RACE-BASED PRESCRIBING FOR BLACK AND AFRICAN AMERICAN INDIVIDUALS WITH HIGH BLOOD PRESSURE:

IS IT TIME FOR A CHANGE?

Abby Frye, PharmD, BCACP

DISCLOSURES

None

OBJECTIVES

Pharmacists & Technicians

- Review the current hypertension treatment guidelines
- Evaluate the impact of race-specific recommendations for initial hypertension treatment
- Analyze the literature supporting a race-agnostic approach to hypertension treatment

Pharmacists Only

- Apply guidelines and literature to individualize treatment of hypertension

#1

Most current hypertension treatment guidelines recommend that Black and African American individuals without comorbidities should receive which of the following classes as initial drug therapy?

A. Calcium channel blockers
B. Thiazide diuretics
C. Angiotensin-converting enzyme inhibitors and/or angiotensin receptor blockers
D. A or B only

#2

True or False: Adherence to the race-specific treatment recommendations for initial antihypertensive therapy has resulted in improved blood pressure control rates in the Black and African American population.

A. True
B. False

#3

Which of the following factors has been associated with reduced racial disparities in blood pressure control?

A. Adherence to race-specific recommendations for initial monotherapy
B. Race-agnostic treatment algorithms that minimize therapeutic inertia and promote use of combination therapy
C. Comprehensive, team-based models that use race-informed communication, self-care, and dietary strategies
D. All of the above
E. B & C only

#4

Your patient is a 55-year-old Black man who was recently diagnosed with hypertension. Over the past 6 months he has focused on reducing the sodium in his diet and increasing his physical activity. His BP is 152/94 today and he is agreeable to start pharmacologic therapy. Which of the following is the most evidence-based recommendation?

A. Amlodipine 5 mg daily
B. Chlorthalidone 25 mg daily
C. Olmesartan 20 mg daily
D. Amlodipine/Olmesartan 5-20 mg daily

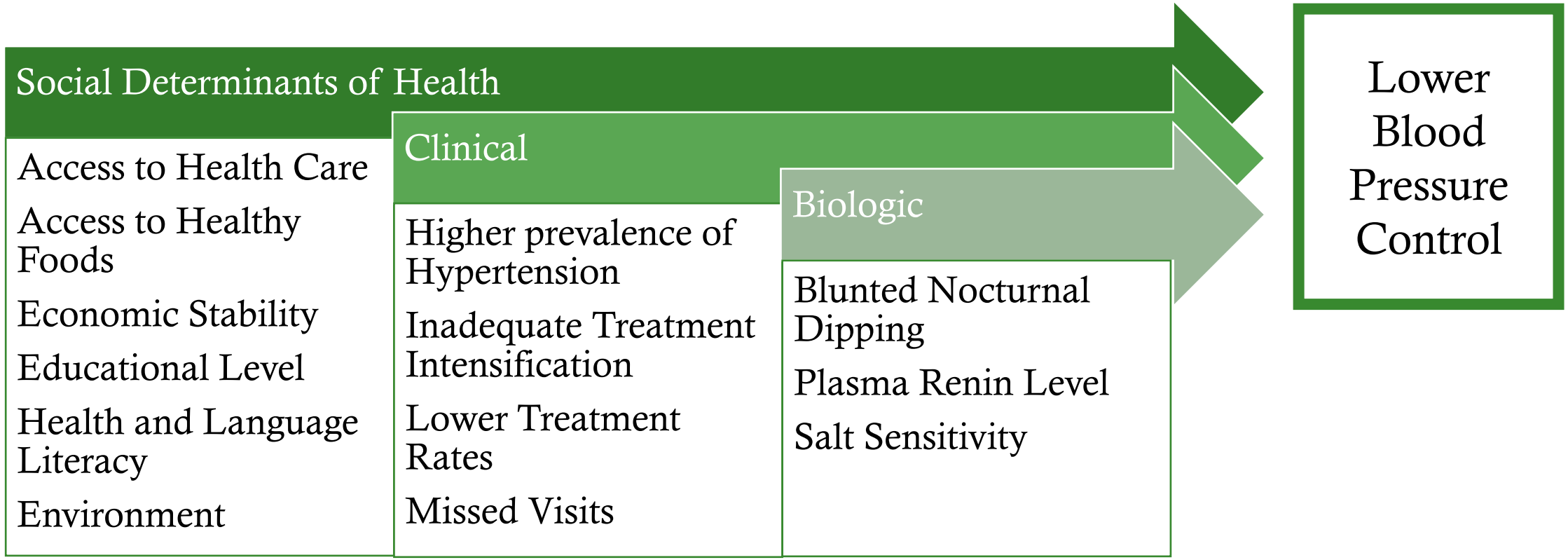
BACKGROUND

Hypertension is the most prevalent modifiable risk factor for cardiovascular disease

Black populations, whether residing in Africa, the Caribbean, United States, or Europe, develop hypertension and associated organ damage at younger ages, have a higher frequency of resistant and nighttime hypertension, and a higher risk of kidney disease, stroke, HF, and mortality, than other ethnic groups

In the US, mortality due to hypertension and its consequences is 4 to 5 times more likely in African Americans than in Whites

FACTORS CONTRIBUTING TO RACIAL AND ETHNIC DISPARITIES IN HYPERTENSION



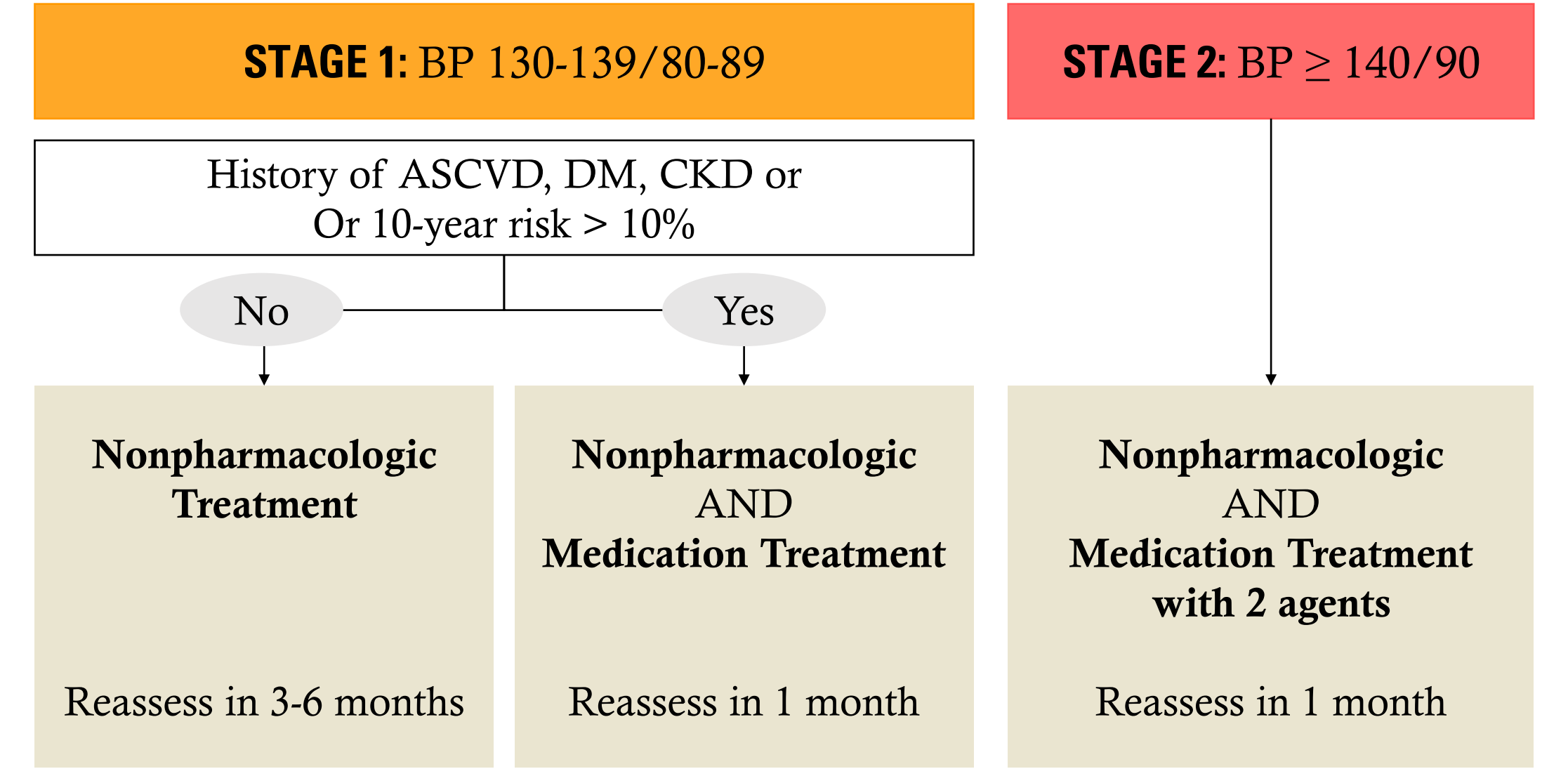
Curr Cardiol Rep. 2023; 25(1): 17–27

REVIEW THE CURRENT HYPERTENSION TREATMENT GUIDELINES

ACC/AHA: **CLASSIFICATION**

	Systolic BP	Diastolic BP
Normal	<120	<80
Elevated	120-129	<80
Stage 1 Hypertension	130-139	80-89
Stage 2 Hypertension	≥ 140	≥ 90

