

Clinical Pearls Based on the New Hypertension Guideline

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Disclosure

Consultant: Alnylam (Hypertension); AstraZeneca; Blue Earth Diagnostics; Boehringer Ingelheim; Corcept; Eli Lilly (SURPASS-CVOT); Idorsia (Hypertension); Mineralys; Novo Nordisk; ReCor; Up-to-Date (Hypertension)

Research Grant: Corcept; Eli Lilly – TRIUMPH; Sonivie – THRIVE Study

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Objectives

At the conclusion of this presentation the participant will know:

1. How to Properly Take BP Accurately in the office.
2. To teach patients how to Self-Measure their own BP at home.
3. That Home (Self Measured) BP is a better predictor of CV events than office BP.
4. That Home BP is as good as 24-hr ABPM in predicting clinical events with some caveats.
5. The proper initial laboratory w/up of HTN have some new additions.
6. The AHA/ACC definition of HTN and the target for BP control of < 130/80 mm Hg, with encouragement to achieve < 120/80 in patients at increased risk for CVD.
7. The Lifestyle Changes (Non-Pharmacologic Therapies) and the new suggestions in 2025.
8. The new PREVENT™ risk estimator in evaluating the patient with hypertension.
9. The recommendations for initial antihypertensive drug therapy in addition to Lifestyle Modification in patients with hypertension and diabetes.
10. That achieving a BP of < 130/80 mm Hg to reduce dementia in those with hypertension is a Class I recommendation and we should start BP control earlier than later in life.

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Recent Hypertension Guideline

CLINICAL PRACTICE GUIDELINES



2025 AHA/ACC/AANP/AAPA/ABC/ACCP/ACPM/AGS/AMA/ASPC/NMA/PCNA/SGIM Guideline for the Prevention, Detection, Evaluation and Management of High Blood Pressure in Adults: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines

Jones DW. *Circulation* Sept 16, 2025;152 (11):e114–e218.

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Why Are We Committed to Controlling BP?

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Uncontrolled HTN Is Responsible for More Worldwide Death and DALYs than Any Other CV Risk Factor

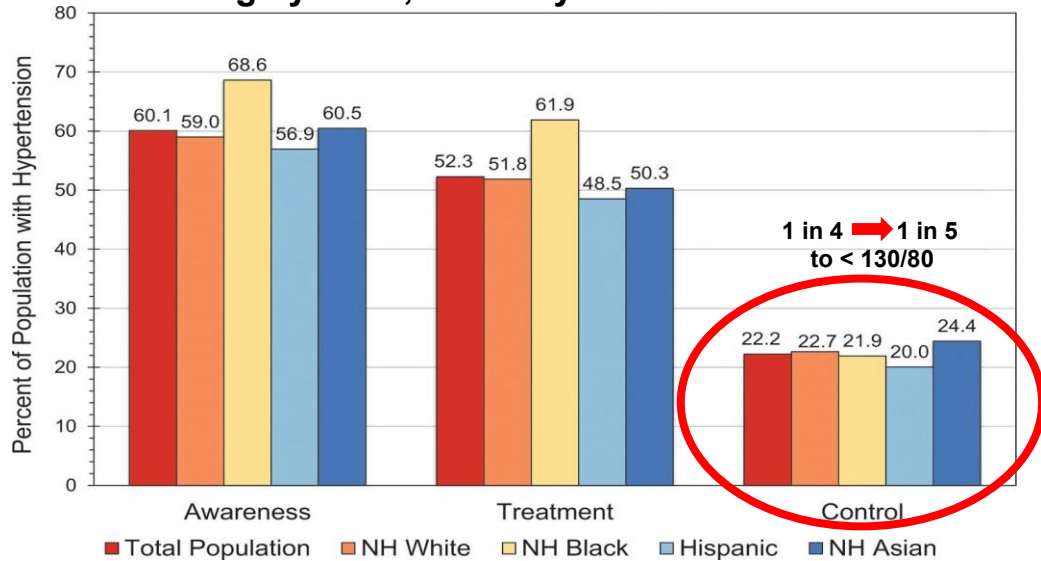
High SBP # 1 Worldwide

Rank	Cause of Death	No. of Deaths in 2021 (95% UI)	No. of DALYs (95% UI)
1	High SBP	10,800,000 (9,150,000, 12,100,000)	209,000,000 (172,000,000, 236,000,000)
2	Dietary risks	6,580,000 (2,270,000, 9,520,000)	142,000,000 (45,300,000, 200,000,000)
3	High LDL-C	3,810,000 (2,170,000, 5,420,000)	86,300,000 (54,100,000, 115,000,000)
4	Ambient particulate matter pollution	3,130,000 (2,310,000, 3,930,000)	62,500,000 (45,700,000, 78,400,000)
5	Smoking	2,370,000 (498,000, 4,410,000)	59,600,000 (13,100,000, 107,000,000)
6	High fasting plasma glucose	2,300,000 (2,030,000, 2,650,000)	41,200,000 (36,600,000, 47,600,000)
7	High BMI	1,950,000 (1,120,000, 2,910,000)	43,900,000 (23,800,000, 65,400,000)
8	Kidney dysfunction	1,870,000 (1,440,000, 2,340,000)	38,200,000 (30,700,000, 45,900,000)
9	Household air pollution from solid fuels	1,610,000 (904,000, 2,820,000)	36,200,000 (21,200,000, 61,100,000)
10	Lead exposure	1,570,000 (~139,000, 3,170,000)	29,700,000 (~2,780,000, 61,200,000)
11	Low temperature	1,020,000 (915,000, 1,100,000)	17,700,000 (15,900,000, 19,200,000)
12	Secondhand smoke	743,000 (297,000, 1,070,000)	16,700,000 (6,870,000, 24,300,000)
13	High alcohol use	407,000 (179,000, 708,000)	9,260,000 (3,830,000, 16,300,000)
14	Low physical activity	397,000 (122,000, 684,000)	7,220,000 (2,870,000, 11,500,000)
15	High temperature	164,000 (114,000, 205,000)	3,440,000 (2,370,000, 4,300,000)

BMI, body mass index; CV, cardiovascular; DALY, disability-adjusted life-year; HTN, hypertension; LDL-C, low-density lipoprotein cholesterol; SBP, systolic blood pressure; UI, uncertainty interval.
 Vaduganathan M, et al. J Am Coll Cardiol. 2022;80:2361-2371.

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Extent of Awareness, Treatment, and Control of HBP to < 130/80 mm Hg by Race, Ethnicity in the United States 2021-2023



1. Chart 9-3. Palaniappan, L.P. et al. 2026 Heart Disease and Stroke Statistics: A Report of US and Global Data From the American Heart Association Circulation Vol 153, Issue 9, March 3 2026, pgs e275-e906. <https://doi.org/10.1161/CIR.0000000000001412>.
2. Hardy S.T. et al. JAMA 2026;335:816

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CLINICAL PEARL #1

Make Sure the BP Measured Is Accurate

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“The measurement of BP is likely the clinical procedure of greatest importance that is performed in the sloppiest manner.”

—Norman Kaplan, MD
Lancet. 2007;370:591

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Checklist for Accurate Office Blood Pressure Measurement-COR I-EO

Office Blood Pressure Measurement



1. The patient should avoid caffeine, exercise, and smoking for at least 30 minutes before measurement. Ensure the patient has emptied their bladder.
2. Use a blood pressure device that has been validated for accuracy (validatebp.org).
3. Use the correct cuff size on a bare arm.
4. The patient's arm should be supported at heart level.
5. Have the patient relax, sitting in a chair (feet on floor, legs uncrossed, and back supported) for more than 5 minutes of rest.
6. Neither the patient nor the clinician should talk during the rest period or during the measurement. The patient should not be using their phone. **No talking, No phone**
7. Blood pressure measurement should be taken in a temperature-controlled room.
8. Take 2 or more blood pressure measurements at least 1 minute apart. Average the readings, and provide the patient their blood pressure readings both verbally and in writing. **At least 2 measurements 1 min apart**

Fig 3. Jones D.W. et al. *Circulation* Vol 152, Iss 11 Sept 16, 2025. Pages e114-e218. 2025 Guideline for the Prev, Det. Eval. And Rx of HTN in Adults.



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Fig 3. Jones D.W. et al. *Circulation* Vol 152, Iss 11 Sept 16, 2025. Pages e114-e218. 2025 Guideline for the Prev, Det. Eval. And Rx of HTN in Adults.

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All Guidelines Stress Proper Cuff Sizes Be Used

ACC/AHA Selection Criteria for BP Cuff Size for Measurement of BP in Adults

Mid-Arm Circumference	Usual Cuff Size
22–26 cm	Small adult
27–34 cm	Adult
35–44 cm	Large adult
45–52 cm	Adult thigh

Whelton et al.. *Hypertension* 2018; 71:e13-e115.

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CLINICAL PEARL #2

Automated Office Blood Pressure (AOBP) Readings with an **oscillometric device** should now be the preferred method for recording BP in routine **adult** clinical office practice.

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Devices



Myers MG. et al. *Hypertension* 2010;55:195-200.

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Accurate Measurement of In-Office Blood Pressure

Recommendations for Accurate Measurement of In-Office Blood Pressure		
1: Strong (Benefit >>> Risk) 2a: Moderate (Benefit >> Risk) certainty is reasonable/useful/effective 2b: Weak (Benefit ≥ Risk), may/might be considered, may/might be reasonable		
COR	LOE	Recommendations
2a	C-EO	2. When measuring in-office BP in adults, it is reasonable to use the <u>oscillometric method</u> with an <u>automated device</u> over the auscultatory method. Not True in Pediatrics where the auscultatory method is still used.

Jones D.W. et al. *Circulation* Vol 152, Iss 11 Sept 16, 2025. Pages e114-e218. 2025 Guideline for the Prev, Det. Eval. And Rx of HTN in Adults.



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Cuffless Blood Pressure Devices



Recommendation for Cuffless Blood Pressure Devices		
COR	LOE	Recommendation
3: No Benefit	C-LD	1. In adults, the use of cuffless BP devices is not recommended for the <u>diagnosis or management</u> of high BP.

Getting closer but still not validated for clinical use

Jones D.W. et al. *Circulation* Vol 152, Iss 11 Sept 16, 2025. Pages e114-e218. 2025 Guideline for the Prev, Det. Eval. And Rx of HTN in Adults.

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CLINICAL PEARL #3

Office Blood Pressure (**OBP**) measurement should solely be used as a **screening** method to suggest the diagnosis of hypertension and Out-Of-Office BP measurement (Ambulatory or **Home-Self**) should be used as a diagnostic method to **confirm** the diagnosis of hypertension.

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Ambulatory Blood Pressure Monitoring and Home (SELF) Blood Pressure Monitoring

1: Strong (Benefit >>> Risk)
2a: Moderate (Benefit >> Risk) certainty is reasonable/useful/effective
2b: Weak (Benefit > Risk), may/might be considered, may/might be reasonable

Recommendations for Ambulatory Blood Pressure Monitoring (ABPM) and Home Blood Pressure Monitoring (HBPM)		
Referenced studies that support the recommendations are summarized in the evidence table.		
COR	LOE	Recommendations
1	A	1. In adults with suspected hypertension, out-of-office BP measurements by either ABPM or HBPM are recommended to confirm the diagnosis of hypertension.

