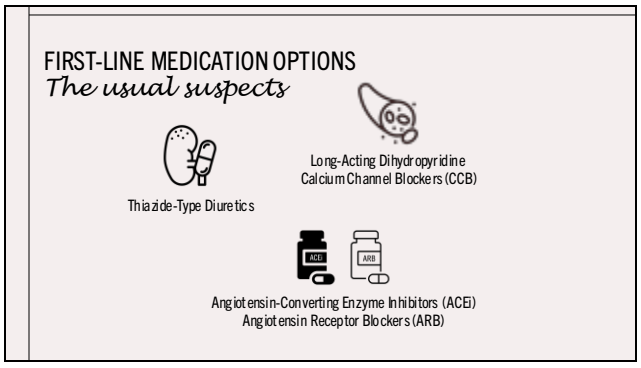

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BUT… WITH A GREATER EMPHASIS ON SINGLE PILL COMBINATIONS AS INITIAL THERAPY

Improved Adherence
&
Greater BP Lowering

In the START study[1], adults with hypertension on SPCs had fewer cardiovascular events and all-cause deaths than those on equivalent multiple-pill combination therapy

Consider stepped care for:

- Stage 1 hypertension
- Frail older adults
- Individuals who have a history of hypotension or multiple drug-associated side effects

1. Hypertension. 2023 May;80(5):1127-1135

AND…WITHOUT RACE-BASED RECOMMENDATIONS

2014 — Race-specific recommendations for initial monotherapy with alternate pathways for Black and non-Black patients

2017

2025 — Consider all antihypertensive options for blood pressure control in Black patients

Focus on achieving the appropriate intensity of treatment with an emphasis on early use of combination therapy

Address diet, lifestyle, SDOH as needed in a culturally competent way

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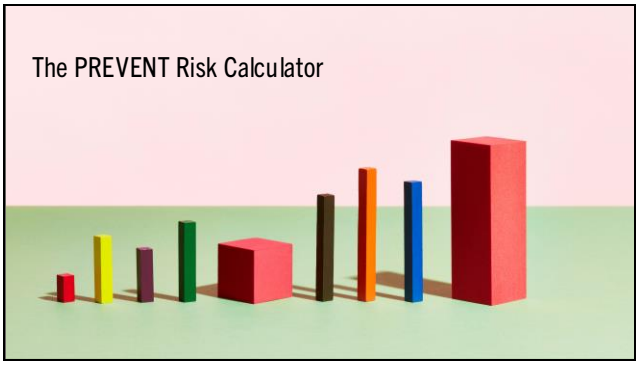
The PREVENT Risk Calculator



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The PREVENT Risk Calculator

- Developed as an update to the Pooled Cohort Equations (PCE)
- Validated for adults ages 30-79 without known CVD
- \+ Incorporates additional predictors including uACR, eGFR, A1C, and Zip code (used to estimate social deprivation index)

https://professional.heart.org/en/guidelines-and-statements/prevent-calculator

PCE		PREVENT	
Simple, widely used, and integrated in guidelines and EHRs	+	Based on much larger, more recent, diverse data	+
Outdated cohorts (pre-statin era, less diversity)	−	Expanded outcomes (CVD, ASCVD, HF)	+
Overestimates risk in many subgroups	−	Can calculate both 10-year and 30-year risk	+
Static model, not recalibrated since 2013	−	Designed to be updated as new data accrue	+
		Newer, not yet universally adopted in guidelines or EHRs	−

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APPLY NEW RECOMMENDATIONS REGARDING TREATMENT GOALS, INITIATION OF THERAPY, LABORATORY MONITORING, AND NON-PHARMACOLOGIC INTERVENTIONS

CAROL

60 years old

No prior history of hypertension and no cardiac symptoms

No evidence of cardiovascular disease

She does not smoke or use tobacco

She drinks alcohol, but no more than 2 glasses of wine per night

BMI = 35 kg/m^2

Serial BP Average: 136/85

ROUTINE LABORATORY TESTING FOR NEW DIAGNOSIS OF HYPERTENSION

CBC	Serum sodium, potassium, and calcium	SCr with eGFR
Lipid profile	Fasting blood glucose or A1C	TSH
Urinalysis	uACR	ECG

