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Ohio Cardiovascular Health Collaborative



In partnership with:



Cardi-OH ECHO Reducing the Burden of Hypertension

Thursday, February 27, 2020

Disclosure Statements



The following planners, speakers, moderators, and/or panelists of the CME activity have financial relationships with commercial interests to disclose:

- Adam T. Perzynski, PhD reports being co-founder of Global Health Metrics LLC, a Cleveland-based software company and royalty agreements for forthcoming books with Springer publishing and Taylor Francis publishing.
- Brian Bachelder, MD received funds for his role as Physician Advisor at VaxCare.
- SiranM. Koroukian, PhD received grant funds for her role as a subcontractor on a study funded by Celgene.
- Christopher A. Taylor, PhD, RDN, LD, FAND reports grant funding and travel support for his role as a consultant, researcher, and presenter for Abbott Nutrition, and is also a member of the Scientific Advisory Council of Viocare, Inc.
- Jackson T. Wright, Jr., MD, PhD reports research support from the NIH and Ohio Department of Medicaid and consulting with NIH, AHA, and ACC.
- These financial relationships are outside the presented work.

All other planners, speakers, moderators, and/or panelists of the CME activity have no financial relationships with commercial interests to disclose.

Special Populations: African Americans



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Objectives



- Briefly describe the epidemiology and impact of hypertension among African Americans.
- List and describe a minimum of two guideline-based recommendations tailored for the treatment of hypertension among African Americans.
- Describe a culturally sensitive approach to recommending lifestyle and medication treatment for individual adult African American patients.

Prevalence of Hypertension Based on 2 SBP/DBP Thresholds*†

	SBP/DBP ≥130/80 mm Hg or Self-Reported Antihypertensive Medication†		SBP/DBP ≥140/90 mm Hg or Self-Reported Antihypertensive Medication‡	
Overall, crude	46%		32%	
	Men (n=4717)	Women (n=4906)	Men (n=4717)	Women (n=4906)
Overall, age-sex adjusted	48%	43%	31%	32%
Age group, y				
20–44	30%	19%	11%	10%
45–54	50%	44%	33%	27%
55–64	70%	63%	53%	52%
65–74	77%	75%	64%	63%
75+	79%	85%	71%	78%
Race-ethnicity §				
Non-Hispanic White	47%	41%	31%	30%
Non-Hispanic Black	59%	56%	42%	46%
Non-Hispanic Asian	45%	36%	29%	27%
Hispanic	44%	42%	27%	32%

The prevalence estimates have been rounded to the nearest full percentage.

*130/80 and 140/90 mm Hg in 9623 participants (≥20 years of age) in NHANES 2011–2014.

†BP cutpoints for definition of hypertension in the present guideline.

‡BP cutpoints for definition of hypertension in JNC 7.

§ Adjusted to the 2010 age-sex distribution of the U.S. adult population.

BP indicates blood pressure; DBP, diastolic blood pressure; NHANES, National Health and Nutrition Examination Survey; and SBP, systolic blood pressure.

Morbidity and Mortality in AA Hypertensive Patients



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- Hypertension occurs at younger age and more resistant to treatment
- Mortality in African American males—30% hypertension-related, females—20%
- Nonfatal strokes—1.3 x greater than whites
- Fatal strokes—1.8 x greater than whites
- Heart disease deaths—1.5 x greater than whites
- End-stage renal disease—4.2 x greater than whites (HTN-related—20 x greater)
- Numbers have changed little over past decade