Jones D.W. et al. *Circulation* Vol 152, Iss 11 Sept 16, 2025. Pages e114-e218. 2025 Guideline for the Prev, Det. Eval. And Rx of HTN in Adults.

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Circulation

AHA POLICY STATEMENT

Self-Measured Blood Pressure Monitoring at Home

A Joint Policy Statement From the American Heart Association and American Medical Association

www.validatebp.orgfor approved
home BP devices

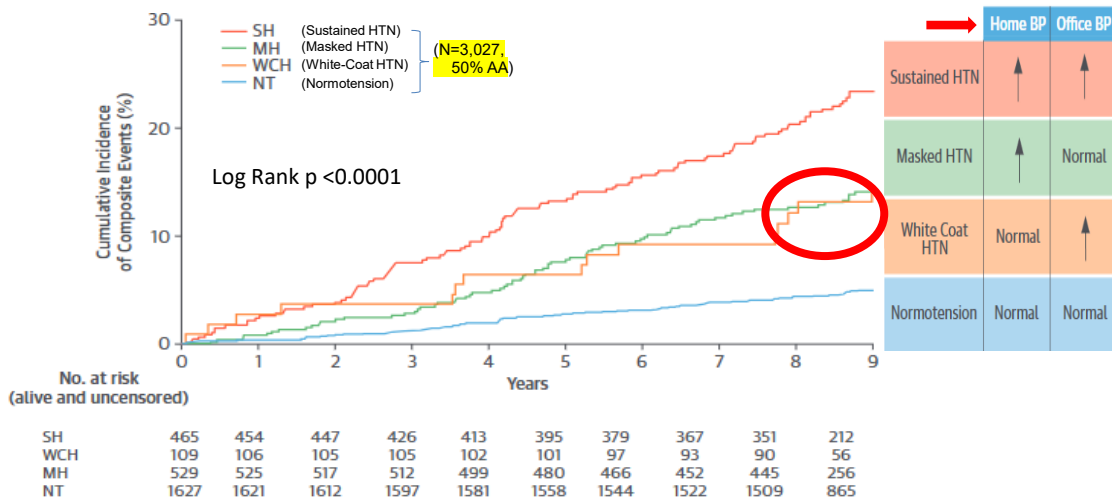
ABSTRACT: The diagnosis and management of hypertension, a common cardiovascular risk factor among the general population, have been based primarily on the measurement of blood pressure (BP) in the office. BP may differ considerably when measured in the office and when measured outside of the office setting, and higher out-of-office BP is associated with increased cardiovascular risk independent of office BP. Self-measured BP monitoring, the measurement of BP by an individual outside of the office at home, is a validated approach for out-of-office BP measurement. Several national and international hypertension guidelines endorse self-measured BP monitoring. Indications include the diagnosis of white-coat hypertension and masked hypertension and the identification of white-coat effect and masked uncontrolled hypertension. Other indications include confirming the diagnosis of resistant hypertension and detecting morning hypertension. Validated self-measured BP monitoring devices that use the oscillometric method are preferred, and a standardized BP measurement and monitoring protocol should be followed. Evidence

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Karen L. Margolis, MD,
MPH
Michael K. Rakotz, MD,
FAHA
Gregory Wozniak, PhD
On behalf of the American
Heart Association and
the American Medical
Association

Shimbo D., Artinian N, Basile J. et al. *Circulation* 2020; 142:e42-e63. July 28, 2020.

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Composite CV Events Associated with Masked and White-Coat vs Sustained and Normotension: The Dallas Adult Heart Study

Tientcheu. D. et al. *J Am Coll. Cardiol.* 2015; Vol 66 Issue 20;pg 2159-2169..

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How to measure your blood pressure at home

Follow these steps for an accurate blood pressure reading

1 PREPARE

Avoid caffeine, cigarettes and other stimulants 30 minutes before you measure your blood pressure.

Wait at least 30 minutes after a meal.

If you're on blood pressure medication, measure your BP **before** you take your medication.

Empty your bladder beforehand.

Find a quiet space where you can sit comfortably without distraction.

2 POSITION

POSITION ARM SO CUFF IS AT HEART LEVEL

PUT CUFF ON BARE ARM, ABOVE ELBOW AT MID-ARM

KEEP ARM SUPPORTED, PALM UP, WITH MUSCLES RELAXED

SIT WITH LEGS UNCROSSED

KEEP FEET FLAT ON THE FLOOR

KEEP YOUR BACK SUPPORTED

3 MEASURE

Rest for five minutes while in position before starting.

Take two or three measurements, one minute apart.

Keep your body relaxed and in position during measurements.

Sit quietly with no distractions during measurements—avoid conversations, TV, phones and other devices.

Record your measurements when finished.

TARGET:BP™

American Medical Association. Not to be used.

AMA

www.TARGETBP.org

This Prepare, position, measure handout was adapted with permission of the American Medical Association and The Johns Hopkins University. The original copyrighted content can be found at <https://www.ama-assn.org/ama-johns-hopkins-blood-pressure-resources>.

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Centers for Medicare and Medicaid Services (CMS) Incentives for Using SMBP (Self or Home Measured BP): Coverage & Reimbursement

2026 CPT codes for Self or Home Measured BP

- Medicare has coverage for Self or Home Measured BP in the 2026 fee schedule

99473: Education/Training

SMBP using a device validated for clinical accuracy; patient education/training and device calibration

- Can be submitted **once**
- Staff time = \$11-\$16 from Medicare (in 2026) and \$13-\$29 for commercial payers.

99474: Monthly Patient Use

SMBP using a **device validated** for clinical accuracy; separate **self-measurements of two readings, one minute apart, twice daily** over a 30-day period (**minimum of 12 readings**), **collection of data reported** by the **patient and/or caregiver** to the **physician** or other **qualified health care professional**, with report of average systolic and diastolic pressures and **subsequent communication of a treatment plan to the patient**

- Can be submitted **monthly**
- Provider = Medicare national average reimbursement for this code is approximately (\$51.54) in non-facility settings and (\$32.44) in facility settings, though commercial and Medicaid rates vary. **Will increase the use of telehealth in BP control**

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Home or Self BP Measurement: Proper Elements for Monitoring of Home BP

Element	Comments	Basile's Approach
Frequency of BP readings	At least 2, measured 30-60 seconds apart	2 readings. 1-minute apart
Time of day	AM before medications and eating PM before medications, either before dinner or before bedtime	Twice- 1) When first rising 2) Before getting in bed to sleep
Minimum readings if BP uncontrolled	At least 12 readings over 3-7 days Some suggest discarding first day	1 week of the month
Goal	Average BP <130/<80	Discard first day upper arm device
Type of device	Validated upper arm oscillometric device preferred Wrist devices only in settings of large arm circumferences	www.validatebp.org

Table 3. Cluett J. L. and William J.H. Am J Kidney Dis. 84(3):374-387. Published online July 24, 2024.

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CLINICAL PEARL #4

Out Of Office (Home or Self) BP Measurement Is a Better Predictor of CV Events Than Office BP and at least as good a predictor of risk as 24-hr ABPM which is not often available in many practices

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Ambulatory Blood Pressure Monitoring and Home (SELF) Blood Pressure Monitoring



Recommendations for Ambulatory Blood Pressure Monitoring and Home Blood Pressure Monitoring (HBPM)		
Referenced studies that support the recommendations are summarized in the evidence table.		
COR	LOE	Recommendations
1	A	2. In adults who are taking antihypertensive medication, HBPM is recommended for monitoring the titration of BP-lowering medication, along with cointerventions such as patient education, telehealth counseling, and clinical interventions.

Jones D.W. et al. *Circulation* Vol 152, Iss 11 Sept 16, 2025. Pages e114-e218. 2025 Guideline for the Prev, Det. Eval. And Rx of HTN in Adults.

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Prognostic Significance of Home BP and Developing CV Disease

- 4,939 patients with HTN
- Age: 70 ± 6 yrs
- Data: baseline office and 4-day home BP (2 readings/day) taken with Omron 705 CP
- Follow-up: Mean 3.2 yrs

O=office; H=Home; (-)=normal; (+)=high

	O-/H-	O+/H+	O-/H+	O+/H-
RR	1.00	1.96	2.06	1.18

- Home BP is more strongly related to target organ damage and CV outcomes than is office BP

Bobrie G et al. *Arch Intern Med.* 2001;161:2205.
Bobrie G et al. *JAMA.* 2004;291:1342.

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Prognostic Ability of Home BP vs 24-hr ABPM Measurement: A Systematic Review and Meta-Analysis of Outcome Studies

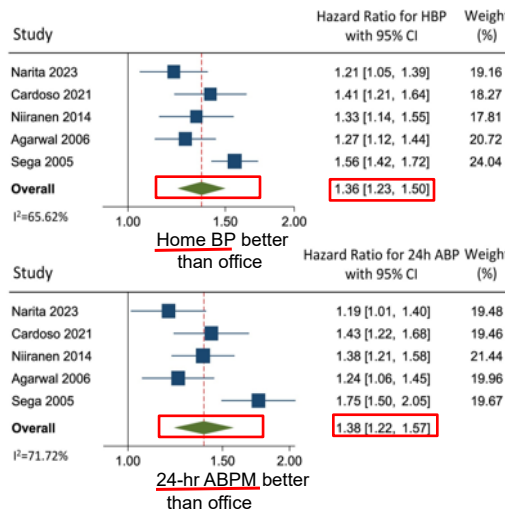
Hazard Ratios per 10 mmHg increase in Systolic Home BP (1.36) and 24-hr ABPM (1.38) for the Primary CV Endpoint in Each Study

- Meta-analysis of 5 studies (n=4439)
- Mean age 57
- 52% men
- 68% HTN
- 15% Diabetes
- 11% CV Disease
- For each 10 mm Hg increase in SBP no Difference in Outcomes between Home vs 24-hr ABPM

Home BP better than Office BP



24-hr ABPM Better than Office BP

Conclusion:

Home and 24-hr ambulatory BP have similar ability in predicting CV outcome and both were superior to Office BP.

Fig 1. Kolias A. et al. *Journal of Hypertension* 42(3):385-392, March 2024.

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Out-of-Office (Self) Blood Pressure Measurement



- Provides a better risk prediction than office-based monitoring
- Correlates better with the cardiac (LVH) and renal (albuminuria) consequences of hypertension than office readings

Use and Advantages:

- Helps identify WCH and Masked Hypertension
- Improves patient adherence
- Reduces overall costs of care

Pickering TG, White W. *J Clin Hypertens*. 2008;10:850-855;

Izzo JL, Sica DA, Black HR, eds, and the Council for High Blood Pressure Research (American Heart Association). *Hypertension Primer: The Essentials of High Blood Pressure*. 4th ed. Philadelphia; 2008:339-342.