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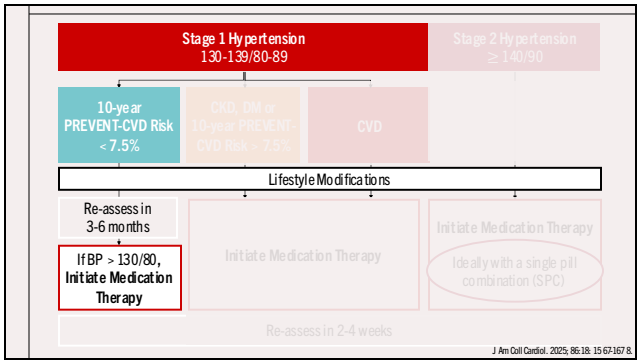
PREVENT-CVD RISK

https://professional.heart.org/en/guidelines-and-statements/prevent-calculator



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Lifestyle Intervention	Evidence-Based Goals	Mean Change in SBP (mmHg)
Weight loss	Sustained ≥ 5% reduction in body weight	-6 to -8
Heart-healthy diet/ DASH eating pattern	Consume a diet rich in fruits, vegetables, whole grains, and low-fat dairy products, with reduced content of saturated and total fat	-5 to -8
Reduced intake of sodium Use of K+ based salt substitute	Optimal goal: < 2 300 mg/day; ideally < 1500 mg/day Replace cooking/table salt with substitute	-6 to -8 -5 to -7
Enhanced intake of potassium	Goal: 3500-5000 mg/day, ideally by dietary consumption	-6
Reduce alcohol intake	Optimal goal: abstinence For consumers, aim for > 50% reduction; no more than 2 drinks/day for men or 1 drink/day for women	-4 to -6
Exercise	90-150 min/week of aerobic exercise 90-150 min/week of dynamic resistance Isometric resistance 4 x 2 min (handgrip), 3 sessions/week	-4 to -8 -2 to -7 -5 to -10
Transcendental Meditation Breathing control	Training by a professional, followed by 2 x 20 minute sessions/day Device-guided session to decrease respirations to < 10 breaths/minute for 15 minutes/day	-5 to -7 -5

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OUT-OF-OFFICE BLOOD PRESSURE MONITORING

24-hour **Ambulatory Blood Pressure Monitoring** (if available) to confirm diagnosis

Home Blood Pressure Monitoring to confirm diagnosis AND to guide treatment intensification

- Recommend a validated cuff (validatebp.org)
- Cuffless BP devices are not yet recommended
- Ensure patient is educated on technique
- Schedule follow-up and intervene if indicated

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CAROL

3 months later…

She is now abstaining from alcohol

Serial BP Average: 132/82

Home BP Average: 124/78

WILLIAM

73 years old

Office BPs from last 2 visits: 148/94, 144/88

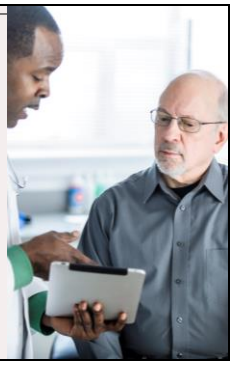
- consistent with home BPs

Co-morbidities: Type 2 diabetes, CKD with albuminuria

BMI = 32 kg/m^2

Pertinent labs:

A1C = 6.6%, K+ = 3.9, eGFR = 55, uACR = 88 mg/g



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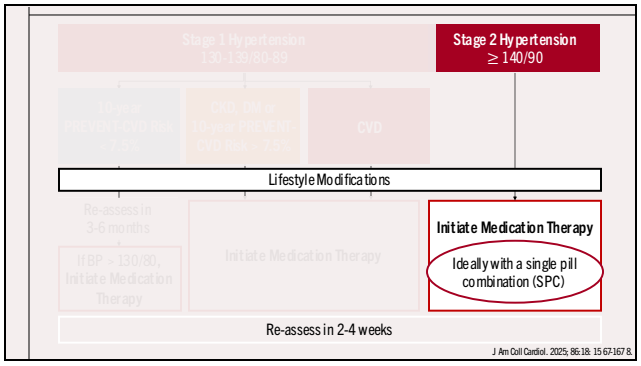

AVAILABLE SINGLE PILL COMBINATIONS WITH 2 FIRST-LINE AGENTS

ACEi or ARB + Thiazide-Type Diuretic	ACEi or ARB + CCB
Benazepril + HCTZ	Benazepril + amlodipine
Captopril + HCTZ	Perindopril + amlodipine
Enalapril + HCTZ	Olmesartan + amlodipine
Fosinopril + HCTZ	Telmisartan + amlodipine
Lisinopril + HCTZ	Valsartan + amlodipine
Moexipril + HCTZ	
Quinapril + HCTZ	
Azilsartan + chlorthalidone	
Candesartan + HCTZ	
Irbesartan + HCTZ	
Losartan + HCTZ	
Olmesartan + HCTZ	
Telmisartan + HCTZ	
Valsartan + HCTZ	