Social Determinants of Health



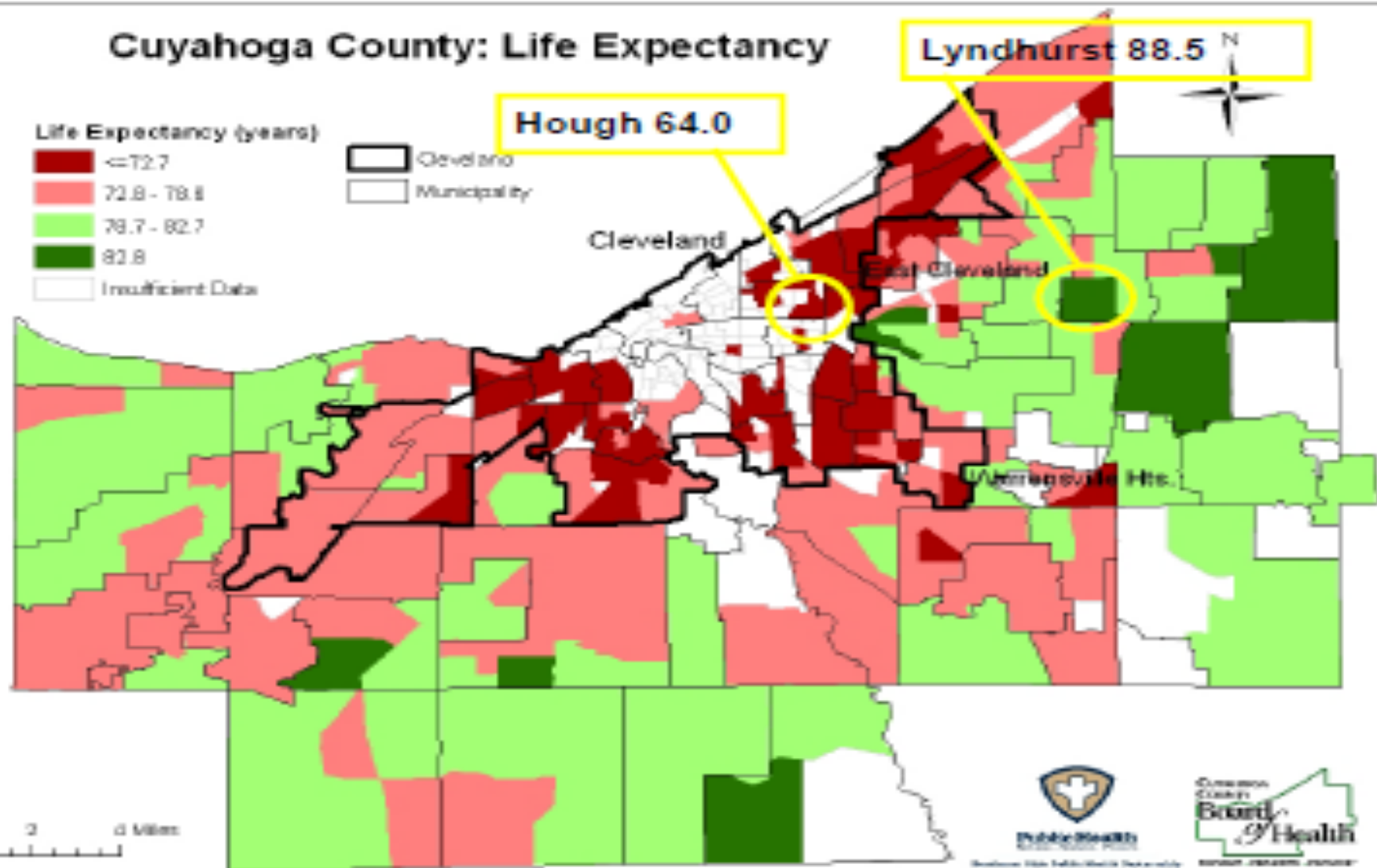
- Socioeconomic status
- Social challenges associated with Race, ethnicity
- Social support
- Culture and language
- Access to care
- Residential environment
- Above mediated via psychological, behavioral, and biologic mechanisms

Cuyahoga County: Life Expectancy

Life Expectancy (years)

- <= 72.7
- 72.8 - 78.8
- 78.7 - 82.7
- 82.8
- Insufficient Data

- Cleveland
- Municipality



Lyndhurst 88.5

Hough 64.0

Cleveland

East Cleveland

Warrensville Hts.

0 1 2 3 Miles



Public Health



Cuyahoga County Board of Health



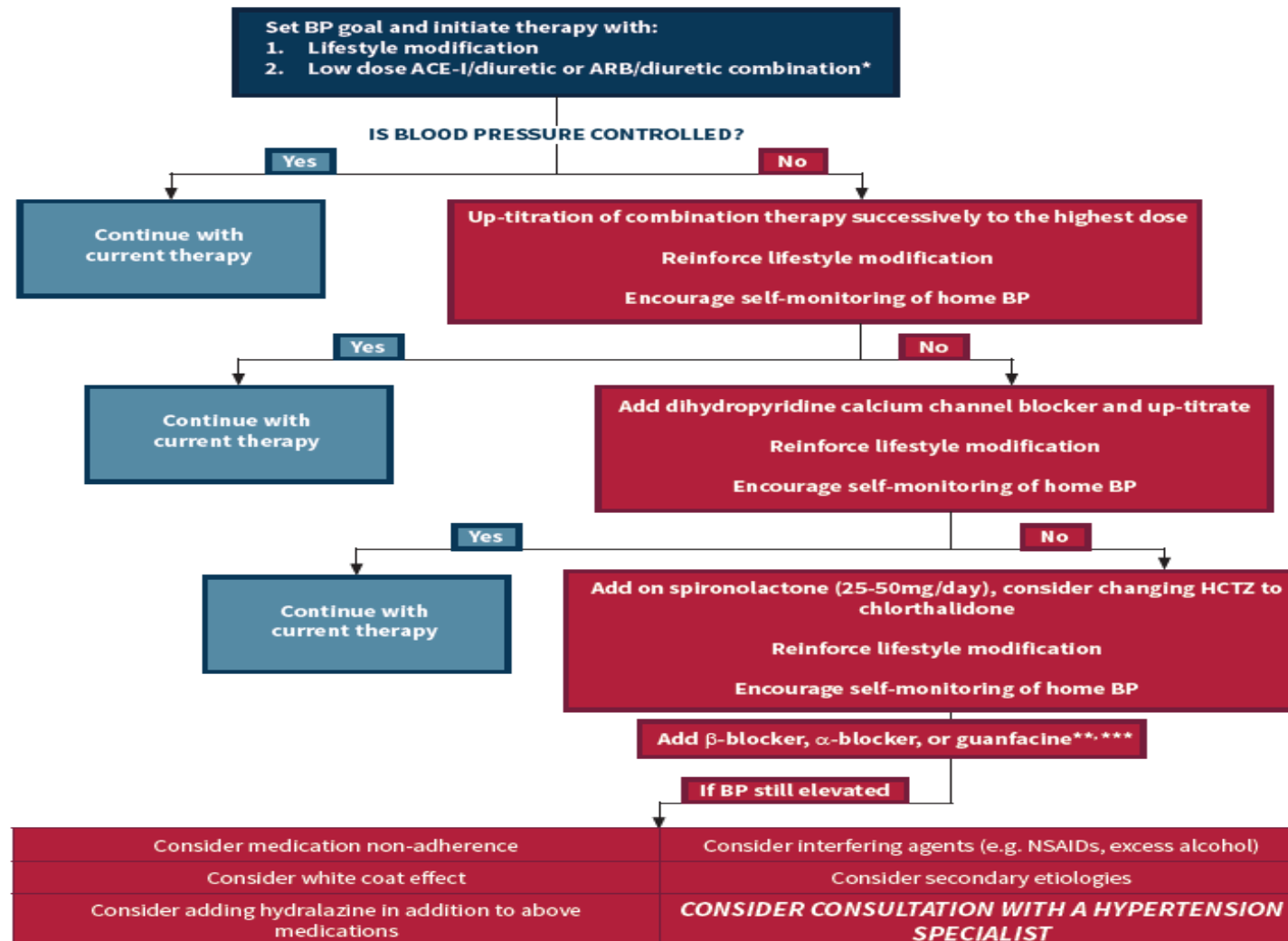
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Hypertension Change Package Algorithm