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CLINICAL PEARL #5

Be Familiar with the Initial Laboratory Tests in the W/Up of the New Patient Diagnosed with Hypertension

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Routine 2025 Laboratory Testing for New Diagnosis of HTN



Diagnostic Tests
Complete blood count
Serum sodium, potassium, calcium
Serum creatinine with estimation of glomerular filtration rate (based on the 2021 CKD-EPI Creatinine Equation)
Lipid profile
Fasting blood glucose or Hgb A1C
Thyroid-stimulating hormone
Urinalysis
Urine albumin-to-creatinine ratio;urine protein-to-creatinine ratio
ECG

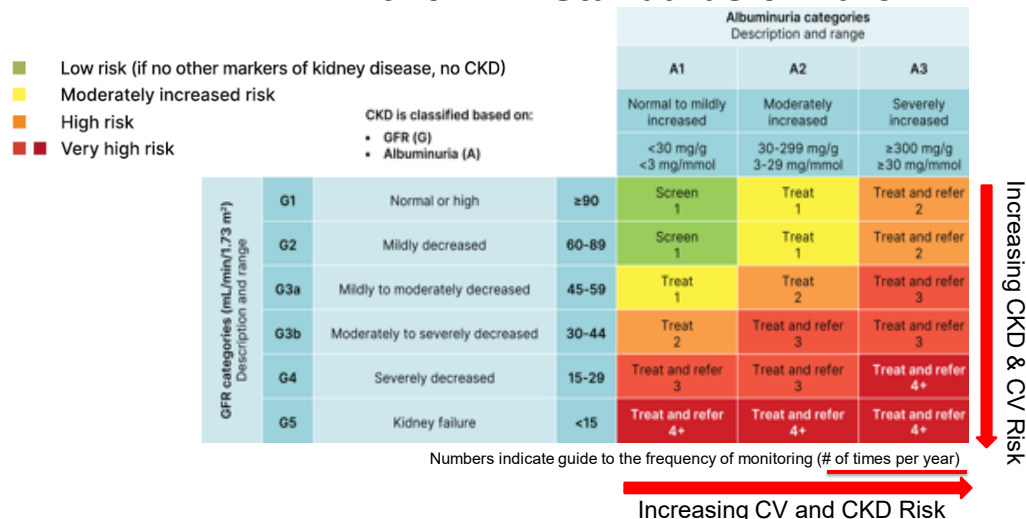
 =new test in 2025

ECG indicates electrocardiogram.

Table 6. Jones D.W. et al. *Circulation* Vol 152, Iss 11 Sept 16, 2025. Pages e114-e218. 2025 Guideline for the Prev, Det. Eval. And Rx of HTN in Adults.

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Monitoring Disease Progression in Chronic Kidney Disease: 2026 ADA Standards of Care



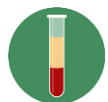
- Recognize that small fluctuations in GFR are common and are not necessarily indicative of progression.
- Repeat measurement at 3 months to make dx and over q 3-6 months to properly follow changes in UACR.

Figure 11.1 Diabetes Care. 2026;49(Supplement_1):S246-S260. doi:10.2337/dc26-S011

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2024 ESC Guidelines for Managing Elevated BP and HTN

This Is New



- Renin and aldosterone should be measured in all patients with HTN:



McEvoy JW, et al; ESC Scientific Document Group. *Eur Heart J*. 2024; 45:3912-4018.

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The Endocrine Society 2025: Screen All With Hypertension for Primary Aldosteronism

1. PA screening is suggested in all individuals with hypertension.

Adler, G.K.et al. Endocrine Society Guideline *Journal Clin. Endocrine and Metab.* July 14 2025; <https://doi.org/10.1210/clinem/dgaf284>.

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2025 AHA/ACC Guideline: Screening for Primary Aldosteronism

1: Strong (Benefit >>> Risk)
2a: Moderate (Benefit >> Risk) certainty is reasonable/useful/effective
2b: Weak (Benefit ≥ Risk), may/might be considered, may/might be reasonable

COR	LOE	Recommendations
1	C-EO	1. In adults with hypertension, <u>screening for primary aldosteronism</u> is recommended in the presence of any of the following conditions to increase rates of detection, diagnosis, and specific targeted therapy: <u>resistant hypertension (regardless of whether hypokalemia is present), hypokalemia (spontaneous or diuretic induced), OSA, incidentally discovered adrenal mass, family history of early-onset hypertension, or stroke at a young age (<40 years).</u>

Jones D.W. et al. *Circulation* Vol 152, Iss 11 Sept 16, 2025. Pages e114-e218. 2025 Guideline for the Prev, Det. Eval. And Rx of HTN in Adults.

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2025 AHA/ACC Guideline: Screening for Primary Aldosteronism

1: Strong (Benefit >>> Risk)

2a: Moderate (Benefit >> Risk) certainty is reasonable/useful/effective

2b: Weak (Benefit ≥ Risk), may/might be considered, may/might be reasonable

Recommendations for Primary Aldosteronism		
2b	C-EO	2. In adults with <u>stage 2 hypertension</u> , screening for primary aldosteronism may be considered to increase rates of detection, diagnosis, and specific targeted therapy.

Jones D.W. et al. *Circulation* Vol 152, Iss 11 Sept 16, 2025. Pages e114-e218. 2025 Guideline for the Prev, Det. Eval. And Rx of HTN in Adults.

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CLINICAL PEARL #6

The Definition of Hypertension Should begin at 130/80 mmHg and the Target for Control Should be < 130 mm Hg, with **encouragement** in those at increased risk for CVD to achieve a SBP <120 mm Hg to reduce the risk of cardiovascular events and total mortality.

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2025 Blood Pressure Categories

BLOOD PRESSURE CATEGORY	SYSTOLIC mm Hg (top/upper number)		DIASTOLIC mm Hg (bottom/lower number)
NORMAL	LESS THAN 120	and	LESS THAN 80
ELEVATED	120–129	and	LESS THAN 80
STAGE 1 HYPERTENSION (High Blood Pressure)	130–139	or	80–89
STAGE 2 HYPERTENSION (High Blood Pressure)	140 OR HIGHER	or	90 OR HIGHER
w/o acute sx's → SEVERE HYPERTENSION (If you don't have symptoms, call your health care professional)	HIGHER THAN 180	and/or	HIGHER THAN 120
HYPERTENSIVE EMERGENCY (If you have any of these symptoms*, call 911)	HIGHER THAN 180	and/or	HIGHER THAN 120
*symptoms: chest pain, shortness of breath, back pain, numbness, weakness, change in vision, or difficulty speaking			

* We have abandoned the term Hypertensive Urgency

Jones D.W. et al. *Circulation* Vol 152, Iss 11 Sept 16, 2025. Pages e114–e218. 2025 Guideline for the Prev, Det. Eval. And Rx of HTN in Adults.

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2025 AHA/ACC HTN Guideline: What's New

- Severe HTN without evidence of acute TOD

No longer called a hypertensive urgency

- Requires a good hx, physical examination, and labs to be sure.
- There should not be aggressive BP lowering in the short-term.
- Instead, the clinician should just reinstitute previously used oral HTN medications or add additional HTN medications, preferably in the outpatient setting to get BP better controlled. **No Clonidine, No ER visit.**
- Requires follow-up in 24-48 hours. **"Hypertension is an outpatient disease"**

Jones D.W. et al. *Circulation* Vol 152, Iss 11 Sept 16, 2025. Pages e114–e218. 2025 Guideline for the Prev, Det. Eval. And Rx of HTN in Adults.

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What Should the BP Target Be?

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BONUS DIGITAL CONTENT

Practice Guidelines

Blood Pressure Targets in Adults With Hypertension: A Clinical Practice Guideline From the AAFP

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Melanie D. Bird, PhD, MSAM, American Academy of Family Physicians, Leawood, Kansas

Am Fam Physician. 2022;106(6):721-722

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TABLE 4

Comparison of Recommended Blood Pressure Targets in Recent Guidelines

Guideline	18 to 59 years of age (mm Hg)	60 to 69 years of age (mm Hg)	70 to 79 years of age (mm Hg)	Older than 80 years (mm Hg)
2022 American Academy of Family Physicians*	< 140/90	< 140/90	< 140/90	< 140/90
2022 National Institute for Health and Care Excellence ¹³	< 140/90	< 140/90	< 140/90	< 150/90
2021 European Society of Hypertension Council ¹⁴	< 130/80†	< 130/80†	< 140/80	< 140/80
2020 International Society of Hypertension‡ ⁴⁴	< 130/80	< 140/90§	< 140/90	< 140/90
2020 U.S. Department of Veterans Affairs/U.S. Department of Defense ¹⁵	< 130/90¶	< 150/90	< 150/90	< 150/90
2017 American College of Cardiology/American Heart Association* ¹⁶	< 130/80	< 130/80	< 130/80	< 130/80
2017 American College of Physicians and American Academy of Family Physicians ¹¹	—	< 150/90	< 150/90	< 150/90
2014 Eighth Joint National Committee ¹⁰	< 140/90	< 150/90	< 150/90	< 150/90

*—Lower targets are reasonable based on clinical judgment and patient preferences or values.

†—A target of less than 140/90 mm Hg is recommended for patients with chronic kidney disease.

‡—Recommendation is to treat all patients to less than 140/90 mm Hg but states it is optimal to treat persons younger than 65 years and people with coronary artery disease, chronic kidney disease, heart failure, previous stroke, chronic obstructive pulmonary disease, or diabetes mellitus to less than 130/80 mm Hg (less than 140/80 mm Hg in older patients).

§—Recommendation is to transition from target of 130/80 mm Hg to 140/90 mm Hg at 65 years of age.

||—A target of less than 140/90 mm Hg is recommended in patients with diabetes.

¶—Recommendation is to treat all patients 18 to 59 years of age (including those with diabetes) to a systolic blood pressure target of less than 130 mm Hg. For patients 30 years and older, a diastolic blood pressure target of less than 90 mm Hg is recommended.

Information from references 10, 11, 13–16, and 44.

Am Fam Physician. 2022;106(6):721-722

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The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

A Randomized Trial of Intensive versus Standard Blood-Pressure Control

The SPRINT Research Group*

Intensive Group < 120 mm Hg
Standard Group < 140 mm Hg

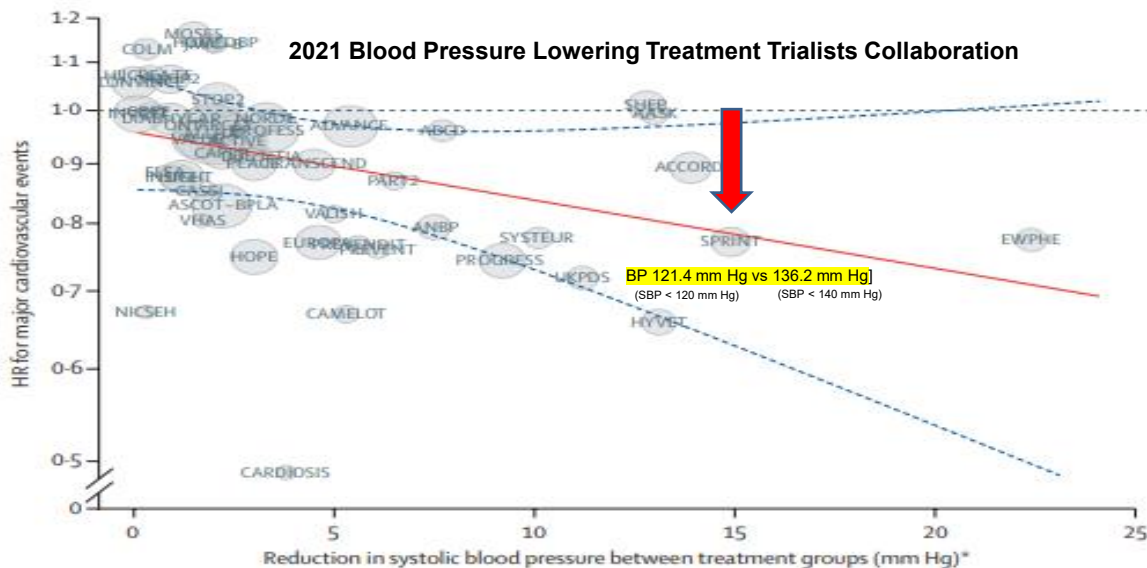
9,361 pts
Mean 68 yrs old
~30% > age 75
16.7% Clinical CVD
26% with CKD
No Diabetes, No stroke

Primary Outcome: MI, ACS
HF, Stroke, CV Death

*N Engl J Med 2015;373:2103-16.

