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What's New in Hypertension? An Update on the Latest Clinical Guidelines

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Disclosure

I do not have a vested interest in or affiliation with any corporate organization offering financial support or grant monies for this continuing education activity, or any affiliation with an organization whose philosophy could potentially bias my presentation (within the last 12 months).

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Presentation Objectives

1. Compare prior ACC/AHA hypertension guidelines with the updated recommendations
2. Review the evidence supporting key ACC/AHA guideline recommendations
3. Apply the updated ACC/AHA hypertension guidelines into patient-specific case scenarios
4. Describe the role of pharmacists and pharmacy technicians in implementing the updated guidelines

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Abbreviations

- ACEi: angiotensin converting enzyme inhibitor
- ARNi: angiotensin receptor-neprilysin inhibitor
- ARB: angiotensin receptor blocker
- ASCVD: atherosclerotic cardiovascular disease
- BB: beta blocker
- BP: blood pressure
- BMI: body mass index
- DASH: dietary approaches to stop hypertension
- CAD: coronary artery disease
- CCD: chronic coronary disease
- CI: confidence interval
- CKD: chronic kidney disease
- CVD: cardiovascular disease
- DBP: diastolic blood pressure
- DHP-CCB: dihydropyridine calcium channel blocker
- DM: diabetes mellitus
- GDMT: guideline-directed medical therapy
- GLP-1: glucagon-like peptide-1
- HF: heart failure
- HFpEF: heart failure with preserved ejection fraction
- HFrEF: heart failure with reduced ejection fraction
- HR: hazard ratio
- HTN: hypertension
- ICH: acute intracerebral hemorrhage
- MCI: mild cognitive impairment
- MRA: mineralocorticoid receptor antagonist
- OR: odds ratio
- OSA: obstructive sleep apnea
- PAD: peripheral artery disease
- PREVENT: predicting risk of cardiovascular disease events
- RAASi: renin-angiotensin-aldosterone system inhibitor
- RR: rate ratio
- SGLT2i: sodium-glucose cotransporter inhibitor
- SBP: systolic blood pressure
- TIA: transient ischemic attack

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BACKGROUND

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Prevalence of HTN

HTN is a prevalent modifiable CVD risk factor but remains the leading cause of disability and death

From the years 2017-2020 for adults in the US, HTN prevalence was 46.7%

In middle aged patients the lifetime risk for incident HTN could be as high as 80% to 90%

- Earlier onset in men and in the Black and Hispanic ethnicity

Jones DW, et al. Hypertension. 2025;82:e212-e316.
Martin SS, et al. Circulation. 2024;149:e347-e913.
Chen Y, et al. JAMA Cardiol. 2019;4:455-459.

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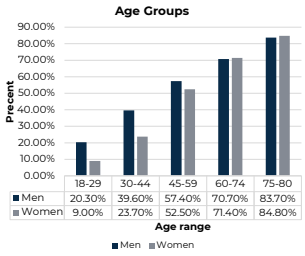
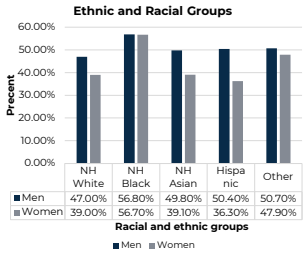
Prevalence of HTN



	18-29	30-44	45-59	60-74	75-80
Men	20.30%	39.60%	57.40%	70.70%	83.70%
Women	9.00%	23.70%	52.50%	71.40%	84.80%



	NH White	NH Black	NH Asian	Hispanic	Other
Men	47.00%	56.80%	49.80%	50.40%	50.70%
Women	39.00%	56.70%	39.10%	36.30%	47.90%

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.

NH: non-Hispanic

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HTN Definition and Classification

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

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.

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Causes of HTN

Dietary Intake Factors

- Higher sodium intake
- Lower potassium intake
- Lower calcium/magnesium intake
- Lower diet quality
- Alcohol intake

Non-Dietary Factors

- Genetic variants
- Overweight/obesity
- Lower physical activity/fitness
- Sleep disturbances
- Psychosocial stressors
- Air pollution

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.

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Lifestyle Therapy Approaches

Modification	SBP reduction
Moderation of alcohol consumption	4 to 6 mmHg
Weight reduction	1 mmHg per kg of weight loss
Physical activity	2 to 10 mmHg
DASH diet	5 to 8 mmHg
Reducing sodium intake	6 to 8 mmHg
Potassium supplementation	~ 6 mmHg

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.
Fu J, et al. *J Am Heart Assoc*. 2020;9:e016804.

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Potassium Based Salt Substitutes Recommendations

In individuals with or without HTN, most dietary salt intake comes from meals prepared at home; using potassium-based salt substitutes can help control and prevent high BP

Use in caution in patients who are taking medication that reduce potassium excretion or CKD

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.