Resource III: Treatment Algorithm¹³ (Secondary Drivers B1-B3)

Use of a validated treatment algorithm will improve blood pressure control within your practice.



*If pregnant or pregnancy potential, avoid using ACE-I or ARB or spironolactone
 **Avoid starting a beta blocker if pulse <70 or on a non-dihydropyridine calcium channel blocker
 ***Guanfacine has similar mechanism of action as clonidine and is once daily instead of three times a day

Kaiser Improvement



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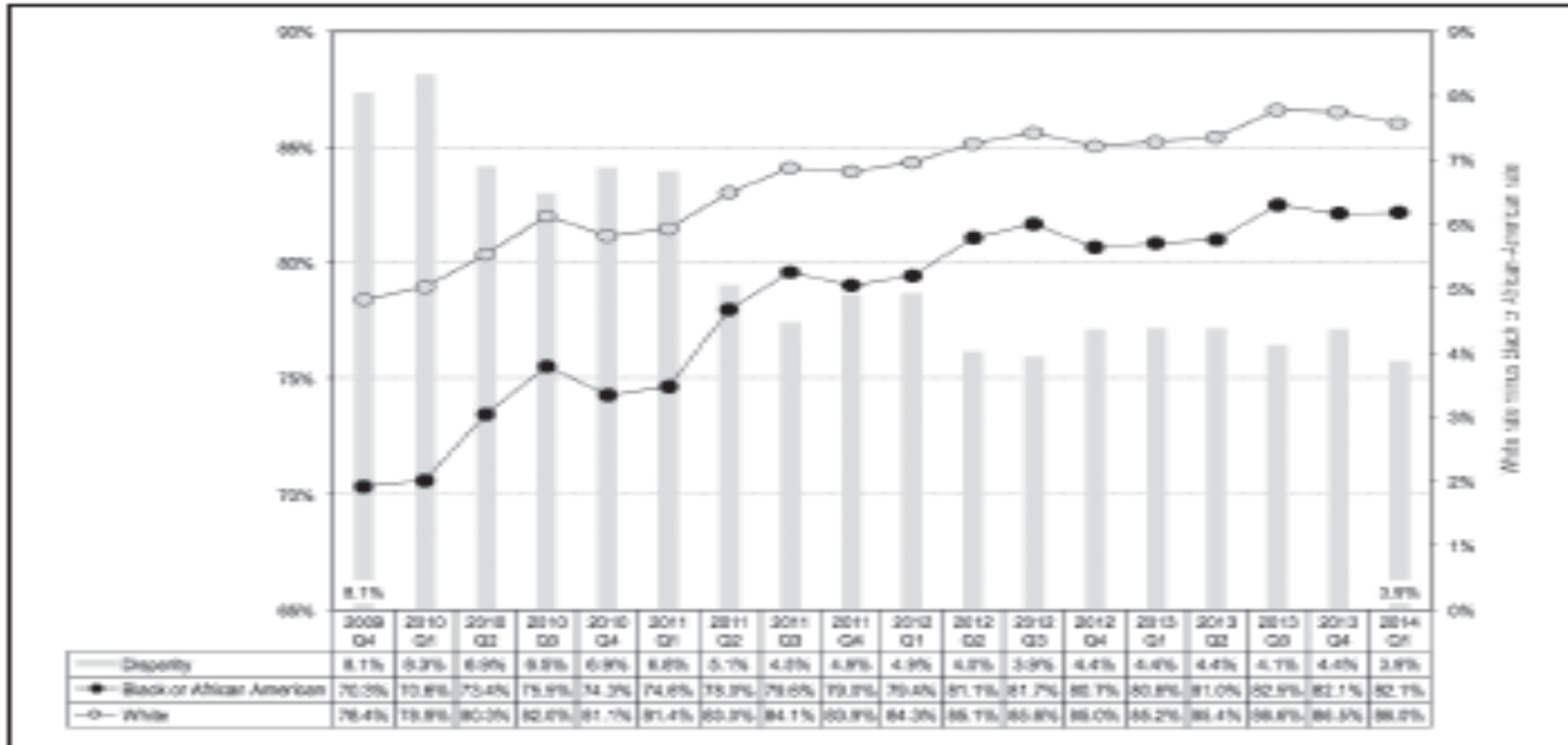


Figure 3. Hypertension control for Kaiser Permanente programwide.¹

Percentage of members in hypertension registry with blood pressure below 140/90 mmHg (left x-axis) and disparity between control rates for white and black members (bars), 2009 Quarter (Q) 4 through 2014 Q1.

