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CCI
CENTER FOR CARE INNOVATIONS

TC3 Wireside Chat

Overcoming Barriers in Improving Blood Pressure Control:

The Kaiser Permanente Experience

Dec 19, 2019 | 12-1pm

Webinar Housekeeping

1. Lines are muted. Press *7 to **unmute** and *6 to re-**mute**

2. Feel free to chat in questions

3. Webinar is being recorded and will be posted on the TC3 and PHASE Support sites. A link will be sent via email.

4. Please fill out our feedback survey at the end of the webinar

Our Presenter Today

Dr. Jeff Brettler, MD

SCAL Kaiser HTN Co-Lead

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Today's Objectives

- Participants able to identify key drivers of BP control
- Participants have strategies to overcome barriers to improving BP control

Overcoming Barriers in Improving Blood Pressure Control: The Kaiser Permanente Experience

December 19, 2019
Transforming Cardiovascular Care in our Communities

Jeff Brettler, MD, SCAL Kaiser HTN Co-Lead

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<POLL> What do you think are the key drivers to improve BP control?

- Accurate BP measurement
- Accurate data systems and performance monitoring
- Medication adherence
- Treatment intensification
- Patient follow-up

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As you listen, think about:

What you can do to improve your current system?

- Short term
- Long term
- Barriers to both

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Agenda

- How did KP improve performance?
- What are the key drivers to improve BP control rates?
- Lessons learned to overcome barriers for those key drivers

Why are we still talking about HTN?

- HTN is quantitatively the most important risk factor for premature CVD, being more common than smoking, dyslipidemia and diabetes.
- HTN accounts for an estimated 54% of all strokes and 47% of all ischemic heart disease events globally. (Lancet 2008; 371; 1513 – Global burden of blood pressure related disease 2001).
- Increases the risk for CKD, HF, afib and PVD.

And treatment works!

Large scale RCTs show that antihypertensive treatment results in the following:

- 50% reduction in heart failure
- 30-40% reduction in stroke
- 20-25% reduction in MI

BMJ 2008: BP Trialists' BP lowering collaboration

Southern California Permanente Medical Group (SCPMG)/Kaiser Permanente Southern California

SCPMG: Who we are in 2019

- **4.5 million members**
- **74,290 employees**
- **7,421 physicians**
- **21,167 nurses**
- **15 hospitals**
- **230 medical offices**
- 319,000 hospital discharges
- 42,500 babies delivered
- 23.2 million outpatient visits
- 29 million prescriptions filled
- **2.3 million BP checks/month**
- **869,943 members with HTN**

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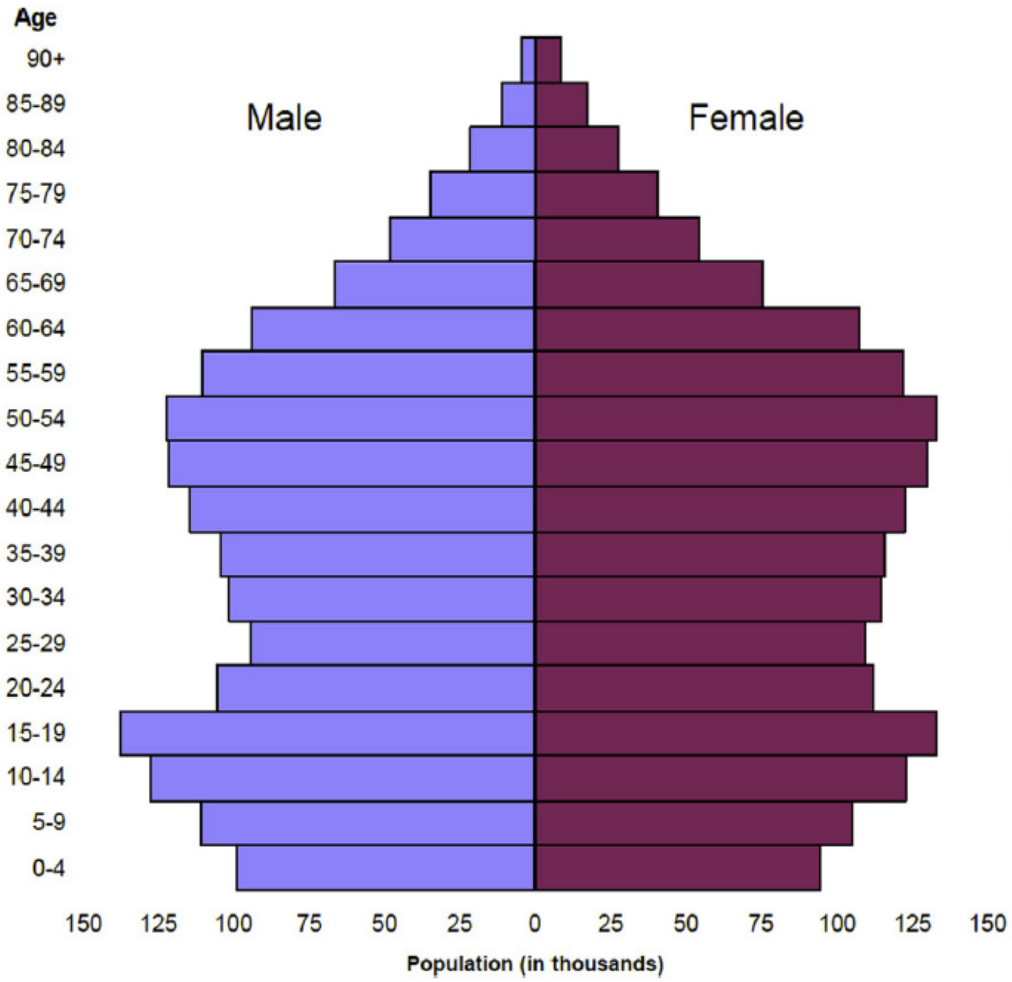

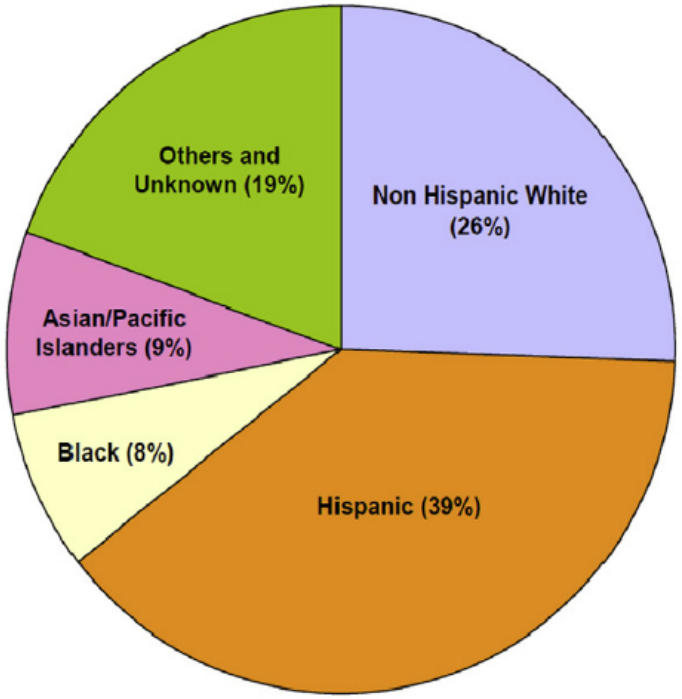

Figure 2. Kaiser Permanente Southern California population overview.

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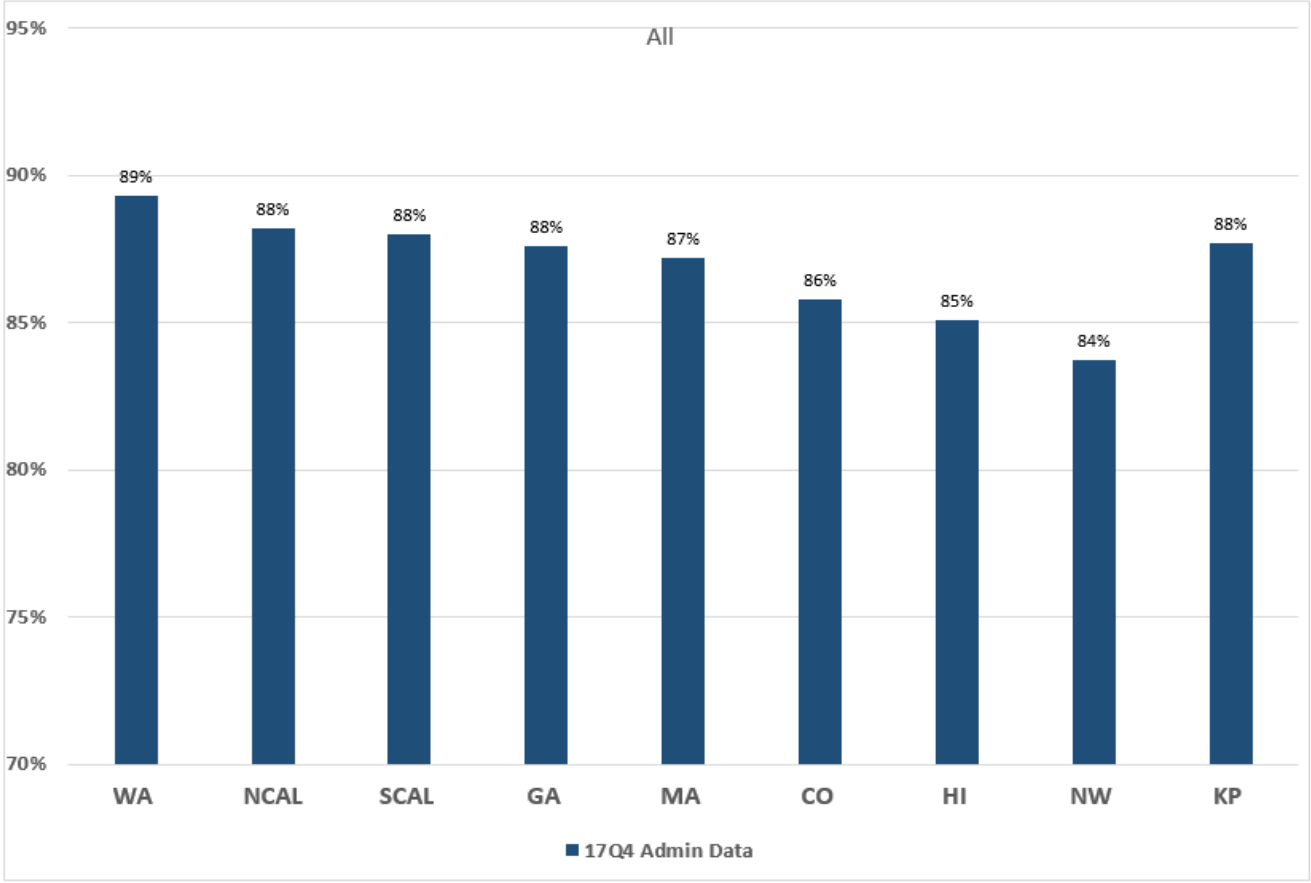
HEDIS 2018 Controlling BP Results
All – Administrative Data



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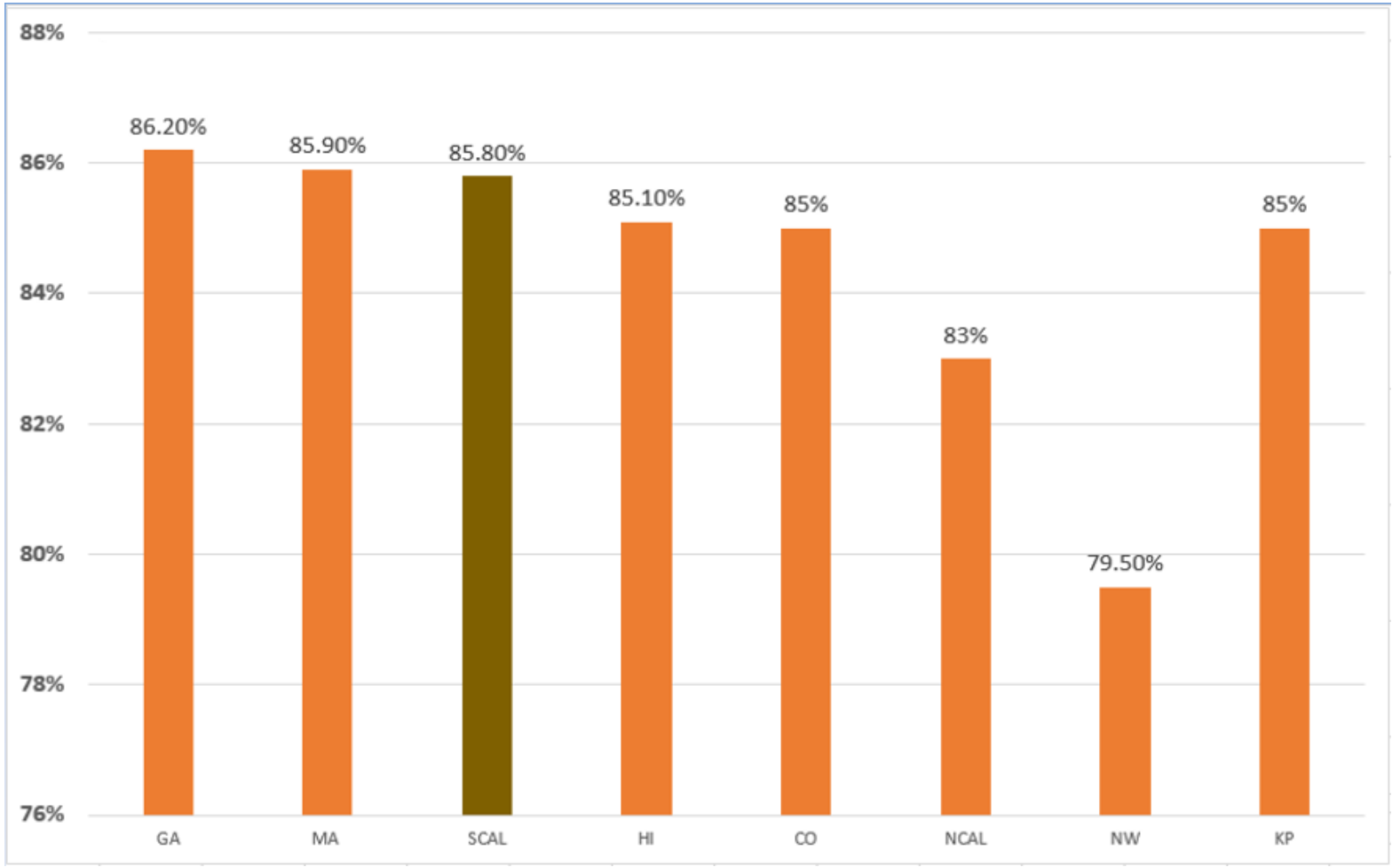
Black/African American HTN Control



