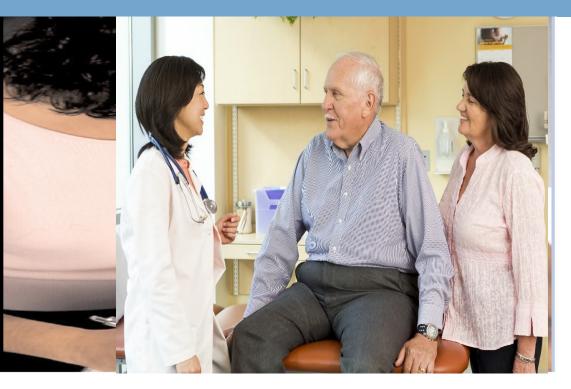
2018 National KP BP Guidelines 2018 Hypertension Symposium



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Kaiser Permanente National CLINICAL PRACTICE GUIDELINES

Adult Blood Pressure

Clinician Guide

June 2018

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 Introduction
 This Clinician Guide is based on the 2018 KP National Blood Pressure (BP) Guidelines. It was developed to assist primary care physicians and other health care professionals in the outpatient setting with screening and treatment of elevated BP in non-pregnant adults aged ≥ 18 years. The KP National BP Guideline is revised after review of the 2017 ACC/AHA/AAPA/ABC/

 ACPM/AGS/APhA/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults. It is not intended or designed as a substitute for the reasonable exercise of independent clinical judgment by practitioners.

Definitions KP National BP categories are defined in Table 1.

BP Category	Systolic Blood Pressure (SBP) mm Hg		Diastolic Blood Pressure (DBP) mm Hg	
Normal	< 120	and	< 80	
Elevated or Prehypertension	120 - 139	or	80 - 89	
Hypertension	≥ 140	or	≥ 90	

- BP values in this table and elsewhere in this document refer to standard office BP measurements unless otherwise specified. See Table 2 for corresponding SBP/DBP values.
- ASCVD is atherosclerotic cardiovascular disease. CKD is chronic kidney disease.
- 10-year ASCVD risk is the risk of fatal or nonfatal myocardial infarctions or strokes in adults.
- Key Points BP is an important and modifiable risk factor for cardiovascular disease (CVD).
 - In adults with elevated BP or hypertension, encourage a low sodium, high potassium, hearthealthy diet, physical activity, weight control, and limited alcohol use.
 - To further promote vascular health, follow KP Guidelines to treat cholesterol and/or diabetes mellitus (DM), recommend aspirin use, and promote smoking cessation and adherence to medication and monitoring.
 - Treat adults with hypertension to a goal BP < 140/90 mm Hg.</p>
 - In adults with ASCVD, CKD, age ≥ 75 years, or 10-year ASCVD risk* ≥ 10%, consider treating to a goal SBP of < 130 mm Hg.</p>

Exclude adults with estimated glomerular filtration rate (eGFR) <20 mL/min/1.73² from this lower target. * a region may choose which tool (and corresponding cut-point) to use for calculating 10-year ASCVD risk based on regional needs. Kaiser Permanente ASCVD Risk Estimator (KPARE) of 10% correlates approximately with ACC/AHA ASCVD Risk of 15% and Framingham Risk Score of 15% (used in SPRINT) at the population level.

Screening and Diagnosis of High Blood Pressure

- Screen adults aged > 18 years for high BP.
 - In adults aged 18-39 years with BP < 130/85 mm Hg without other risk factors, screen every 3 to 5 years.

This Clinician Guide expires within two years of the posted month. See National Clinical Library for current version (https://cl.kp.org).

E 2016 Kaiser Permanente Care Management Institute



HTN Definition

BP Category	Systolic Blood (SBP) mm Hg	Pressure	Diastolic Blood Pressure (DBP) mm Hg
Normal	< 120	and	< 80
Elevated or Prehypertension	120 - 139	or	80 - 89
Hypertension	≥ 140	or	≥ 90

 BP values in this table and elsewhere in this document refer to standard office BP measurements unless otherwise specified. See Table 2 for corresponding SBP/DBP values.



Screening for High BP

- Screen adults
 <u>></u> 18 for High BP
- In adults 18-39 with BP < 130/85 mm Hg without other risk factors, screen every 3-5 years.
- In adults > 40 and those at increased risk of high BP, screen annually. Adults at increased risk include those who have BP > 130/85 mm Hg or are overweight, obese or Black/African American.