1. Platt ST. Kaiser Permanente Programwide Quarterly ECHO (Equitable Care Health Outcomes) Report (unpublished). Oakland, CA: Center for Healthcare Analytics, Hospitals, Quality and Care Delivery Excellence; 2014.

BP Control VAMCs 2000-2010

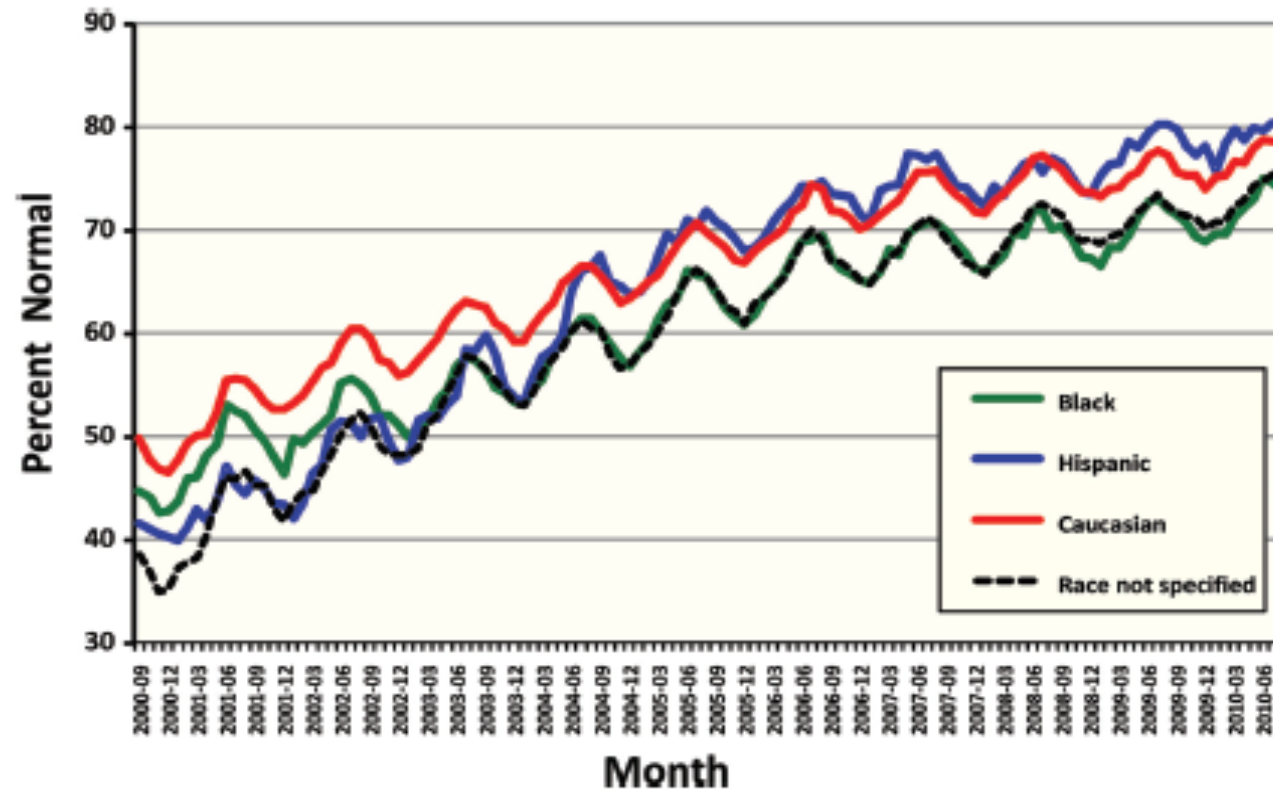


Figure 2. Percentage of patients with hypertension who exhibited normal blood pressure each month, stratified by race/ethnicity. In the year 2000, white patients exhibited the best control rates, followed by blacks and Hispanics. Patients in the nonspecified group had the worse control rates. There was a continuous improvement in yearly control rates among all ethnic groups. However, after the year 2004, improvement was greater among the Hispanic group, and by the year 2010, control rates were better among Hispanics than all other groups. In contrast, improvement in control rates among blacks was slower and became identical to the nonspecified group after the year 2002. At the end of the follow-up period, these 2 groups had control rates that were significantly lower than in the white and Hispanic groups.

Table 2. BP Values and Hypertension Control Rates at the Past Visit of the Baseline and After Months 1 to 6 and 7 to 12 of MAP