Hypertension. 2018;71:e13–e115



Hypertension. 2018;71:e13–e115

ACC/AHA: **PHARMACOLOGICAL TREATMENT**

Initial first-line therapy includes thiazide diuretics, CCBs, and ACEi/ARBs

Chlorthalidone is the preferred diuretic because of its long half-life and proven CVD risk reduction

Beta-blockers are not first-line therapy except in CAD and HFrEF

Initiation of 2 first-line agents is recommended in adults with an average BP >20/10 mmHg above their BP target

Spironolactone is preferred for the treatment of resistant hypertension

Once-daily dosing and use of single-pill combinations can improve adherence

Hypertension. 2018;71:e13–e115

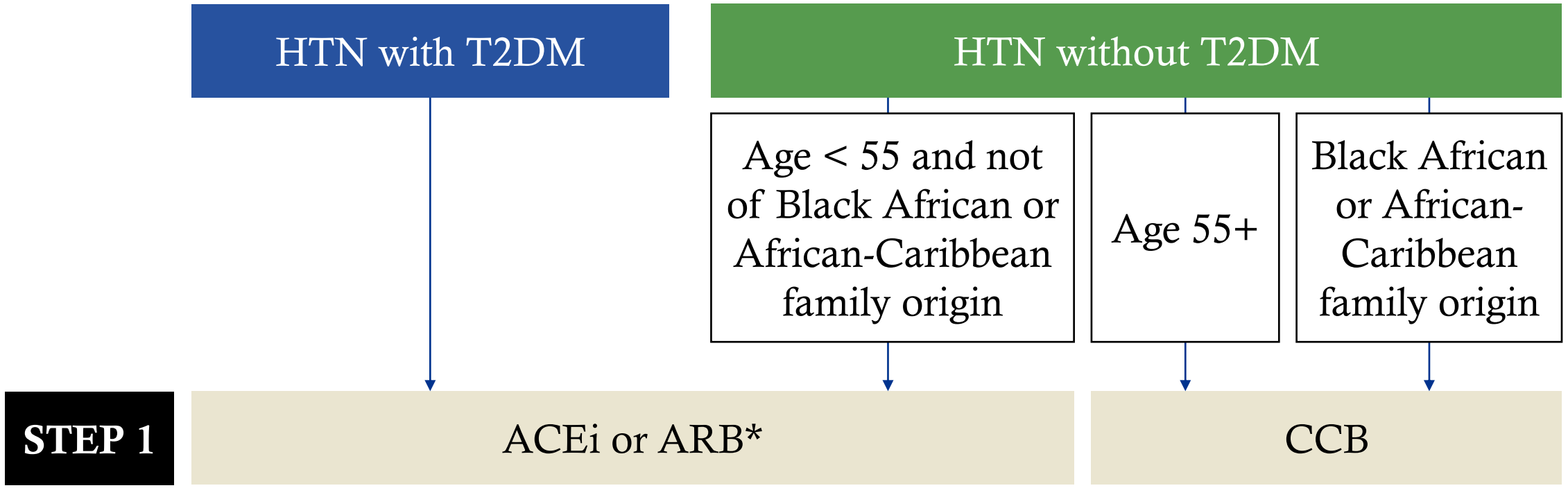
ACC/AHA: **RACE & ETHNICITY**

In African American adults with hypertension but without HF or CKD, including those with DM, initial antihypertensive treatment should include a **thiazide-type diuretic or CCB**

Two or more antihypertensive medications are recommended to achieve a BP target of <130/80 in most adults, **especially in African American adults**

Hypertension. 2018;71:e13–e115

NICE: **STEP 1 TREATMENT**



*For individuals of Black African or African–Caribbean family origin, consider an ARB in preference to an ACE inhibitor

https://www.nice.org.uk/guidance/ng136

ESC/ESH: **HYPERTENSION IN ETHNIC GROUPS**

Two-drug combination therapy, usually as a single-pill combination, should be used as initial therapy for most Black patients

In Black patients, initial antihypertensive treatment should include a diuretic or a CCB either in combination or with an ACEi/ARB

In other ethnic groups, BP-lowering treatment may be based on the core treatment algorithm

Eur Heart J 2018; 39: 3021–3104

ISH: **POPULATIONS FROM AFRICAN DESCENT**

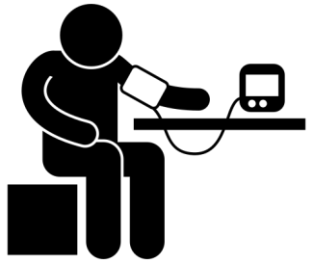
Among RAS-inhibitors, ARBs may be preferred

Single pill combination therapy including a thiazide-like diuretic plus CCB or CCB plus ARB is the recommended first-line therapy

Lifestyle modification should place additional focus on salt restriction, increased intake of vegetables and fruits, weight management, and reducing alcohol intake

Hypertension. 2020;75:1334–1357

ALLHAT



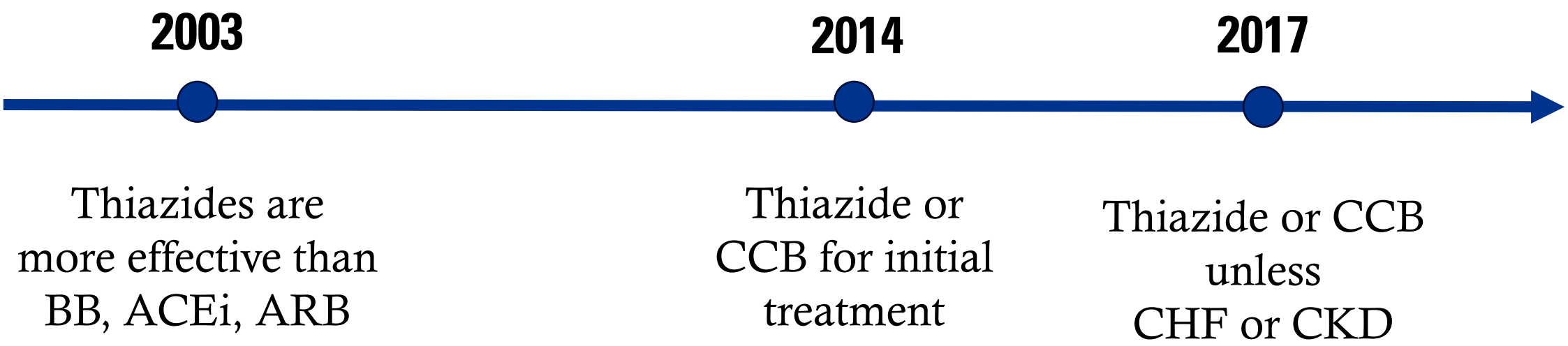
Participants were randomized to chlorthalidone, amlodipine, or lisinopril

Consistent with previous studies, Black participants had a lesser systolic blood pressure response to lisinopril (~4-5 mmHg)

Black participants randomized to lisinopril also had a greater risk of stroke and combined cardiovascular disease

JAMA. 2002. 288(23):2981-2997

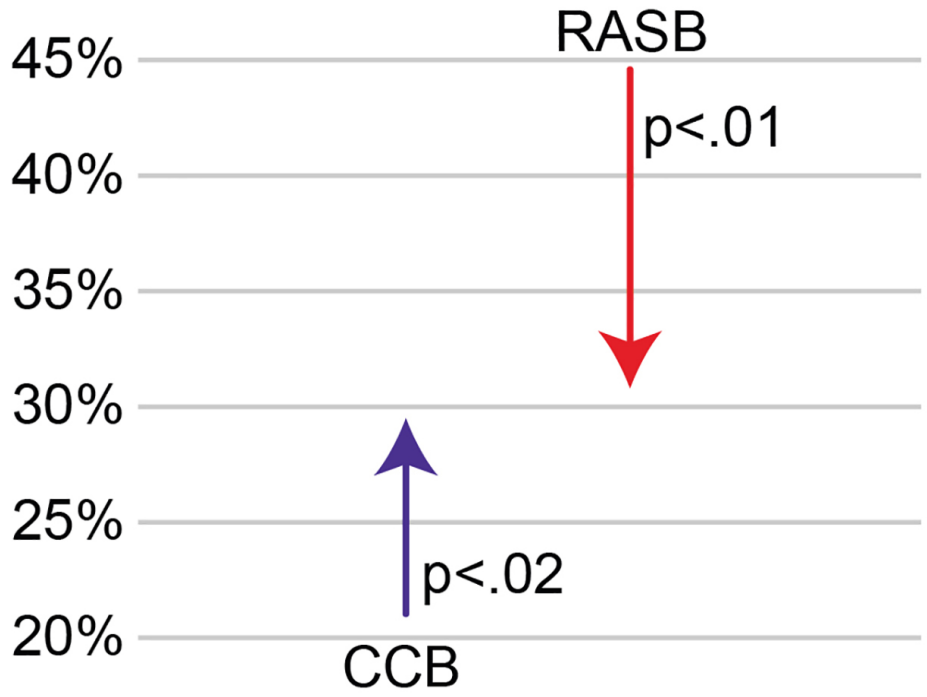
INITIAL MONOTHERAPY RECOMMENDATIONS IN BLACK ADULTS WITH HYPERTENSION: **A TIMELINE**