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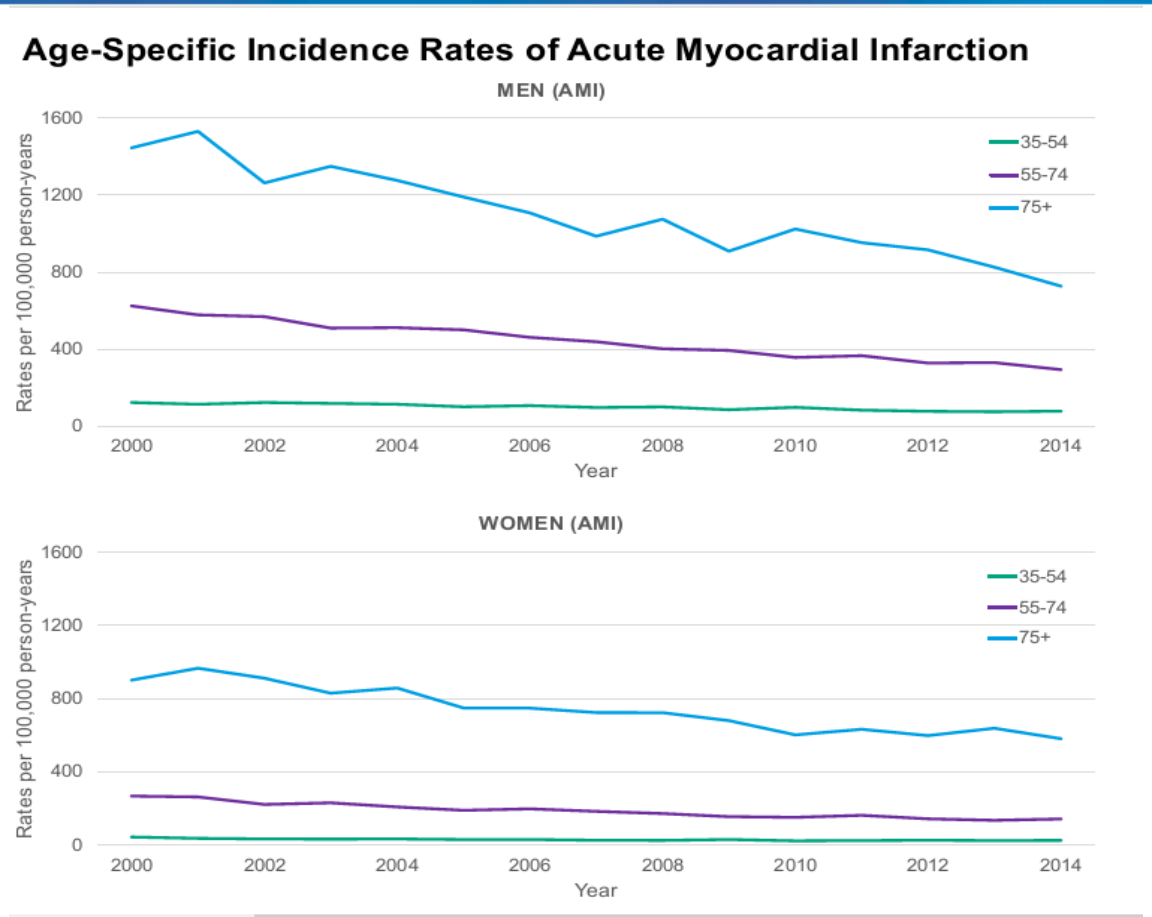
Sex-Specific Trends in Acute Myocardial Infarction Hospitalization, 2000 to 2014

Stephanie R. Reading, PhD, MPH; Kristi Reynolds, PhD, MPH; Bonnie H. Li, MS; Lei X. Qian, PhD; Denison S. Ryan, MPH; Teresa N. Harrison, SM; Ronald D. Scott, MD; Jeffrey J. Cavendish, MD; Steven J. Jacobsen, MD, PhD; Michael H. Kanter, MD



Circulation: Cardiovascular Quality and Outcomes. 2017;10:A061

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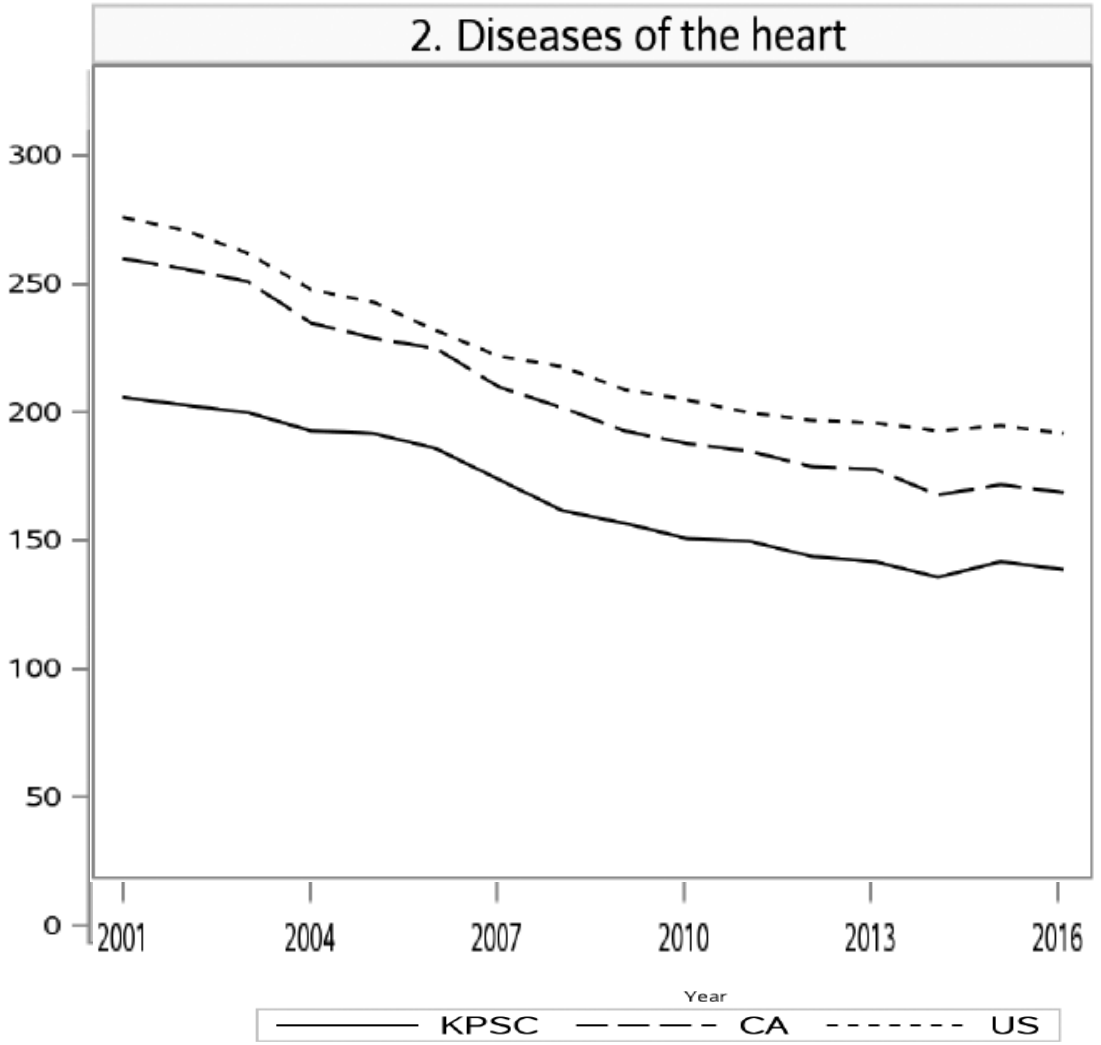

Figure 2. Age-adjusted mortality rates for each of the top 6 causes of death in Kaiser Permanente Southern California (KPSC), the US, and CA, 2001-2016.

The Permanente Journal •
https://doi.org/10.7812/TPP/18-213

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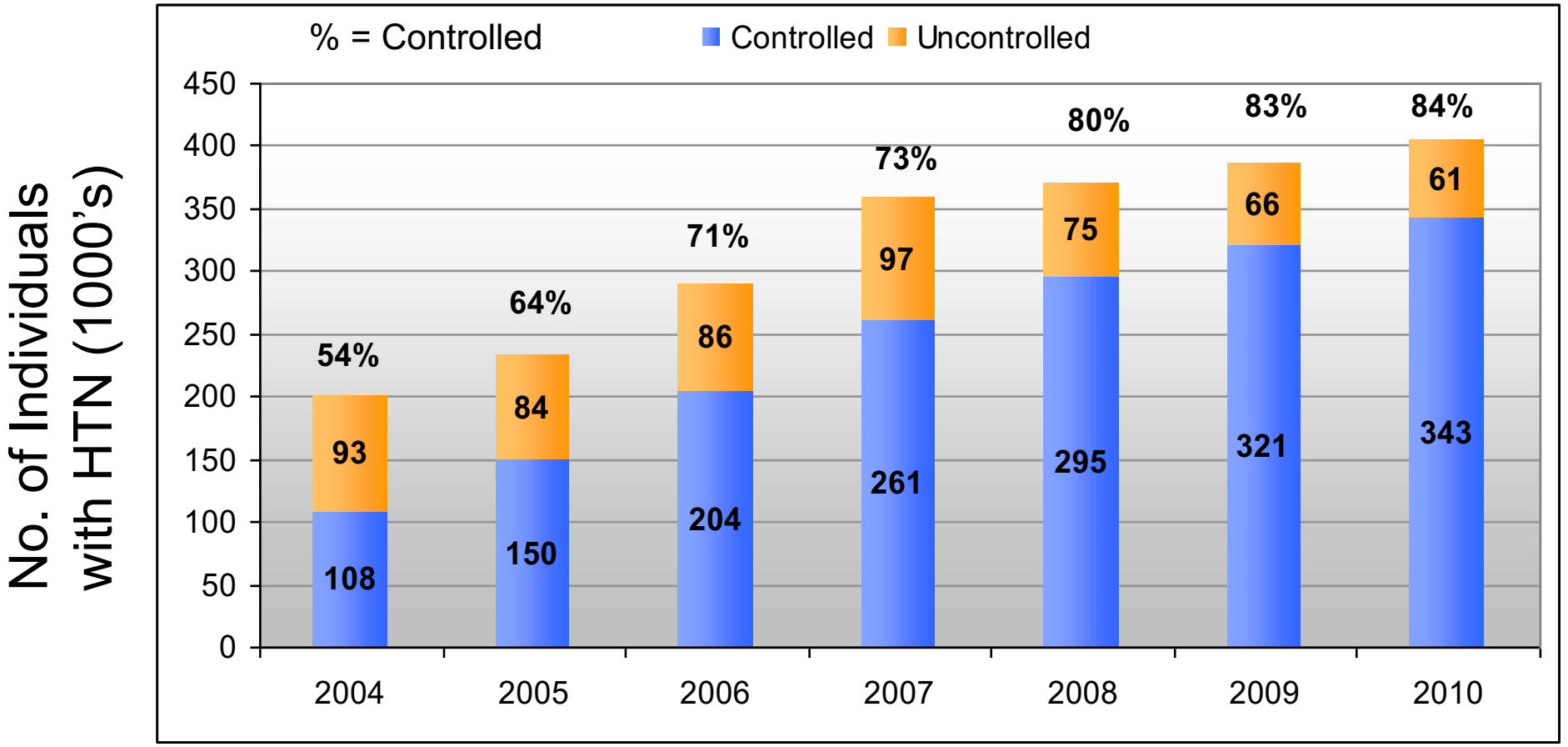
SCAL HTN Control 2004 - 2010



CSG Performance & CSG Population

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So What Happened in 2005?

- Combination therapy with lisinopril-hydrochlorothiazide became 1st step of national KP algorithm
- Widespread implementation of 2-4 week MA/LVN follow-up BP checks.