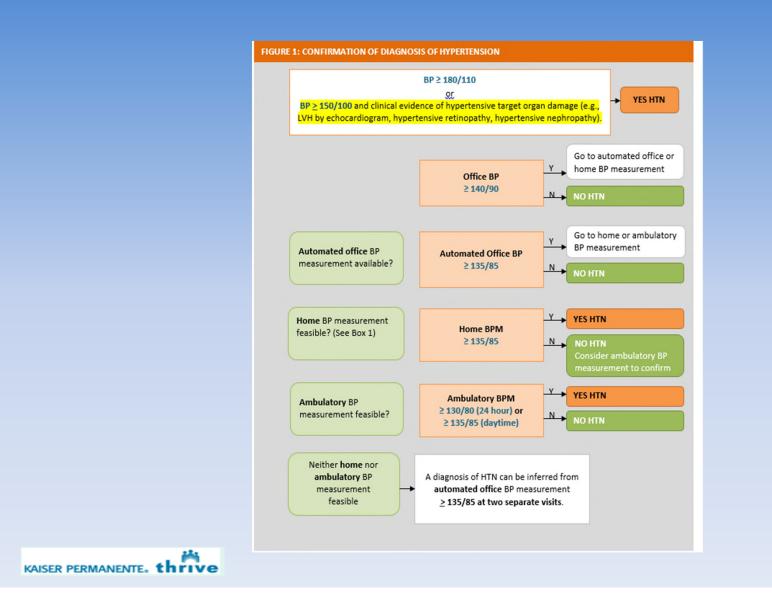
Diagnosis of HTN

- > Obtain measurements outside of the clinical setting for diagnostic confirmation before starting treatment.
- BP readings equal to or higher than those in Table 2, Row 1 = confirm the diagnosis of hypertension. Use clinical judgment or regional protocol if obtaining BP outside the clinical setting is not possible. Automated office blood pressure (AOBP) measurements at ≥ 2 visits may be used.
- Diagnose hypertension for BP ≥ 180/110 at a single office reading or ≥ 150/100 with clinical evidence of target organ damage (left ventricular hypertrophy, hypertensive retinopathy, or hypertensive nephropathy).

Table 2: CORRESPONDING SBP/DBP VALUES							
	Office BP	AOBP	Home BPM	Day ABPM	Night ABPM	24-Hour ABPM	
Row 1	140/90	135/85	135/85	135/85	120/70	130/80	
Row 2	130/90	130/85	130/85	130/85	110/70	125/80	

Office BP: Taken in the clinic setting using an oscillometric (preferred) or aneroid device but not including automated office BP. AOBP: Taken in the clinic setting using a commercially available device that allows for measurements to be taken with patient unobserved. Home BP Monitoring (Home BPM): Taken by the patient at home (see Box 1). Ambulatory BP Monitoring (ABPM): Taken at regular intervals by a device worn by the patient, usually for 24 hours.

