HEARTS

IN THE AMERICAS

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HEARTS IN THE AMERICAS

Standardized Treatment Protocol
Kaiser Permanente Perspective – Day 2

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Kaiser SCAL Hypertension Program

Panama City, Panama November 20, 2019

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Agenda

- How to reinforce implementation of the protocol
- Team based care
- Staff education
- Monitoring/reporting
- Follow-up

The Two Most Important Drivers of HTN Performance

- Treatment Intensification
- Follow-up

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).

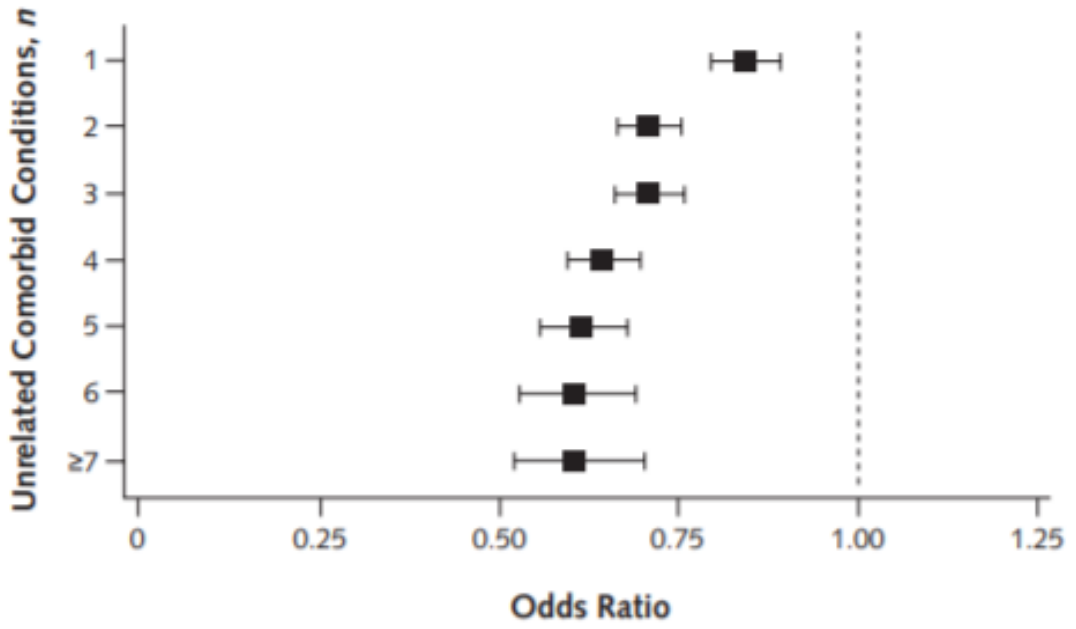
Competing Demands

Table 1. **Unrelated and Related Comorbid Conditions Reported at Visits**

Variable	Patients, *n* (%)	Visits, *n* (%)
Total	15 459 (100)	70 557 (100)
Number of unrelated comorbid conditions*		
0	786 (5.1)	12 074 (17.1)
1	2035 (13.2)	16 655 (23.6)
2	2816 (18.2)	15 334 (21.7)
3	2827 (18.3)	11 472 (16.2)
4	2507 (16.2)	7097 (10.1)
5	1751 (11.3)	3909 (5.5)
6	1215 (7.9)	1900 (2.7)
≥7	1522 (9.8)	1803 (2.6)
Related comorbid conditions		
Single vascular disease†	2300 (14.9)	7998 (11.3)
Multiple vascular diseases†	873 (5.6)	1927 (2.7)
Diabetes	4943 (32.0)	31 533 (44.7)
Chronic renal insufficiency	999 (6.5)	6969 (9.9)