Table 1. Summary of Evidence-Based Clinical Practice Guideline for Initial Therapy and Treatment Intensification for the Kaiser Permanente Northern California Hypertension Program, by Year

Step	2001	2003	2005	2007	2009
1	Thiazide diuretic or β-blocker	Thiazide diuretic	Thiazide diuretic or thiazide diuretic + ACE inhibitor	Thiazide diuretic or thiazide diuretic + ACE inhibitor	Thiazide diuretic or thiazide diuretic + ACE inhibitor
2	Thiazide diuretic + β-blocker	Thiazide diuretic + ACE inhibitor or thiazide diuretic + β-blocker	Thiazide diuretic + ACE inhibitor	Thiazide diuretic + ACE inhibitor	Thiazide diuretic + ACE inhibitor
3	Thiazide diuretic + β-blocker + ACE inhibitor	Thiazide diuretic + β-blocker + ACE inhibitor	Thiazide diuretic + β-blocker + ACE inhibitor	Thiazide diuretic + β-blocker + ACE inhibitor	Thiazide diuretic + ACE inhibitor + DCCB
4	Thiazide diuretic + β-blocker + ACE inhibitor + DCCB	Thiazide diuretic + β-blocker + ACE inhibitor + DCCB	Thiazide diuretic + β-blocker + ACE inhibitor + DCCB	Thiazide diuretic + β-blocker + ACE inhibitor + DCCB	Thiazide diuretic + ACE inhibitor + DCCB + β-blocker or spironolactone

Abbreviations: ACE, angiotensin-converting enzyme; DCCB, dihydropyridine calcium channel blocker.

Jaffe, et al. JAMA Aug 2013

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Treatment Intensification over Time in US

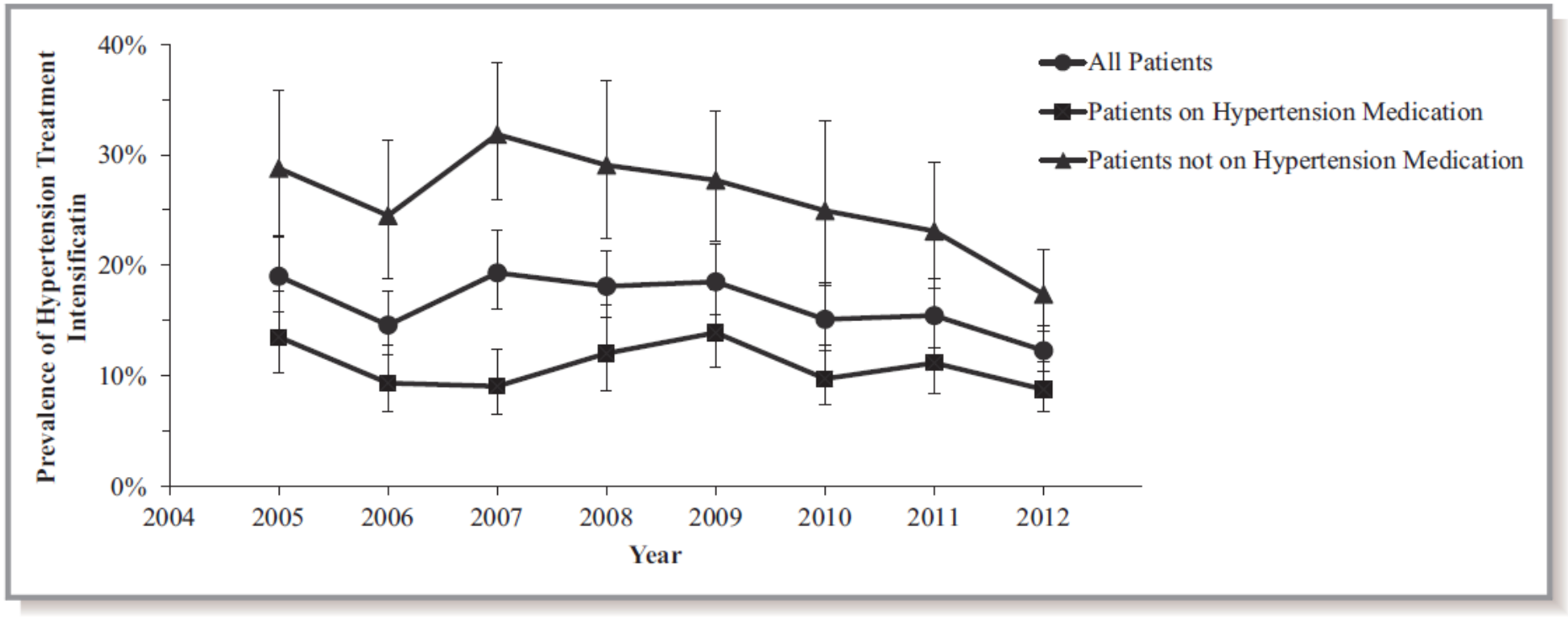

Figure 1. Prevalence of hypertension treatment intensification in the United States 2005–2012.

Lu, Min J Am Heart Assoc. 2016;5

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Circulation: Cardiovascular Quality and Outcomes

ORIGINAL ARTICLE

Clinic-Based Strategies to Reach United States Million Hearts 2022 Blood Pressure Control Goals

A Simulation Study

Bellows, Moran, Fontil. June 2019

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Table 1. Comparison of Key Hypertension Process Inputs Across Simulated Interventions.

Variable	Usual Care	Best Observed Values	Perfect Care
Probability of Adhering to Last Antihypertensive Medication at One Year	57.0%[17-22]	75.6%[22]	100.0%
Probability of Intensifying Antihypertensive Medication When:			
Adding/titrating first antihypertensive medication during simulation			
Systolic blood pressure ≥160 mm Hg or blood pressure ≥140/90 mm Hg with diabetes or chronic kidney disease	33.3%[13-15]	44.0%[14]	100%
Systolic blood pressure is uncontrolled but <160 mm Hg or blood pressure is uncontrolled but <140/90 mm Hg with diabetes or chronic kidney disease	20.8%[11, 12]	31.0%[11]	100%
Adding/titrating additional antihypertensive medications	13.0%[16]	19.5%[16]	100%
Return Visit Interval When Blood Pressure Uncontrolled	~13.8 weeks[12]	1 week[12]	1 week

Notes: The table shows the model inputs for the key hypertension management processes, best observed values were preferentially derived from the highest reported mean or calculated using sample size or variance estimates as available. Perfect care values were based on the best input possible for each parameter.

Figure 3. Return Visit Interval Needed to Achieve Million Hearts 2022 Goal of 80% Blood Pressure Control at Different Antihypertensive Intensification and Adherence Rates.

Average Antihypertensive Intensification Rate After Uncontrolled Blood Pressure	Average Antihypertensive Adherence Rate						
	100%	*90%*	*80%*	*70%*	*60%*	*50%*	*40%*
70%	16.0	16.0	16.0	16.0	16.0	16.0	12.0
60%	16.0	16.0	16.0	16.0	15.2	11.9	8.0
50%	16.0	16.0	14.7	12.2	10.5	8.2	4.0
40%	13.1	11.7	9.3	8.1	5.8	4.0	2.0
30%	7.6	6.3	5.0	3.3	1.4	-	-
20%	2.0	1.1	-	-	**Usual Care***	-	-
10%	-	-	-	-	-	-	-

Maximum Average Return Visit Interval Achieving 80% Blood Pressure Control

Average Return Visit Interval After Uncontrolled Blood Pressure
≤16 weeks
≤12 weeks
≤8 weeks
≤4 weeks
Will not reach 80% control

*Usual care input for adherence was 57.0%, return visit interval was ~13.8 weeks, and mean simulated usual care intensification rate over 4 years was 18.7%.

Notes: The figure shows the 4-year results when varying key hypertension management process parameters and the combination needed to achieve ≥80% blood pressure control. The columns are the average antihypertensive adherence rate (i.e., proportion of patients continuing antihypertensive medication for at least one year). The rows are the average antihypertensive intensification rate (i.e., proportion of clinic visits with an uncontrolled blood pressure where antihypertensive medication was intensified). The boxes, are the maximum average return visit interval (in weeks) after an uncontrolled blood pressure.

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Model Findings

Only 46% of patients who present with uncontrolled BP at the beginning of 2018 would achieve BP control by the end of 2021 under usual care.

80% control rate within 4 years possible with the following: 70% medication adherence, 30% probability of treatment intensification, and having follow-up visits within 4 weeks after an uncontrolled office BP.

Increasing treatment intensification had the most significant impact on achieving 80% BP control.

When the probability of intensification was 62% (usual care 13.0%-33.3%), $\geq$ 80% of patients achieved BP control, even when patient medication adherence and the return visit interval were kept at usual care.

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Key Elements of a Successful HTN Program 2019

- Comprehensive and accurate registry
- Simple and clear guidelines
- **Credibility of BP measurement**
- **Treatment algorithm using combination pill**
- Performance feedback
- **Team based care**
- **Treatment intensification and medication adherence**
- EMR/decision support
- Patient empowerment

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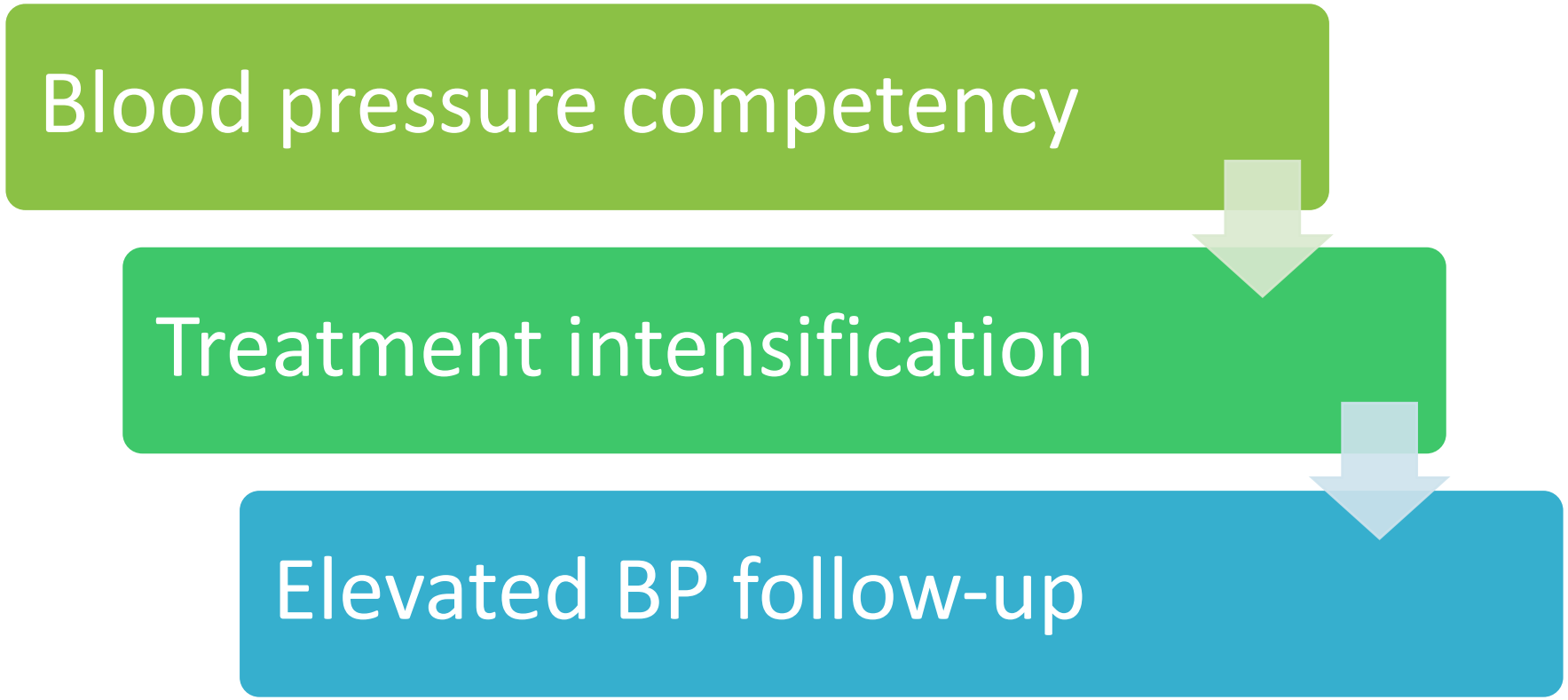
Key Drivers for BP Control



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Blood Pressure Technique Competency

- Education of MAs, LVNs, RNs
- Audits: observed vs unobserved
- AOBP: SPRINT protocol - mandates 5 minute rest and multiple measurements
- Nurse specific data

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Annual Skills Validation

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Skills Validation Tool –
Taking a Blood Pressure with an Automatic Digital Monitor

Name (print):	**Job Title:**
Department/work area:	**Employee #**
Subject: **Taking a Blood Pressure with an Automatic Digital Monitor**	**Date:**
Rationale for Selection: ☐ high risk ☐ low volume ☐ problem prone ☐ new equipment/technology	**Job Category:** ☒ RN ☒ LVN ☒ MA Complete by (Date) _____ ☐ Able to validate others (may only by checked by RN Validator)

Arrange time with approved validator to perform competency/return demonstration & turn in completed form by date indicated above.