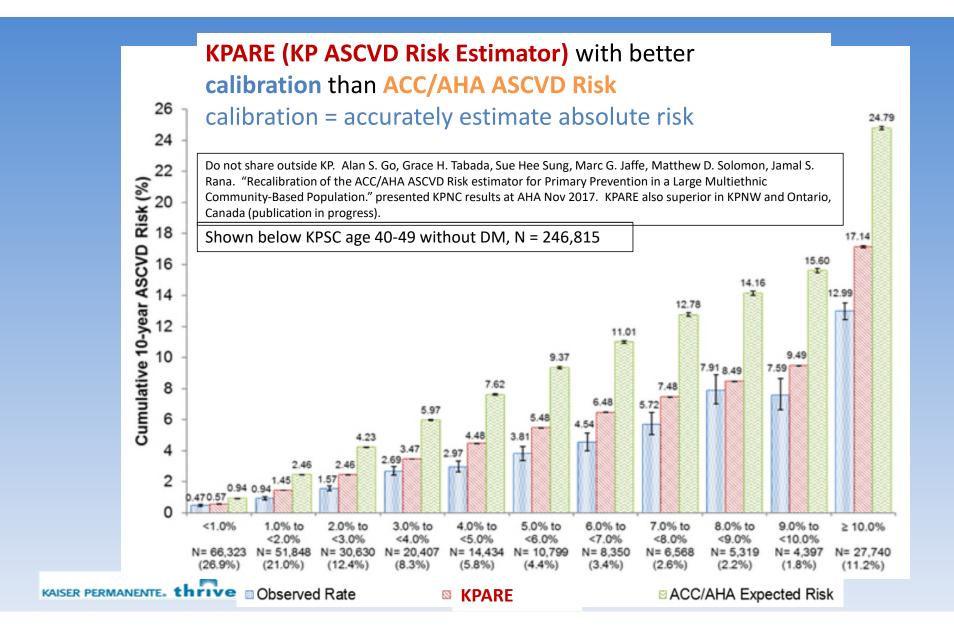




Treatment Initiation, Blood Pressure Targets, and Typical Tests

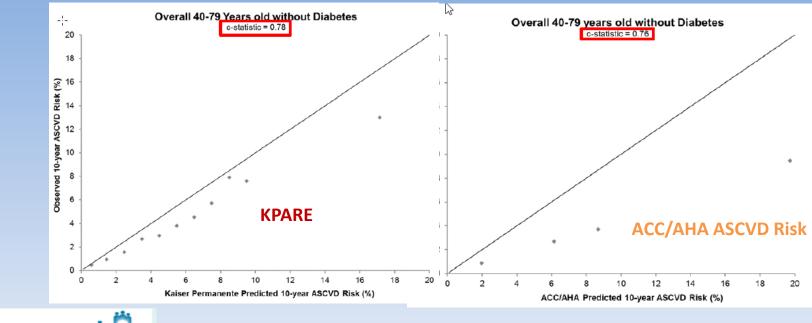
- All Adults → In adults with confirmed hypertension, initiate pharmacologic treatment to lower blood pressure (BP) at systolic blood pressure (SBP) ≥ 140mm Hg or diastolic blood pressure (DBP)
 ≥ 90 mm Hg and treat to a goal SBP < 140 mm Hg and goal DBP < 90 mm Hg.
- High Risk In adults with ASCVD, CKD, age ≥ 75 years, or KP's A-Risk ≥ 10%, consider treating to a goal SBP of <130 mmHg. Exclude adults with eGFR <20 mL/min/1.73² from this lower target. Incorporate blood pressure monitoring details, medication benefits and risks, and patient preferences when deciding whether to treat to this lower target.
- KP's A-Risk Consider using KP's A-Risk to estimate 10-year ASCVD risk for individuals without clinical ASCVD. KP's A-Risk of 10% correlates with ACC/AHA ASCVD Risk of 15% and Framingham Risk Score (FRS) of about 15% at the population level. KP's A-Risk is more accurate at the population and individual level. If a different risk calculator is used, a different threshold may be used.
- DM Diabetes Mellitus (DM) alone does not qualify for consider goal SBP < 130 mmHg. DM is a variable in A-Risk.</p>





KPARE (KP ASCVD Risk Estimator) with better discrimination than ACC/AHA ASCVD Risk Discrimination = correctly sorts higher vs. lower risk adult

- **KPARE** includes options for Hispanic and Asian/Pacific Islanders.
- Equations calibrated for more modern (baseline 2008), KP population with high blood pressure control rate.



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Revising and aligning KP Clinician Guides

- During 2018 Aspirin, Blood Pressure, and Cholesterol guideline updates, plan to align risk thresholds.
- In all three: "10-year ASCVD risk* >10% . . .

* A region may choose which tool (and corresponding cut-point) to use for calculating 10-year ASCVD risk based on regional needs. **KPARE (KP ASCVD Risk Estimator)** of 10% correlates approximately with ACC/AHA ASCVD Risk of 15% and Framingham Risk Score of 15% (used in SPRINT) at the population level."

Significant cutpoints:

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- Aspirin: USPSTF 10%, ACC/AHA 10%, ADA 10%
- Blood Pressure: SPRINT FRS 15% ~ KPARE 10%. ACC/AHA 10%.
- Cholesterol: ACC/AHA 5, 7.5%, USPSTF 7.5, 10%.

Technical specifications are available for KPARE. Scaffold / Aura has started implementation work.