Variables	Baseline	6 Months	12 Months	12 Months LOCF
n	16 787	16 787	11 863	16 787
Blood pressure values at baseline, 6 and 12 mo				
SBP, mm Hg	132.6±0.13	130.7±0.12	130.3±0.14	130.5±0.12
DBP, mm Hg	78.7±0.08	77.2±0.08	77.0±0.10	77.1±0.08
Change in BP from baseline to 6 and 12 mo				
Δ SBP from baseline, mm Hg		−1.9±0.14*	−2.1±0.17*	−2.0±0.14*
Δ DBP from baseline, mm Hg		−1.5±0.08*	−1.6±0.10*	−1.6±0.08*
Blood pressure categories				
BP <140/<90 mm Hg (controlled), n (%)	10 816 (64.4)	12 475 (74.3)	8 797 (74.2)	12 346 (73.6)
BP 140–159/90–99 mm Hg, n (%)	4 722 (28.1)	3 359 (20.0)	2 482 (20.9)	3 557 (21.2)
BP ≥160/≥100 mm Hg, n (%)	1 249 (7.4)	953 (5.7)	584 (4.9)	884 (5.3)
Hypertension control in black and white hypertensive adults				
BP <140/ <90 mm Hg whites, n (%)	7 472 (67.3)	8 524 (76.8)	6 406 (76.1)	8 442 (76.0)
BP <140/<90 mm Hg blacks, n (%)	1 076 (56.8)	1 352 (71.4)	1 056 (69.7)	1 318 (69.6)
White:black comparison	<i>P</i> <0.0001	<i>P</i> <0.0001	<i>P</i> <0.0001	<i>P</i> <0.0001

All data shown as mean±SE or n (number) and percent (%). BP indicates blood pressure; DBP, diastolic BP; LOCF, last observation carried forward; MAP, Measure accurately, Act rapidly, and Partner with patients; and SBP, systolic BP.

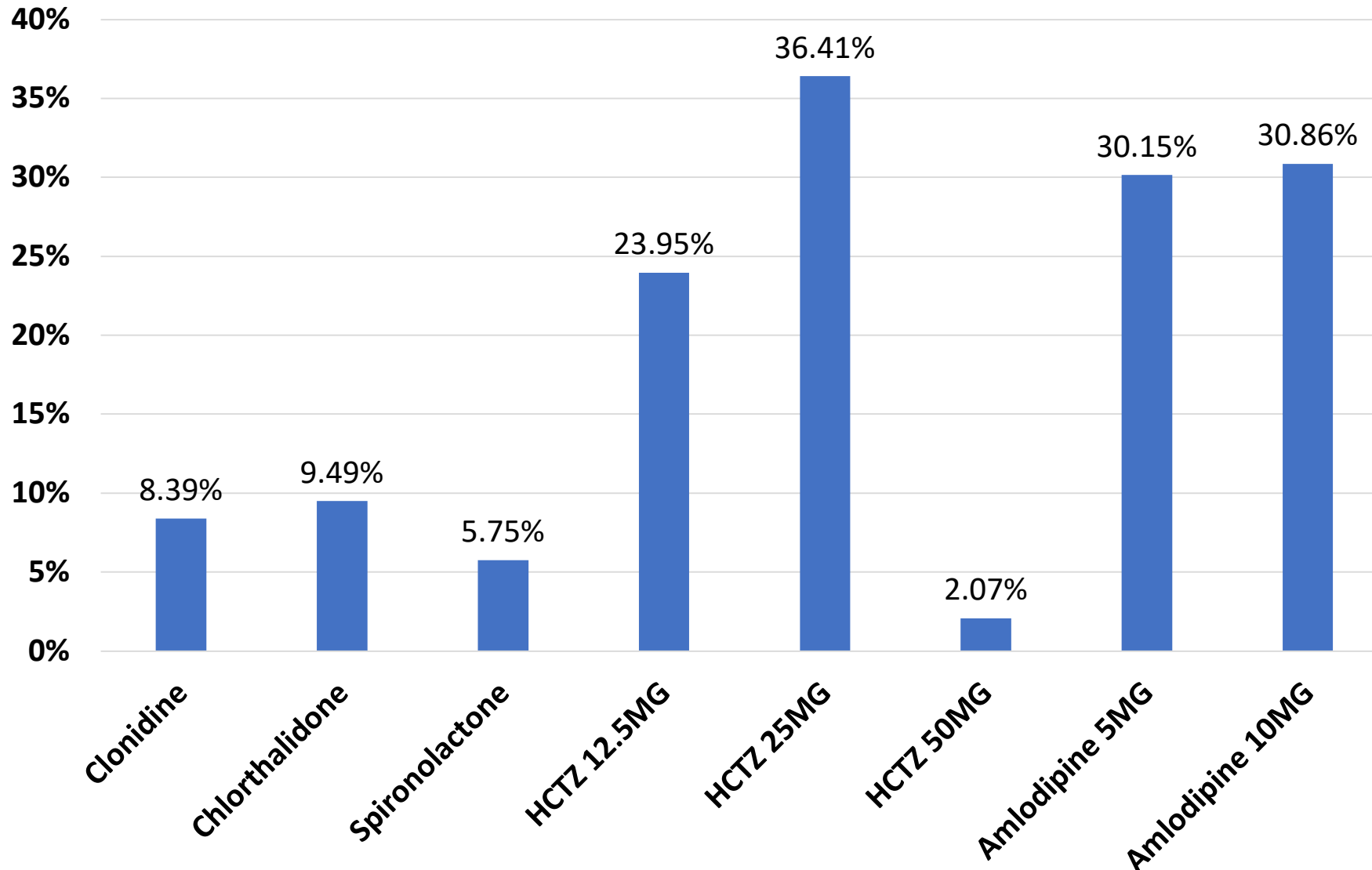
**P*<0.001.