ELEMENT	*MET*	*NOT MET*	*COMMENTS*
1. Verifies patient identity with 2 identifiers: name, MR #, date of birth, or other personal data; have patient state their name and DOB; or name and MR # on armband (if used)			
2. Explains procedure to patient taking into account age, education level, physical and mental condition, language, and cultural background			
3. Selects appropriate cuff size (resets equipment from prior patient if needed)			
4. Palpates brachial artery			
5. Removes all clothing covering the patient's upper arm, as needed			
6. Properly places cuff on bare arm with arrow over brachial artery. Wraps cuff smoothly and snugly.			
7. Ensures patient's arm is fully supported on furniture (i.e. mayo stand, arm of chair) at heart level			
8. Instructs patient to sit still with back supported, feet flat on floor, and legs uncrossed			
9. Instructs patient to relax and sit calmly without talking for at least 5 minutes.			
10. Sets the auto inflation on the digital monitor. Turns the power ON. Makes sure that the battery is charged or that the monitor is plugged in.			
11. The cuff will auto-inflate. Instructs the patient not to move or talk during blood pressure measurement. Digital monitors measure blood pressure by detecting small movements.			
12. Does not speak to patient during blood pressure measurement.			
13. After the cuff auto-deflates, note the monitor readings. The top number on the monitor is the systolic pressure and the bottom is the diastolic pressure reading. The last number is the pulse			

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BP Technique Audits

Instructions for Blood Pressure Spot Check

Team leaders to complete one spot check per day (5 per week), every week, capturing all staff multiple times throughout the year.

Important criteria to be assessed:

a. **Is the patient's arm bare?**
b. **Is the patient's arm totally supported at heart level?**
c. **Neither the patient nor the MA/Nurse should be talking during the procedure.**
d. **Proper size cuff**

If any of the important criteria is missed, please privately coach the MA/Nurse on the criteria missed.

Please return the completed form to the DA/ADA.

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Repeat BP Report

SCBPA0001c - High Blood Pressure Best Practice Alert Report with User MA Detail - Summar

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High Blood Pressure Best Practice Alerts: Fired Alerts With 2nd BP Reading
Blood Pressure readings are limited to those recorded in Flowsheet row 9005
Contact Date Range from: 7/1/2019 to 7/31/2019
Medical Center Location: All

Med Center / Location / Specialty/ User/MA /	Total Encounters with High BP BPA: User/MA/ Specialty/ *Location/*	Number of Encounters With 2nd BP Reading User/MA/ Specialty/ *Location/*	Percentage of Encounters With 2nd BP Reading User/MA/ Specialty/ *Location/*
WEST LA MEDICAL CENTER AREA			
Internal Medicine			
KEYHEA, DEVON - X841856	1	0	0%
WILLIAMS, STEPHANIE - X652961	6	6	100%
ZUNIGA, PEARL - K245533	5	5	100%
CANDLER, RONEISHA - H818330	2	2	100%
GARDOCE, MARICEL - W964937	6	6	100%
BROWN, ALICIA - K222474	9	9	100%
HERNANDEZ, CHRISTOPHER - M681989	15	15	100%
RODRIGUEZ, ROXANNA - K254772	12	12	100%
SIEGEL, JEFFREY - P301459	1	0	0%
KWON, KAREN - W059395	12	12	100%
ACOSTA, MARIA - I571153	11	11	100%
ANGUIANO, DANIEL - C663196	12	12	100%
CAIN, LEATRICE - K391682	3	3	100%
JOHNSON, CHERYL - K237488	6	6	100%
CHEN, ALLAN - P160781	1	1	100%
Specialty Total:	109	106	97%

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AOBP – Automated Office Blood Pressure

- Automated
- Multiple
- Alone

SPRINT: 5 minute rest, BP measurement, 1 minute rest, BP measurement, 1 minute rest, BP measurement; average of 3 readings

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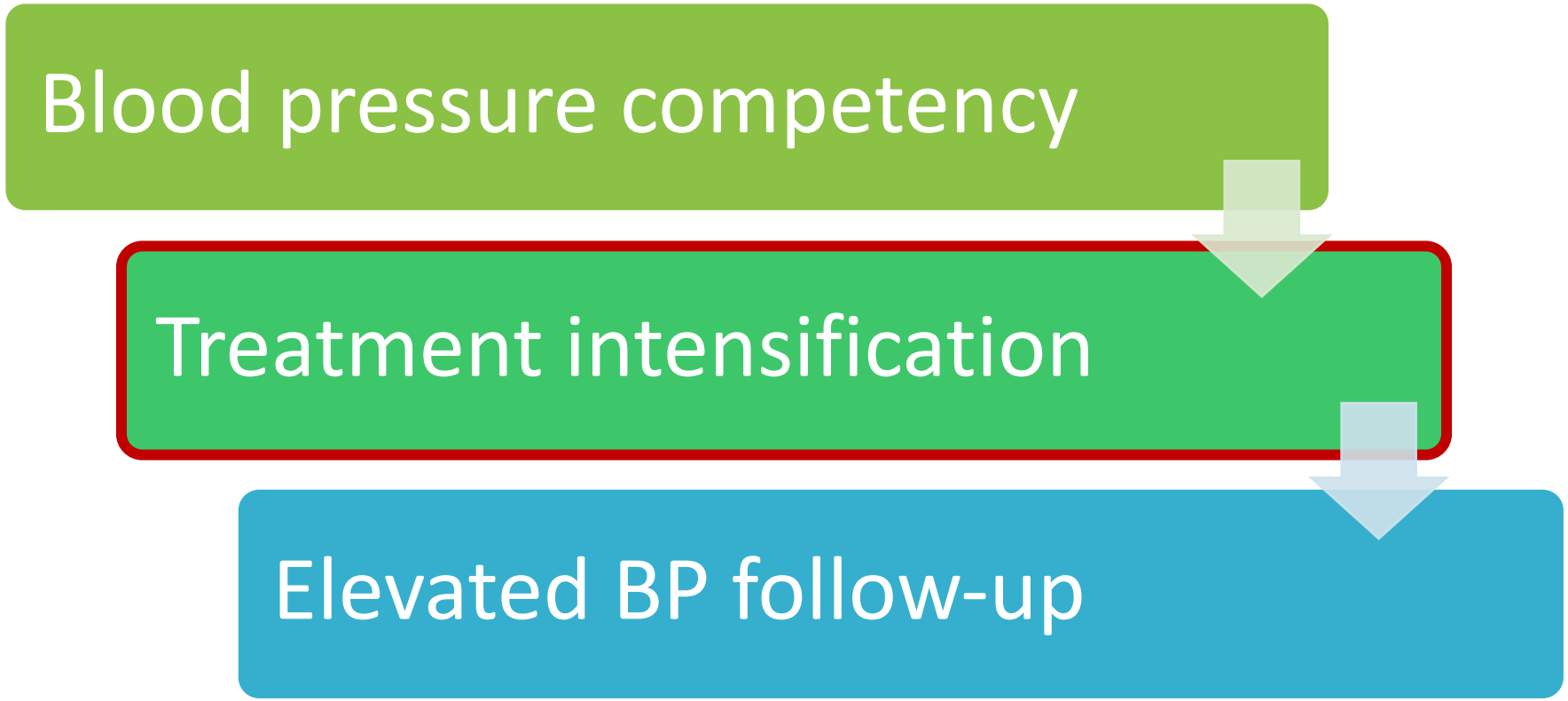
Key Drivers for BP Control



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Treatment Intensification

- Most effective driver to improve BP control
- Importance of standardized protocol, especially with fixed dose combination pill

Advantages of Single Pill Fixed Dose Combo (FDC)

- Decreased daily pill burden
- Improved medication adherence
- Faster BP control
- Less time exposed to CVD-risk
- 14 randomized controlled trials (5,120 participants) for initial dual vs monotherapy (at least 4 weeks) - 27% improvement in BP control without an increase in withdrawals due to adverse events*

*Salam A, KanukulaR, EsamH, et al. An application to include blood pressure lowering drug fixed dose combinations to the model essential medicines list for the treatment of essential hypertension in adults.

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Simple Algorithm:
Fixed Dose Combination Based

SIMPLICITY = PERFORMANCE

- Fewer steps
- Fewer pills
- Faster control
- Fewer visits/ improved access

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Combination Pill Use and BP Control

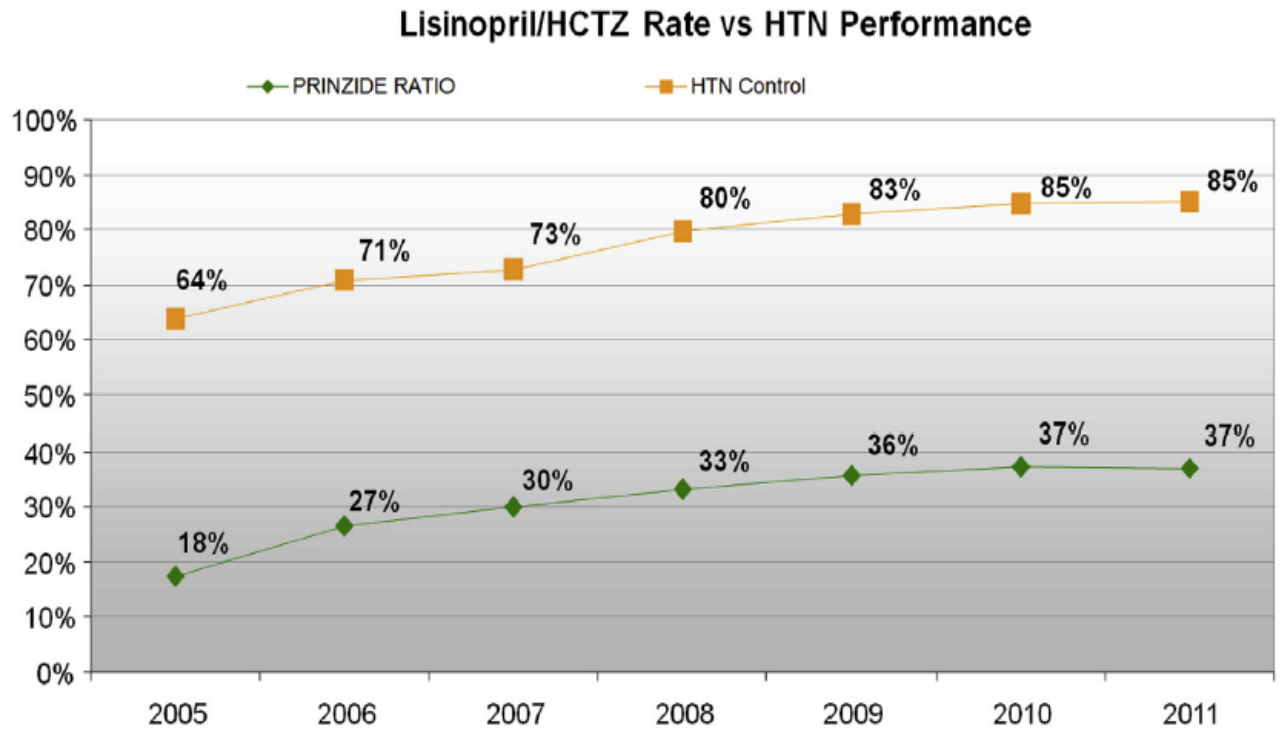

Figure 4. Combination pill use and hypertension control at Kaiser Permanente Southern California. Since 2005, when the combination of lisinopril/HCTZ was advocated, hypertension control rates have steadily increased, paralleling the proportion of those prescribed the lisinopril/HCTZ combination pill. HCTZ, hydrochlorothiazide; HTN, hypertension.

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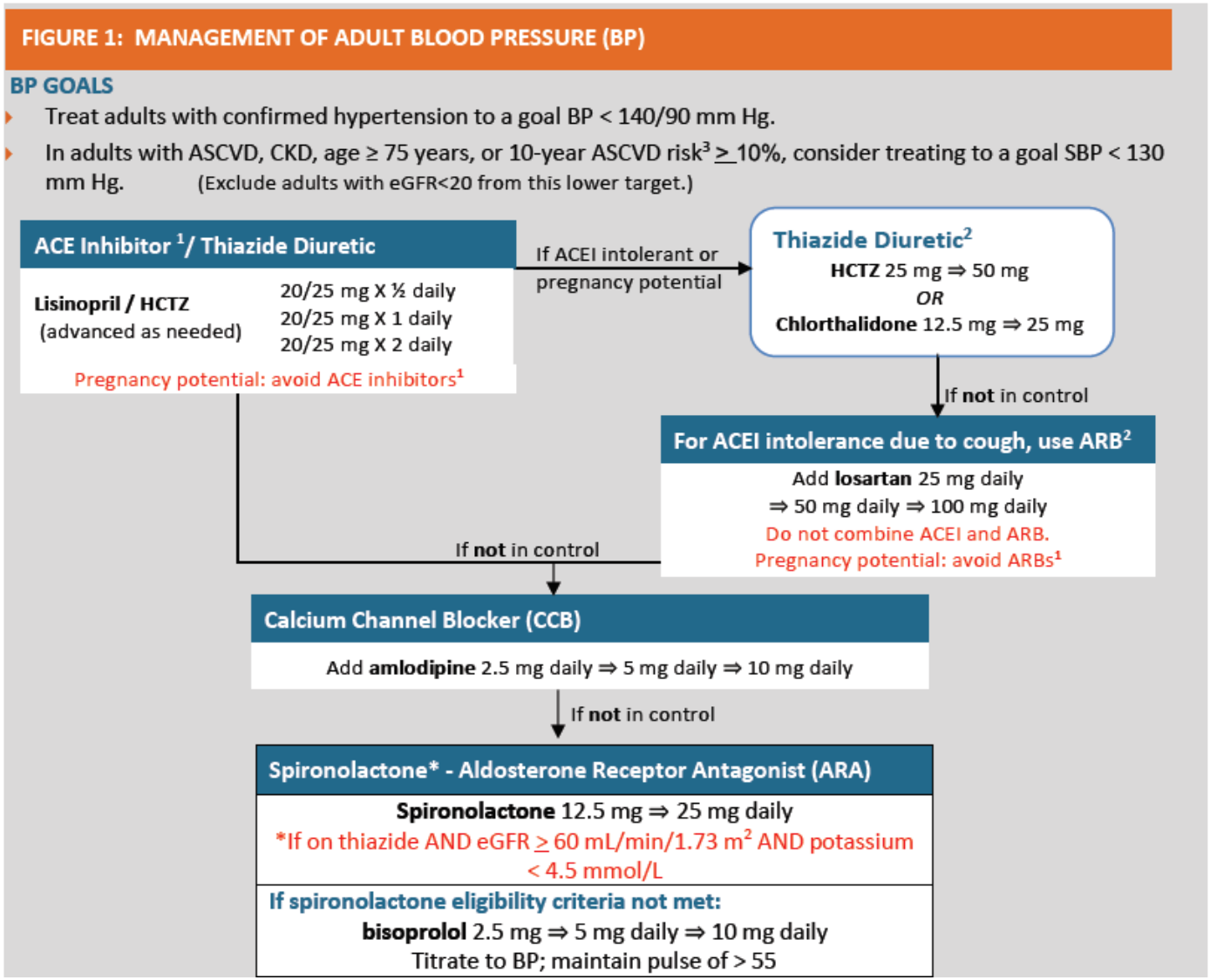
KP HTN Treatment Algorithm 2019