Treatment Initiation, Blood Pressure Targets, and Typical Tests

Risk in the Elderly	•	Because elderly patients are at higher risk of side effects of treatment, including postural hypotension, check standing blood pressures to guide treatment decisions.
	•	Incorporate blood pressure monitoring details, medication benefits and risks, and patient preferences in frail elderly adults.
Treatment DE intensification	•	Consider down-titration of blood pressure medicine in patients with SBP < 110 mmHg without heart failure, or in a patient with symptoms of orthostasis.
Typical Tests	•	Typical tests for patients with a new diagnosis of hypertension may include: Fasting glucose or hemoglobin A1C, lipid panel, creatinine with eGFR, sodium, potassium, calcium, thyroid stimulating hormone, complete blood count, urinalysis, and electrocardiogram.



Pharmacotherapy and Monitoring

Attain and Maintain Goal BP	The main objective of blood pressure treatment is to attain and maintain goal BP. If goal BP is not reached within a month of treatment, consider increasing the dose of the initial drug or add a second drug from one of the thiazide-type diuretic, CCB, ACEI, or ARB classes. The clinician should consider continued assessment of BP and adjust the treatment regimen until goal BP is reached. If goal BP cannot be reached with 2 drugs, consider adding and titrating a third drug from the indicated classes. If goal BP cannot be reached using only the drugs in these classes because of contraindications or the need for more than 3 drugs to reach goal BP, antihypertensive drugs from other classes can be considered. Consider referral to a hypertension specialist for patients in whom goal BP cannot be attained using the above strategy or for the management of complicated patients for whom additional clinical consultation is needed.
Drug-Drug Interaction	Simultaneous use of an ACEI, ARB, and/or renin inhibitor is potentially harmful and is not recommended.
Initial Therapy	Initial single pill combination therapy with lisinopril-hydrochlorothiazide is preferred. This may be used as initial therapy in all patients.
CKD ,	In adults with CKD, regardless of race, consider initial (or add-on) treatment that includes an ACEI or ARB to improve kidney outcomes.
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Pharmacotherapy and Monitoring

African American/Black	•	In African American/Black adults without heart failure or CKD, initial treatment should include a thiazide-type diuretic or CCB.
CAD, HF, DM	•	Coronary artery disease, heart failure, and DM KP Guideline recommendations may inform medicine use independent of blood pressure in certain individuals.
Three Medicines	•	If blood pressure is not controlled within a month of treatment on a thiazide-type diuretic plus ACEI, then add a CCB.
Four Medicines	•	If blood pressure is not controlled within a month of treatment on a thiazide-type diuretic plus ACEI plus CCB, then add spironolactone (if on thiazide AND eGFR ≥ 60mL/min/1.73 m2 AND potassium < 4.5). If criteria for use of spironolactone are not met, use beta blocker as fourth agent.