EVALUATE THE IMPACT OF THE RACE-SPECIFIC RECOMMENDATIONS FOR INITIAL HYPERTENSION TREATMENT

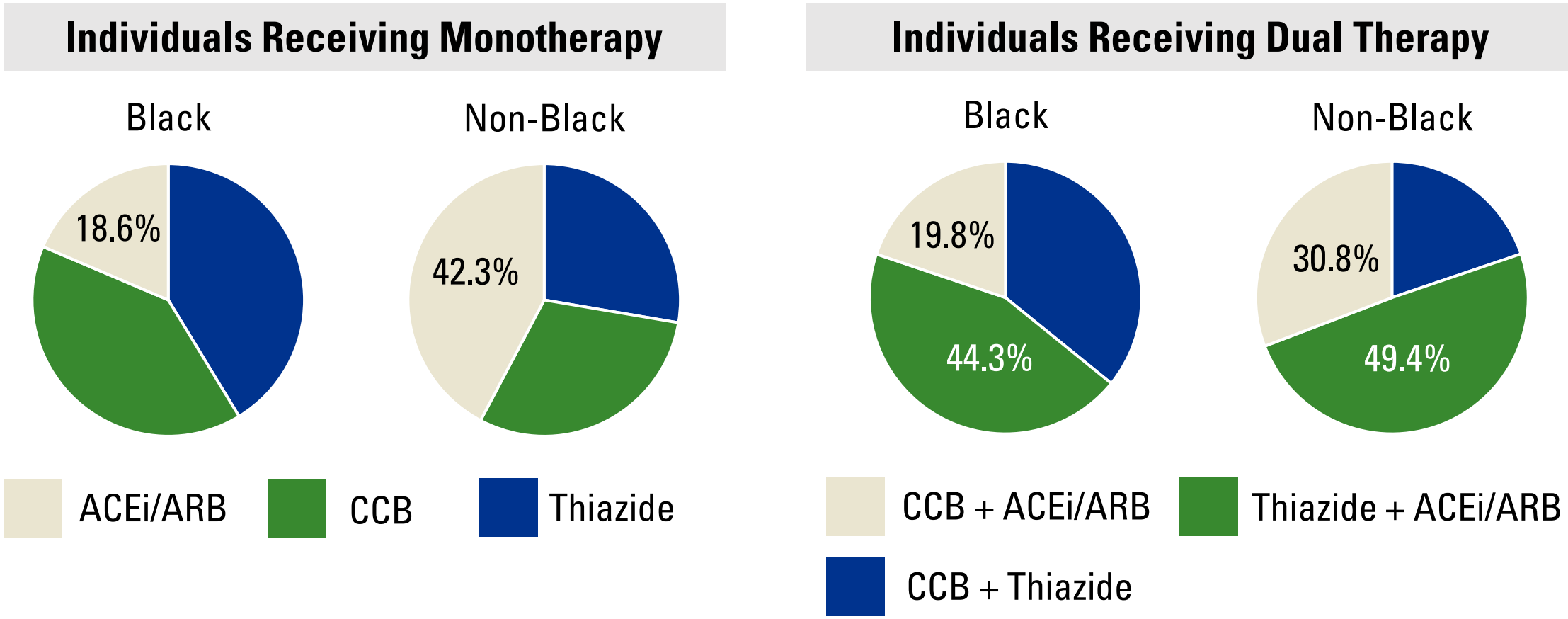
CLINICIANS ARE PRESCRIBING FEWER ACEI/ARB FOR BLACK PATIENTS WITH HYPERTENSION

National Health and Nutrition Examination Survey (NHANES) data from 2007-2012 vs. 2015-2018



Hypertension. 2022 Feb;79(2):338-348

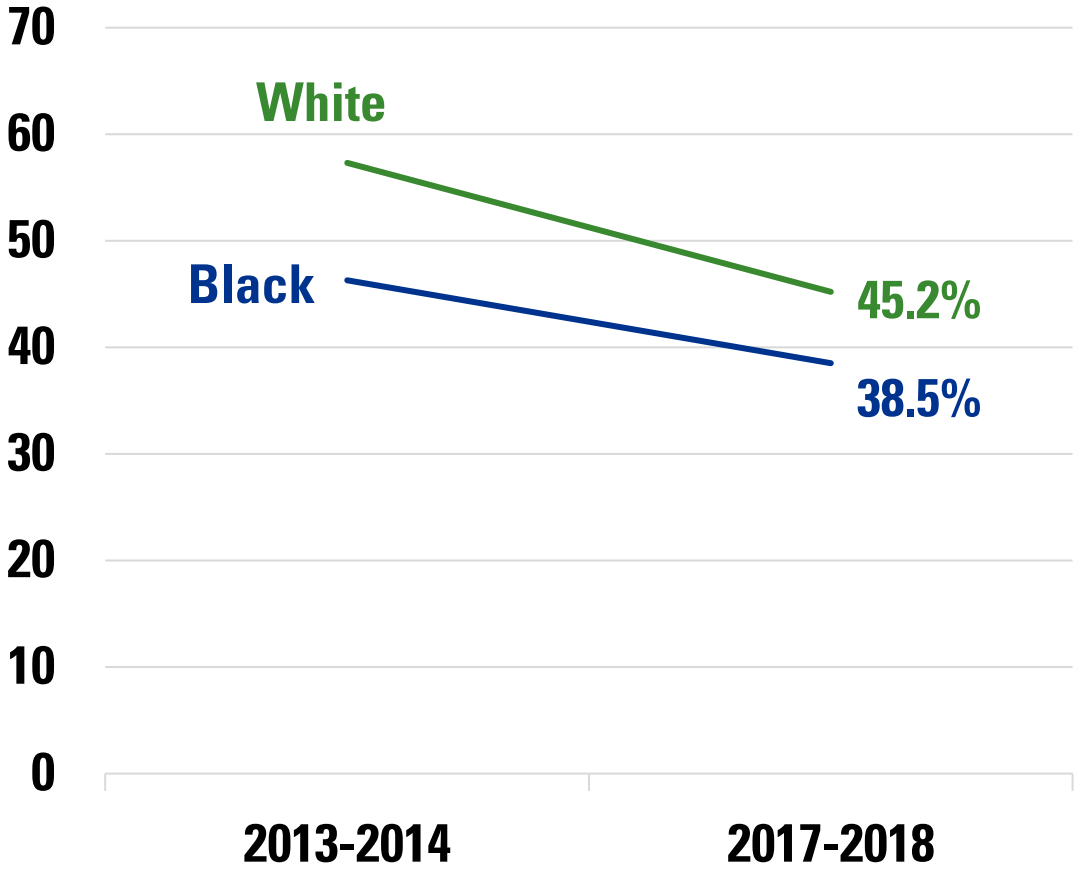
CLINICIANS ARE PRESCRIBING FEWER ACEI/ARB FOR BLACK PATIENTS WITH HYPERTENSION



J Am Board Fam Med 2022;35:26–34

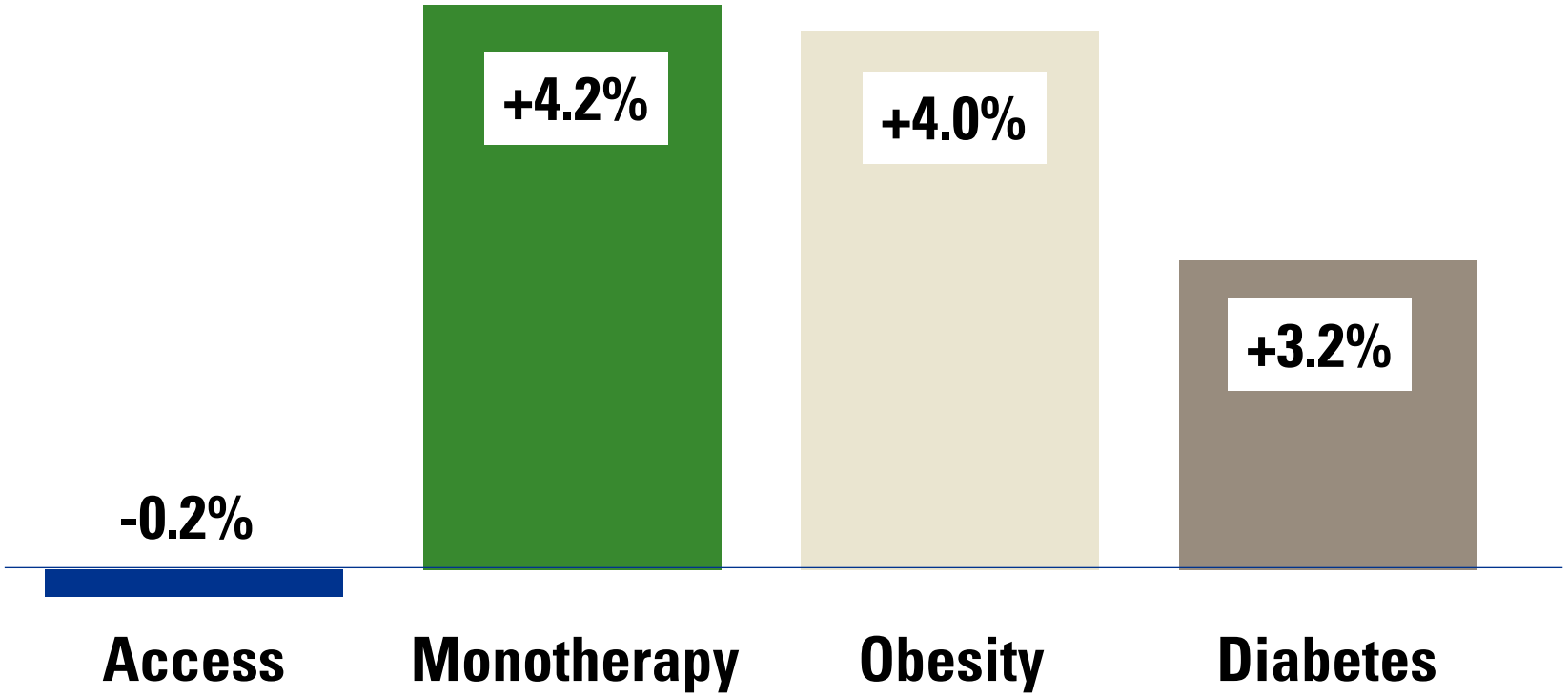
BUT…

Overall hypertension control rates have fallen, and racial disparities have persisted



JAMA. 2020;324(12):1190-1200

WHY? **FACTORS UNDERLYING FALLING CONTROL RATES DURING 2015 TO 2018**



Hypertension. 2021; 78:578–587

WHY?