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Step 1 of Current KP Algorithm

ACE Inhibitor [1] / Thiazide Diuretic	
Lisinopril / HCTZ (advanced as needed)	20/25 mg X ½ daily 20/25 mg X 1 daily 20/25 mg X 2 daily

Pregnancy potential: avoid ACE inhibitors[1]

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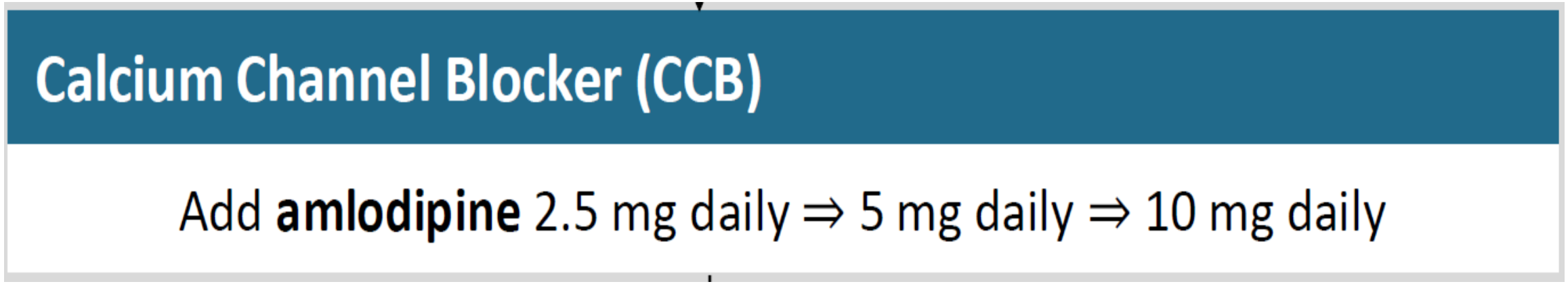
Step 2 of KP Algorithm



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Step 3 of KP Algorithm

Spironolactone* - Aldosterone Receptor Antagonist (ARA)
Spironolactone 12.5 mg ⇒ 25 mg daily *If on thiazide AND eGFR ≥ 60 mL/min/1.73 m^2 AND potassium < 4.5 mmol/L
If spironolactone eligibility criteria not met: **bisoprolol** 2.5 mg ⇒ 5 mg daily ⇒ 10 mg daily Titrate to BP; maintain pulse of > 55

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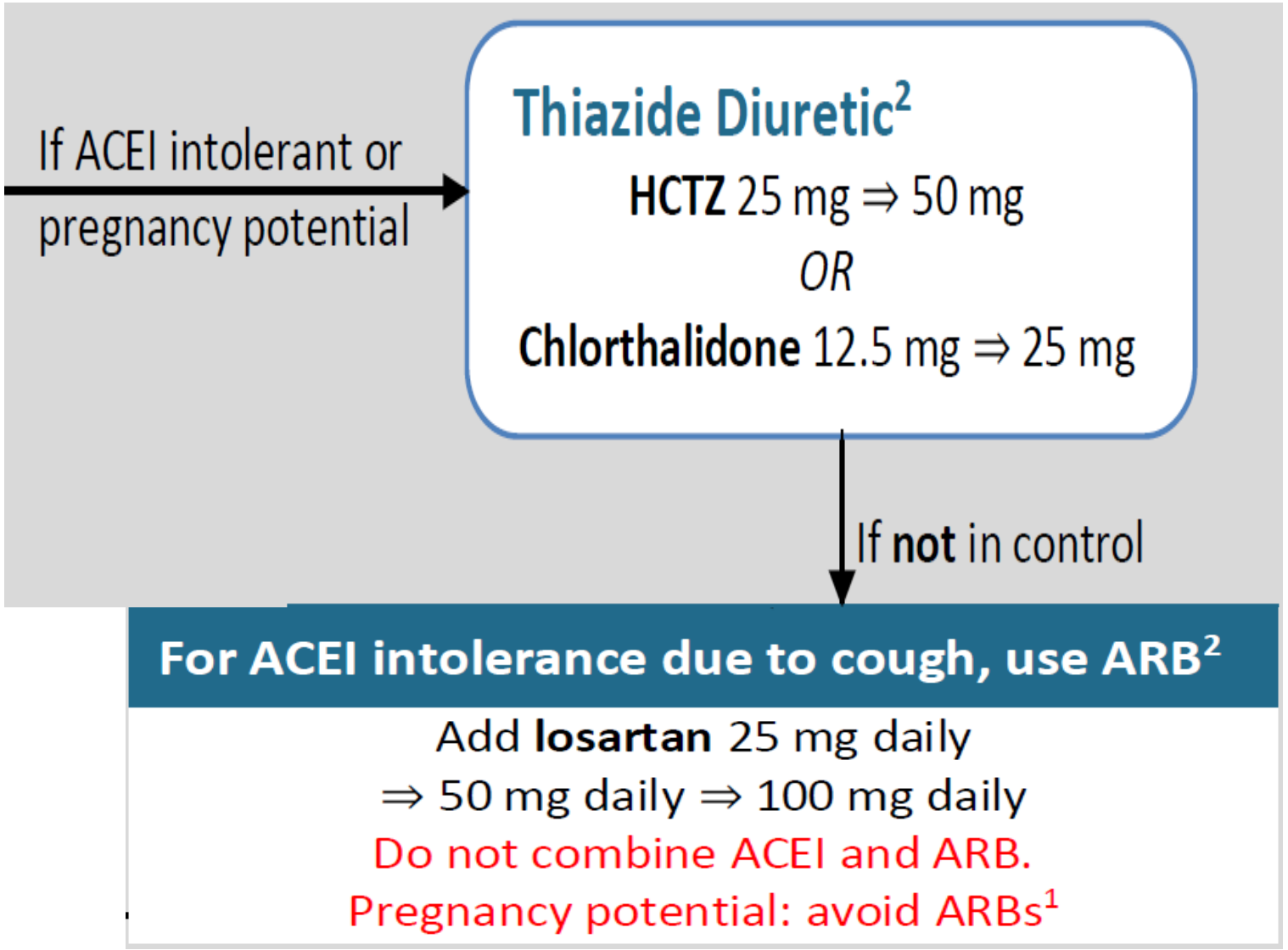

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Benefits of KP Algorithm

- 2 pills – max of 3 medications.
- Only requires 2 trips to pharmacy.
- ½ to 1 to 2 tabs for both
- ½ tab – effective for overcoming inertia, but still using combination pill
- Long acting, once daily medications
- Facilitates team-based care

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Benefits of KP Algorithm

- Works for all ages, race/ethnicity, comorbidities: ACEI for CKD, diuretic/CCB for older patients/African American, etc.
- Synergy of ACEI with thiazide
- Built in safety: Spironolactone criteria: GFR $\geq$ 60, K < 4.5
- Max dose of thiazide
- Cost: $3.55/month for Lisinopril-HCTZ, $2.73/month for amlodipine

Dealing with Combination Pill Resistance 2005

- Our slogan at the time was: "**we have an epidemic of undertreatment rather than overtreatment**."
- Concerns: overtreatment and how to deal with reactions/side effects.
- Keep education regarding side effects simple: if hyponatremia or rash, it's HCTZ, if cough, it's lisinopril.
- Acceptance easier over time (we now have almost 15 years of experience).

Algorithms and Guidelines Need to Evolve

- Guidelines and algorithm are updated every 2 years: national process with input from all regions; primary care + specialists.
- Spironolactone added in 2009, then became preferred # 4 agent after PATHWAY-2
- Beta blocker changed in 2018 guideline: Atenolol switched to bisoprolol – longer ½ life, less dose adjustment in CKD, cost equivalency

Spironolactone as Preferred 4th Agent – PATHWAY-2

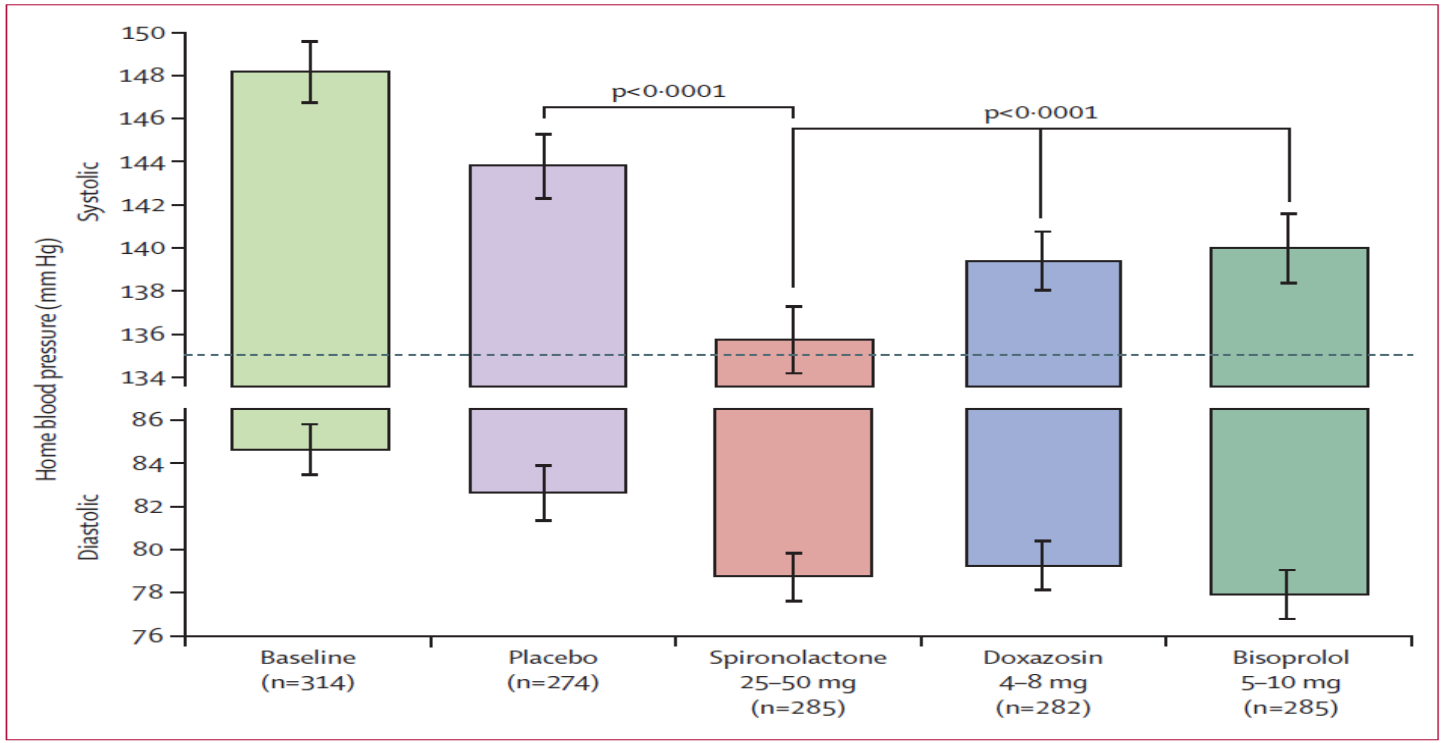

Figure 2: **Home systolic and diastolic blood pressures comparing spironolactone with each of the other cycles**

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.

PATHWAY-2, Lancet Sep 2015

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Barriers to Treatment Intensification

- Competing demands for clinician attention
- Uncertainty as to “true” BP
- Provider issues: comfort level/education regarding dose escalation, comorbidities, side effects
- Concern over nonadherence
- Overestimation of performance
- Decision cycle time

Competing Demands

- In one study, each additional unrelated comorbidity was associated with a 15% lower odds of treatment intensification at a given visit (Turner, BJ, Ann Int Med. 2008: 148).
- Solution: team based care utilizing pharmacists, NPs/PAs or RNs (under protocol).

Structured, Team-Based Care Interventions for Hypertension Control

COR	LOE	Recommendation for Structured, Team-Based Care Interventions for Hypertension Control
I	A	A team-based care approach is recommended for adults with hypertension.