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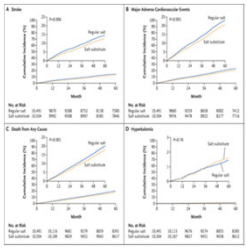
Effect of Salt Substitution on Cardiovascular Events and Death

Design	Open-label, cluster-randomized trial conducted in China
Patient Population	Patients 60 years or older or history of a stroke and had elevated BP
Intervention	Intervention group, salt substitute (75% sodium chloride and 25% potassium chloride), or control group, regular salt (100% sodium chloride)
Results	The salt substitute group showed lower rates of stroke (RR 0.86; 95% CI 0.77–0.96; P=0.006), major cardiovascular events (RR 0.87; 95% CI 0.80–0.94; P<0.001), and mortality (RR 0.88; 95% CI 0.82–0.95; P<0.001)
Conclusion	Among patients with a prior stroke or those aged 60 years or older with HTN, the salt substitute group had lower rates of major cardiovascular events, stroke, and death



Neal B, et al. *N Engl J Med*. 2021;385:1067–1077.

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Long-Term Effect of Salt Substitution for Cardiovascular Outcomes : A Systematic Review and Meta-analysis

Design	Systematic review and meta-analysis
Patient Population	Compare salt substitute with no intervention or the use of regular salt • Included 16 randomized controlled trials
Results	• Salt substitute may reduce the risk of all-cause mortality (RR, 0.88 [95% CI, 0.82–0.93]) and cardiovascular mortality (RR, 0.83 [95% CI, 0.73–0.95])
Conclusion	Salt substitution may reduce cardiovascular and all-cause mortality; however, its effect on reducing cardiovascular events remains uncertain

Greenwood H, et al. *Ann Intern Med.* 2024;177:643-655.

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Secondary Forms of HTN Recommendations

In patients with HTN, it is recommended to screen for specific forms of secondary HTN when clinical suspicion is present

In patients with resistant HTN, it is recommended to screen for specific forms of primary aldosteronism whether hypokalemia is present or not

Jones DW, et al. *Hypertension.* 2025;82:e212-e316.

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Secondary Forms of HTN

Common causes

- CKD
- Drug induced
- Alcohol induced
- Primary aldosteronism
- OSA
- Renovascular HTN

Uncommon Causes

- Hypothyroidism
- Hyperthyroidism
- Cushing syndrome
- Pheochromocytoma
- Acromegaly

Jones DW, et al. *Hypertension.* 2025;82:e212-e316.

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Primary Aldosteronism Screening

In patients with resistant HTN, it is recommended to screen for primary aldosteronism regardless of hypokalemia

To minimize barriers and prevent delays in patients who need screening for primary aldosteronism, it is recommended to continue antihypertensive therapy except for MRA

Jones DW, et al. *Hypertension.* 2025;82:e212-e316.

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Initial Treatment Recommendations on Primary HTN

Thiazide type diuretic | **Long acting DHP-CCB**

ACEi OR **ARB**

Jones DW, et al. *Hypertension.* 2025;82:e212-e316.
Picture: https://tse4.mm.bing.net/th/id/OIP.58U3UkdFqkzXipmuzDKzlQHaD4?w=345&h=181&c=7&r=0&o=7&dpr=1.3&pid=1.7&rm=3

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Monotherapy vs Combination Therapy

Stage 1 HTN* Class 2a

- SBP 130-139 mmHg
- DBP 80-89 mmHg
- **Initiation of <u>a single</u>** first line agent is reasonable

Stage 2 HTN* Class 1

- SBP ≥140 mmHg
- DBP ≥90 mmHg
- **Initiation of <u>two</u>** first line agents of different classes
- **Some high-risk patients with stage 1 HTN**

Any stage HTN Class 3: Harm

- **<u>Don't</u>** combine ACEi, ARB and/or renin inhibitors

Jones DW, et al. *Hypertension.* 2025;82:e212-e316.

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Medication Adherence Strategies

Class 1 Recommendation
- Single pill combination
- Dosed once daily

Class 2 Recommendation
- Monitoring BP at home with feedback
- Reminder aids
- Education and coaching
- Managing anxiety and depression

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.

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Recommendations

Increased risk for CVD (defined as a 10-year predicted risk for CVD events of ≥7.5%)
- Goal SBP of at least 130 mmHg, however achieving a SBP <120 mmHg can reduce the risk of cardiovascular events and mortality
- Goal DBP of <80 mmHg
- Initiation of medication therapy in addition to lifestyle modifications

NOT at an increased for CVD (2b recommendation)
- Goal SBP of at least 130 mmHg; however, achieving a SBP <120 mmHg can reduce the risk of cardiovascular events and mortality
- Goal DBP of <80 mmHg
- Initiation of medications if average BP remains ≥130/80 mmHg after 3 to 6 months of lifestyle modifications

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.