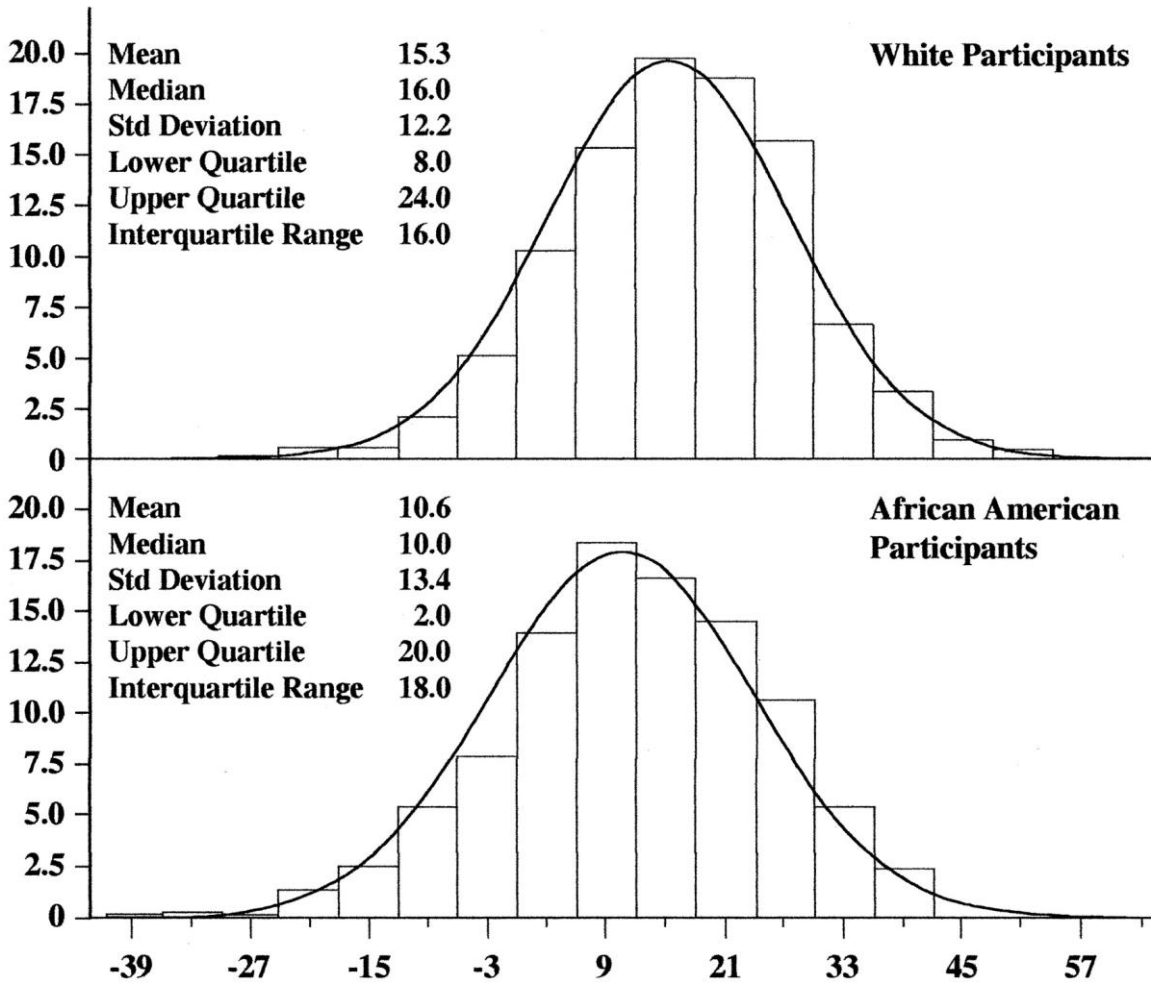
Skin color is increasingly recognized as a poor proxy for precision medicine

Following race-specific monotherapy guidance is not consistent with other evidence-based recommendations

ANALYZE THE LITERATURE SUPPORTING A RACE-AGNOSTIC APPROACH TO HYPERTENSION MANAGEMENT

OTHER **PATIENT-SPECIFIC** FACTORS MAY BE MORE IMPORTANT THAN RACE

In the ATIME study, systolic blood pressure responses were more dissimilar within than between racial groups



Hypertension. 2004;43:1202–1207

OTHER **PROCESS-RELATED** FACTORS MAY BE MORE IMPORTANT THAN RACE

- ✓Decreasing the return visit interval
- ✓Overcoming therapeutic inertia and increasing the probability of treatment intensification
- ✓Improving medication adherence

Cardiovascular Quality and Outcomes. 2019;12:e005624

THE KAISER MODEL: **KEY FEATURES**

Physician-led educational programs on treatment intensification, medication adherence, and consistent use of clinical practice guidelines

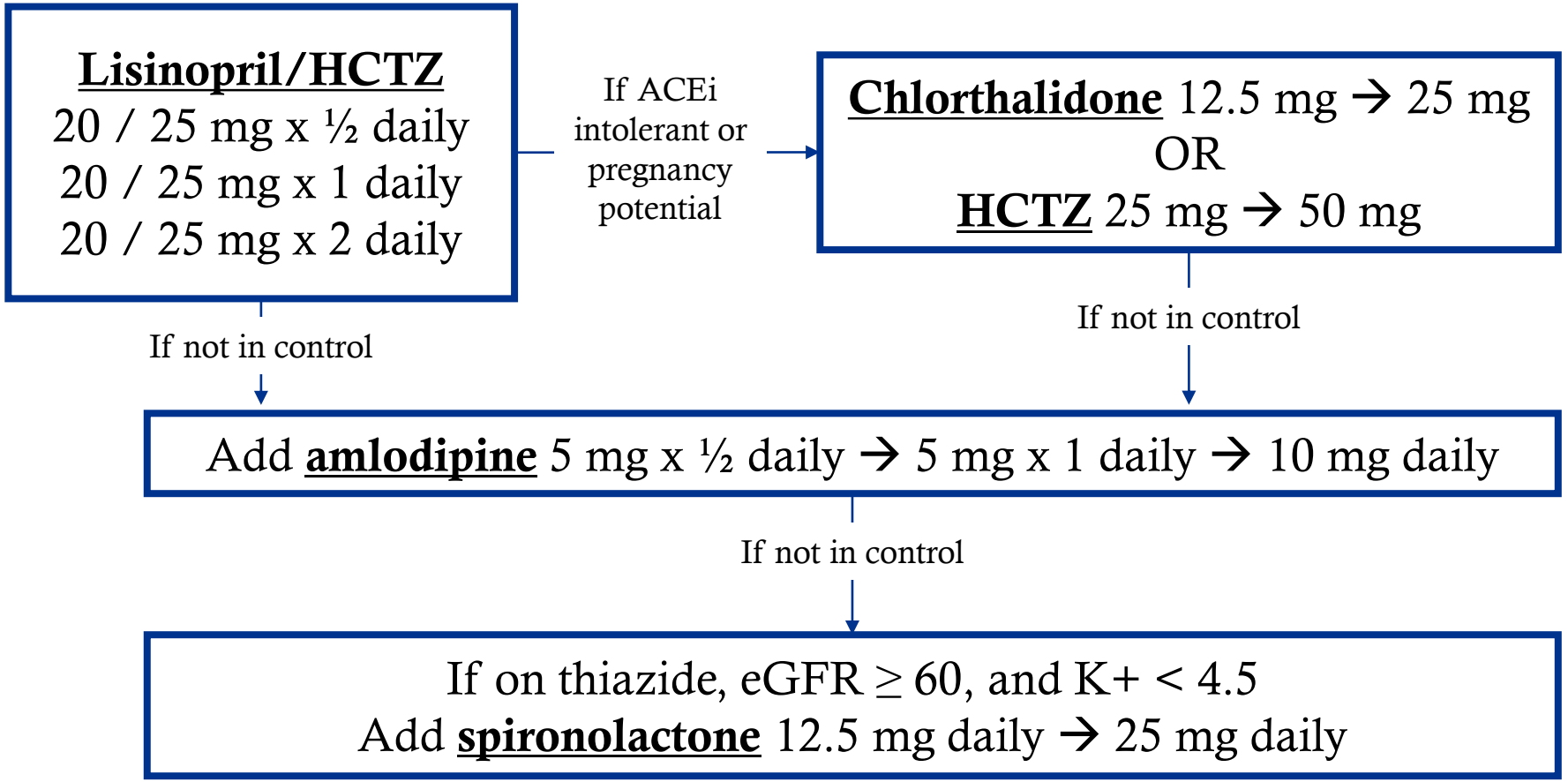
High-functioning primary care teams with nonphysician team members (e.g., advanced practice providers, nurses, and medical assistants)