AMERICAN COLLEGE of CARDIOLOGY

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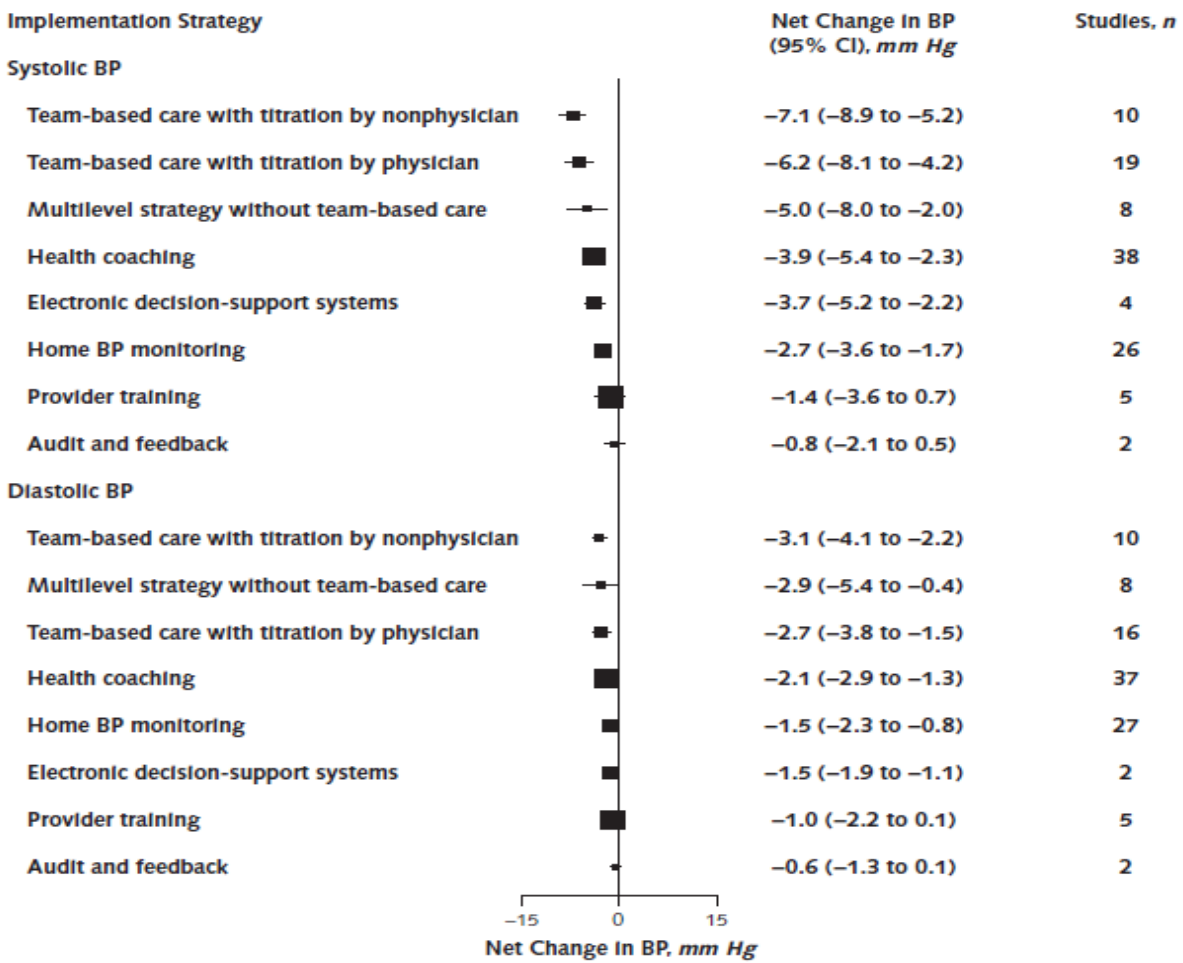
Figure 2. Adjusted mean net reduction in BP associated with implementation strategies.



Mean net reductions were estimated using generalized estimating equations and adjusted for sex, age, baseline systolic (or diastolic) BP, trial duration, type of control group, and all other intervention strategies. Boxes are weighted by sample size. BP = blood pressure.

Meta-Analysis of Implementation Strategies
Mills, et al. Annals of Int Med Dec 2017

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Team Based Care - Hypertension Visit with non-MD provider

- BP is only complaint that's addressed.
- Focus only on BP related issues – recent vitals, current regimen, adherence, side effects
- Emphasis on titration whenever possible
- Use standard combination medication algorithm
- Repeat every 2 weeks until BP controlled
- Physical or virtual

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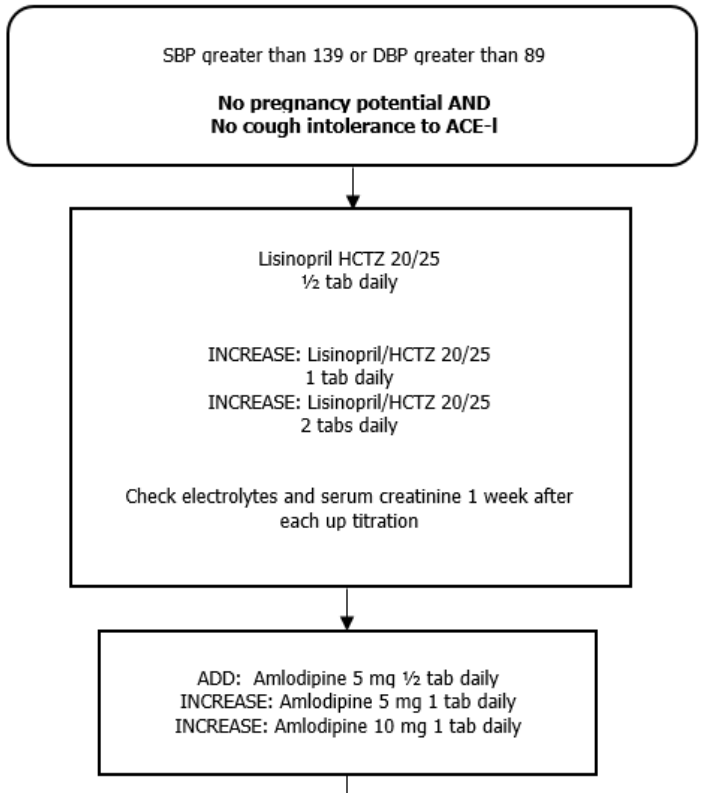
Algorithm for Uncomplicated HTN:
No pregnancy potential, No cough intolerance to ACE-I
(excludes HF, Stage 4 or greater CKD [GFR < 30] or CAD)



Standardized Templates

SmartPhrase Editor

Arial 12 90%

Insert SmartList

HTN Real Time Titration Opportunity

@LASTBP3@
@LASTPULSE(3)@

@TAKINGMED@ ***Delete meds if not taking
@MRAR@***Delete if not HTN meds

Allergies/Intolerances: ***

Did pt take meds today? {:26850::"Yes","No","Unsure"}

Pt states @HE@ takes meds as directed: {:26850::"All the time","Sometimes","Rarely"}

Have you consumed any caffeine drinks (coffee) or smoked in the past 30 minutes? {:26850::"Yes","No"}

Does patient have symptoms? {:26850::"Yes","No"}

Does the patient need a refill? {:26850::"Yes","No"}

@LASTNA@
@LASTCR@
@LASTK@
@LASTGFR@

PROACTIVE CARE ACTIONS

Proactive Office Encounter Actions: { :65444}

AVS given, reviewed with patient, no further questions at this time.

Provider Outcomes

APP HTN Clinical Outcome: **{NONE :26850::"Inappropriate referral- did not adjust","Patient needed labs","Addressed compliance","Medication titration made","New medication initiated","Other: ***"}**

Provider/Outcome	Jan '19	Feb '19	Mar '19	Apr '19*	Total
TG	230	245	367	183	1025
Addressed compliance	77	82	94	46	299
Inappropriate Referral	7	6	13	3	29
Medication titration made	85	88	111	64	348
New medication initiated	10	31	53	29	123
No Outcome	3	11	67	24	105
Other	41	27	20	9	97
Patient needed labs	7		9	8	24

Uncertainty as to “True” BP

- BP competency
- Home BP monitoring
- Use of AOBP
- Look at last several clinic measures

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Performance feedback

- Provider specific control rates
- Provider specific treatment intensification rates

Provider Level Feedback

PCP	HTN Pts (age 18+)						
	Population	BP Controlled		BP Uncontrolled		No BP	
	Pts	Pts	%	Pts	%	Pts	%
	288	255	88.5 %	20	6.9 %	13	4.5 %
	786	642	81.7 %	95	12.1 %	49	6.2 %
	583	493	84.6 %	64	11 %	26	4.5 %
	610	488	80 %	92	15.1 %	30	4.9 %
	277	213	76.9 %	35	12.6 %	29	10.5 %

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How to Monitor Treatment Intensification

- TIS: treatment intensification score – typically measured in uncontrolled patients
- % of visits with uncontrolled BP where titration done
- % of patients on combination pills
- % of uncontrolled patients on 2, 3, 4 meds

Therapeutic Intensity Score

- TIS: prescribed daily dose for each medication is set as numerator; corresponding max FDA approved daily dose set as denominator.
- Example: patient on 3 BP meds, each at 25% max dose: TIS = 0.75.
- Example: patient on Lisinopril-HCTZ 20-25, 2 tabs + amlodipine 5 mg daily: TIS = 2.5.
- **Systolic BP decreased by a significant 14-16 mm for every 1 point increase in TIS.** Levy, PD. JASH 2016. Prospective study in AA uncontrolled patients.

Treatment Intensification Score
April 2019

Med Center	AA UNCTL	ALL UNCTL
ANA	1.05	0.82
AV	0.98	0.85
BAK	1.01	0.85
BEL	1.09	0.89
BPK	1.05	0.87
FON	1.06	0.87
HAR	1.05	0.93
PAN	1.05	0.88
RIV	1.04	0.86
SD	1.08	0.84
SUN	1.04	0.86
WLA	1.05	0.95
WOD	0.95	0.81
SCAL	1.04	0.87

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Treatment Intensification Report

HTN_STAGE_CD	UNCTL		
PREV_STAGE_CD	UNCTL		
PCP_NM	B	W	Grand Total
AVANESSIAN, PATRICK (M.D.)	1.40	0.83	0.89
BARTFELD, NOAH BARNABY (M.D.)	1.20	0.92	1.17
BELYEU, BRITTANEY MARIE (M.D.)	1.11	1.00	1.09
BHAI, AVNEESH KAUR (M.D.)	0.75	1.23	1.07
BHALLA, ANUSHKA RANI MAHAL (M.D.)	1.15	0.13	1.04
BLAKE, OSBOURNE ARTHUR (M.D.)	1.39	0.50	1.32
BRETTLER, JEFFREY WILLIAM (M.D.)	1.53	1.50	1.22
CHEN, ALLAN (M.D.)	1.25	1.25	1.28
DAMSKER, KEITH EVAN (M.D.)	1.49	1.63	1.49
DAVIDSON, DANIELLE LEE (M.D.)	1.26	1.49	1.26
DEWAR, MELANIE SAMANTHA (M.D.)	1.06	1.42	1.04
DUQUETTE, JOANNA MARIE (M.D.)	1.29	0.00	1.11
ETHNASIOS, RAMEZ ADLY (M.D.)	1.80	0.63	1.39
KORB, JAMES ROBERT (M.D.)	1.17	1.70	1.45
LEE, ERIC ANTHONY (M.D.)	0.80	0.91	0.78
LEE, HARRISON (D.O.)	0.91	1.64	1.02
LEE, JEAN HWAJIN (M.D.)	0.67	1.33	1.08
LOHNE, JENNIFER (D.O.)	0.99	0.50	0.89
LORENZO, FELICIO SANTOS (M.D.)	1.14	1.58	1.02
MALLOUK, GEORGE MICHEL (M.D.)	1.36	0.91	1.21
MANN, JUDY MICHELLE (M.D.)	0.94	0.58	0.95
MAYORQUIN, PATRICIA (M.D.)	1.09	0.63	1.20
MENDEZ, DIANA LOWREY (D.O.)	0.90	0.67	0.83
MILLAY, VICTORIA (M.D.)	0.54	2.50	0.84
MILSTEIN, HYMAN JOSEPH (M.D.)	1.00	0.50	0.67
MIRANDA, ERICA CRISTINA (M.D.)	1.13	1.13	1.21
MIRDAMADI, LINDA MARIE (M.D.)	1.00	1.57	1.31
MOGHTADER, SAM (M.D.)	0.92	1.19	0.95
MORALES, GREGORY STEWART (M.D.)	0.71	1.03	1.01
MYINT, EMMIE (D.O.)	0.54	0.75	0.89
NEY, BRYAN RAYMOND (M.D.)	1.25	0.75	1.33
NUDELMAN, KENNETH ALAN (M.D.)	1.88	1.35	1.50
OPPENHEIM, GENE LEONARD (M.D.)	3.13	1.57	1.95
OZAKI, RIKIO ALAN (M.D.)	0.99	0.00	0.90
PATHARE, SANDHYA S (M.D.)	1.39	3.50	1.26
Grand Total	1.31	1.06	1.22

HTN_STAGE_CD	UNCTL		
PREV_STAGE_CD	UNCTL		
PCP_FAC_CD	B	W	Grand Total
CCMU	1.55	1.13	1.28
CWMU	1.27	0.97	1.22
INGU	1.46	1.18	1.40
PLVU	1.03	0.99	0.97
SNMU	1.27	0.85	1.24
VENU	1.06	0.82	1.02
WLAU	1.30	1.20	1.20
WLMU	1.33	0.00	1.26
Grand Total	1.31	1.06	1.22