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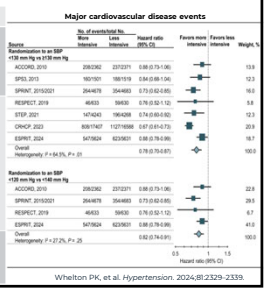
Optimal Antihypertensive SBP

Design	Systematic review and meta-analysis
Patient Population	Comparing SBP <130 mmHg and ≥130 mmHg treatment goals and the incidence of CVD and mortality • Seven trials, including 72,138 participants
Results	• A goal of <130 mmHg showed a significant reduction of major CVD (HR 0.78, 95% CI 0.70–0.87) and all-cause mortality (HR 0.89, 95% CI 0.79–0.99) • A target goal of <120 mmHg compared to a target goal of <140 mmHg showed a significant reduction in major CVD (HR 0.82, 95% CI 0.74–0.91)
Conclusion	Targeting a goal of SBP <130 mmHg significantly reduces the risk of major CVD as well as all-cause morality



Whelton PK, et al. *Hypertension*. 2024;81:2329-2339.

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THE OLD VS THE NEW GUIDELINES

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HTN Guideline Comparisons

New or Revised	Section Title	2017 Recommendation	2025 Recommendation
New terminology	N/A	HTN urgency	Severe HTN
New recommendation	5.1. Lifestyle and Psychosocial Approaches	N/A	COR 2a: In adults with or without HTN, potassium-based salt substitutes can be useful to prevent or treat elevated BP and HTN, particularly for patients in whom salt intake is related mostly to food preparation or flavoring at home, except in the presence of CKD or use of drugs that reduce potassium excretion where additional monitoring is probably indicated

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.

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HTN Guideline Comparisons

New or Revised	Section Title	2017 Recommendation	2025 Recommendation
Revised recommendation	5.2.2. BP Treatment Threshold and the Use of CVD Risk Estimation to Guide Drug Treatment of HTN	COR 1: Use of BP-lowering medications is recommended for secondary prevention of recurrent CVD events in patients with clinical CVD and an average of SBP ≥130 mmHg or an average DBP ≥80 mmHg and for primary prevention in adults with an estimated 10-year ASCVD risk of ≥10% and an average SBP ≥130 mmHg or an average DBP ≥80 mmHg	COR 1: In adults with HTN without clinical CVD but with diabetes or CKD or at increased 10- year CVD risk (≥7.5% based on PREVENT), initiation of medications to lower BP is recommended when average SBP is ≥130 mmHg and average DBP is ≥80 mmHg to reduce the risk of CVD events and total mortality

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.

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HTN Guideline Comparisons

New or Revised	Section Title	2017 Recommendation	2025 Recommendation
Revised recommendation	5.2.2. BP Treatment Threshold and the Use of CVD Risk Estimation to Guide Drug Treatment of HTN	COR 1: Use of BP-lowering medication is recommended for primary prevention of CVD in adults with no history of CVD and with an estimated 10-year ASCVD risk <10% and an SBP ≥140 mmHg or a DBP ≥90 mmHg	COR 1: In adults with HTN without clinical CVD and with estimated 10-year CVD risk (<7.5% based on PREVENT), initiation of medications to lower BP is recommended if average SBP remains ≥130 mmHg or average DBP remains ≥80 mmHg after a 3-to 6-month trial of lifestyle intervention to prevent target organ damage and mitigate further increases in BP

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.

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HTN Guideline Comparisons

New or Revised	Section Title	2017 Recommendation	2025 Recommendation
Revised recommendation	5.3.1. Diabetes	COR 2b: In adults with DM and HTN, ACEi or ARB may be considered in the presence of albuminuria	COR 1: In adults with DM and HTN, ACEi or ARB are recommended in the presence of CKD as identified by eGFR <60 mL/min/1.73 m^2 or albuminuria ≥30 mg/g and should be considered when mild albuminuria (<30 mg/g) is present to delay progression of diabetic kidney disease

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.

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HTN Guideline Comparisons

New or Revised	Section Title	2017 Recommendation	2025 Recommendation
Revised recommendation	5.3.8. HTN Treatment in Patients With CKD	COR 2a: In adults with HTN and CKD (stage 3 or higher or stage 1 and 2 with albuminuria ≥300 mg/d, or ≥300 mg/g albumin-to-creatinine ratio or the equivalent in the first morning void), treatment with an ACEi is reasonable to slow kidney disease progression AND COR 2b: In adults with HTN and CKD (stage 3 or higher or stage 1 and 2 with albuminuria ≥300 mg/d, or ≥300 mg/g albumin-to-creatinine ratio or the equivalent in the first morning void), treatment with an ARB may be reasonable if an ACEi is not tolerated	COR 1: For adults with HTN and CKD as identified by eGFR <60 mL/min/1.73 m^2 with albuminuria of ≥30 mg/g, RAASi (either with ACEi or ARB but not both) is recommended to decrease CVD and delay progression of kidney disease

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.

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HTN Guideline Comparisons

New or Revised	Section Title	2017 Recommendation	2025 Recommendation
New recommendation	5.3.9.1. Acute Intracerebral Hemorrhage	N/A	COR 2a: For adult patients with acute spontaneous ICH who present with SBP between 150 and 220 mmHg, it can be beneficial to immediately lower SBP to 130 to <140 mmHg for at least 7 days after ICH to improve functional outcomes, but stop antihypertensive medications if SBP <130 mmHg
Revised recommendation	5.3.9.1. Acute Intracerebral Hemorrhage	COR 2a: In adults with ICH who present with SBP >220 mmHg, it is reasonable to use continuous intravenous drug infusion and close BP monitoring to lower SBP	COR 2a: In adults with acute spontaneous ICH requiring acute BP lowering, careful titration to ensure smooth, nonlabile, and sustained control of BP, avoiding peaks and large variability in SBP, can be beneficial for improving functional outcomes

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.