Pharmacotherapy and Monitoring

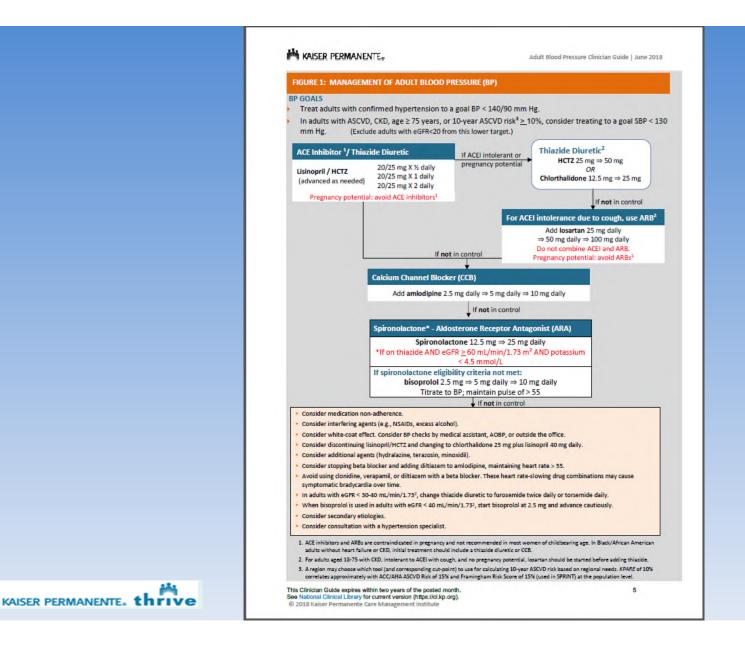
Women of Childbearing Potential

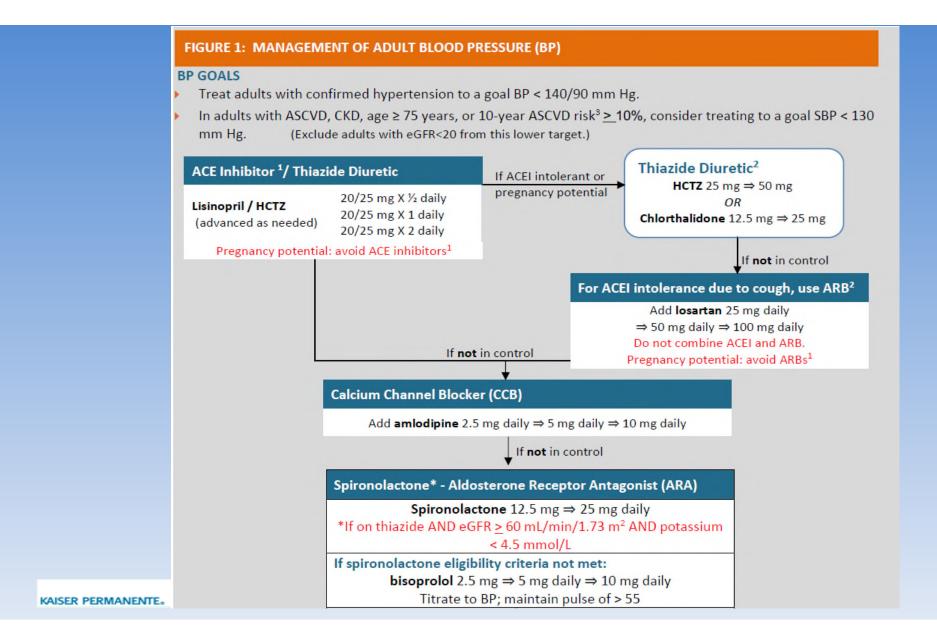
- Half of all pregnancies are unplanned. Do not prescribe medications contraindicated in pregnancy, such as ACEIs/ARBs, to women of childbearing potential, unless there is a compelling indication.
 For women of childbearing potential taking medications contraindicated in pregnancy, such as ACEIs/ARBs:
 - Discuss potential risks to the fetus should they become pregnant. Discuss practicing contraceptive measures with extremely low failure rates (sterilization, implant, or IUD).
 - Advise women using ACEIs/ARBs to stop these medications and contact their OB/GYN provider immediately if they become pregnant.

Monitoring

- In adults with hypertension monitor BP at least annually.
- Self-monitoring of BP and team-based care can help achieve BP control.







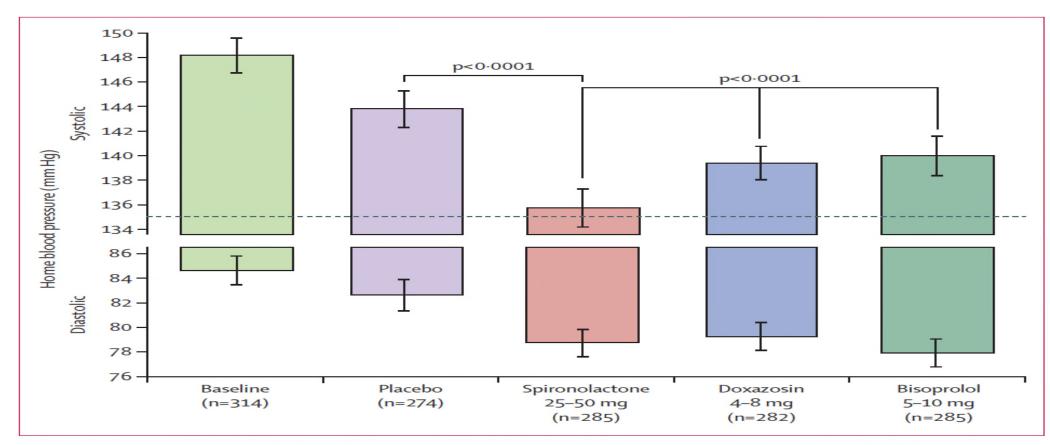


Figure 2: Home systolic and diastolic blood pressures comparing spironolactone with each of the other cycles

The top and bottom of each column represents the unadjusted home systolic and diastolic blood pressures, respectively, averaged across the mid-cycle (low-dose) and end-of-cycle (high-dose) visits (6 weeks and 12 weeks) in which patients received the drug. Error bars represent 95% CI. Comparisons are as described under methods for the primary endpoint.