42

Association Between Intensity of BP Reduction and Relative Rx Effects for Prevention of Major CV Events

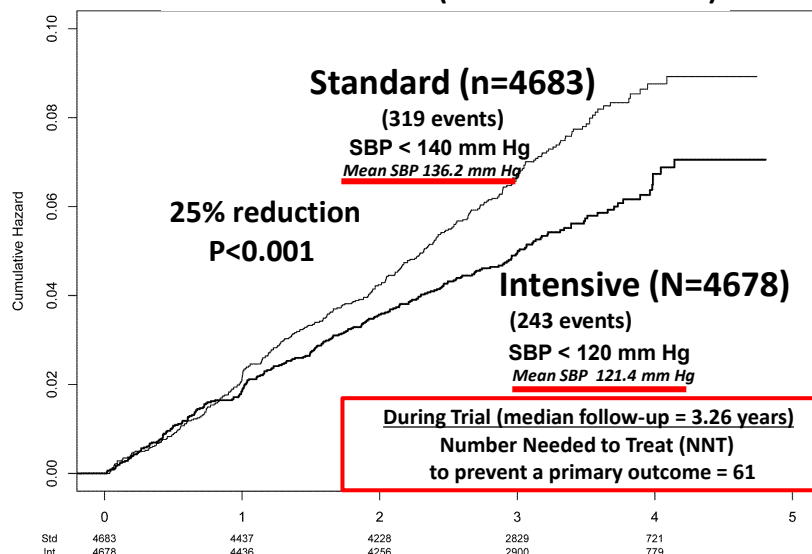


Rahimi K et al. *Lancet* 2021;397(10285):1625-1638. Blood Pressure Lowering Treatment Trialists Collaboration

43

SPRINT Primary Outcome (CVD) Cumulative Hazard

Hazard Ratio = 0.75 (95% CI: 0.64 to 0.89)



The SPRINT Research Group. *N Engl J Med*. 2015;373:2103-16

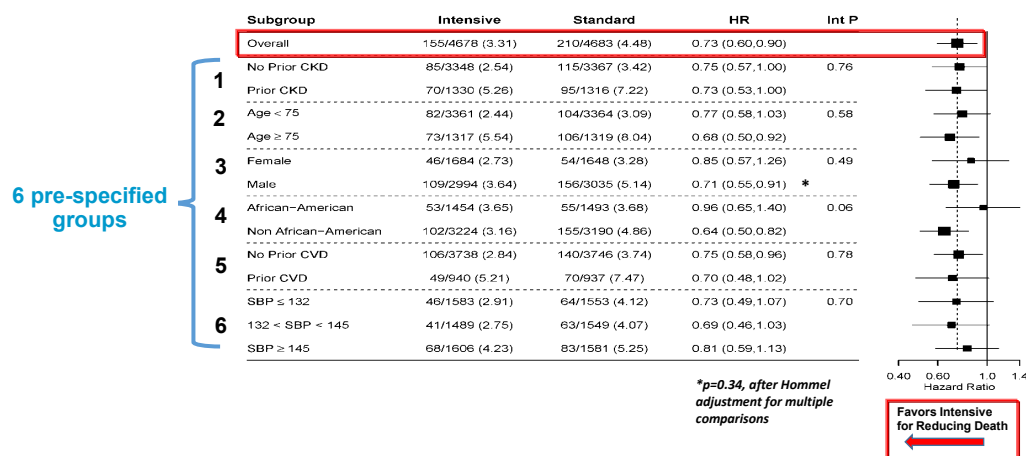
SPRINT
Systolic Blood Pressure Intervention Trial

	Hazard Ratio	P value
Primary Outcome	0.75	<0.001
Components		
All MI	0.83	0.19
Non-MI ACS	1.00	0.99
All Stroke	0.89	0.50
All HF	0.62	0.002
CVD Death	0.57	0.005

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All Cause Mortality Experience in the Six Pre-Specified Subgroups of Interest

Figure 4: All-Cause Mortality

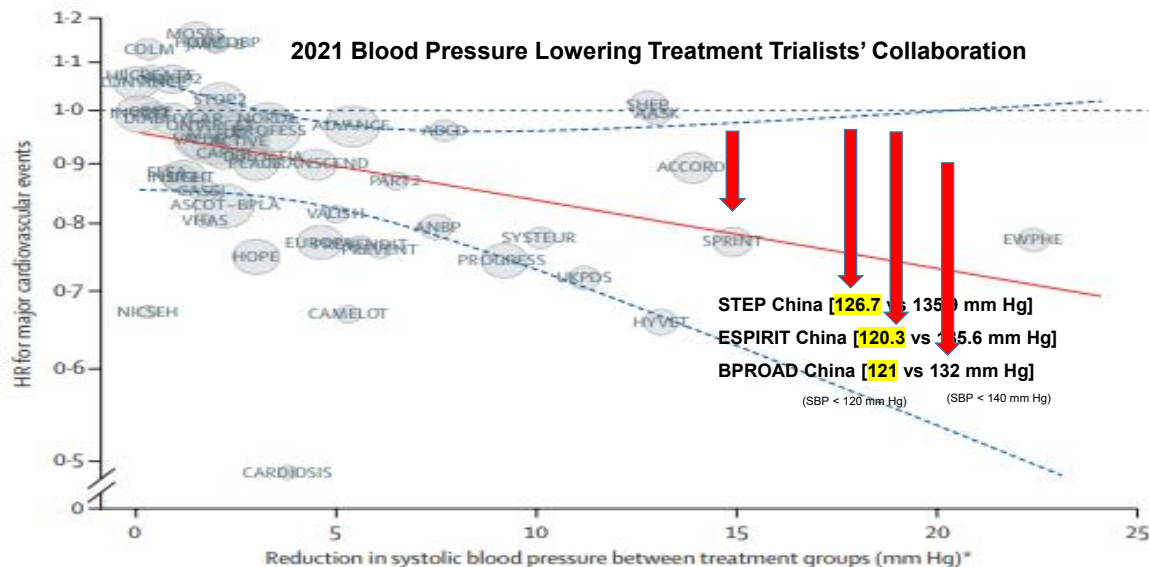


SPRINT Research Group. *N Engl J Med.* 2015;373:2103-2116.



45

Association Between Intensity of BP Reduction and Relative Rx Effects for Prevention of Major CV Events



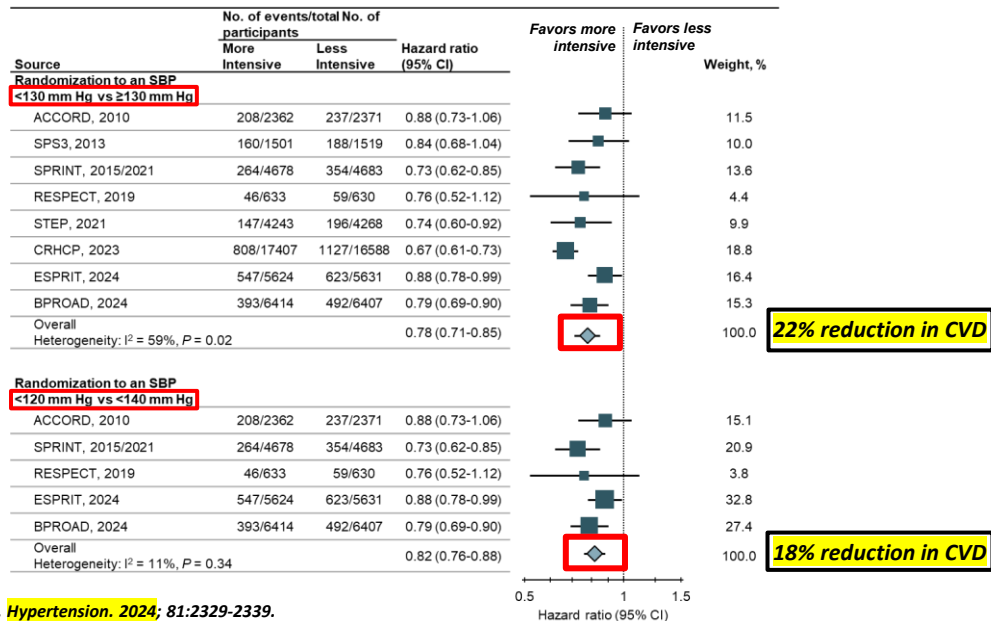
Rahimi K et al. *Lancet* 2021;397(10285):1625-1638. Blood Pressure Lowering Treatment Trialists' Collaboration

46

Major CVD Events, Randomization to More vs Less Intensive SBP Lowering

(Stroke, CHD, HF, CVD mortality)

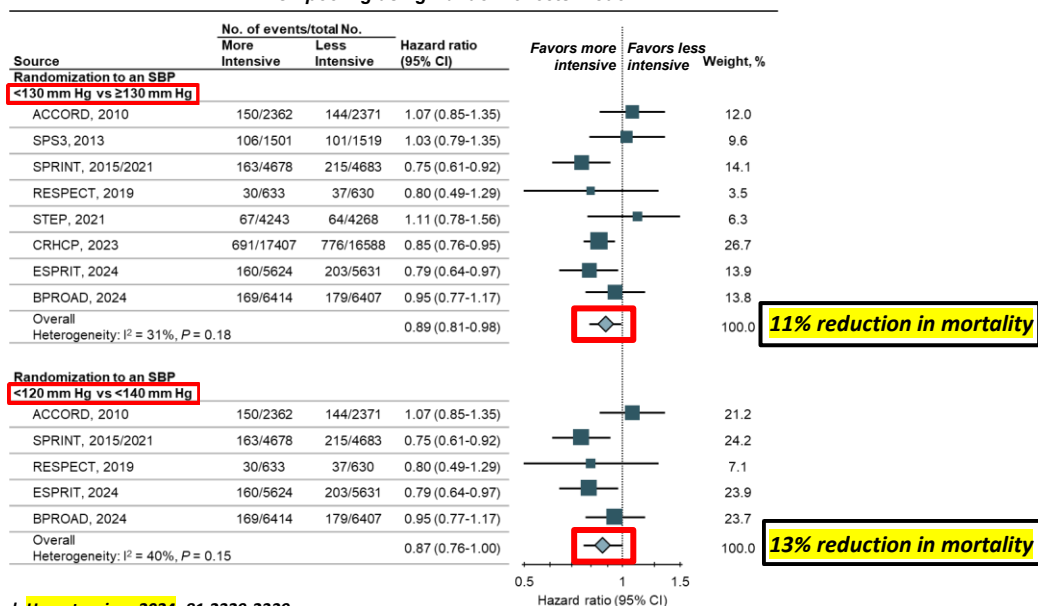
RCT pooling using Random effects model

**High quality for BP
and CVD outcomes
assessment**Adapted from Whelton PK et al. *Hypertension*. 2024; 81:2329-2339.

47

All-Cause Mortality, Randomization to More vs Less Intensive SBP Lowering

RCT pooling using Random effects model

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

48

2025 AHA/ACC HTN Guideline:

1: Strong (Benefit >>> Risk)

2a: Moderate (Benefit >> Risk) certainty is reasonable/useful/effective

2b: Weak (Benefit ≥ Risk), may/might be considered, may/might be reasonable



Blood Pressure Goal for Patients With Hypertension

Recommendations for Blood Pressure Goal for Patients With Hypertension

Referenced studies that support recommendations are summarized in the evidence table.