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HTN Guideline Comparisons

New or Revised	Section Title	2017 Recommendation	2025 Recommendation
New recommendation	5.3.9.2. Acute Ischemic Stroke	N/A	COR 3 Harm: In patients undergoing successful brain reperfusion with endovascular treatment for a large vessel occlusion, lowering SBP <140 mmHg within the first 24 to 72 hours after reperfusion can worsen long-term functional outcome.
Revised recommendation	5.3.9.4. Mild Cognitive Impairment and Dementia	COR 2a: In adults with HTN, BP lowering is reasonable to prevent cognitive decline and dementia	COR 1: In adults with HTN, a goal of <130 mmHg SBP is recommended to prevent MCI and dementia

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.

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HTN Guideline Comparisons

New or Revised	Section Title	2017 Recommendation	2025 Recommendation
New recommendation	5.5. HTN and Pregnancy	N/A	COR 1: Pregnant individuals with chronic HTN (defined as pre-pregnancy HTN or SBP 140 to 159 mmHg and/or DBP 90 to 109 mmHg prior to 20 weeks gestation) should receive antihypertensive therapy to achieve BP <140/90 mmHg to help prevent maternal and perinatal morbidity/mortality
Revised recommendation	5.5. HTN and Pregnancy	COR 3 Harm: Women with HTN who become pregnant should not be treated with ACEi or direct renin inhibitors	COR 3 Harm: Individuals with HTN who are planning a pregnancy or who become pregnant should not be treated with atenolol, ACEi, ARB, direct renin inhibitors, nitroprusside, or MRA to avoid fetal harm

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.

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HTN Guideline Comparisons

New or Revised	Section Title	2017 Recommendation	2025 Recommendation
New recommendation	6.2. Hypertensive Emergencies and Severe HTN for Nonpregnant and Nonstroke Patients	N/A	COR 3 Harm: For adults with severe HTN (>180/120 mmHg) who are hospitalized for noncardiac conditions without evidence of acute target organ damage, intermittent use of additional intravenous or oral antihypertensive medications are not recommended to acutely reduce BP

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.

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LITERATURE ON THE RECOMMENDATIONS

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Predicting Risk of CVD EVENTs (PREVENT)

- Developed in 2023 by the American Heart Association
- Estimate 10-year and 30-year risk for total CVD
- For targeted primary prevention, it is the first risk assessment tool to integrate cardiovascular, kidney, and metabolic health measures

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.

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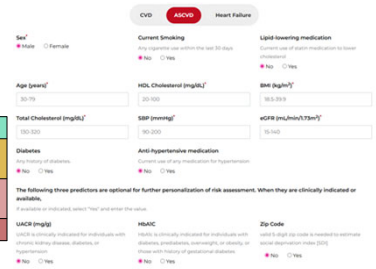
PREVENT Calculator

Low Risk	<5%
Borderline Risk	5% to <7.5%
Intermediate Risk	≥7.5% to <20%
High Risk	≥20%



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

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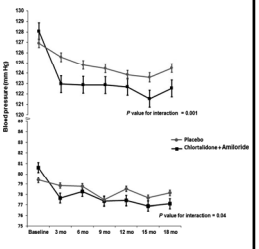
PREVER - Prevention Trial

Design	Randomized, parallel, double-blind, placebo-controlled trial
Patient Population	Patients age 30 to 70 years old with prehypertension that did not achieve optimal BP goals after 3 months of lifestyle intervention
Intervention	Chlorthalidone/amiloride combination pill (n=372) vs placebo (n=358)
Results	Cumulative incidence of HTN was lower in the diuretic arm of 11.7% vs 19.5% in the placebo arm (P=0.004)
Conclusions	Among patients with prehypertension, the combination of chlorthalidone and amiloride effectively reduces the risk of incident HTN



Fuchs SC, et al. *J Am Heart Assoc*. 2016;5:e004248.

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ASCVD Risk Prediction Tools

2017 APA/AHA

- Pooled Cohort Equations used to estimate ASCVD risk
- Non diverse patient population
- Age range 40-79 years old
- Excluded patients on a statin

2025 APA/ACC

- PREVENT calculator
- Diverse data use to estimate total ASCVD, CVD, HF risk over 10 and 30 years
- More accurate as it included patient using statins, CKD, and social risk factors
- Age range 30–79 years
- Not intended for secondary prevention

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.

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SPECIAL POPULATIONS – LITERATURE

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Management of HTN in Chronic Coronary Disease

Goal BP target in patients who have HTN is <130/<80 mmHg to help reduce CVD events as well as all-cause death

In patients with SBP >130 and/or DBP >80 mmHg for specific indications such as recent MR or angina, preferred medications include ACEi, ARB, or BB. In addition to these therapies, other antihypertensive medications such as CCB, MRA, and/or long-acting thiazide diuretics can be added to optimize BP.