DIABETES-SPECIFIC RECOMMENDATIONS

- Antihypertensive medication should be initiated at an SBP ≥ 130 mmHg with a treatment goal of < 130 mmHg, with encouragement to achieve an SBP of < 120 mmHg to reduce CVD morbidity and mortality
- All first-line classes of antihypertensive agents are useful and effective
- An ACEi or ARB is recommended in the presence of CKD (i.e., eGFR < 60 or uACR ≥ 30 mg/g), and should be considered when mild albuminuria (<30 mg/g) is present, to delay progression of diabetes-related kidney disease

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CKD-SPECIFIC RECOMMENDATIONS

- In individuals with CKD (eGFR < 60 or uACR ≥ 30 mg/g) treatment should target an SBP goal of < 130 to decrease all-cause mortality
- If eGFR < 60 AND uACR ≥ 30 mg/g, either an ACEi or ARB is recommended to decrease CVD and delay progression of kidney disease

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OBESITY-SPECIFIC RECOMMENDATIONS

- A GLP-1 RA, when used for weight management, may be effective as an adjunct to lower BP

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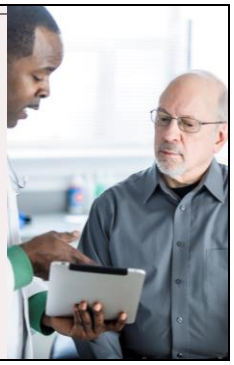
WILLIAM

3 weeks later…

He has been adherent to amlodipine-olmesartan 5-20 mg, and he is tolerating it well without side effects

BMP stable

1-week home BP average: 138/82



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DAVID

48 years old

History of hypertension for several years and OSA on CPAP

Current regimen

- telmisartan-amlodipine 80-10 mg daily
- HCTZ 25 mg daily

Serial BP average: 142/84

BMP within normal limits, uACR = 14 mg/g

RESISTANT HYPERTENSION

1 **Confirm treatment resistance**
- BP > 130/80 on 3+ antihypertensives (preferably ACEi or ARB + CCB + thiazide)
- Office BP < 130/80, but requires 4+ antihypertensives

2 **Exclude pseudoresistance**
- Ensure accurate office BP measurements
- Assess for medication nonadherence
- Obtain home or ambulatory BP readings to exclude white coat effect

3 Identify and address contributing lifestyle factors

4 Discontinue or minimize interfering substances

5 Screen for secondary causes of hypertension

6 **Optimize pharmacologic treatment**
- Maximize diuretic therapy
- Add spironolactone if eGFR > 30-45 and K+ < 5
- Add other agents with different MOA as indicated/appropriate

7 **Refer to specialist**
- For known or suspected secondary causes(s) of hypertension
- If BP remains uncontrolled > 6 months of treatment

J Am Coll Cardiol. 2025; 86:18: 1567-1678.

Does the patient have any of the following conditions associated with secondary hypertension?

- Drug-resistant HTN
- Abrupt onset HTN
- Onset of HTN at < 30 years
- Exacerbation of previously controlled HTN
- Disproportionate target organ damage for degree of HTN
- Accelerated or malignant HTN
- Onset of diastolic HTN at age ≥ 65 years
- Unprovoked or excessive hypokalemia
- Insomnia or daytime sleepiness
- Concomitant adrenal nodule
- History of early-onset stroke
- Family history of primary aldosteronism

NO → Screening not indicated

YES → Screen for primary aldosteronism and other secondary forms of HTN
- (−) Enhance medication therapy
- (+) Refer to appropriate specialist

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COMMON CAUSES OF SECONDARY HYPERTENSION

Sleep apnea
25-50%

Primary aldosteronism
5-25%

Chronic Kidney Disease
14%

Drug or Alcohol Induced
2-20%

J Am Coll Cardiol. 2025; 86:18: 1567-1678.

PRIMARY ALDOSTERONISM
new recommendations

Screening for primary aldosteronism is recommended for adults with resistant hypertension regardless of whether hypokalemia is present to increase rates of detection, diagnosis, and specific targeted therapy.

Screening may be considered in adults with stage 2 hypertension.