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PATHWAY-2, Lancet Sep 2015

HTN Treatment Algorithm – Beta Blockers

	Atenolol	Bisoprolol
Half-life	6-7 hours	9-12 hours
Elimination	Renal	Renal and hepatic
Use in HFrEF	No	Yes
Use in CKD	Max dose 50 mg for GFR 15-35 Max dose 25 mg for GFR < 15	Start at 2.5 mg for GFR < 40 and increase cautiously

If **not** in control

- Consider medication non-adherence.
- Consider interfering agents (e.g., NSAIDs, excess alcohol).
- Consider white-coat effect. Consider BP checks by medical assistant, AOBP, or outside the office.
- Consider discontinuing lisinopril/HCTZ and changing to chlorthalidone 25 mg plus lisinopril 40 mg daily.
- Consider additional agents (hydralazine, terazosin, minoxidil).
- Consider stopping beta blocker and adding diltiazem to amlodipine, maintaining heart rate > 55.
- Avoid using clonidine, verapamil, or diltiazem with a beta blocker. These heart rate-slowing drug combinations may cause symptomatic bradycardia over time.
- In adults with eGFR < 30-40 mL/min/1.73², change thiazide diuretic to furosemide twice daily or torsemide daily.
- When bisoprolol is used in adults with eGFR < 40 mL/min/1.73², start bisoprolol at 2.5 mg and advance cautiously.
- Consider secondary etiologies.
- Consider consultation with a hypertension specialist.



Selected Antihypertensive Medica	Usual Dose Range, comments		
Single Pill Combinations	Lisinopril/HCTZ (Prinzide)	10/12.5 mg - 20/25 mg. May use 20/25 mg at ½, 1, then 2 tabs daily. Preferred initial therapy.	
	Amlodipine/Benazepril (Lotrel)	2.5/10 mg - 10/40 mg daily.	
	Losartan/HCTZ (Hyzaar)	50/12.5 mg – 100/25 mg daily. Cannot maximize diuretic with this combination.	
	Bisoprolol/HCTZ (Ziac)	2.5/6.25 mg – 10/6.25 mg daily. Cannot maximize diuretic with this combination.	
Thiazide-type Diuretics	Hydrochlorothiazide (HCTZ) (Esidrix)	12.5 – 50 mg daily, half-life 6-15 hrs.	
	Chlorthalidone (Hygroton)	12.5 – 25 mg daily, half-life 45-60 hrs.	
	Indapamide (Lozol)	1.25 - 2.5 mg daily, half-life 14-25 hrs.	
ACE Inhibitors (ACEI)	Lisinopril (Zestril, Prinivil)	10 - 40 mg daily.	
	Benazepril (Lotensin)	5 – 40 mg daily.	
Angiotensin II Receptor Blockers (ARB)	Losartan (Cozaar)	25 – 100 mg daily. Do not use with ACEI.	
Long-Acting Dihydropyridine	Amlodipine (Norvasc)	2.5 – 10 mg daily.	
Calcium Channel Blockers (CCB)	Felodipine ER (Plendil)	2.5 – 10 mg daily.	
Aldosterone Receptor Antagonist (ARA)	Spironolactone (Aldactone)	12.5 – 25 mg daily.	
Beta-Blockers (BB)	Bisoprolol (Zebeta)	2.5 – 10 mg daily, half-life 9-12 hrs. Appropriate for use in heart failure.	
	Atenolol (Tenormin)	25 – 100 mg total, daily or BID, half-life 6-7 hrs. Do not use in heart failure, adjust dos in CKD.	
	Carvedilol (Coreg)	3.125 – 37.5 mg BID. Appropriate for use in heart failure.	
	Metoprolol (Lopressor)	25 – 100 mg BID. Do not use in heart failure.	
metoprolol succinate (Toprol XL) remo	ved from table due to high cost or aldosterone receptor antago	nist (ARA), monitor potassium and creatinine	

HEDIS

Changes to Existing Measure for HEDIS® 2019: Controlling High Blood Pressure (CBP)

- Update the blood pressure target to <140/90 mm Hg for all hypertensive patients 18–85 years of age.
- Allow remote monitoring device readings directly transmitted to and interpreted by the provider to satisfy the numerator.