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.

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Management of HTN in PAD

HTN is the most common risk factor in PAD

Recommendation: goal BP <130/80 mmHg in patients with PAD to reduce the risk of MACE which includes MI, HF, stroke, and cardiovascular death

In patients with HTN and PAD, ACEi or ARB should be first-line therapy, as their use has been associated with cardiovascular benefits

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.
Investigators O, et al. *N Engl J Med*. 2008;358:1547-1559.

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Management of HTN in Atrial Fibrillation

HTN is the most common comorbid condition affecting >80% of patients with atrial fibrillation

HTN is the highest attributable risk factor for the development of atrial fibrillation

A key component of atrial fibrillation management is to control HTN

The BP optimal treatment target remains unclear; however, it is reasonable to apply the general HTN guideline goal of <130/80 mmHg

Gawalko M, et al. *Hypertension*. 2023;80:523-533.
Jones DW, et al. *Hypertension*. 2025;82:e212-e316.

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Management of HTN in Prevention and Treatment of HF

- Goal BP target in patients who have HTN is <130/<80 mmHg to lower the risk of developing HF
- HTN is a major risk factor for developing either HFrEF or HFpEF

HFrEF
- Up titrating GDMT as indicated:
  - ACEi, ARB, ARNi
  - BB
  - MRA
  - SGLT2i
- Volume overloaded: add a diuretic
- HTN despite optimizing GDMT: add DHP-CCB

HFpEF
- Volume overloaded: add a diuretic
- RAASi is indicated if MRA or ARNi, or ARB when ARNi is not feasible
- SGLT2i

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.

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Management of HTN in Obesity

Obesity is a modifiable risk factor for HTN, as increasing adiposity is associated with higher BP levels

Patients with HTN and a BMI ≥27 kg/m², incretin memetics (GLP-1 receptor agonist) may be used as an adjunct to lower BP

In patients with HTN and a BMI >30 kg/m², bariatric surgery may be considered in combination with behavioral interventions and antihypertensive therapy, as it can be effective in lowering BP

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.

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Management of HTN in DM

BG goal: SBP of <130 mmHg; however, recommended to achieve SBP of <120 mmHg and DBP of <80 mmHg to reduce CVD mortality and morbidity

Medication: first line antihypertensive medications: thiazide-type diuretics, long-acting CCB, and ACEi or ARB

In the updated guidelines, the term "considered" has been replaced with "recommended" regarding treatment with ACEI or ARB. These medication can also be considered in patients with mild albuminuria (<30 mg/g) to help delay progression of diabetic kidney disease.

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.

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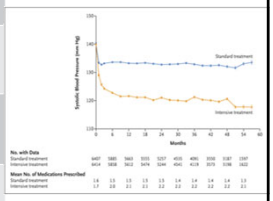
Intensive BP Control in Patients with Type 2 DM

Design	Parallel-design, randomized clinical trial
Patient Population	Patients 50 years or older with type 2 DM, elevated SBP, and increased risk of CVD
Intervention	Intensive treatment group targeted SPB <120 mmHg (n=6,414) vs standard treatment group targeted SPB <140 mmHg (n=6,407)
Results	Primary outcome occurred in 393 patients in the intensive-treatment group and 492 patients in the standard-treatment group (HR, 0.79; 95% CI, 0.69–0.90; P<0.001)
Conclusion	In patients with type 2 DM, intensive BP control targeting SBP <120 mmHg significantly lowered the risk of major cardiovascular events



Bi Y, et al. *N Engl J Med*. 2025 Mar 27;392(12):1155-1167.

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Management of HTN in CKD

BG goal: <130 mmHg to decrease all-cause mortality, in patients with eGFR <60 ml/min/1.73m² or moderate to severe albuminuria ≥30 mg/g

Patients with HTN and CKD (defined by an eGFR <60 mL/min/1.73 m²): a RAASi (ACEi or ARB) is recommended to help slow the progression of kidney disease and reduce cardiovascular risk

Updated ACEi and ARB recommendation to a class 1 (previously ACEi was a class 2a and ARB was a class 2b if ACEi was not tolerated)

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.
Malhotra R, et al. *JAMA Intern Med*. 2017;177:1498-1505.

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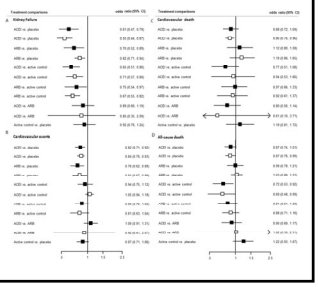
Renin-angiotensin System Meta-analysis

Design	Meta-analysis of randomized trials
Patient Population	Patients with CKD taking a RAS inhibitor • Included 119 randomized controlled trials (n=64,768)
Results	• Reduced the odds of renal failure by 39% for ACEi and 30% for ARB • Compared to controls ACEi reduced all-cause death (not ARBs)
Conclusion	Relative to ARBs, ACEi were consistently associated with greater probabilities of lowering the risk of kidney failure, cardiovascular death, and all-cause mortality



Xie X, et al. *Am J Kidney Dis*. 2016;67:728-741.