Selected blood pressure (BP) medications filled in adults on Medicaid with uncontrolled BP

Calendar years 2017-2018 (N=1549)

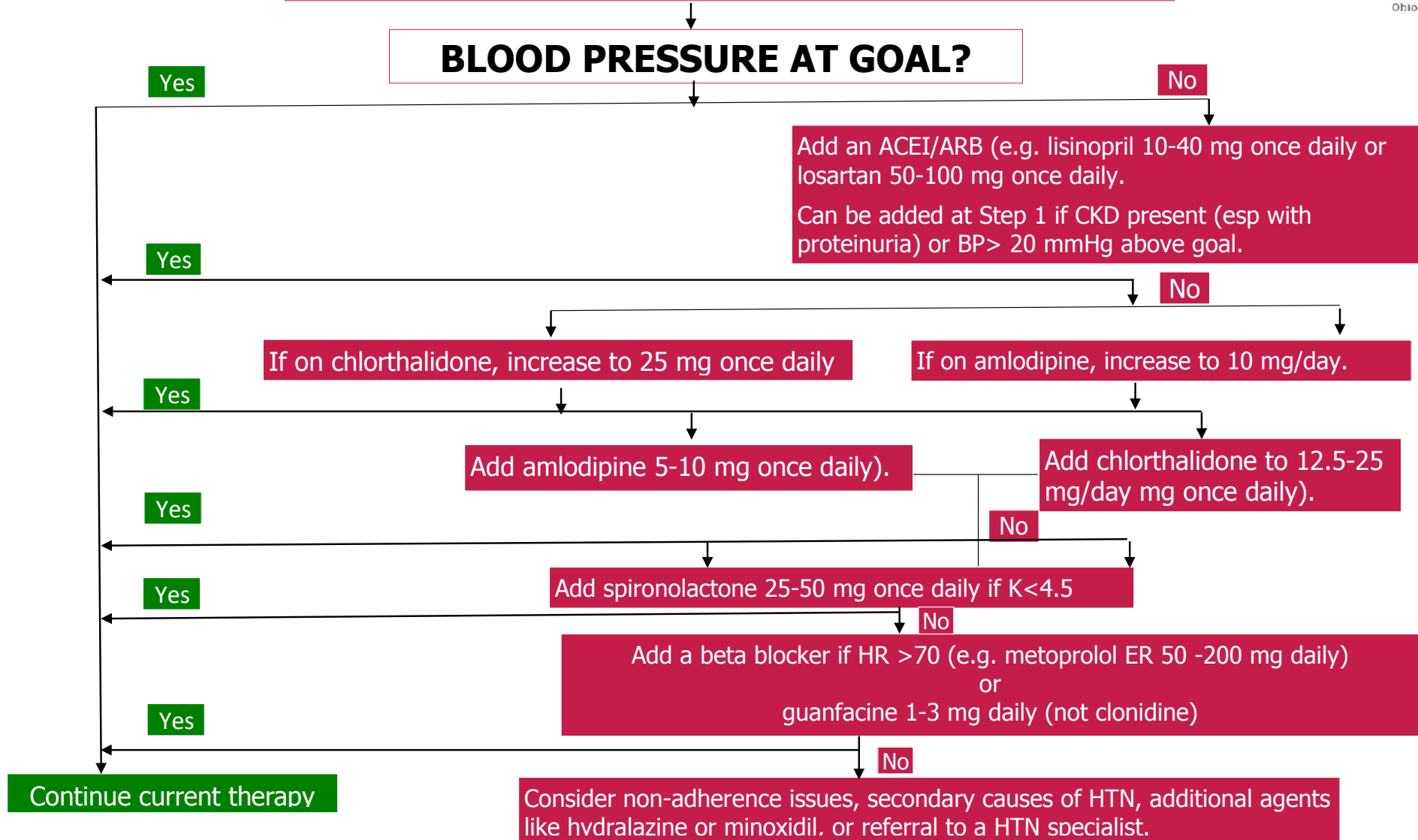


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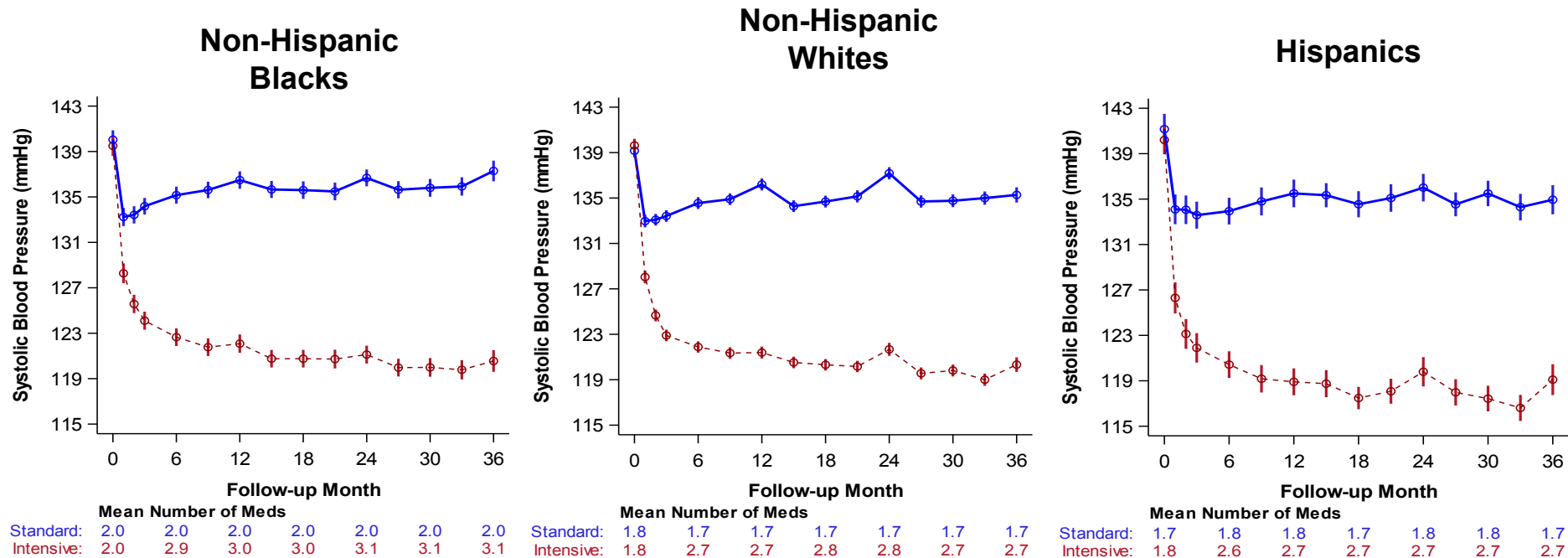