Workflows that maximized the role of non-physician health care team members and expanded access

Culturally tailored communication tools and patient-centered education

Perm J. 2016; 20:53–59

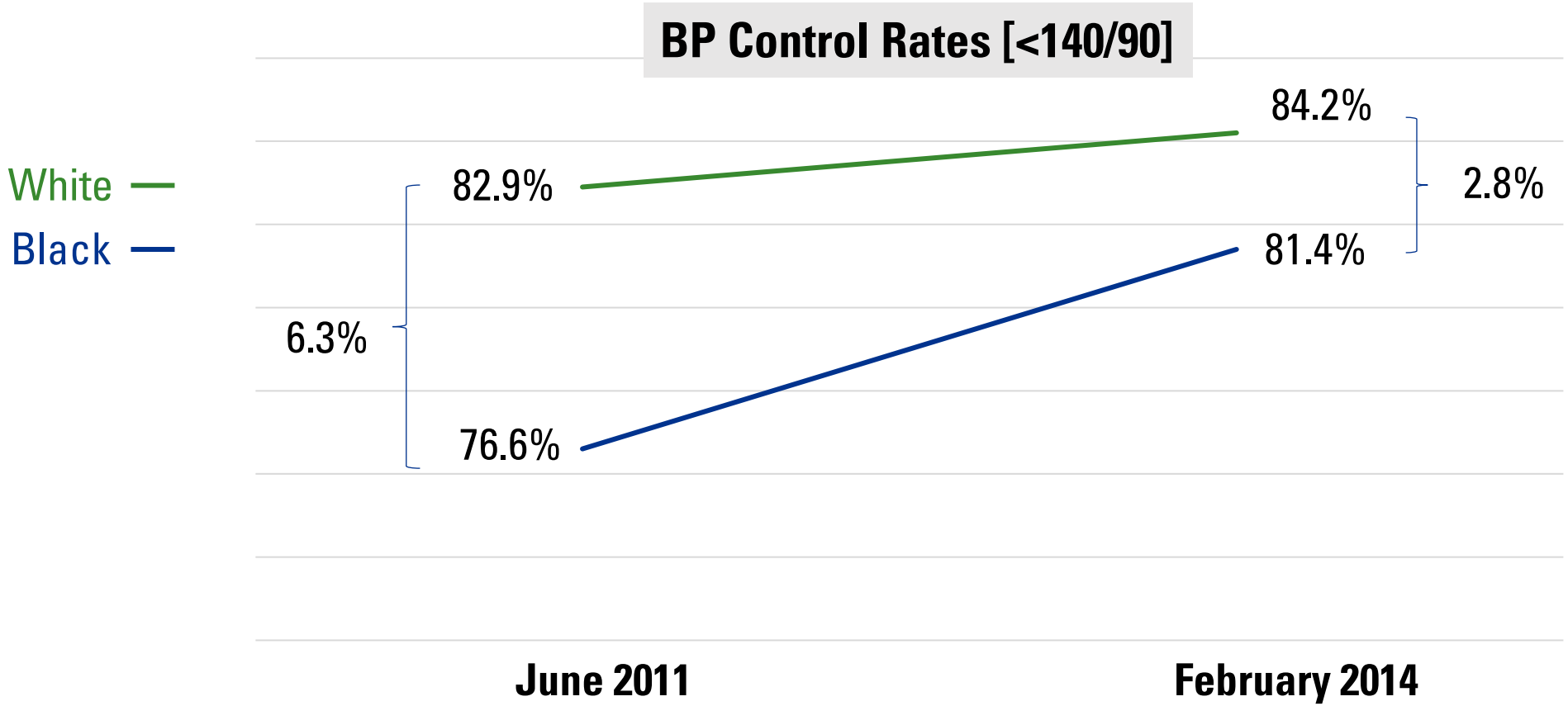
THE KAISER MODEL: **ALGORITHM**



**a recommended sodium restriction of 2400 mg/day was also included in the treatment guidelines

Perm J. 2016; 20:53–59

THE KAISER MODEL: **RESULTS**

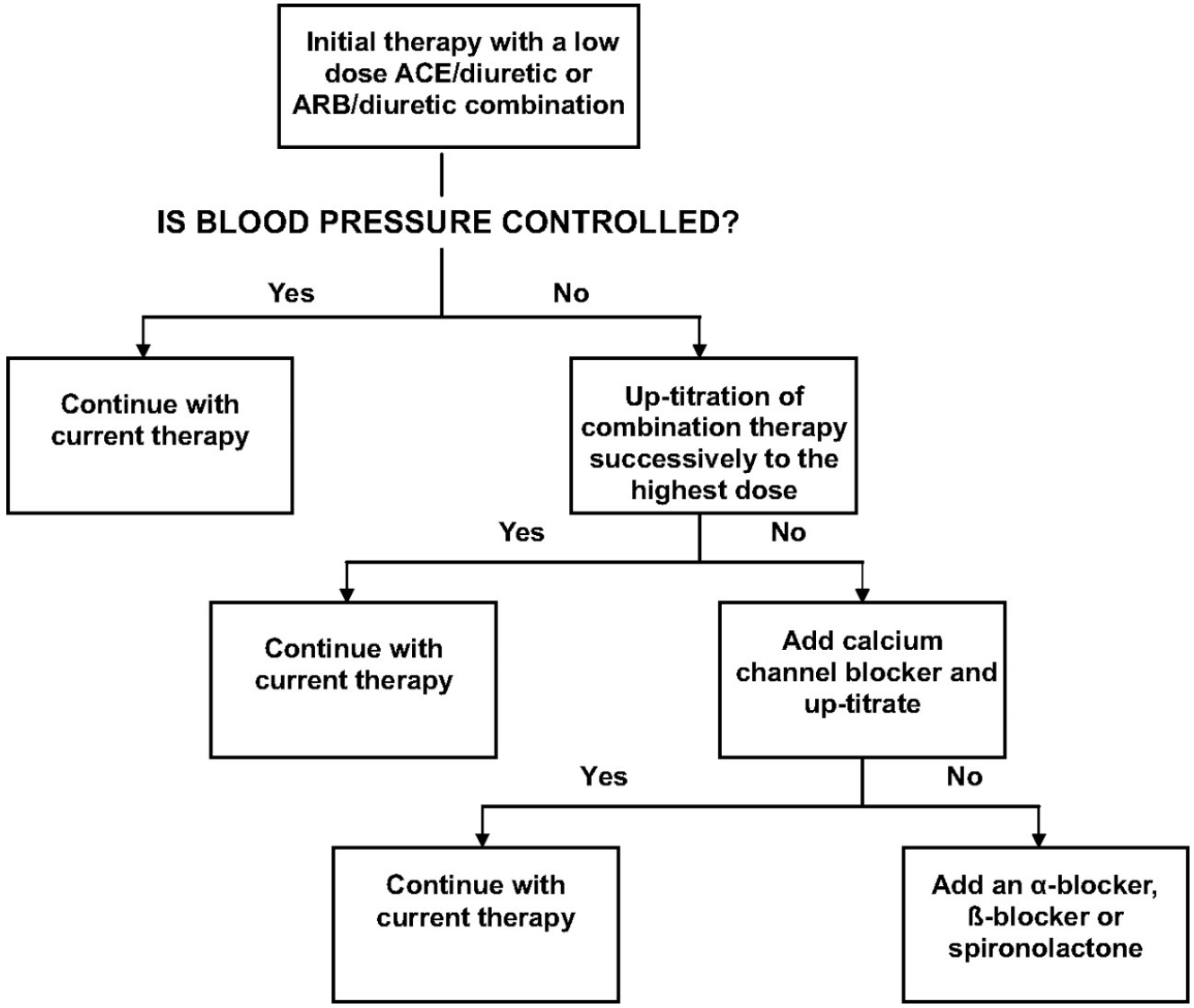


Perm J. 2016; 20:53–59

SIMPLIFIED TREATMENT INTERVENTION TO CONTROL HYPERTENSION: **STITCH**

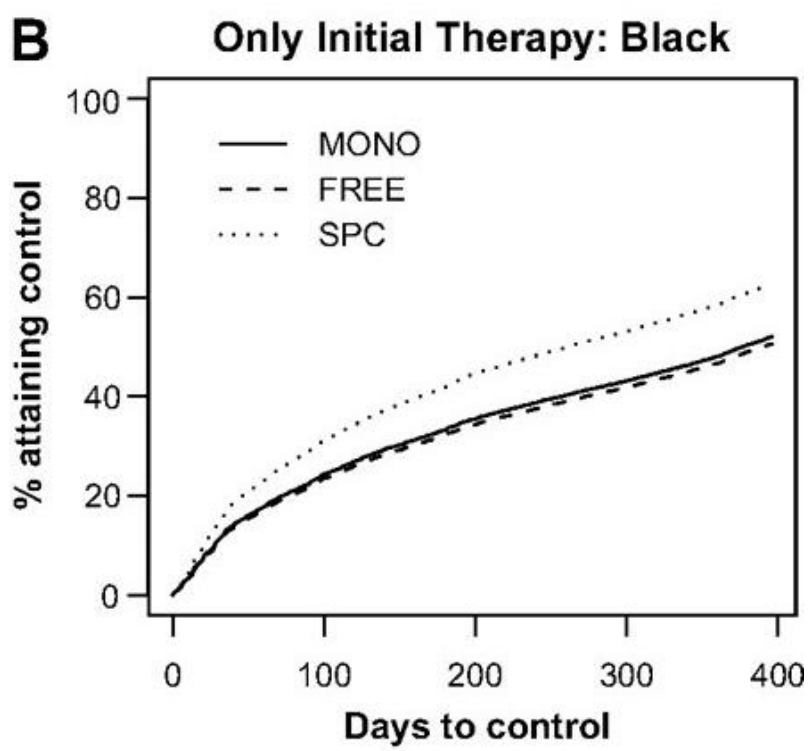
STITCH-care was associated with:

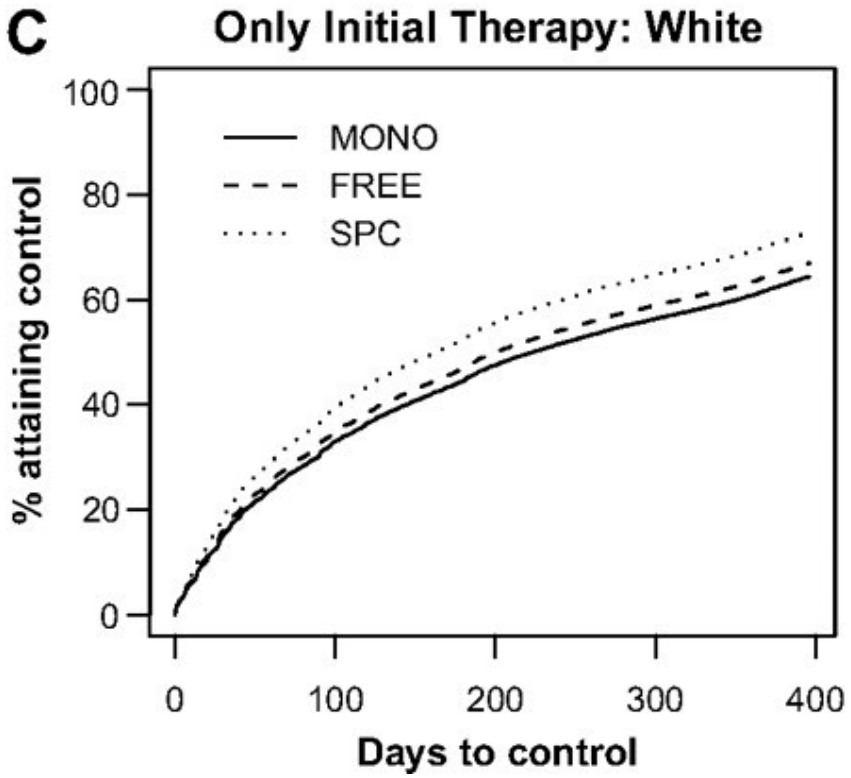
- ✓ Better overall control at 6 months
  64.7% vs. 52.7%
- ✓ Less therapeutic inertia
  Medication up-titration occurred in 82.6% of participants in the STITCH-care group vs. 69.6% of patients in the usual care group



Hypertension. 2009; 53:646–653

In a retrospective study of >100,000 adults with hypertension, individuals who began treatment with single-pill combinations were more likely to achieve BP control compared to those who started on free combinations or monotherapy





Hypertension. 2012; 59:1124–1131

COULD INCREASED USE OF SINGLE-PILL COMBINATION THERAPY REDUCE RACIAL DISPARITIES?

Racial differences in BP response to ACEi monotherapy can be ameliorated with the addition of a diuretic or calcium channel blocker

Single-pill combinations improve adherence, reduce clinical inertia, and have the potential to reduce medication cost

APPLY GUIDELINES AND LITERATURE TO INDIVIDUALIZE TREATMENT OF HYPERTENSION

THE FUTURE? **AI-GUIDED TREATMENT**

Researchers used Machine Learning methods to develop a prescriptive model that can determine the optimal antihypertensive therapy for individual patients based on their specific characteristics

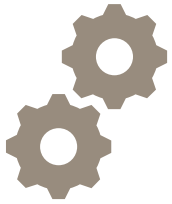
The model provides a list of recommended agents and their associated confidence probabilities

The Machine Learning method achieved a mean SBP reduction of -14.22 mmHg; 70% better than the SBP reduction under standard of care (-8.35 mmHg)

BMC Med Inform Decis Mak 23, 44 (2023)

BETTER IMPLEMENTATION OF WHAT IS KNOWN

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



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

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

Hypertension. 2021;78:588–590

RECOMMENDATIONS BEYOND INITIAL MONOTHERAPY

ISH:

Lifestyle modification should place additional focus on salt restriction, increased intake of vegetables and fruits, weight management, and reducing alcohol intake

ESC/ESH:

Salt restriction is particularly important in Black patients, in whom it may lead to greater BP reductions and more favorably impact the effectiveness of BP-lowering drug treatment

ACC/AHA:

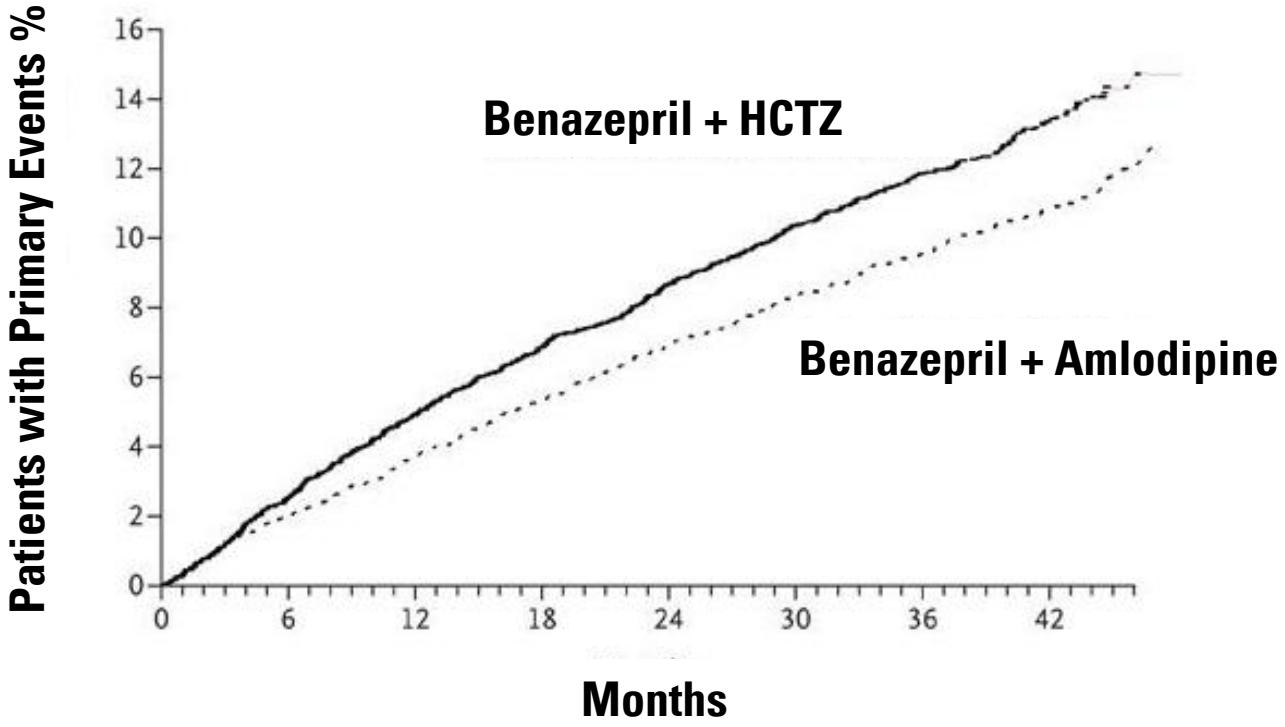
Two or more antihypertensive medications are recommended to achieve a BP target of <130/80 mm Hg in most adults, especially in African-American adults

ESC/ESH & ISH:

In Black patients, initial antihypertensive treatment should include a diuretic or a CCB either in combination or with an ARB, usually as a single-pill combination

ACC/AHA: Hypertension. 2018;71:e13–e115 **ESC/ESH:** Eur Heart J 2018; 39: 3021–3104 **ISH:** Hypertension. 2020;75:1334–1357