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Management of HTN in Acute ICH

Among adult patients that present with acute spontaneous ICH and SBP of 150–220 mmHg, immediate lowering of SBP to 130 to <140 mmHg for a minimum of 7 days may be beneficial for improving functional outcomes

Hold all antihypertension medications if SBP drops below 130 mmHg

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.

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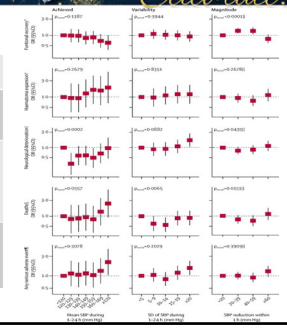
BP Control and Clinical Outcomes in Acute ICH

Design	Pooled analysis of the INTERACT2 and ATACH-II trials
Patient Population	Age 18 years or older with non-traumatic spontaneous ICH and elevated BP
Results	• Improved functional status was seen in patients that achieved SBP (improvement per 10 mmHg increase adjusted OR 0.90 [95% CI 0.87–0.94], P<0.0001)
Conclusion	In patients with mild to moderate acute ICH, early and stable systolic BP was safe and associated with favorable outcomes



Moullaali TJ, et al. *Lancet Neurol*. 2019;18:857–864.

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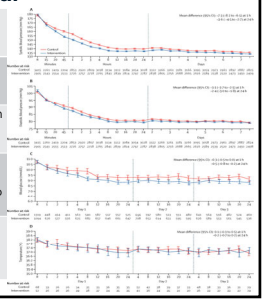
INTERACT3 Trial

Design	International, multicenter, prospective, stepped wedge, cluster randomized, blinded, outcome assessed, controlled trial
Patient Population	Patients older than 18 years who present within 6 hours of ICH onset and have a local implementation champion
Intervention	Usual care vs a bundled care (target SBP less than 140 mmHg within an hour, BG control, warfarin reversal if indicated, and treatment of pyrexia)
Results	• Intervention group had better functional outcomes (OR 0.86, 95% CI 0.76–0.97, P=0.015) • Lower odds of death in the bundled care group (OR 0.77, 95% CI 0.63–0.95)
Conclusion	In patients with acute ICH, improved functional outcomes was seen with the bundled care group with intensive BP control within hours of symptom onset



Ma L, et al. *Lancet*. 2023;402:27–40.

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Management of HTN in Acute Ischemic Stroke

Underwent a successful endovascular reperfusion for a large vessel occlusion: Lowering SBP below 140 mmHg in the first 24 to 72 hour could worsen long-term functional outcomes

Underwent endovascular treatment: Maintaining a BP <180/105 mmHg for 24 hours after procedure could improve long-term functional outcomes and prevent death

Did not undergo an endovascular treatment or receive IV thrombolytic: might be reasonable to lower BP by 15% during the first 24 hours after the onset of the stroke to improve outcomes

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.

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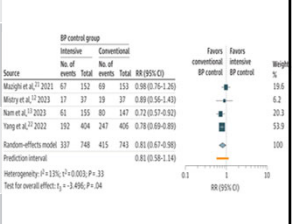
Intensive vs Conventional Status Post Thrombectomy Systematic Review and Meta-Analysis

Design	Systematic review and meta-analysis
Patient Population	Age 18 years or older post endovascular thrombectomy with an acute ischemic stroke due to a large vessel occlusion comparing intensive SBP vs conventional SBP targets
Results	• In the intensive SBP group lower functional independence rates were seen (RR, 0.81 [95% CI, 0.67–0.98]) • No difference seen in 90-day mortality, ICH or hypotensive events
Conclusion	Post endovascular thrombectomy intensive BP reduction does not provide benefits and carries risks



Nam HS, et al. *JAMA*. 2023;330:832–842.

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Management of HTN in Secondary Stroke Prevention

Greatest risk factor for ICH and stroke recurrence is HTN

For patients who have experienced a TIA, ICH, or ischemic stroke, treatment with an ACEi, ARB, or a thiazide-type diuretic is recommended to lower BP and reduce the risk of ICH or recurrent stroke

An office BP target of <130/80 mmHg is recommended for patients with a history of TIA, ICH, or ischemic stroke to reduce the risk of recurrent stroke, ICH, and other vascular events

In patients without a prior history of HTN who have experienced a TIA, ICH, or ischemic stroke and have an office BP >130/80 mmHg, initiating antihypertensive therapy may help reduce the risk of ICH, other vascular events, and recurrent stroke

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.

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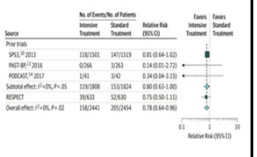
Effect of Standard vs Intensive BP Control on the Risk of Recurrent Stroke

Design	Randomized clinical trial and meta-analysis
Patient Population	BP control <140/90 mmHg (standard treatment) (n=640) or <120/80 mmHg (intensive treatment) (n=640)
Results	• For recurrent stroke, a non-significant reduction was observed in the intensive treatment group (HR 0.73; 95% CI 0.49–1.11; P=0.15) • In the meta-analysis, the pooled risk ratio favored intensive BP control (RR 0.78; 95% CI 0.64–0.96; P=0.02), with a number needed to treat of 67 (95% CI 39–250)
Conclusion	Intensive BP lowering was associated with reduced stroke recurrence, supporting a target of 130/80 mmHg for secondary stroke prevention



Kitagawa K, et al. *JAMA Neurol*. 2019;76:1309–1318.