Hypertension Drug Treatment Algorithm

In addition to lifestyle change: Start a thiazide diuretic (chlorthalidone 25 mg ½ tab once daily. [Need pill cutter])
OR
Amlodipine 5 mg once daily.



Systolic BP During Follow-up



Average post-baseline follow-up SBP mean±SE for standard (vs intensive) group:
 NHW=134.7±0.1 (vs 119.9±0.4) mmHg; NHB = 135.5±0.2 (vs of 121.8±0.2) mmHg;
 Hispanic= 134.8±0.3 (vs 122.6±0.2) mmHg.

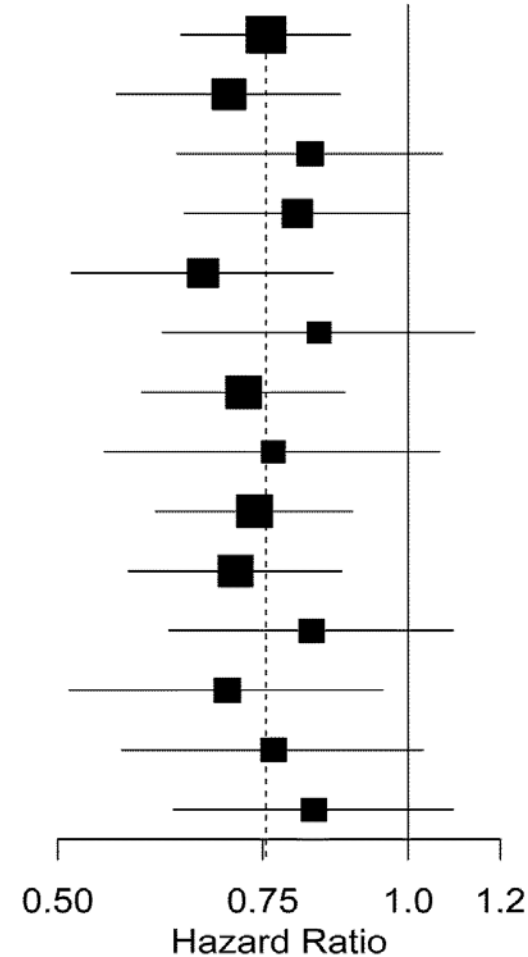
Primary Outcome in the Pre-specified Subgroups



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Subgroup	HR	P*
Overall	0.75 (0.64,0.89)	
No Prior CKD	0.70 (0.56,0.87)	0.36
Prior CKD	0.82 (0.63,1.07)	
Age < 75	0.80 (0.64,1.00)	0.32
Age ≥ 75	0.67 (0.51,0.86)	
Female	0.84 (0.62,1.14)	0.45
Male	0.72 (0.59,0.88)	
African-American	0.77 (0.55,1.06)	0.83
Non African-American	0.74 (0.61,0.90)	
No Prior CVD	0.71 (0.57,0.88)	0.39
Prior CVD	0.83 (0.62,1.09)	
SBP ≤ 132	0.70 (0.51,0.95)	0.77
132 < SBP < 145	0.77 (0.57,1.03)	
SBP ≥ 145	0.83 (0.63,1.09)	

*Unadjusted for multiplicity



*Treatment by subgroup interaction

Diuretic Duration of Action and Pharmacokinetics							
Drug	Vol of Distribution	BP↓/mg	Oral Bioavail	Onset of Effect	Peak Effect	Half-life (chronic dosing)	Duration (chronic dosing)
HCTZ	3-4 L/kg 40% protein bound	ref	~70%	2 hr	4-6 hr		16-24 hr
Chlorthalidone	3-13/kg 75% protein bound (98% RBC distribution)	2	~65%	2-3 hr	2-6 hr		48-72 hr
Indapamide		20	~93%	1-2 hr	< 2 hr		~36 hr

Note: Compared to HCTZ, chlorthalidone ~ twice as potent in BP lowering, more gradual onset of diuretic action, longer duration of action of BP lowering, and has larger evidence base documenting CVD reduction

Carter BL, Ernst ME, Cohen JD. Hypertension 2004;43:4-9.
Abernathy DR, Cardiol 1992; 80:31-36