COR	LOE	Recommendations
1	A	1. In adults with confirmed hypertension who are at increased risk* for CVD, an SBP goal of at least <130 mm Hg, with encouragement to achieve SBP <120 mm Hg, is recommended to reduce the risk of cardiovascular events and total mortality.
1	B-R	3. In adults with confirmed hypertension who are at increased risk* for CVD, a DBP target of <80 mm Hg is recommended to reduce the risk of cardiovascular events and total mortality.
2b	B-NR	2. In adults with confirmed hypertension who are not at increased risk* for CVD , an SBP goal of <130 mm Hg, with encouragement to achieve SBP <120 mm Hg, may be reasonable to reduce risk of further elevation of BP.
2b	B-NR	4. In adults with confirmed hypertension who are not at increased risk* for CVD , a DBP target of <80 mm Hg may be reasonable to reduce the risk of cardiovascular events.

*Increased risk is defined as a 10-year predicted risk for CVD events of ≥7.5% using the PREVENT risk Calculator, or have diabetes, ASCVD, or CKD

Jones D.W. et al. *Circulation* Vol 152, Iss 11 Sept 16, 2025. Pages e114-e218. 2025 Guideline for the Prev, Det. Eval. And Rx of HTN in Adults.

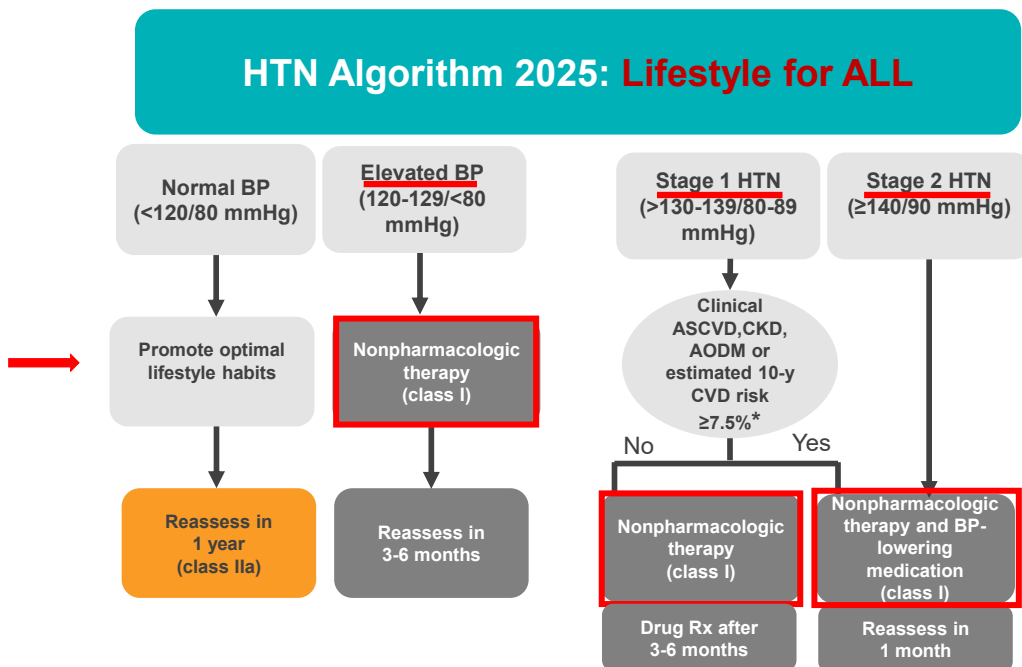
49



CLINICAL PEARL #7

All patients with either elevated BP or hypertension, regardless of risk, benefit from Lifestyle Modification, almost all a Class I and Level of Evidence A recommendation.

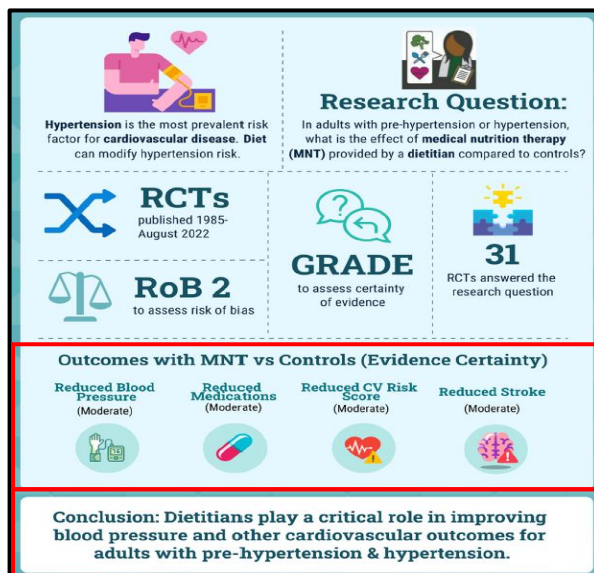
50



Adapted from Jones D.W. et al. *Circulation* Vol 152, Iss 11 Sept 16, 2025. Pages e114-e218. 2025 Guideline for the Prev, Det. Eval. And Rx of HTN in Adults.

51

Medical Nutrition Therapy Provided by Dietitians for Adults with Pre-Hypertension or Hypertension: A Systematic Review and Meta-Analysis



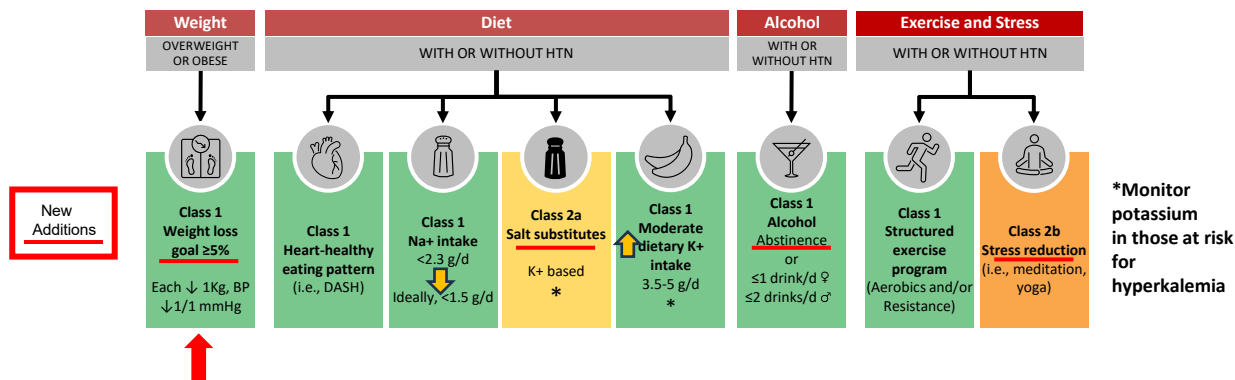
Senkus K.E. et al. *Am Jnl of Clinical Nutrition*. Vol 119, Issue 6, pg 1417-1442. June 2024

52



Treatment Starts with Non-Pharmacologic (Lifestyle) and Psychosocial Approaches

For All Adults, Lifestyle Changes Are Strongly Recommended to Prevent or Treat Elevated Blood Pressure and Hypertension.



Adapted from Jones D.W. et al. *Circulation* Vol 152, Iss 11 Sept 16, 2025. Pages e114-e218. 2025 Guideline for the Prev, Det. Eval. And Rx of HTN in Adults.

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2025 AHA/ACC Guideline: Treatment Starts with Non-Pharmacologic (Lifestyle and Stress Reduction) Rx



Recommendations for Lifestyle and Psychosocial Approaches

COR	LOE	Recommendations
		Weight
1	A	1. In adults who have overweight or obesity, <u>weight loss is recommended with a goal of at least 5% of body weight reduction to prevent or treat elevated BP and HTN.</u>

Jones D.W. et al. *Circulation* Vol 152, Issue 11 Sept 16, 2025. Pages e114-e218.

54

Trends in Central Obesity Prevalence Among Adults with Hypertension in the United States, 2001–2023

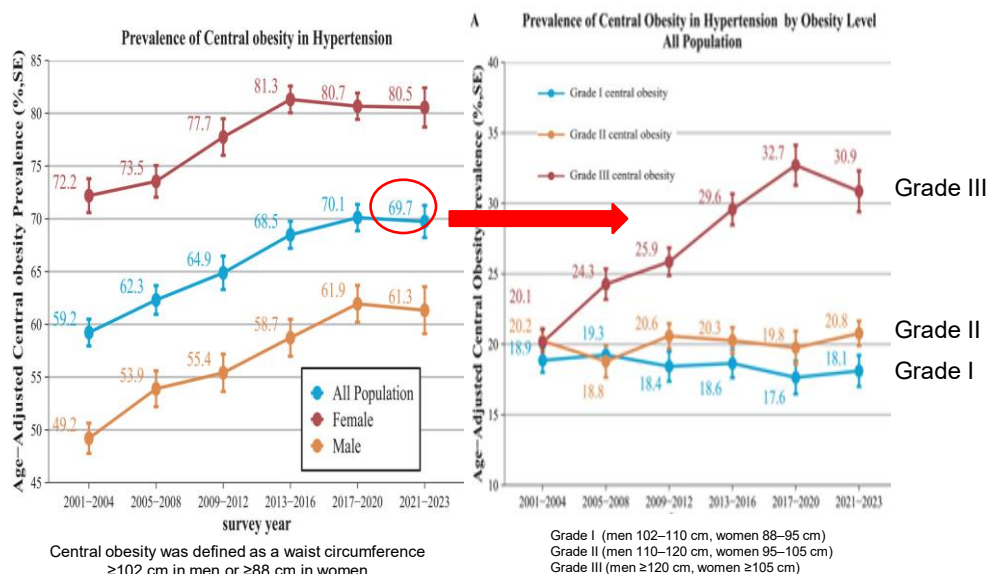


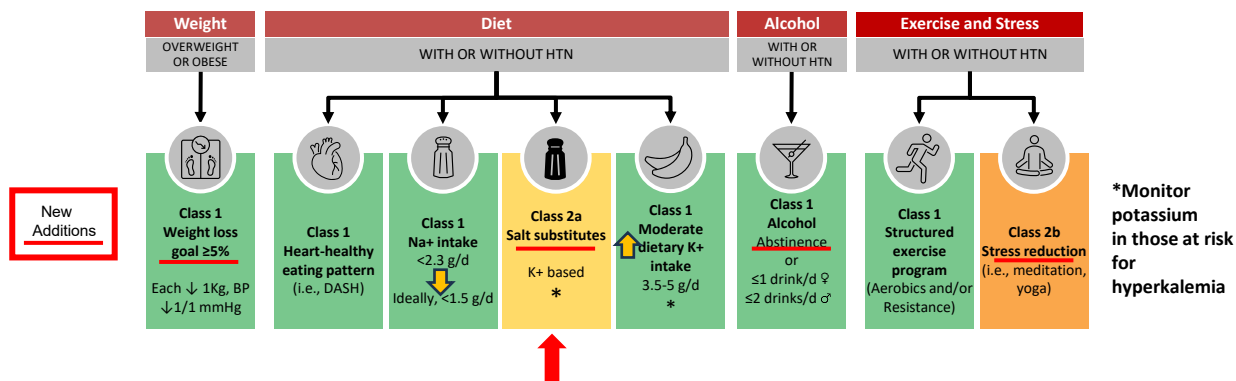
Fig 1 and 2A. Lin Y. et al. *J of Clinical Hypertension*, Volume: 28, Issue: 4, First published: 13 April 2026, DOI: (10.1111/jch.70252)

55



Treatment Starts with Non-Pharmacologic (Lifestyle) and Psychosocial Approaches

For All Adults, Lifestyle Changes Are Strongly Recommended to Prevent or Treat Elevated Blood Pressure and Hypertension.