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HTN Demographics and Utilization

HYPERTENSION Demographics and Utilization Report - African Americans within POINT HTN*				
	Controlled		Uncontrolled	
	Counts	% of Controlled Population	Counts	% of Controlled Population
1-2 Rx Classes	26,896	52.02%	5,831	44.53%
3-4 Rx Classes	16,868	32.63%	4,760	36.35%
>4 Rx Classes	3,150	6.09%	1,348	10.29%
Specific HTN Med or Rx Class Dispensed in the Past 12 Months				
FDC - lisinopril/HCTZ	9,043	17.49%	2,455	18.75%
ACEI (other than lisinopril/HCTZ)	16,129	31.20%	4,271	32.61%
ARB	7,562	14.63%	2,242	17.12%
Beta blocker	20,851	40.33%	5,872	44.84%
CCBs - dihydropyridine	15,680	30.33%	5,038	38.47%
CCBs - nondihydropyridine	2,938	5.68%	822	6.28%
Thiazide Diuretic (other than lisinopril/HCTZ)	20,450	39.55%	4,794	36.61%
Loop Diuretic	5,731	11.08%	1,704	13.01%
K-sparing Diuretic - spironolactone or eplerenone	1,564	3.03%	428	3.27%
K-sparing Diuretic - triamterene or amiloride	5,275	10.20%	1,031	7.87%
Central Alpha2 Adrenergic Agonist	2,264	4.38%	1,006	7.68%
Peripheral Alpha1 Adrenergic Blocker	3,844	7.43%	960	7.33%
Adrenergic blocker	9	0.02%	10	0.08%
Vasodilator	2,984	5.77%	1,451	11.08%
Renin inhibitor	7	0.01%	2	0.02%
FDC containing spironolactone	37	0.07%	7	0.05%
FDC containing triamterene or	5,243	10.14%	1,026	7.83%
FDC (other than lisinopril/HCTZ or amiloride or spironolactone)	392	0.76%	110	0.84%

3-4 Rx Classes+
36.35%
>4= **10.29%**

3.27%

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Focused Interventions

African Americans with uncontrolled HTN – generally require 2 or more medications and higher dose diuretic.

- % on suboptimal Lisinopril-HCTZ
- % thiazide naïve

Monthly reports down to clinic level

Suboptimal Lisinopril-HCTZ

2019 PROACTIVE PANEL MANAGEMENT
Black / African American HTN Control

Black/African-American HTN Control	SAN BERNARDINO COUNTY		SAN DIEGO		SOUTH BAY		WEST LOS ANGELES		WOODLAND HILLS		REGION		Best Performing Area		Most Improved Area	
MEASURES PPM TARGETS FOR IMPROVEMENT BY 10/31/19	Mar 2019 (Baseline)	August 2019	Mar 2019 (Baseline)	August 2019	Mar 2019 (Baseline)	August 2019	Mar 2019 (Baseline)	August 2019	Mar 2019 (Baseline)	August 2019	Mar 2019 (Baseline)	August 2019	Area	Rate August 2019	Area	August 2019 % Improvement
Measure 1: BP Control Rate in **Black/African American** HTN Population Ages 18-64 (Target: 80%)	71.7%	73.9%	72.9%	70.5%	70.4%	70.3%	73.2%	74.6%	70.4%	69.9%	72.2%	72.8%	Orange County	76.4%	Orange County / San Bernardino County	2.2%
# Additional Pts Needed to Meet Target	769	566	374	491	912	913	700	549	120	140	4,619	4,215				
% Change from baseline	2.2%		-2.3%		-0.1%		1.4%		-1.6%		0.6%					
Measure 2: BP Control Rate in **White/Caucasian** HTN Population Ages 18-64 (No Target)	76.0%	76.5%	74.2%	73.7%	75.3%	75.9%	77.2%	77.9%	74.6%	74.4%	75.0%	75.2%	West Los Angeles	77.9%	Los Angeles	1.3%
% Change from baseline	0.5%		-0.5%		0.6%		0.6%		-0.1%		0.2%					
Measure 3: HTN Disparity Ages 18-64 - Black/African American vs White/Caucasian **(No Target)** *(Lower / Negative rate is favorable)*	4.3%	2.6%	1.5%	3.2%	4.9%	5.7%	4.0%	3.2%	4.1%	5.7%	2.8%	2.3%	Orange County	-1.2%	Orange County	-2.3%
% Change from baseline (A reduction in disparity is favorable)	-1.7%		1.8%		0.7%		-0.8%		1.5%		-0.6%					
Measure 4: No BP Test in **Black/African American** HTN Population Ages 18-64 (No Target)	7.8%	7.2%	9.5%	10.8%	8.6%	8.8%	8.7%	9.1%	10.7%	11.2%	8.4%	8.8%	San Bernardino County	7.2%	San Bernardino County	-0.6%
% Change from baseline (Lower/Negative Rate is favorable)	-0.6%		1.3%		0.2%		0.4%		0.5%		0.4%					
Measure 5a: Reducing # of Thiazide Naive Patients (No Target) *(Lower rate is favorable)*	23.0%	23.1%	23.5%	22.8%	21.4%	22.3%	20.0%	20.6%	28.6%	28.8%	21.9%	22.5%	Downey	20.2%	Kern County	-5.0%
% Change from baseline (Lower/Negative Rate is favorable)	0.1%		-0.7%		1.0%		0.6%		0.1%		0.6%					
Measure 5b: Reducing # of Suboptimal Prinzide Patients (No Target) *(Lower rate is favorable)*	20.1%	19.1%	19.1%	16.7%	19.8%	17.7%	22.1%	18.5%	15.9%	14.4%	19.5%	17.2%	Kern County	10.4%	Orange County	-3.7%
% Change from baseline (Lower/Negative Rate is favorable)	-1.0%		-2.6%		-2.1%		-3.6%		-1.6%		-2.3%					

Data Source: Regional Complete Care - Panel Management. The Black

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Treatment Intensification - MDs

- MD specific data
- Yearly educational programs
- Academic detailing – MD champion meets with colleague
- Monthly meetings at level of clinic or module with shared data

Provider Education – How to Deal with Common Side Effects of Algorithm Meds

- ACEI cough and angioedema
- CCB related edema
- Thiazide-related hyponatremia
- Gout occurring on thiazide
- Erectile dysfunction

Provider Education

- Case studies
- Which side effects are dose related?
- When should medications be discontinued?

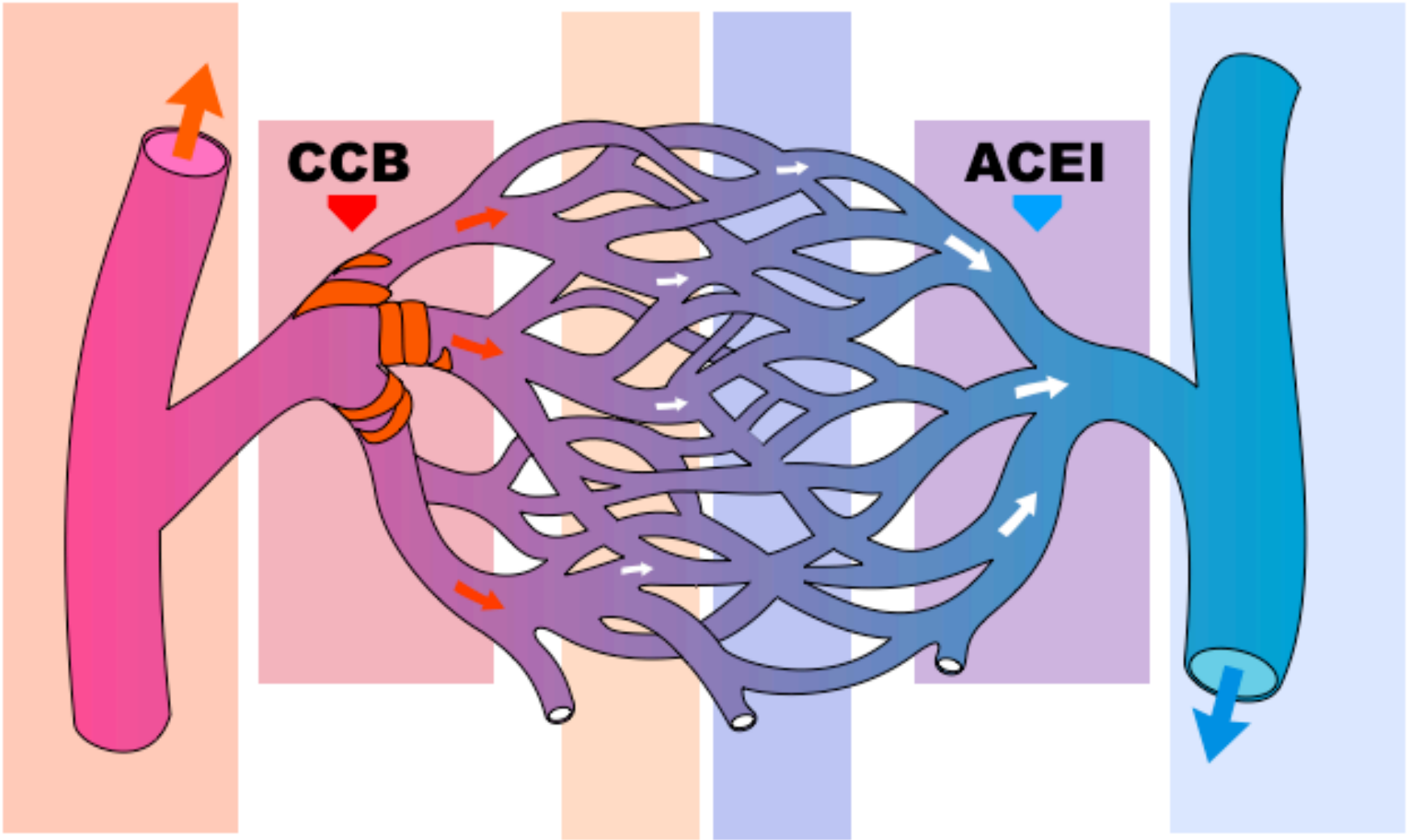
Calcium Blocker Edema Case

A 67 year old female with controlled hypertension on prinzide 20/25mg x 2, amlodipine 10mg, and atenolol 25 mg develops mildly bothersome 1+ bilateral pedal edema. You should advise her to:

A. Change prinzide to lisinopril 40mg plus furosemide 20mg daily
B. Switch amlodipine to long acting diltiazem 120mg daily
C. Advise sodium reduction to control edema
D. Maintain amlodipine 10mg and advise daytime compression stockings as needed, emphasizing reassurance

Pathophysiology of Calcium Channel Blocker Related Edema

- Not caused by fluid overload
- Not responsive to furosemide
- CCBs target precapillary arterioles to increase intracapillary pressure
- Intracapillary hypertension leads to fluid transudation into soft tissue and edema
- Edema is dependent, worse later in day and better in morning



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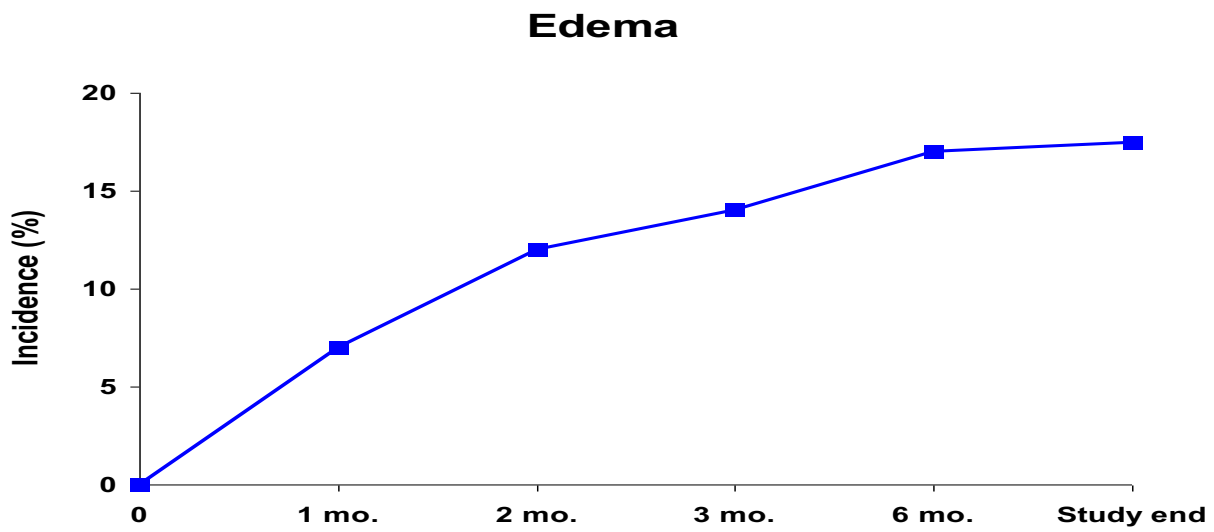

Edema rate over time for amlodipine

AJH 2002;15:932-940

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Managing Calcium Channel Blocker Related Edema

1. Always consider other etiologies of edema, ie right heart failure due to sleep apnea, steroids, anegrilide, NSAIDs; heart, kidney, and liver failure
2. Lisinopril and losartan act on venular side of capillary circuit to reduce intracapillary pressure
3. Additional antihypertensive agents permit reduction of dose of CCB
4. Daytime compression stockings, leg elevation
5. Switch to another calcium blocker
6. Reassurance