Competing Demands

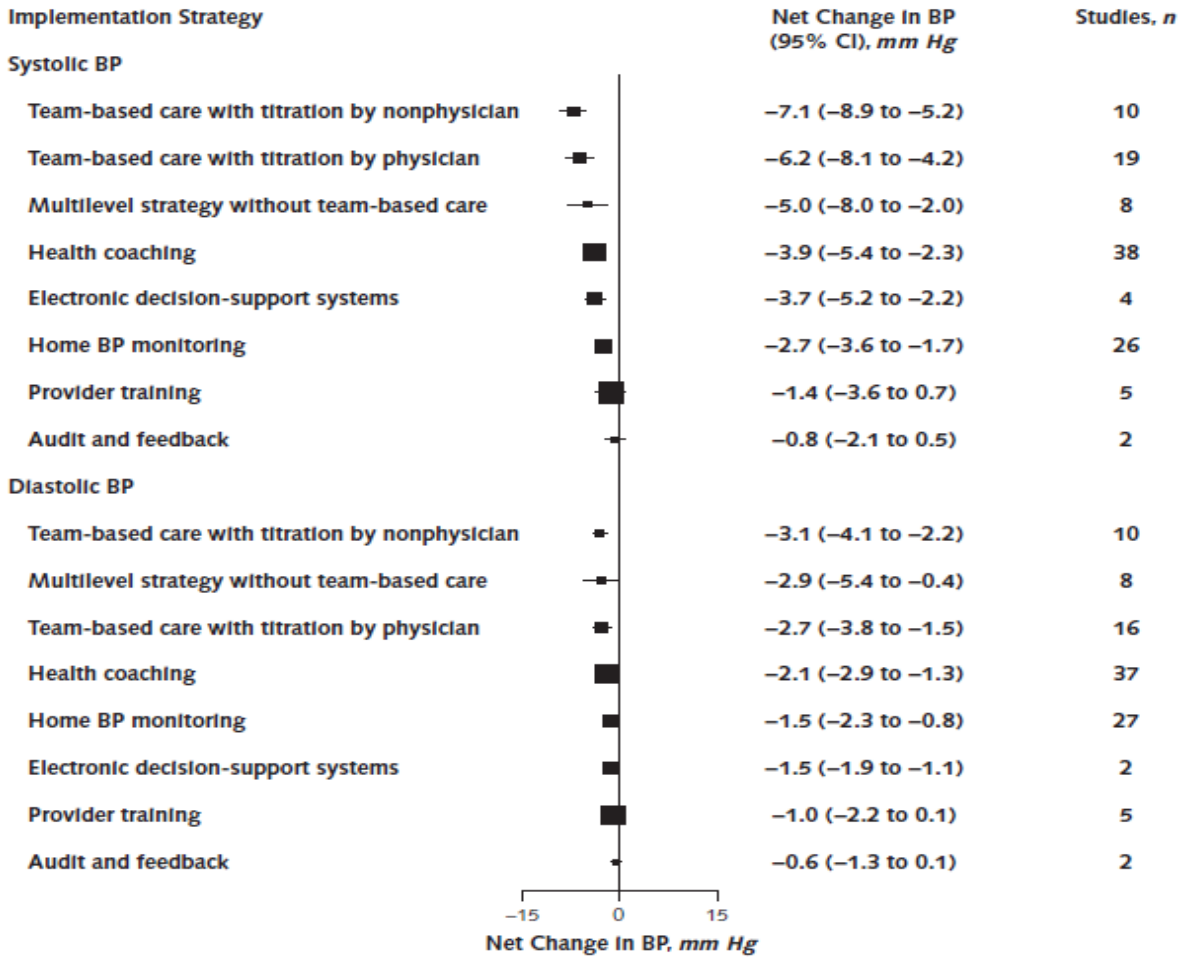
Figure 2. **Adjusted association of unrelated comorbid conditions with management of uncontrolled hypertension.**



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.

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



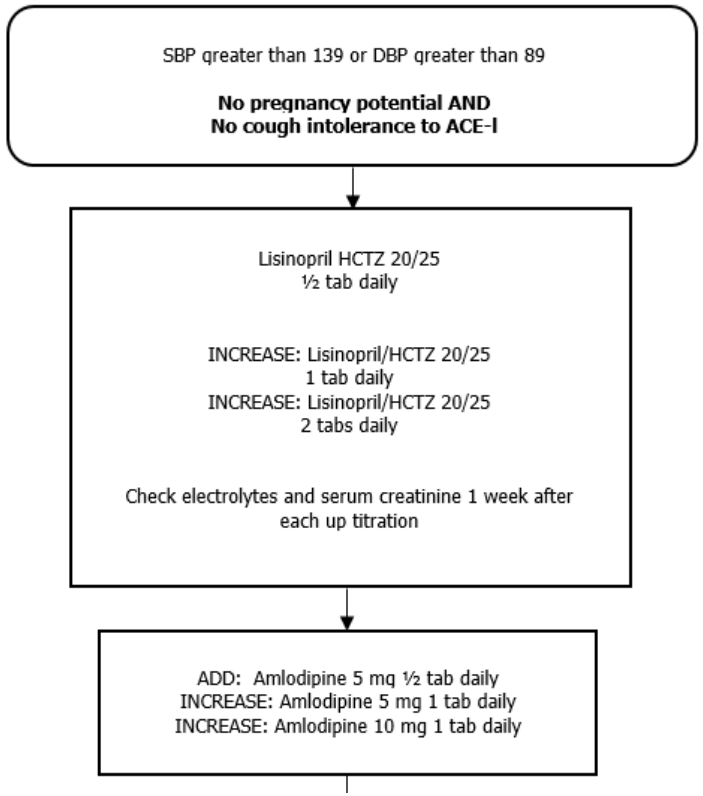
Mean net reductions were estimated using generalized estimating equations and adjusted for sex, age, baseline systolic (or diastolic) BP, trial duration, type of control group, and all other intervention strategies. Boxes are weighted by sample size. BP = blood pressure.