Calcium Channel Blocker Half-Life

Sica DA. J Clin Hypertens 2005; 7(4) Supp 1: 21-26



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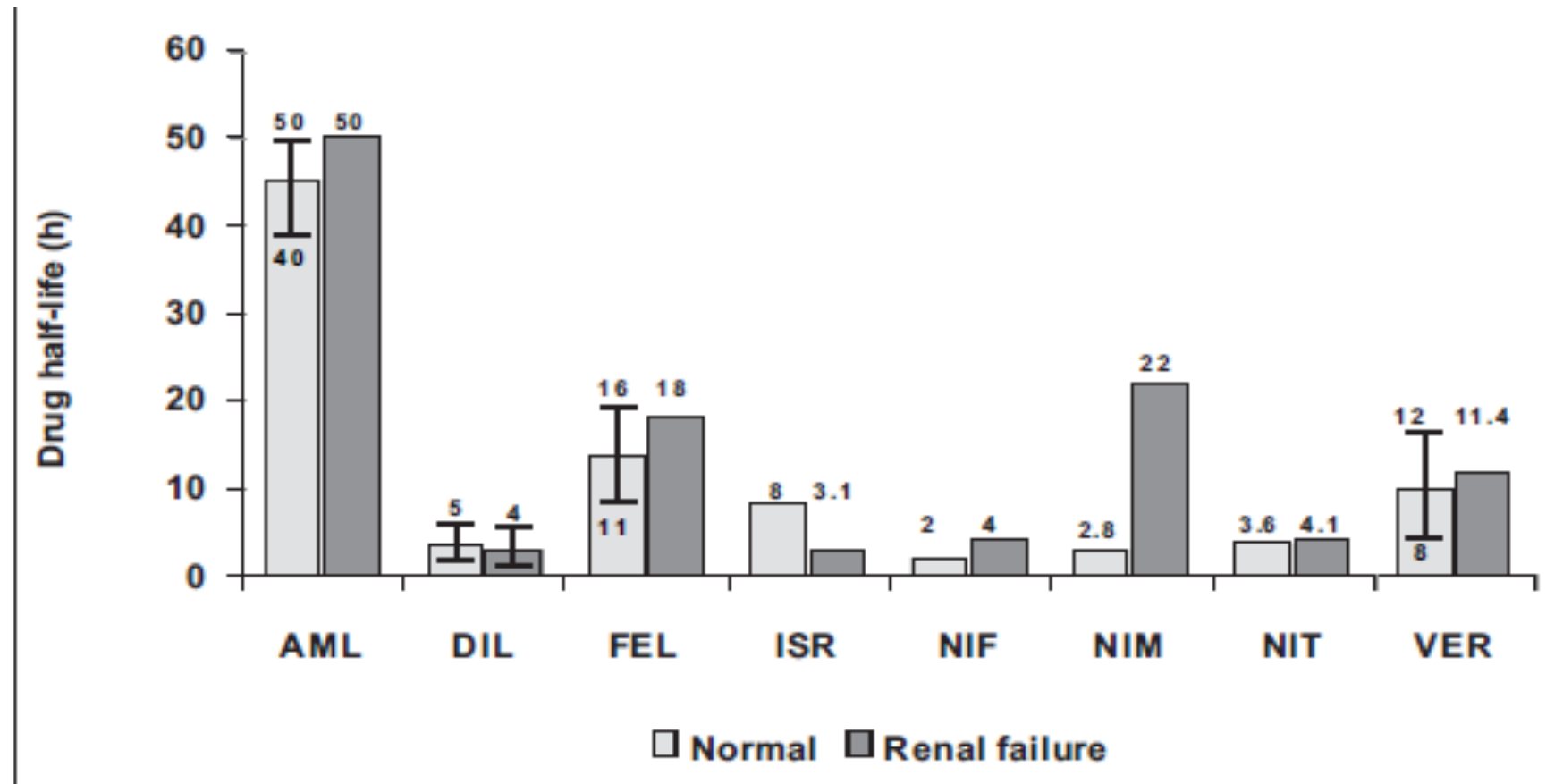


Figure 1. Drug half-life for calcium channel blockers in the presence of renal failure. AML=amlodipine; DIL=diltiazem; FEL=felodipine; ISR=isradipine; NIF=nifedipine; NIM=nimodipine; NIT=nitrendipine; VER=verapamil

Blood Pressure During Follow-up

	Ramipril	Amlodipine	Metoprolol	Low MAP Goal	Usual MAP Goal
SBP (mm Hg)	134	131	134	128*	141
DBP (mm Hg)	81	81	81	78*	85
MAP (mm Hg)	99	98	99	94*	104

*Significantly different between two blood pressure goals $p < 0.01$

Wright et al. JAMA 2002; 288:2421

Strategies to Improve Hypertension Treatment and Control



Recommendation for Structured, Team-Based Care Interventions for Hypertension Control

COR LOE Recommendation

I	A	A team-based care approach is recommended for adults with hypertension.
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Summary/Conclusions

- We can no longer use minority, or even Black race, as an excuse for inadequate BP control
- We have the therapeutic tools to manage and control the disorder to recommended targets, even in the most severe hypertensive subgroups (e.g. Black hypertensive pts with CKD)
- It will require measures to address the failure to intensify treatment required to achieve BP control
- Greater use of chlorthalidone, amlodipine, and spironolactone is needed to achieve and maintain BP control, esp when adherence is a challenge
- Greater emphasis on life-style modification to reduce need for drug treatment (though not addressed in this presentation)
- Team-base care essential, esp to address SDOH

Thank you!

Questions/Discussion