In adults with an indication for screening for primary aldosteronism, it is recommended to continue most antihypertensive medications (other than MRA) prior to initial screening to minimize barriers to or delays in screening.

- ❑ Plasma aldosterone (increased, > 10 ng/dL)
- ❑ Renin activity (suppressed, < 1 ng/mL/h)
- ❑ Plasma aldosterone:renin activity ratio (> 30:1; range 20-40)

J Am Coll Cardiol. 2025; 86:18: 1567-1678.

DAVID

1 month later…

On telmisartan-amlodipine 80-10 mg daily and chlorthalidone 25 mg daily, tolerating well

Serial BP average = 136/80

Lab results

- BMP stable
- Renin activity: 22 ng/mL/hr
- Aldosterone: 3 ng/dL

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A SIMPLIFIED ALGORITHM

Step 1	**Start a Single Pill Combination (SPC) with CCB+RASI** Amlodipine 5 mg/Olmesartan 20 mg Amlodipine 5 mg/Telmisartan 40 mg Amlodipine 5 mg/Valsartan 160 mg Amlodipine 5 mg/Benazepril 20 mg
Step 2	**Increase dose after 2-4 weeks if BP is still elevated** Increase to full-dose combination therapy, or increase individual components to max-effective or max-tolerated doses
Step 3	**Add a thiazide or thiazide-like diuretic** **Preferred Options:** Chlorthalidone 12.5 mg or indapamide 1.25 mg; double dose if needed after 2-4 weeks **Alternative Option:** HCTZ 25 mg daily
Step 4	**Add MRA unless K+ > 5, SCr >1.5, or eGFR < 30** Spironolactone 12.5 mg, increase if needed to 25 mg daily after 4 weeks

Drug Therapy Considerations

1. Consider starting with a single agent if patient is frail, has low CV risk, or if SBP is near goal
2. Consider ACEi/ARB + thiazide as initial therapy if post-stroke, incipient HF, or CCB intolerance
3. ARB preferred over ACEi for Black individuals based on a lower risk of angioedema
4. If high co-pays are an issue, amlodipine-benazepril and lisinopril-HCTZ are generally the lowest tier/lowest cost SPC options

43

JULIA

55 years old

Recently moved and had difficulty finding a PCP, so she has been out of her chronic medications x 1 month

Previously on amlodipine-benazepril 5-20 mg daily and indapamide 1.25 mg daily

Office BP initially 190/100,
On recheck, serial BP average = 184/92

She is asymptomatic

HYPERTENSIVE URGENCY → SEVERE HYPERTENSION

Is there evidence of Acute Target Organ Damage?

- Neurologic disorders such as PRES, encephalopathy, retinal hemorrhage, papilledema, or stroke
- Acute decompensated heart failure or acute coronary syndrome
- Acute kidney injury
- Acute aortic syndrome (penetrating aortic ulcer, or aortic dissection)

+ <u>Hypertensive Emergency</u>
Admit to ICU

− <u>Severe Hypertension</u>
Treat in the outpatient setting

Initiate, reinstitute, or intensify oral antihypertensive medications in a timely manner

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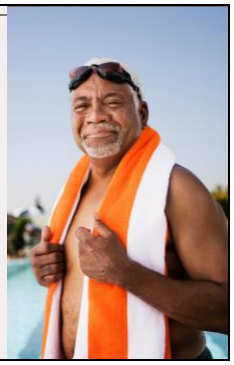
GARY



80 years old

History of hypertension, CKD, and RLS

Currently on amlodipine 5 mg + irbesartan 75 mg daily for HTN and ropinirole for RLS

Serial BP average (seated)= 152/86

1 minute standing BP = 115/68

Denies dizziness of any other symptoms

Swims 3x a week, Does yoga 2x a week

MANAGEMENT OF ORTHOSTATIC HYPOTENSION

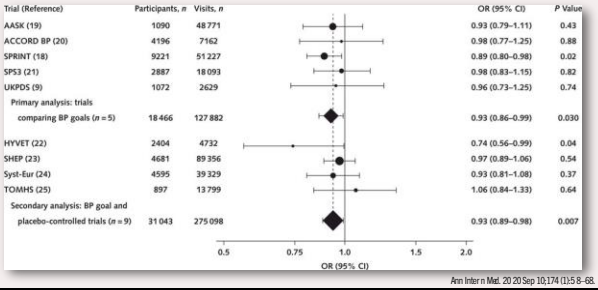
✕ Intensive BP lowering with 1st line medications is not associated with an increased risk of orthostatic hypotension (OH)

In adults with hypertension, improved BP control is recommended to reduce the risk for OH

Consider (other) medication-related causes: anticholinergic agents, TCAs, dopaminergic agents, 3rd line antihypertensives (i.e., beta blockers, alpha blockers, centrally-acting alpha-2 agonists), second-generation antipsychotics, SGLT-2 inhibitors

J Am Coll Cardiol. 2025; 86:18: 1567-1678.