HEDIS

Our clinical advisory panels reviewed and discussed the relevant guidelines and their respective recommendations. Members of our cardiovascular panel were divided on blood pressure targets for different age ranges and conditions and had mixed support for a single measure of <140/90 for 18-85 years of age. Our diabetes panel supported maintaining the current target of <140/90 for patients with diabetes. Our geriatric panel supported a single measure of <140/90 for all patients 18-85 years of age with hypertension. We therefore propose a treatment target of <140/90 mm Hg for all hypertensive patients 18–85 years of age. This target is supported by strong evidence and gives physicians the flexibility to treat to a lower target (<130 mm Hg), when appropriate.



SPRINT MIND

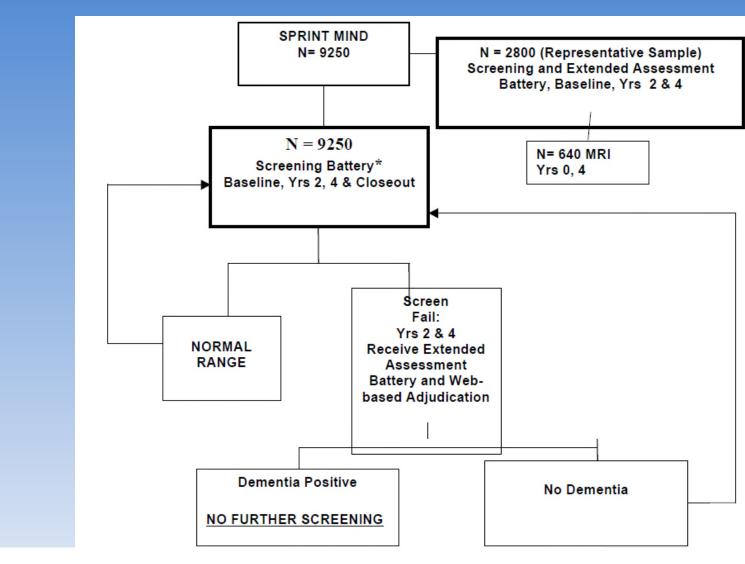
Memory and cognition IN Decreased hypertension

Three objectives:

- Primary: does intensive BP lowering to target SBP <120 mm Hg vs. standard treatment target < 140 mm Hg produce a greater reduction in the incidence of all-cause dementia. Tested in all SPRINT participants; 60 months.
- Second: does global cognitive function measured in key specific domains of cognition decline less in persons randomized to a SBP goal of <120 mm Hg vs. SBP < 140 mm Hg in a representative sub-sample of approximately 2800 SPRINT participants (enrollment in all clinics, CKD, SENIOR); 48 months.
- Third: assess whether MRI-derived changes in brain structure (volume of small vessel disease; total brain volume/atrophy) differ by treatment assignment in a subset (approximately 640) of the 2800 participants; 48 months.



NEJM, Nov 2015



SPRINT MIND – Preliminary Findings

Presented at Alzheimer's Association International Conference in July, but unpublished

Endpoint	Intensive vs standard cases	Change with Intensive Tx	P value			
Primary - dementia	147 vs 175	15% decrease	0.10 (not significant)			
Secondary - MCI	285 vs 348	19% decrease	0.01			
Secondary – MCI + dementia	398 vs 463	15% decrease	0.02			
Imaging – brain volume (454 total)	Not reported	none	Not reported			
Imaging – white matter lesions	Not reported	18% decrease	0.04			
Williamson et al. AAIC 2018 DT-0202 25						

Summary

- BP goal < 140/90 for all
- Consider a systolic BP goal < 130 in high risk patients: KP A risk <u>></u> 10%, CKD, ASCVD or age <u>></u> 75