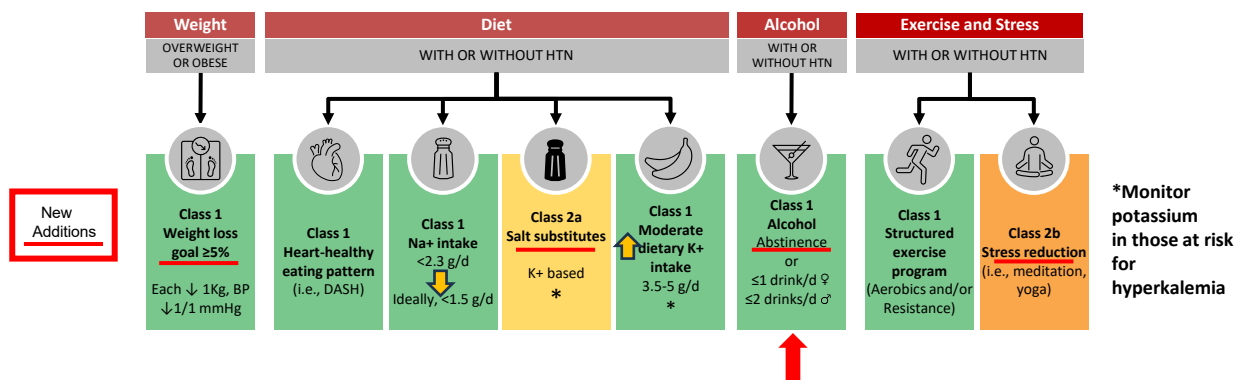
Adapted from Jones D.W. et al. *Circulation* Vol 152, Iss 11 Sept 16, 2025. Pages e114–e218. 2025 Guideline for the Prev, Det. Eval. And Rx of HTN in Adults.

56



Treatment Starts with Non-Pharmacologic (Lifestyle) and Psychosocial Approaches

For All Adults, Lifestyle Changes Are Strongly Recommended to Prevent or Treat Elevated Blood Pressure and Hypertension.



Adapted from Jones D.W. et al. *Circulation* Vol 152, Iss 11 Sept 16, 2025. Pages e114-e218. 2025 Guideline for the Prev, Det. Eval. And Rx of HTN in Adults.

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What's New in 2025 in Lifestyle Modifications

1: Strong (Benefit >>> Risk)
2a: Moderate (Benefit >> Risk) certainty is reasonable/useful/effective
2b: Weak (Benefit ≥ Risk), may/might be considered, may/might be reasonable

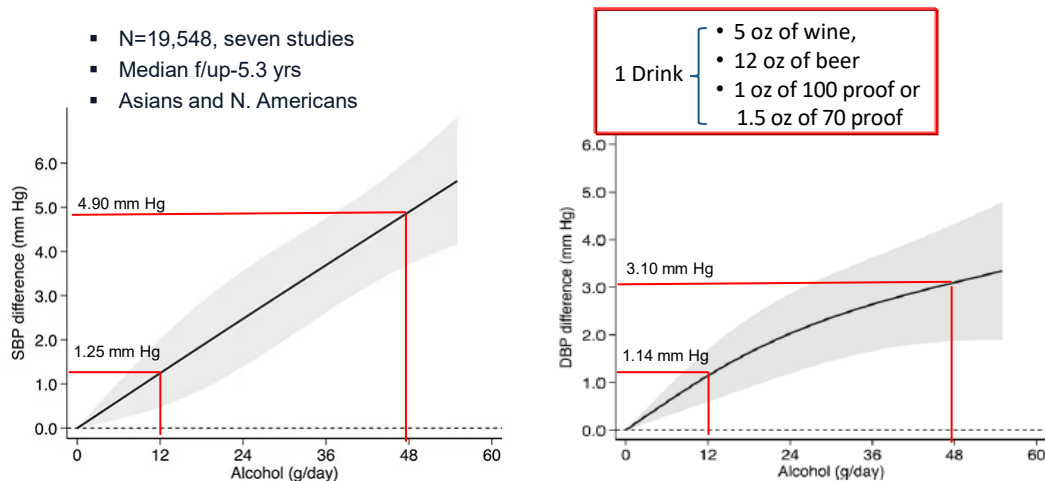
Class	Level	Alcohol
1	A	6. Adults with or without hypertension who currently consume alcohol should be advised to pursue a recommended goal of <u>abstinence</u> , or at least to reduce alcohol intake to ≤1 drink/day for women and ≤2 drinks/day for men <u>to prevent or treat elevated BP and hypertension.</u>

Jones D.W. et al. *Circulation* Vol 152, Iss 11 Sept 16, 2025. Pages e114-e218. 2025 Guideline for the Prev, Det. Eval. And Rx of HTN in Adults.

58

Alcohol Consumption and BP Elevation: A Meta-Analysis

[One Standard Drink = 12 To 14 G Alcohol]



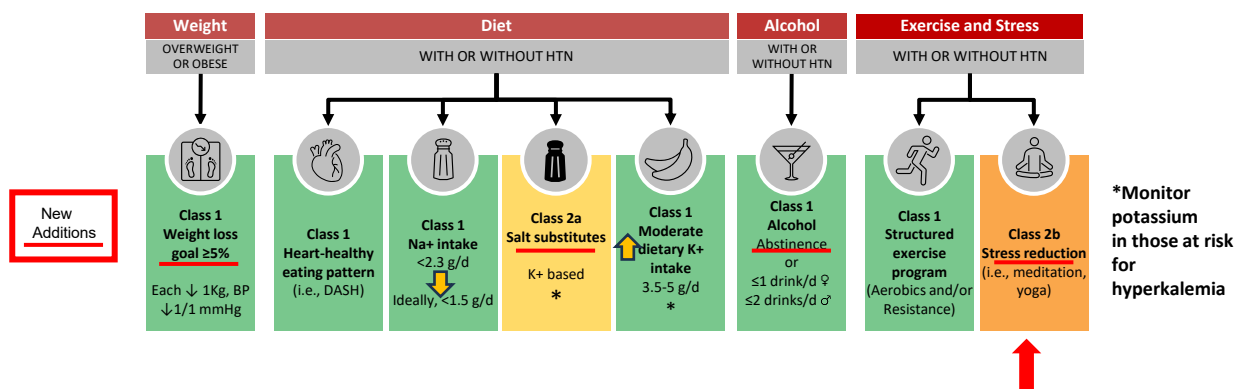
Di Federico et al. *Hypertension* 2023;80:1961-1969.

59



Treatment Starts with Non-Pharmacologic (Lifestyle) and Psychosocial Approaches

For All Adults, Lifestyle Changes Are Strongly Recommended to Prevent or Treat Elevated Blood Pressure and Hypertension.



Adapted from Jones D.W. et al. *Circulation* Vol 152, Iss 11 Sept 16, 2025. Pages e114-e218. 2025 Guideline for the Prev. Det. Eval. And Rx of HTN in Adults.

60

What's New in 2025 in Lifestyle and Psychosocial Modifications

1: Strong (Benefit >>> Risk)
 2a: Moderate (Benefit >> Risk) certainty is reasonable/useful/effective
 2b: Weak (Benefit > Risk), may/might be considered, may/might be reasonable

COE	LOE	
Class	Level	Stress Reduction
2b	B-R	8. In adults with or without hypertension, stress reduction through transcendental meditation may be reasonable to prevent or treat elevated BP and hypertension, as an adjunct to lifestyle or medication interventions.
2b	B-R	9. In adults with or without hypertension, other forms of stress management , such as breathing control techniques or yoga , may be reasonable to prevent or treat elevated BP and hypertension, as an adjunct to lifestyle or medication interventions.

Jones D.W. et al. *Circulation* Vol 152, Iss 11 Sept 16, 2025. Pages e114-e218. 2025 Guideline for the Prev, Det. Eval. And Rx of HTN in Adults.

61

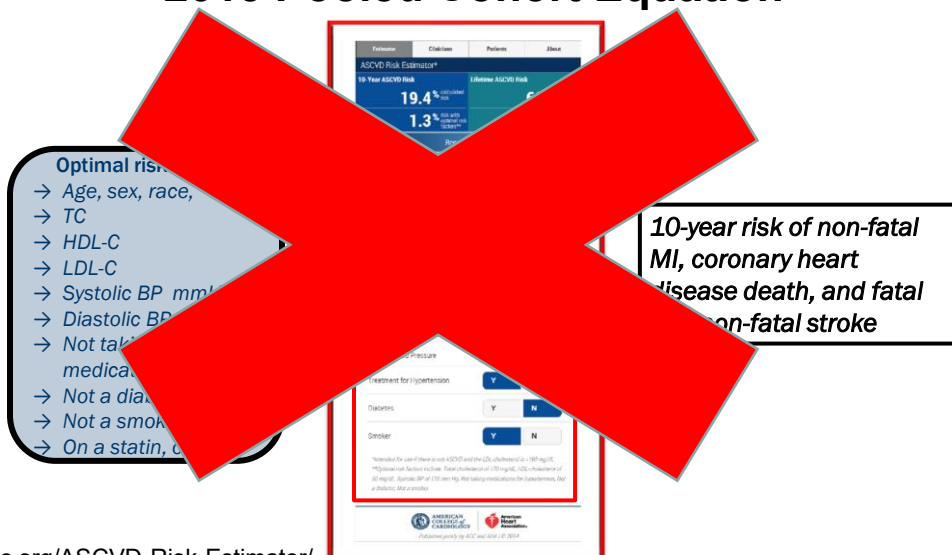


CLINICAL PEARL #8

The PREVENT Risk Estimator should be used in the primary prevention of those hypertensives w/o underlying CVD, diabetes, or CKD to predict their 10-year risk of CV disease. This allows us to decide which patients need lifestyle modification (LM) alone (**< 7.5% risk**) or LM with antihypertensive medications (**any of the above 3 conditions or ≥ 7.5% risk**) using the PREVENT risk estimator.