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Management of HTN in MCI and Dementia

HTN is a risk factor for cortical white matter changes and small-vessel ischemic disease, which may predict dementia and cognitive decline

Recommendation: goal of SBP <130 mmHg is recommended to prevent MCI and dementia

2017 guidelines stated BP lowering is reasonable however did not provide a goal

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.
de Havenon A, et al. *Stroke Vasc Neurol*. 2022;7:364–366.

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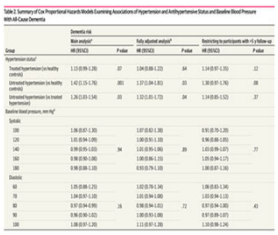
Dementia and Antihypertensives: Meta Analysis

Design	Longitudinal, population-based studies of aging population participating in the Cohort Studies of Memory in an International Consortium group
Patient Population	Age between 60- to 110-year-old and no documentation of dementia at baseline
Results	• Compared to healthy controls, patients with untreated HTN had a 42% increased risk of dementia (HR, 1.42; 95% CI 1.15–1.76; P=0.001) and 26% increased risk compared with individuals with treated HTN (HR, 1.26; 95% CI, 1.03–1.53; P=0.02) • There was no significant increase in dementia among individuals treated for HTN compared with controls
Conclusion	In older adults, antihypertensive therapy was associated with a lower risk of dementia compared with untreated HTN



Lennon MJ, et al. *JAMA Netw Open*. 2023;6:e2333353.

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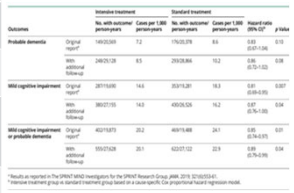
Long-Term Effect of Intensive vs Standard BP Control on MCI and Probable Dementia in SPRINT

Design	Randomized controlled trial
Patient Population	Patients older than 50 years with a history of HTN and having an increased cardiovascular risk
Groups	Randomized to a SBP goal of <120 mmHg (intensive treatment) or <140 mmHg (standard treatment)
Results	• Both MCI (HR, 0.87 95% CI, 0.76–1.00) and a composite of MCI or probable dementia was lower with the intensive treatment group (HR, 0.89; 95% CI, 0.79–0.99)
Conclusion	In patients with a high cardiovascular risk and HTN, the intensive treatment group had a lower risk of MCI and cognitive impairment that includes probably dementia or MCI



Reboussin DM, et al. *Neurology*. 2025;104:e213334

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Management of HTN in Pregnancy

Planning on a pregnancy

- **Medication**: extended-release nifedipine and labetalol are preferred to treat HTN and minimize fetal risk
- Low dose aspirin 81 mg per day to reduce the risk of preeclampsia and its sequelae
- Medications to avoid in pregnancy, now including ARBs, nitroprusside and MRA

Pregnant patients

- **Goal for patients with chronic HTN:** SBP <140 mmHg to prevent maternal and perinatal morbidity and mortality
- If SBP ≥160 mmHg or DBP ≥110 mmHg, lower BP to <160/<110 mmHg within 30 to 60 minutes to prevent adverse events

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.
Magee LA, et al. *Pregnancy Hypertens*. 2022;27:148–169.

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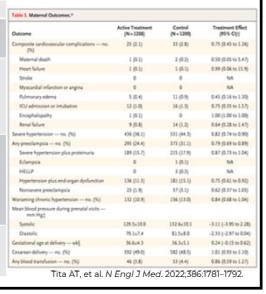
CHAP Trial

Design	Open-label, multicenter, randomized trial
Patient Population	Pregnant women with a singleton fetus (gestation age of less than 23 weeks) with mild chronic HTN
Groups	Participants were assigned to receive antihypertensive medications during pregnancy (active-treatment group) or no treatment unless severe HTN developed (SBP ≥160 mmHg or DBP ≥105 mmHg) in the control group
Results	• The active treatment group had a lower incidence of preeclampsia with severe features, medically indicated preterm birth before 35 weeks, placental abruption, and fetal or neonatal death (adjusted RR 0.82; 95% CI 0.74–0.92; P<0.001)
Conclusion	Targeting a BP of <140/90 mmHg in pregnant patients with mild chronic HTN was associated with improved pregnancy outcomes



Tita AT, et al. *N Engl J Med*. 2022;386:1781–1792.