Adherence as Barrier

- Collect adherence data
- Consider treatment intensification even with suboptimal adherence

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Interplay of Treatment Intensification (TI) and Medication Adherence on BP Reduction

- In a secondary analysis of a RCT containing 58% black patients, the effect of TI and quartiles of med adherence on blood pressure reduction was assessed.
- Patients with <60% adherence had the same BP reduction as those with 85% adherence (p = 0.006)

Intensifying Therapy for Hypertension despite Suboptimal Adherence
Rose, A., et.al., Hypertension, Sept 2009: 54(3):524-529

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Medication Adherence

Medications

Medication Name	Dispense Date	Refill	MRAR	DSR
Atorvastatin (LIPITOR) 40 mg Oral Tab	07/21/2019		99.0	85
Allopurinol (ZYLOPRIM) 300 mg Oral Tab	07/22/2019		93.1	115
Lisinopril (PRINIVIL/ZESTRIL) 20 mg Oral Tab	07/23/2019		93.1	115
VITAMIN B-12 500 MCG ORAL TAB				
Carvedilol (COREG) 12.5 mg Oral Tab	07/21/2019		93.4	114
Spironolactone-Hydrochlorothiazide (ALDACTAZIDE) 25-25 mg Oral Tab	06/21/2019		100	194
ⓘ WARFARIN 2 MG ORAL TAB			86.2	ⓘ-23

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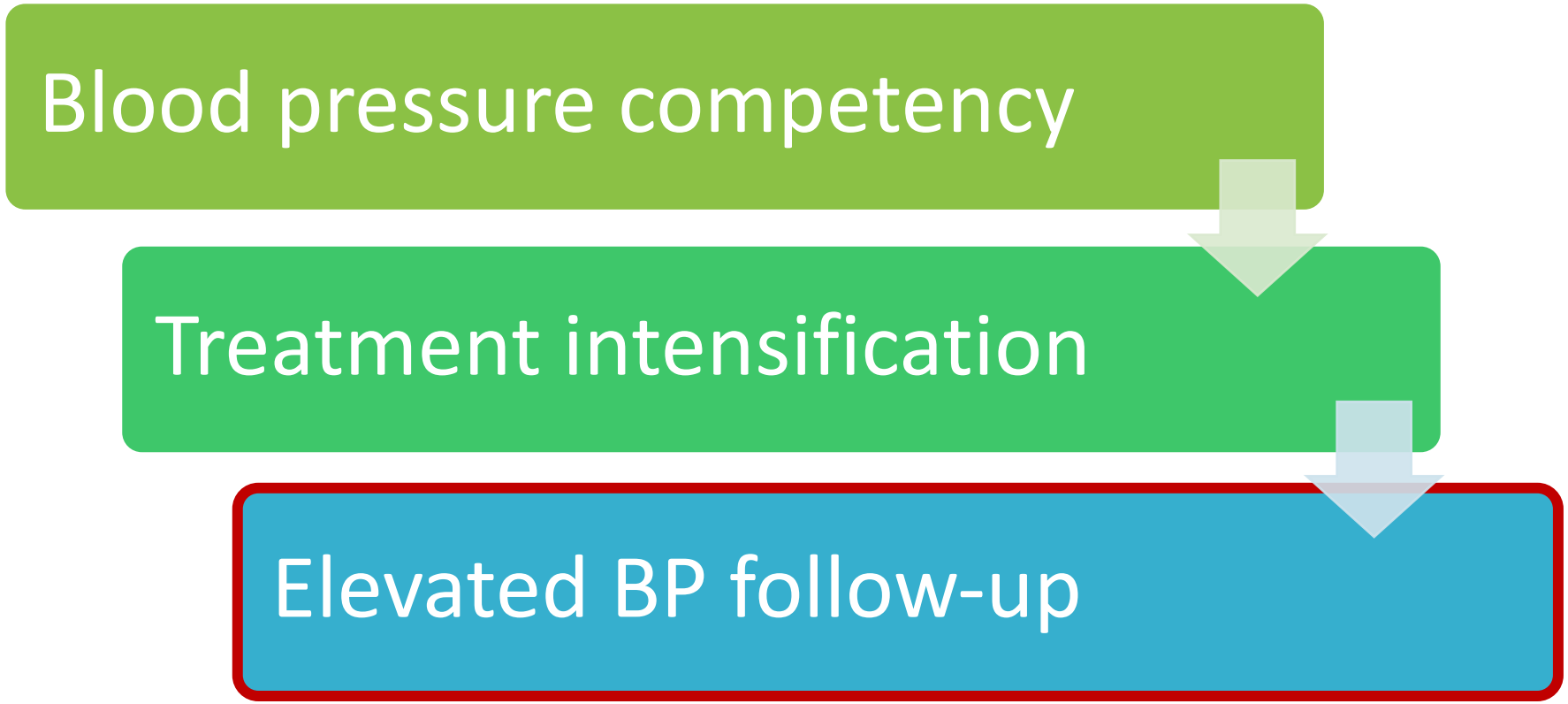
Key Drivers for BP Control



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Follow-up of Elevated BPs

2-4 week follow-up is key, but 2 is more effective

Automate: follow-up appointment can be booked before provider sees patient

Need to measure and report monthly - clinic and nurse level data

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Cycle Time

- Automate 2 week follow-up
- Emphasizes importance of control to both provider and patient

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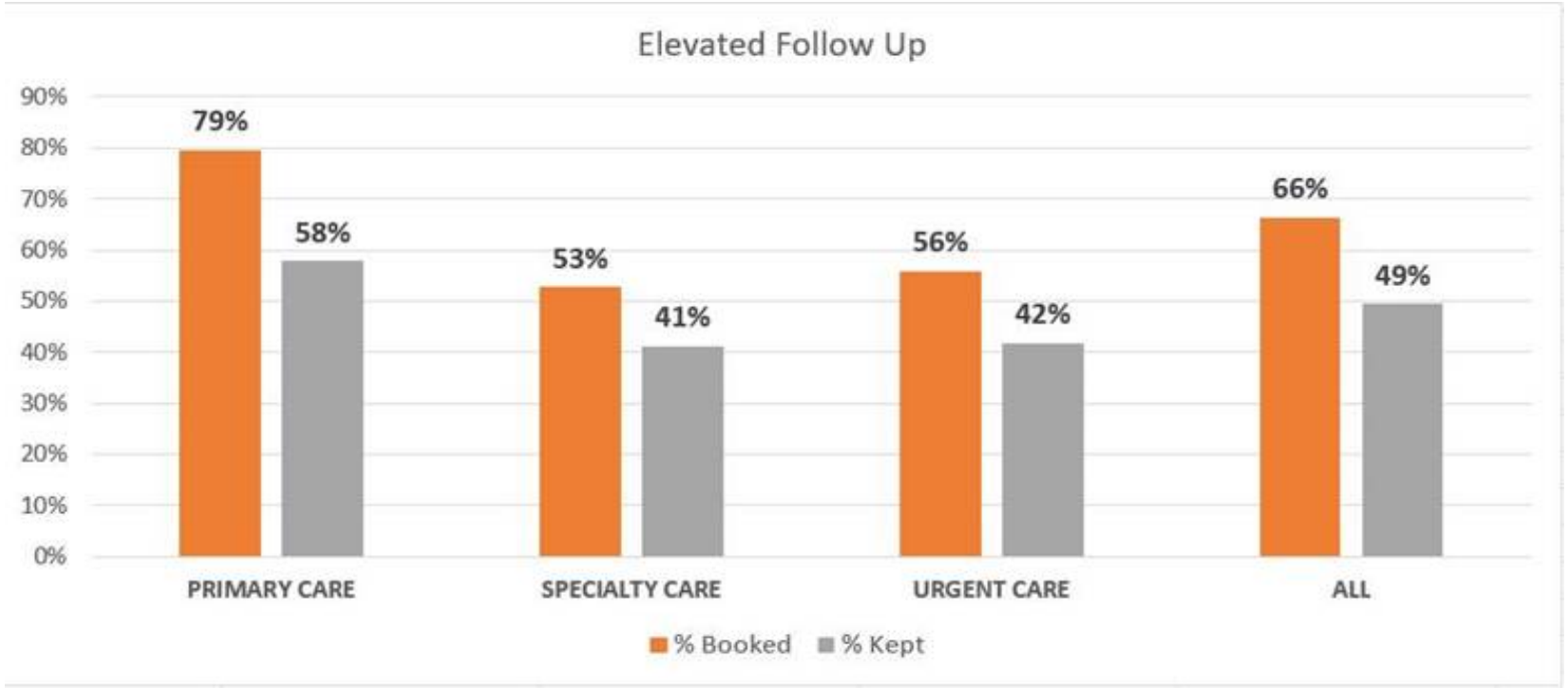
Elevated BP Follow-up - Sep 2019



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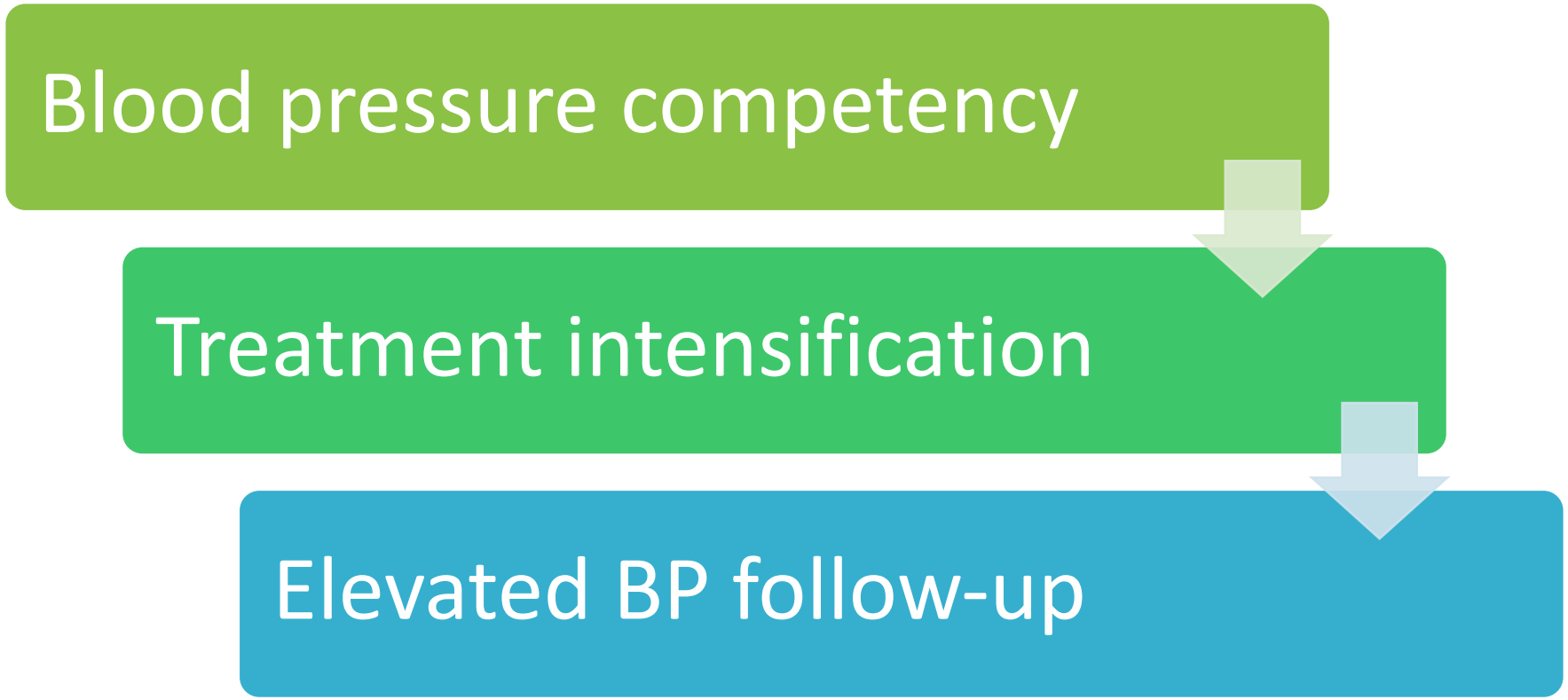
Key Drivers for BP Control



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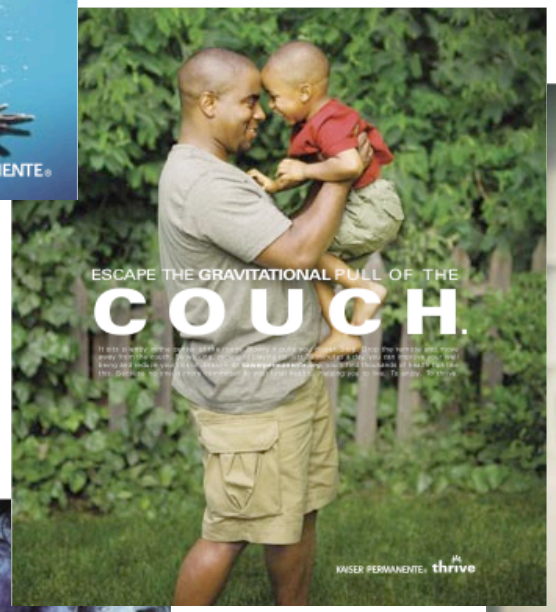
Thank you!



Questions:
Jeffrey.W.Brettler@kp.org

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Initial Invite:
What you can do to improve your current system?

- Short term
- Long term
- Barriers to both

QUESTIONS?

Thank you!

Please fill out the webinar evaluation survey:
https://www.tfaforms.com/4668124

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