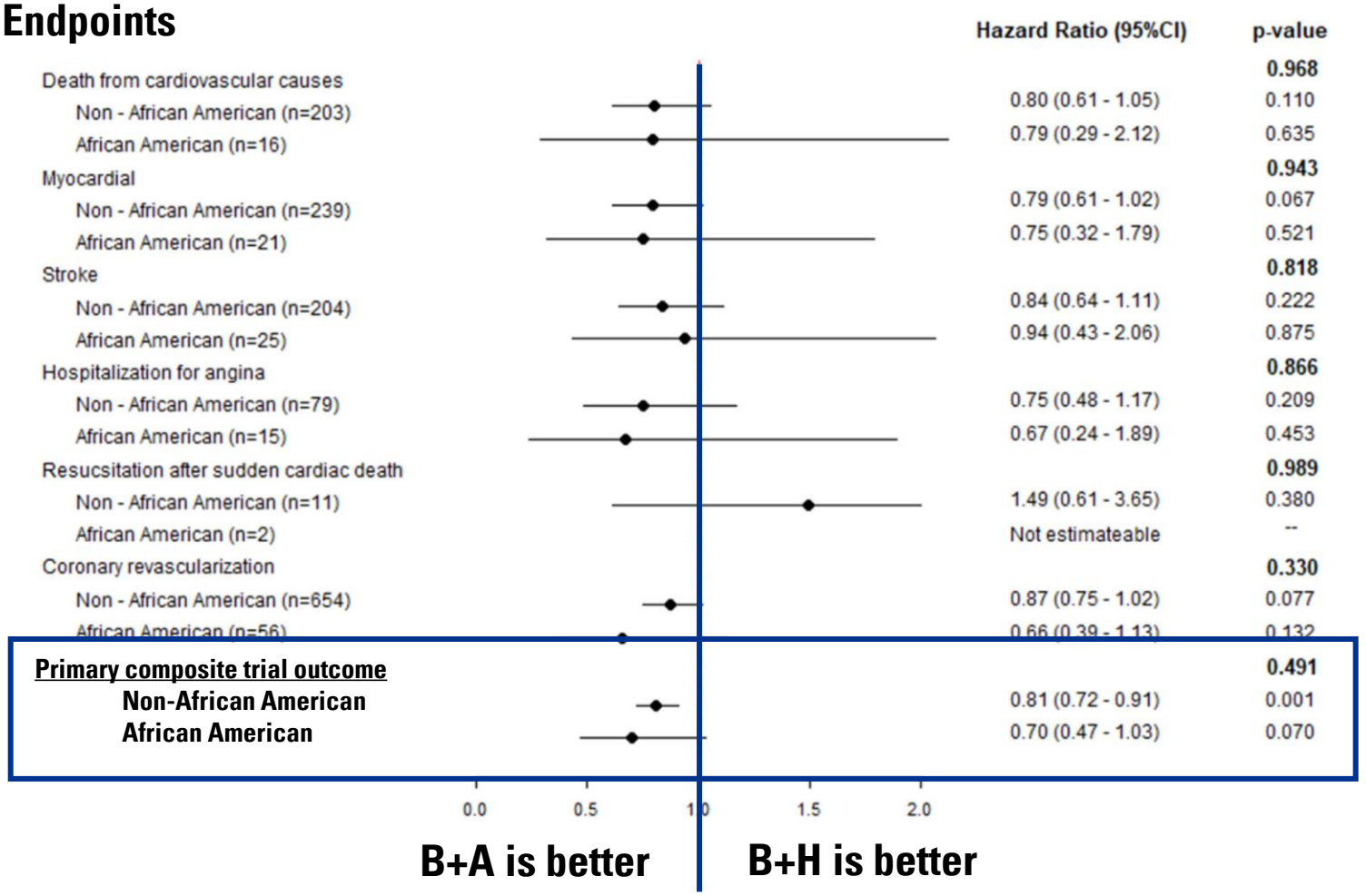
IN THE ACCOMPLISH TRIAL, the benazepril–amlodipine combination was superior to the benazepril–HCTZ combination in reducing the primary composite cardiovascular endpoint in adults with hypertension



ACEi+CCB > ACEi+HCTZ

N Engl J Med 2008; 359:2417-2428

IN A POST HOC ANALYSIS OF THE ACCOMPLISH TRIAL, the primary composite outcome did not reach statistical significance in Black patients, but the results suggested that race did not modify the superior benefits of benazepril-amlodipine seen in ACCOMPLISH, and the HCTZ-based regimen did not convey special benefits in Black participants.

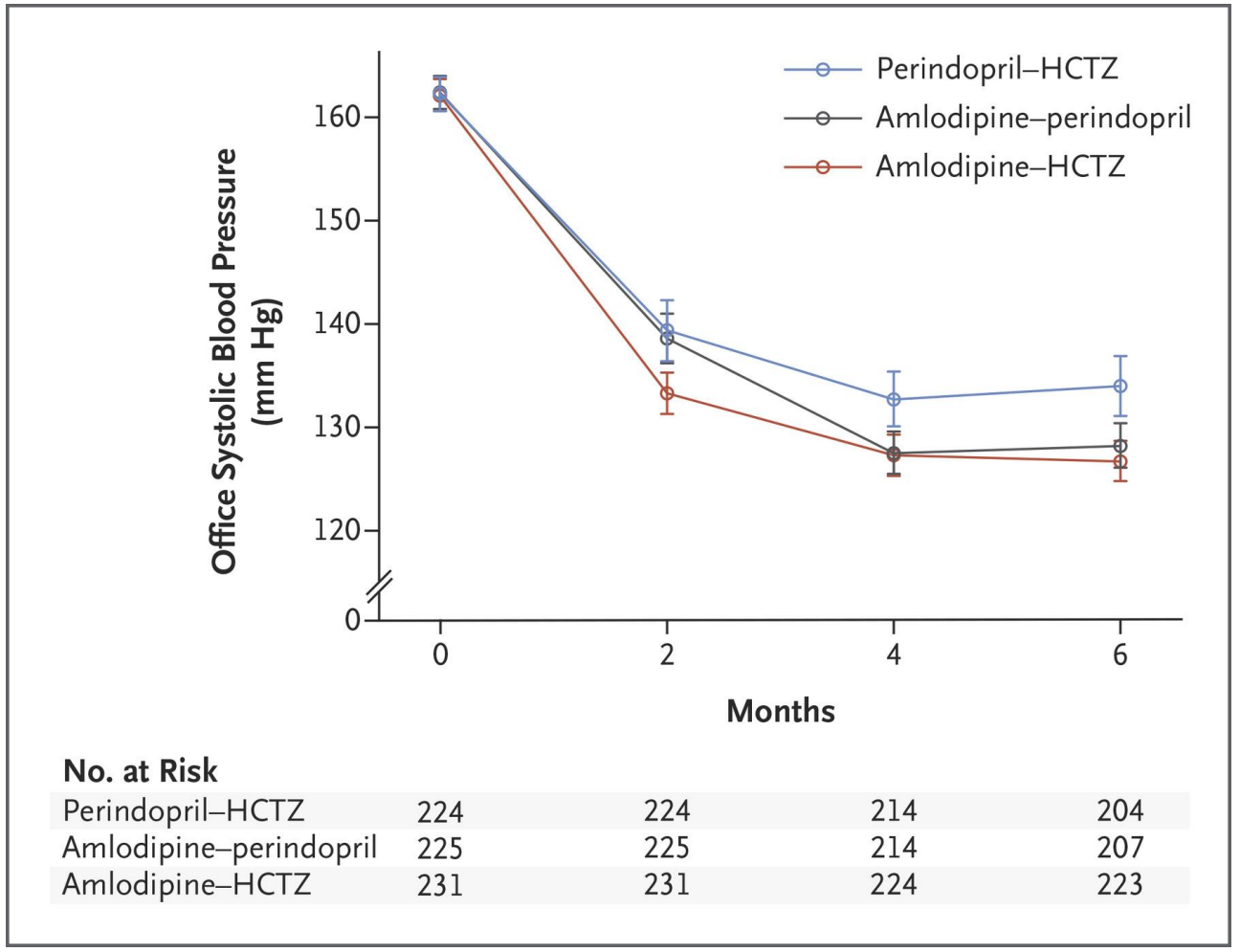


Hypertension. 2021;78:1150–1152

CREOLE STUDY

In Black patients in sub-Saharan Africa, amlodipine plus either hydrochlorothiazide or perindopril was more effective than perindopril plus hydrochlorothiazide at lowering blood pressure

CCB+ACEi ~ CCB+HCTZ > ACEi+HCTZ



No. at Risk				
Perindopril–HCTZ	224	224	214	204
Amlodipine–perindopril	225	225	214	207
Amlodipine–HCTZ	231	231	224	223

N Engl J Med 2019; 380:2429-2439

BLACK BARBERSHOP STUDY

BLACK BARBERSHOP STUDY: **PHARMACIST-LED TREATMENT ALGORITHM**

1. **Initiate 2 First-line Drugs**
   Preferably, amlodipine + a long-acting ARB

2. **If necessary, add a Thiazide-type Diuretic**
   Preferably, indapamide

3. **If necessary, add a 4th drug**
   Preferably, spironolactone

N Engl J Med 2018; 378:1291-1301

BLACK BARBERSHOP STUDY: **RESULTS**

The mean systolic BP fell by 27 mmHg (152.8 → 125.8) in the intervention group and by 9.3 mmHg (154.6 → 145.4) in the control group

A BP of <130/80 was achieved in 63.6% of the participants in the intervention group and 11.7% of the participants in the control group

The use of antihypertensive medication increased from 55% to 100% in the intervention group and from 53% to 63% in the control group