62

ACC/AHA ASCVD Risk Estimator Based on the 2013 Pooled Cohort Equation



<http://tools.acc.org/ASCVD-Risk-Estimator/>

Goff DC, et al. *J Am Coll Cardiol* 2014;63:2935-59

63

~~Pooled Cohort Equation~~ → PREVENT™

PCE

- 5 cohorts, 1960's-1990's (25,000 adults)
- Age 40-79, 10-year risk
- ASCVD risk only
- Overestimates risk in our more modern populations with better background therapy

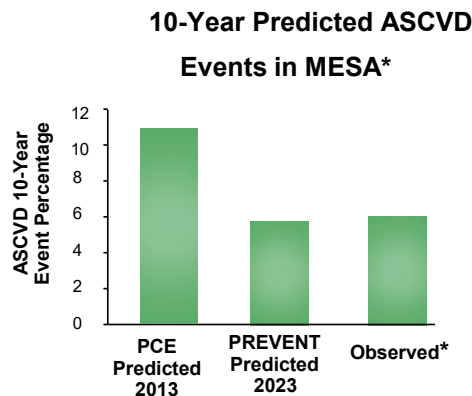
PREVENT

- 25 contemporary datasets (1998-2019); validated in another 21 datasets (6.6 million adults)
- Age 30-79, 10 & 30-year risk
- ASCVD, as well as CVD and heart failure risk
- Recalibrated to current event rates, better in women and older adults
- Not as well studied in minority(Asian) populations

Khan SS, et al. Novel Prediction Equations for Absolute Risk Assessment of Total Cardiovascular Disease Incorporating Cardiovascular-Kidney-Metabolic Health: A Scientific Statement From the American Heart Association. *Circulation*. 2023;148(24):1982-2004.

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Pooled-Cohort Equation (PCE-2013) vs PREVENT (2023)



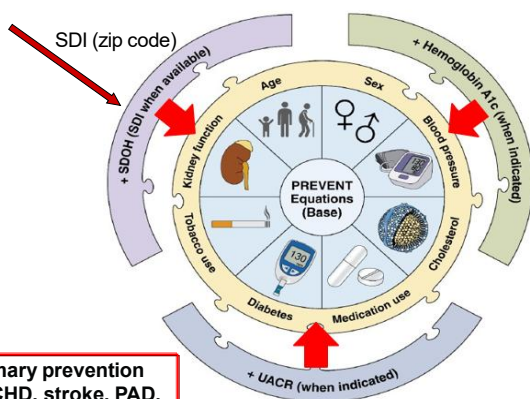
*MESA-Multi-Ethnic Study of Atherosclerosis

Murphy B et al. JACC Adv. 2025 Vol 4 No. 6 June 2025:101825 .

65

Predicting Risk of CVD EVENTS Calculator

NEW PARADIGM FOR CVD RISK: PREVENT™



Abbreviations: CVD indicates cardiovascular disease; PREVENT, Predicting Risk of CVD Events; SDI, social deprivation index; SDOH, social determinants of health; and UACR urine albumin-to-creatinine ratio.

Predictors:

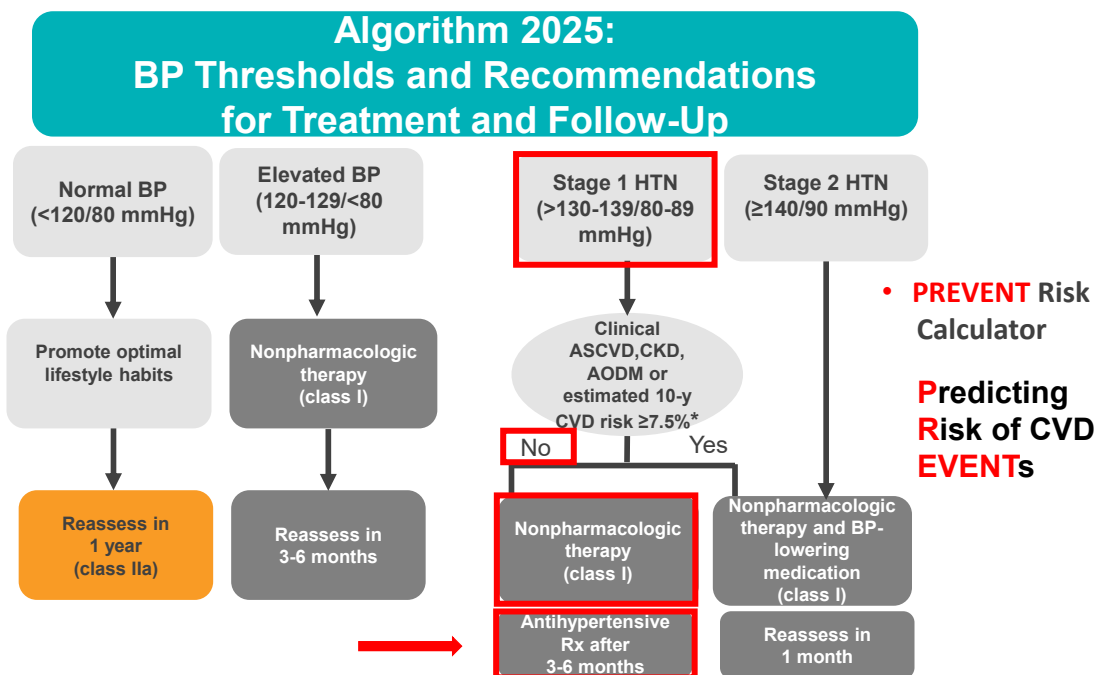
- Base: Traditional risk factors (Gender, Age, SBP, Total and HDL cholesterol, diabetes, use of anti-hypertensive and lipid-lowering medication, smoking, eGFR, and BMI)
- Add-on: UACR, HbA1c, SDI

● Risk of CVD ○ Risk of ASCVD ○ Risk of Heart Failure



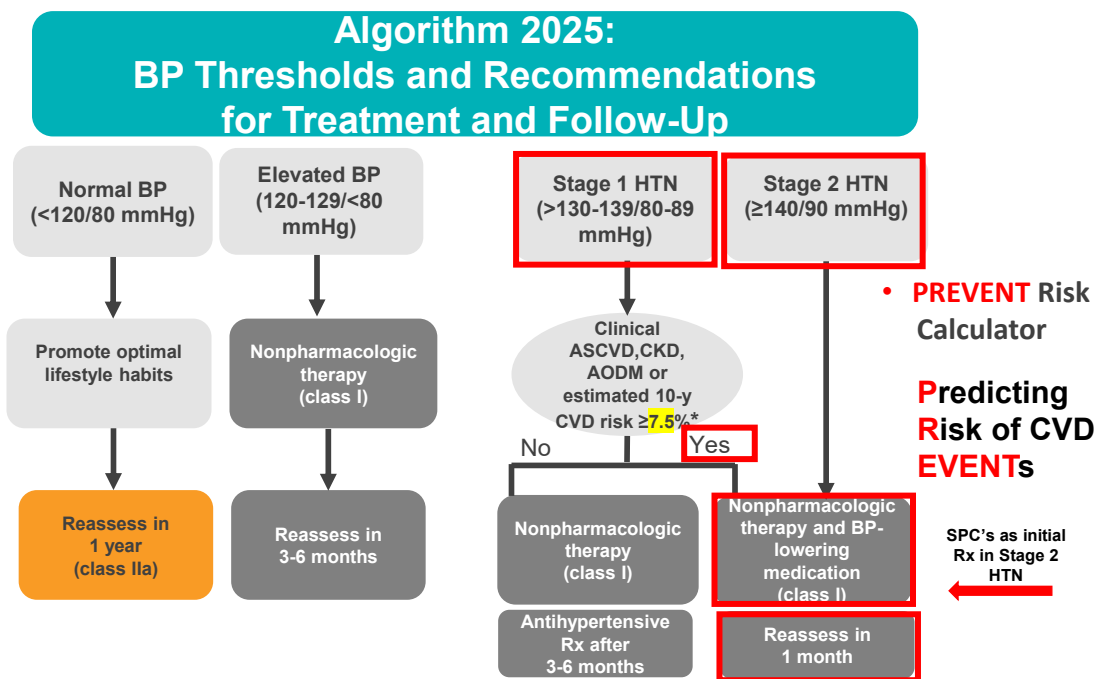
Khan SS et. al. *Circulation* 2023

66



Adapted from Jones D.W. et al. *Circulation* Vol 152, Iss 11 Sept 16, 2025. Pages e114-e218. 2025 Guideline for the Prev, Det. Eval. And Rx of HTN in Adults.

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Adapted from Jones D.W. et al. *Circulation* Vol 152, Iss 11 Sept 16, 2025. Pages e114-e218. 2025 Guideline for the Prev, Det. Eval. And Rx of HTN in Adults.

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CLINICAL PEARL #9

For Adults in whom you initiate Antihypertensive Drug Therapy, the first three drug classes chosen to control BP should be a thiazide-type diuretic (D), long-acting dihydropyridine CCB, or an ACEi or an ARB but not both to prevent CVD.

69

Drug Classes Used to Treat Hypertension

- | | |
|--|-------------------|
| <ul style="list-style-type: none">• Thiazide-type Diuretics• Calcium Channel Blockers• Angiotensin-converting Enzyme Inhibitorsor• Angiotensin Receptor Blockers | } First 3 Classes |
|--|-------------------|

- Mineralocorticoid receptor antagonists
- Potassium Sparing Diuretics
- Loop Diuretics
- Beta-adrenergic Blockers
- Alpha-1 Adrenoreceptor Antagonists
- Alpha/Beta blockers
- Direct-acting Vasodilators
- Central Sympatholytic Drugs
- Renin Inhibitors

70

2025 Guideline Initial Medication Selection for Treatment of Primary Hypertension

Recommendation for Initial Medication Selection for Treatment of Primary Hypertension

Referenced studies that support the recommendation are summarized in the evidence table.

COR	LOE	Recommendation
1	A	1. For adults initiating antihypertensive drug therapy, <u>thiazide-type diuretics, long-acting dihydropyridine CCB, and ACEi or ARB</u> are recommended as first-line therapy to prevent CVD.

Jones D.W. et al. *Circulation* Vol 152, Issue 11 Sept 16, 2025. Pages e114-e218.

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Initial Medications for the Management of Hypertension

Lifestyle Modification—Especially Diet and Exercise

Thiazide-Type Diuretics

**ACE Inhibitors
or
ARBs***

**DHP-Calcium
antagonists**

Jones D.W. et al. *Circulation* Vol 152, Issue 11 Sept 16, 2025. Pages e114-e218.

72

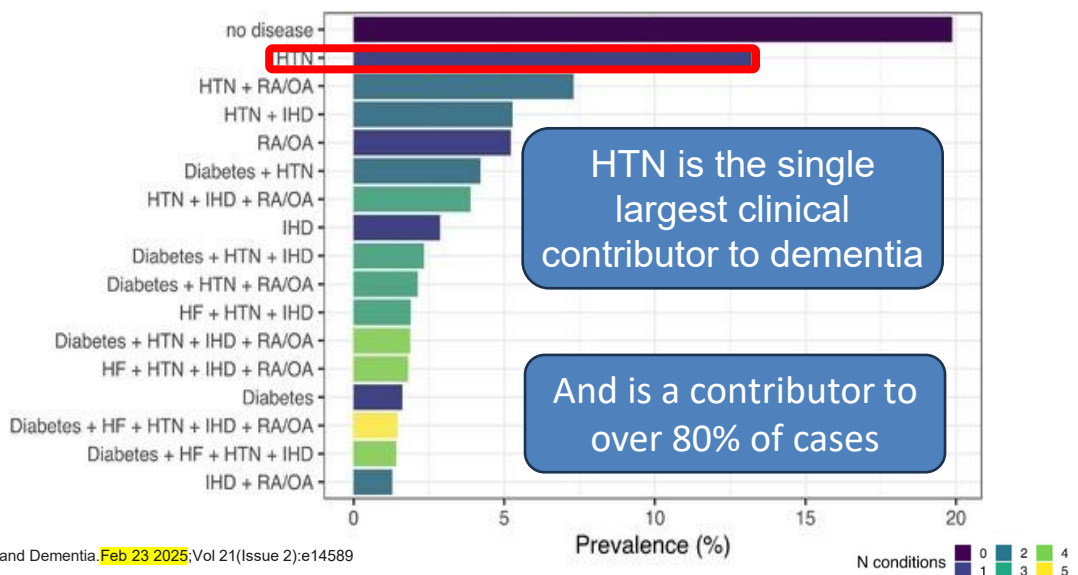


CLINICAL PEARL #10

In Adults with Hypertension, a SBP goal of < 130 mm Hg is recommended to **prevent cognitive impairment and dementia**.