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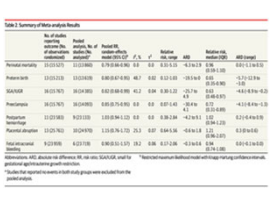
Aspirin Use to Prevent Preeclampsia and Related Morbidity and Mortality

Design	Meta-analysis
Patient Population	Pregnant patients at increased risk for preeclampsia • Aspirin dosages ranged from 50 mg/d to 150 mg/d
Results	• Aspirin use was associated with a significantly lower risk of preeclampsia (RR 0.85; 95% CI 0.75–0.95; I^2=0%), preterm birth (pooled RR 0.80; 95% CI 0.67–0.95; I^2=49%), and perinatal mortality (pooled RR 0.79; 95% CI 0.66–0.96; I^2=0%)
Conclusion	Daily low-dose aspirin during pregnancy was associated with a reduced risk of serious perinatal outcomes



Henderson JT, et al. *JAMA*. 2021;326:1192–1206.

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Resistant HTN

Defined as BP above target despite treatment with three antihypertensive agents of different mechanisms, including a diuretic, or BP at goal requiring four or more antihypertensive medications

Goal BP <130/80 mmHg

Patients with HTN are at increased risk of stroke, end-stage renal disease, myocardial infarction, and cardiovascular death

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.
Ebinger JE, et al. *Eur J Prev Cardiol*. 2023;30:960–968.

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Management of Resistant HTN

Confirm treatment resistance	Other factors to consider	Pharmacological treatment	Refer to a specialist
• Office BP ≥130/80 mmHg and on ≥3 antihypertensives **OR** office BP <130/80 mmHg but requires ≥4 antihypertensive • Combination of ACEi or ARB + CCB + thiazide-like diuretics preferred	• Exclude pseudoresistance • Identify and reverse contributing lifestyle factors • Discontinue or minimize interfering substances • Screen for secondary causes of HTN	• Maximize diuretic therapy (replace thiazide-type diuretic with chlorthalidone 12.5-25 mg daily or indapamide 1.25-2.5 mg daily) • Add spironolactone 25-50 mg daily or equivalent dosage of eplerenone 25-50 mg BID if eGFR ≥45 mL/min/1.73 m² • Use chlorthalidone or loop diuretic in patients with CKD stage 4 or greater • Add agents with different MOA (BB, central sympatholytic drugs or nondihydropyridines CCB for elevated HR) • Add dual endothelin-receptor antagonist or potent vasodilators	• For known or suspected secondary causes of HTN • If BP remain uncontrolled ≥6 months of treatment

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.

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Management of Severe HTN and Hypertensive Emergencies

Severe HTN: SBP >180 mmHg or DBP >120 mmHg **NO** acute target organ damage → Treated in the outpatient setting → Initiating, restarting, or intensifying oral antihypertensive therapy

Hypertensive emergency: SBP >180 mmHg or DBP >120 mmHg with acute target organ damage → Admit to ICU (Class 1)
- Aortic dissection: Reduce SBP <140 mmHg in the first hour and to <120 mmHg
- Reduce SBP by 25% in the first hour and to <160/100-110 mmHg over the next 6 hours and to normal in the net 24–48 hours

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.

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Management of HTN in Patients Scheduled For Surgical Procedures

SBP >180 mmHg or DBP mmHg

- Yes → Could consider delaying the elective surgery to minimize perioperative complication
- No → Continue antihypertensive medications
  - Continue chronic BB therapy throughout perioperative period
  - Abrupt discontinuation of BB is NOT recommended
  - BB should not be started on the day of surgery in naive patients
- No → Clonidine → Abrupt discontinuation of Clonidine is NOT recommended
- No → ACEi/ARB → Preoperative discontinuation could reduce the risk of hypotension

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.

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Recommendations for Uncontrolled HTN

- Team-based care approach
- Evidence-based care (home BP monitoring and team-based care)
- Integrated treatment model (accurate BP measurement, patient engagement, prompt treatment, etc..)
- Health information technology
- Electronic health record and patient registries
- Telehealth interventions

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.

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Pharmacy Role in HTN Management

Multidisciplinary team-based care is effective in evaluating and addressing medication access challenges and other structural barriers, thereby supporting individual patient needs and reducing obstacles to achieving HTN control

Clinical pharmacist role: Comprehensive medication management, evaluation of medication-related interactions, and patient education on appropriate medication use

Literature: Compared with usual care, team-based HTN care incorporating nurse or pharmacist interventions resulted in significant reductions in SBP and DBP and improved BP goal attainment

Jones DW, et al. *Hypertension*. 2025;82:e212-e316.
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Summary

- HTN is the most modifiable risk factor for CVD
- Overarching BP goal is <130/80 mmHg
- Lifestyle changes is recommended for all adults
- Medication initiation is recommended if BP remains ≥130/80 mmHg after 3–6 months of lifestyle modifications in patients with a 10-year ASCVD risk <7.5% as defined by PREVENT
- Medication initiation is recommended for BP ≥140/90 mmHg, or for adults with BP ≥130/80 mmHg who have clinical CVD, DM, CKD, a prior stroke, or a 10-year ASCVD risk >7.5% as defined by PREVENT
- For stage 2 HTN (≥140 mmHg systolic or ≥90 mmHg diastolic), initiating two medications as a single fixed-dose combination is recommended

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Questions?

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What's New in Hypertension? An Update on the Latest Clinical Guidelines

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Thank you!

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