N Engl J Med 2018; 378:1291-1301

MISSISSIPPI TELEHEALTH STUDY

MISSISSIPPI TELEHEALTH STUDY: **BACKGROUND**

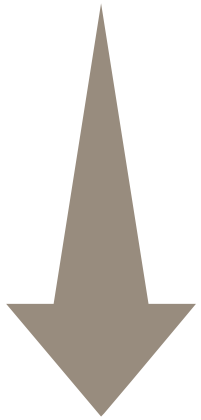
Participants were provided home blood pressure monitors with Bluetooth connectivity and instructed to transmit daily readings

a clinical pharmacist reviewed the BPs every 3 and up-titrated medication according to a pre-specified algorithm

Mean age 59 years; 65% women; 59.2% Black, 27.5% did not complete high school, 46.7% reported an annual household income <$30,000

Hypertension. 2021 Dec; 78(6): 1927–1929

MISSISSIPPI TELEHEALTH STUDY: **RESULTS**

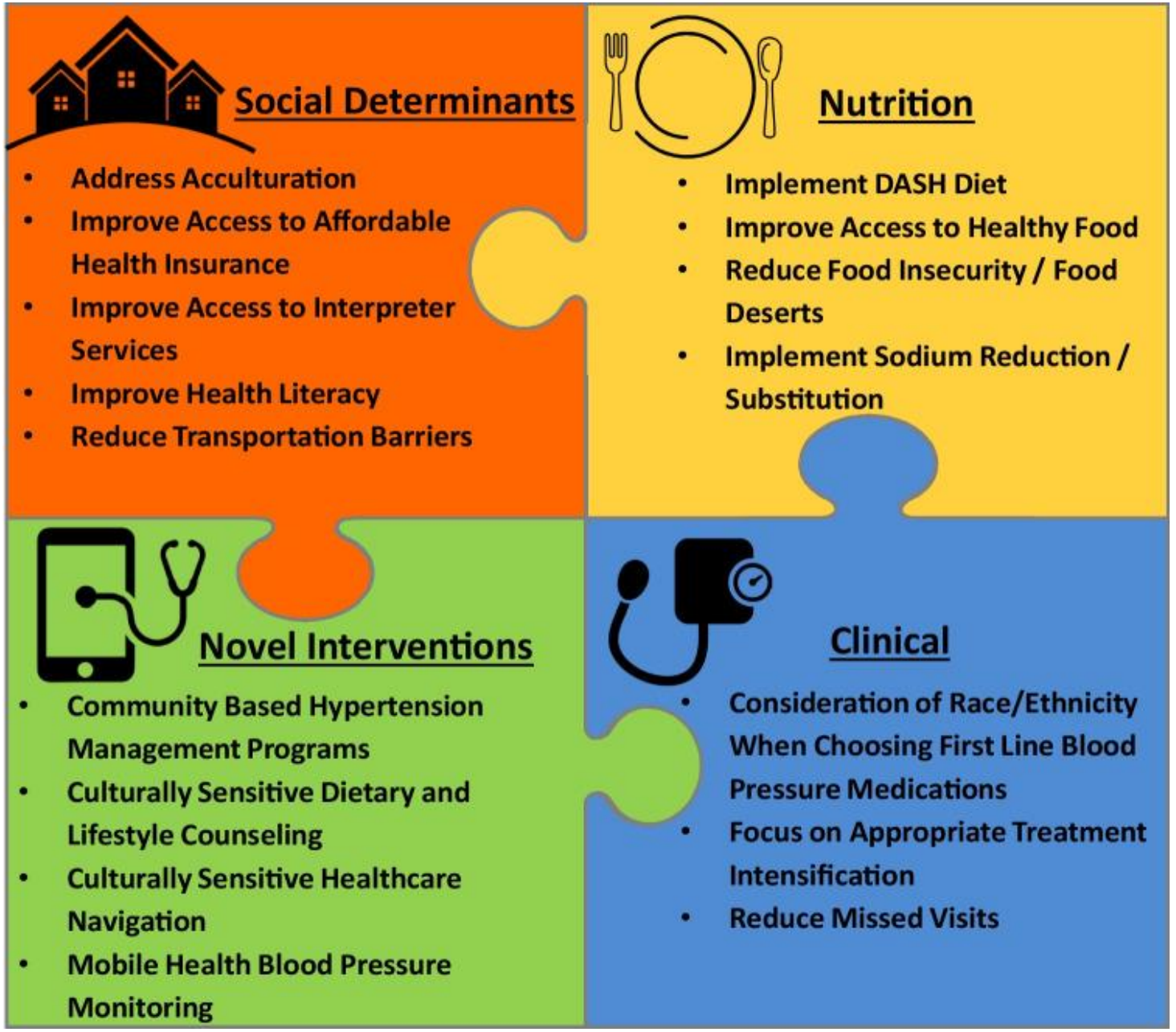


The telehealth intervention was associated with a significant reduction in blood pressure (141.6/84.8 → 127.8/77.1)

After 6 months, 50% of participants had achieved a BP goal of <130/80 and 80% had achieved a BP of <140/90

Hypertension. 2021 Dec; 78(6): 1927–1929

INTERVENTIONS TO IMPROVE RACIAL AND ETHNIC DISPARITIES



Curr Cardiol Rep. 2023; 25(1): 17–27

RACE-BASED VS. RACE-CONSCIOUS

How Race is Currently Used

HTN treatment guidelines provide alternate pathways for Black and non-Black patients

Proposed Race-Conscious Approach

Consider all antihypertensive options for blood pressure control in Black patients; adjust as needed to achieve goals and manage adverse effects

Lancet 2020; 396: 1125–28

A **RACE-CONSCIOUS** ALGORITHM TO CONSIDER

Essential	Optimal	
• Use free combinations if single-pill combinations are not available or unaffordable • Use thiazide diuretics if thiazide-like diuretics are not available • Use non-dihydropyridine CCBs if dihydropyridine (DHP) CCBs are not available or not tolerated	Step 1	Low-dose A + C
	Step 2	Full dose A + C
	Step 3	A + C + D
	Step 4	A + C + D + Spironolactone

A = ACEi or ARB; **C** = DHP-CCB; **D** = Thiazide-like diuretic

Hypertension. 2020;75:1334–1357

SINGLE-PILL COMBINATIONS

ACEi/ARB + Thiazide:

- **Limitations:** All readily-available products include HCTZ instead of indapamide or chlorthalidone, and many under-dose HCTZ
- **Something to consider:** To optimize therapy AND limit risk of errors, consider choosing a product that allows you to maximize HCTZ while prescribing the same tablet strength:
  ½ tablet per day → 1 tablet per day → 2 tablets per day
  - ✓ Lisinopril/HCTZ 20/25 mg
  - ✓ Benazepril/HCTZ 20/25 mg

SINGLE-PILL COMBINATIONS

<u>CCB + ACEi/ARB</u>:

- **Limitations:** Only select combinations available, and can be more expensive than ACEi/ARB +HCTZ depending on insurance formulary
- **Something to consider:** Allows for use of two long-acting, preferred medications, and is consistent with evidence from ACCOMPLISH, CREOLE, and the Black Barbershop Study
  - ✓ Amlodipine/Benazepril
  - ✓ Amlodipine/Olmesartan
  - ✓ Amlodipine/Telmisartan
  - ✓ Amlodipine/Valsartan

  } Preferred single-pill combinations for Black individuals due to lower risk of angioedema with ARB

TAKE HOME MESSAGES

If a clinician is committed to starting with monotherapy, it is reasonable to consider race/ethnicity to help select the most effective initial monotherapy. However, for most patients, monotherapy will be inadequate to achieve their BP goal and this strategy is unlikely to improve racial disparities in the population.

Other factors including use of combination therapy, timely up-titration when indicated, medication adherence, dietary and lifestyle interventions, and social and environmental factors, are likely more important than choice of initial monotherapy based on skin color

Pharmaceutical therapy should be more homogeneous for all racial/ethnic groups with the personalized aspect of therapy focused on sociocultural, environmental and behavioral aspects.

#1

Most current hypertension treatment guidelines recommend that Black and African American individuals without comorbidities should receive which of the following classes as initial drug therapy?

A. Calcium channel blockers
B. Thiazide diuretics
C. Angiotensin-converting enzyme inhibitors and/or angiotensin receptor blockers
D. A or B only

#2

True or False: Adherence to the race-specific treatment recommendations for initial antihypertensive therapy has resulted in improved blood pressure control rates in the Black and African American population.

A. True
B. False

#3

Which of the following factors has been associated with reduced racial disparities in blood pressure control?

A. Adherence to race-specific recommendations for initial monotherapy
B. Race-agnostic treatment algorithms that minimize therapeutic inertia and promote use of combination therapy
C. Comprehensive, team-based models that use race-informed communication, self-care, and dietary strategies
D. All of the above
E. B & C only

#4

Your patient is a 55-year-old Black man who was recently diagnosed with hypertension. Over the past 6 months he has focused on reducing the sodium in his diet and increasing his physical activity. His BP is 152/94 today and he is agreeable to start pharmacologic therapy. Which of the following is the most evidence-based recommendation?

A. Amlodipine 5 mg daily
B. Chlorthalidone 25 mg daily
C. Olmesartan 20 mg daily
D. Amlodipine/Olmesartan 5-20 mg daily

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