73

9,944 Health and Retirement Study Participants (68–99 yrs old), **Without Dementia at Baseline, Followed for 18 Years** (1998-2016). Conditions Related to Development of Dementia



Klee et al. *Alzheimers and Dementia*. Feb 23 2025; Vol 21(Issue 2):e14589

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Cognitive Decline and Dementia: HTN Guideline 2017

1: Strong (Benefit >>> Risk)
IIa: Moderate (Benefit >> Risk) certainty
is reasonable/useful/effective
IIb: Weak (Benefit ≥ Risk), may/might be
considered, may/might be reasonable

Recommendation for Prevention of Cognitive Decline and Dementia		
COR	LOE	Recommendation
IIa	B-R	1. In adults with hypertension, <u>BP lowering is reasonable to prevent cognitive decline and dementia.</u> ^{511.3-1-511.3-6}

2017 Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults, *Hypertension* 2018 Jun;71(6):1269

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SPRINT-MIND:

Effect of Intensive vs Standard Blood Pressure Control on Probable Dementia: A Randomized Clinical Trial

Table 2. Incidence of Probable Dementia and Mild Cognitive Impairment by Treatment Group

	Outcomes	Treatment Group				Hazard Ratio (95% CI) ^a	P Value
		Intensive SBP < 120 mm Hg N=4278		Standard SBP < 140 mm Hg N=4285			
		No. With Outcome/Person-Years	Cases per 1000 Person-Years	No. With Outcome/Person-Years	Cases per 1000 Person-Years		
Primary outcome	Probable dementia	149/20 569	7.2	176/20 378	8.6	0.83 (0.67-1.04)	.10
Secondary outcome	Mild cognitive impairment ^b	287/19 690	14.6	353/19 281	18.3	0.81 (0.69-0.95)	.007
Secondary outcome	Composite of mild cognitive impairment or probable dementia	402/19 873	20.2	469/19 488	24.1	0.85 (0.74-0.97)	.01

^a Intensive treatment group vs standard treatment group based on Cox proportional hazards regression.

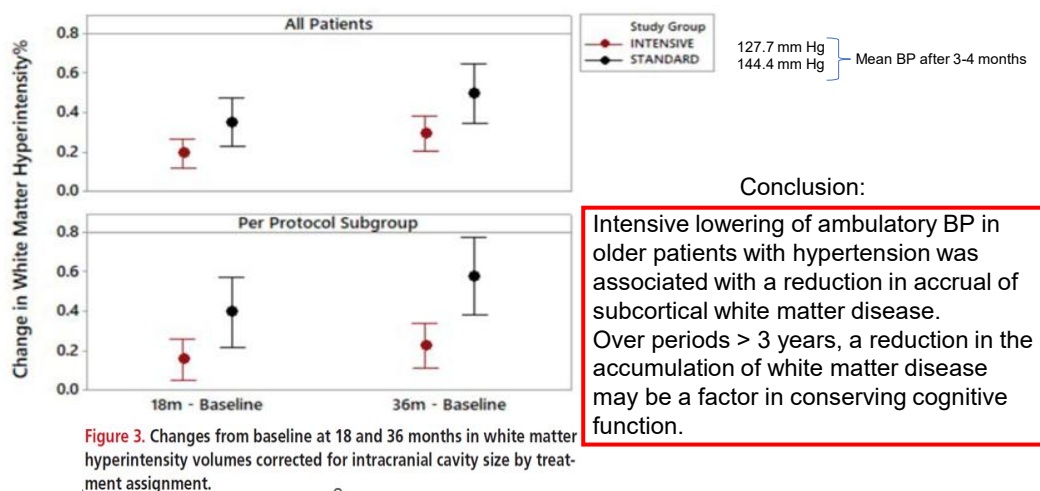
^b Participants adjudicated as having probable dementia at the first follow-up visit (year 2) do not contribute to the analyses of mild cognitive impairment.

Treatment lasted a median of 3 years, and patients were followed for cognitive outcomes over a total of 5 years.

What Should the BP Target Be to Prevent Dementia?

77

Effects of Intensive (SBP < 130) Versus Standard (SBP < 145) Ambulatory BP Control on **White Matter Hyperintensities and Cerebrovascular Outcomes** in 199 Older Age Hypertensives (Mean Age 80.5, F/u 3.5 Years)



White W.B. et al. *Circulation* Vol 140, Is 20 Nov 12, 2019. pages 1625-1635., 2020

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nature medicine

Article

<https://doi.org/10.1038/s41591-025-03616-8>

Blood pressure reduction and all-cause dementia in people with uncontrolled hypertension: an open-label, blinded-endpoint, cluster-randomized trial

Received: 6 July 2024

Accepted: 26 February 2025

Published online: 21 April 2025

Jiang He^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100}, Chuansheng Zhao^{10,11}, Shanshan Zhong^{10,11}, Nanxiang Ouyang^{10,11}, Guozhe Sun^{10,11}, Lixia Qiao^{10,11}, Ruihai Yang^{10,11}, Chunxia Zhao^{10,11}, Huayan Liu^{10,11}, Weliu Teng^{10,11}, Xu Liu^{10,11}, Chang Wang^{10,11}, Songyue Liu^{10,11}, Chung-Shuan Chen^{10,11}, Jeff D. Williamson^{10,11} & Yingxian Sun^{10,11}✉

China Rural Hypertension Control Project Phase-3 (CRHCP-3)

N=33,995 aged ≥40 years, 60% female
Uncontrolled HTN
326 Rural Chinese villages over 4 years

156/88 mm Hg ← 149/81 mm Hg (Usual Care Group) } Δ 22/9 mm Hg
127/72 mm Hg (Intervention Group)

Coresh J., et al; Targeting Blood Pressure to Protect the Brain. Nature Med. 2025 Jun;31(6):1757-1758. (Editorial)

He Jiang, et al; Blood pressure reduction and all-cause dementia in people with uncontrolled hypertension. Nature Med. 2025 Jun;31(6):2054-2061.

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2025 HTN Guideline: Treating Hypertension Can Prevent Cognitive Impairment and Dementia

1: Strong (Benefit >>> Risk)
IIa: Moderate (Benefit >> Risk) certainty is reasonable/useful/effective
IIb: Weak (Benefit > Risk), may/might be considered, may/might be reasonable

Recommendation for Prevention of Mild Cognitive Impairment and Dementia		
COR	LOE	Recommendation
1	A	In adults with hypertension, a goal of <130 mm Hg SBP is recommended to prevent mild cognitive impairment and dementia.

2025 AHA/ACC/AANP/AAPA/ABC/ACCP/ACPM/AGS/AMA/ASPC/NMA/PCNA/SGIM Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults. Published ahead of print August 14, 2025, available at: *Circulation*.
<https://www.ahajournals.org/doi/10.1161/CIR.0000000000001356> And *Jnl of the Am Coll of Card*, <https://www.jacc.org/doi/10.1016/j.jacc.2025.05.007>

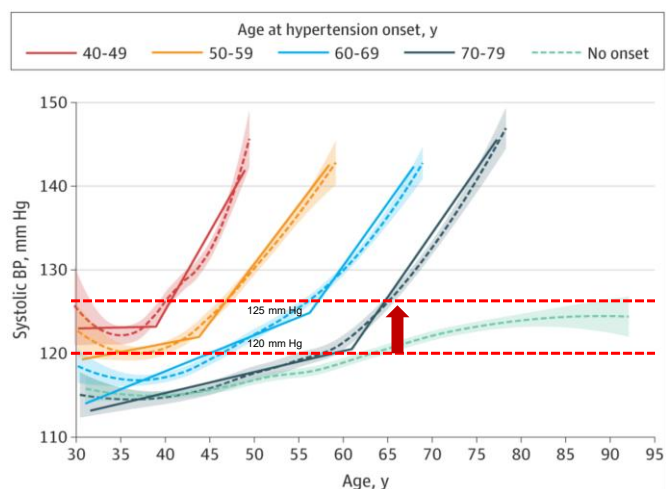
80

When Should We Begin to Treat HTN to Prevent Vascular Dementia?

81

BP Trajectories and Eventual HTN-Framingham

- Observed BP trajectories preceding development of Hypertension in 1252 (mean age 35, 63% women) participants of the Framingham Heart Study Original Cohort.
- Each participant had 28 serial exams between 1948 and 2005.
- Achieving a SBP of 125 mm Hg before age 65 destines you for HTN.



Niiranen T. et al. *JAMA Cardiol.* 2018 May 1;3(5):427-431.

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Control HTN Sooner than Later to Best Prevent Vascular Dementia?

83

“LOWER FOR LONGER STARTING YOUNGER IS BEST”

84

Summary of HTN in 2025

- Proper measurement of BP is important when treating hypertension.
- Automated Oscillometric Blood Pressure Readings (AOBP) should now be the preferred method for recording BP in routine clinical adult office practice.
- Out of office (Home or Self) BP measurement is a better predictor of CV events than office BP, and home BP is at least as good as a 24-hr ABPM in predicting CV risk.
- Do a spot urine alb/creat and A1C in the initial evaluation of the patient with HTN and consider plasma renin /aldosterone levels sooner in the workup.

85

Summary of HTN 2025 (Con't)

- Patients with HTN, regardless of risk, benefit from Lifestyle Modification (LM) and abstaining from alcohol while striving for stress reduction in their lives.
- A transition to using the PREVENT risk calculator should be adopted.
- For low-risk patients whose PREVENT risk is $< 7.5\%$ with a BP $< 140/90$ mm Hg and no evidence of AODM, CKD, or ASCVD, LM for the first 3-6 months is recommended after which antihypertensive drug therapy should be used to lower BP $< 130/80$ mm Hg.
- In adults with confirmed hypertension who are at increased risk for CVD, a BP goal of at least $< 130/80$ mm Hg, with encouragement to achieve a BP $< 120/80$ mm Hg is recommended to reduce the risk of CV events and total mortality.

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Summary of HTN 2025 (Con't)

- The first three drug classes chosen to control BP and reduce CVD should be a thiazide-type diuretic (D), a dihydropyridine CCB, or an ACEi or ARB but not both, and in no specific order.
- Fixed-dose, single-pill combination antihypertensive agents are initially recommended in all patients with Stage 2 HTN ($\geq 140/90$ mm Hg).
- Control BP to $< 130/80$ mm Hg in life sooner than later to prevent vascular dementia.