A MORE INTENSIVE BP GOAL REDUCES THE RISK OF OH



Ann Intern Med. 2020 Sep 10;174 (1):58-68.

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ASSESSMENT QUESTION #1

for pharmacists & technicians

The 2025 ACC/AHA High Blood Pressure Guideline includes new guidance on which of the following topics?

A. Lifestyle modifications including potassium-based salt substitutes, alcohol intake, and weight loss
B. Use of the PREVENT Risk Calculator to estimate the risk of developing cardiovascular disease
C. Single-pill combination therapy as preferred initial therapy for Stage 2 hypertension
D. All of the above

ASSESSMENT QUESTION #2

for pharmacists

Which of the following statements about the PREVENT Calculator is true?

A. Compared to the Pooled Cohort Equations, it is derived from a larger, more contemporary, and more diverse U.S. data set, and it provides a more accurate assessment of 10-year ASCVD risk across sex, race, and ethnicity groups.
B. It is validated for adults ages 30-79 without known CVD.
C. It incorporates additional predictors including uACR, eGFR, A1C, and ZIP code.
D. All of the above

ASSESSMENT QUESTION #3

for pharmacists

JW is a 58-year-old male with a new diagnosis of hypertension. His blood pressure was 146/88 at his annual physical last week. Today, he returns to clinic with a list of home blood pressures from the last 5 days ranging from 142-152/78-86. His blood pressure in clinic today is 144/82. Baseline labs are within normal limits and secondary causes of hypertension have been ruled out.

Based on the 2025 ACC/AHA Guideline, what is the preferred recommendation for initial therapy?

A. Start telmisartan-amlodipine 40-5 mg daily
B. Start losartan 50 mg daily
C. Start chlorthalidone 25 mg daily
D. Start lifestyle modifications now with follow-up in 3-6 months to determine if pharmacologic therapy is indicated

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ASSESSMENT QUESTION #2

for technicians

The 2025 ACC/AHA Guideline recommends assessing an individual's cardiovascular risk with which tool?

A. The Pooled Cohort Equations
B. The Framingham Risk Score
C. The PREVENT Calculator
D. A gut feeling

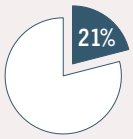
ASSESSMENT QUESTION #3

for technicians

Which of the following is a commercially available single-pill combination option for the management of high blood pressure?

A. amlodipine-olmesartan
B. nifedipine-irbesartan
C. telmisartan-chlorthalidone
D. irbesartan-indapamide

Hypertension is the #1 preventable risk factor for cardiovascular disease and is also a major risk factor kidney disease, cognitive decline, and dementia



However, based on 2021-2023 NHANES data, only 21% of US adults with HTN have well controlled blood pressure (<130/80)

JAMA. 2026;335(9):816-818.

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KEYS TO IMPROVING BLOOD PRESSURE CONTROL

- ✓Increase self-care behaviors
  - HBPM
  - Medication adherence
  - Diet and lifestyle changes
- ✓Keep clinic appointments

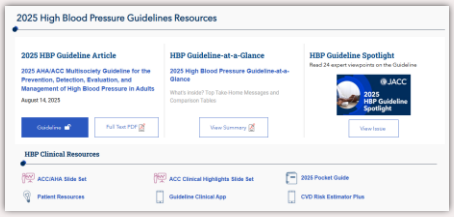
- ✓Utilize multi-disciplinary care teams
- ✓Ensure both patients and staff are trained on accurate BP measurements
- ✓Develop locally tailored treatment algorithms
- ✓Send appointment reminders
- ✓Shift patient encounters to outside of physician office visits

- ✓Use locally developed treatment algorithms
  - Deemphasize monotherapy in favor of effective combination therapy
  - Minimize therapeutic inertia
- ✓Encourage patient engagement
  - Use self-measured BP in therapeutic decision-making

Hypertension. 2021;78:558-590.

BUT, YOU DON'T HAVE TO TAKE MY WORD FOR IT…

https://www.jacc.org/guidelines/high-blood-pressure



Q & A

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