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

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

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 B I U S A 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

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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Annual Competencies

KAISER PERMANENTE

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			

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

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 %

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.

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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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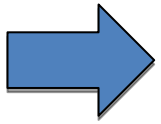
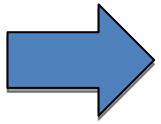
HTN Demographics and Utilization

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%

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?

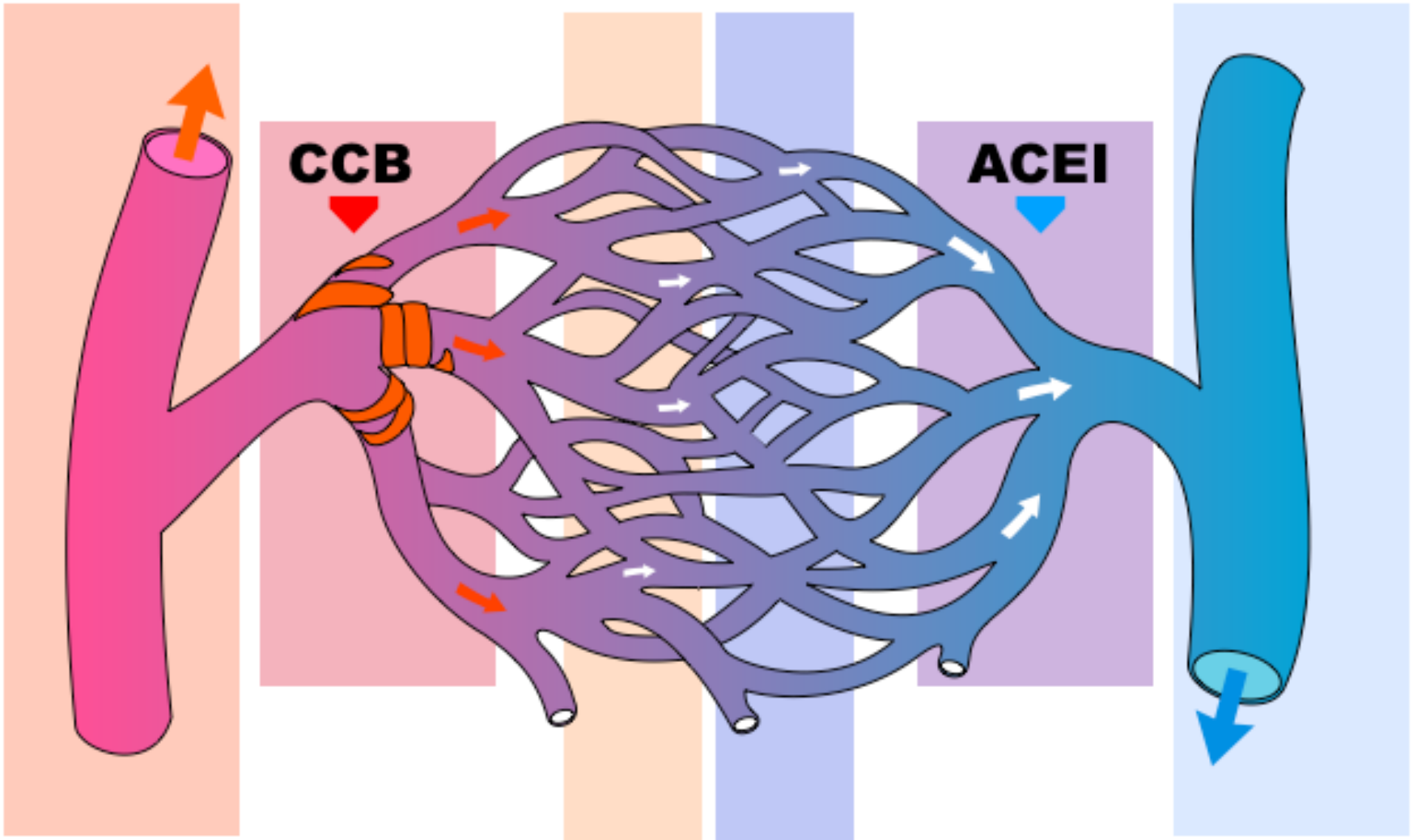
Calcium Blocker Edema Case

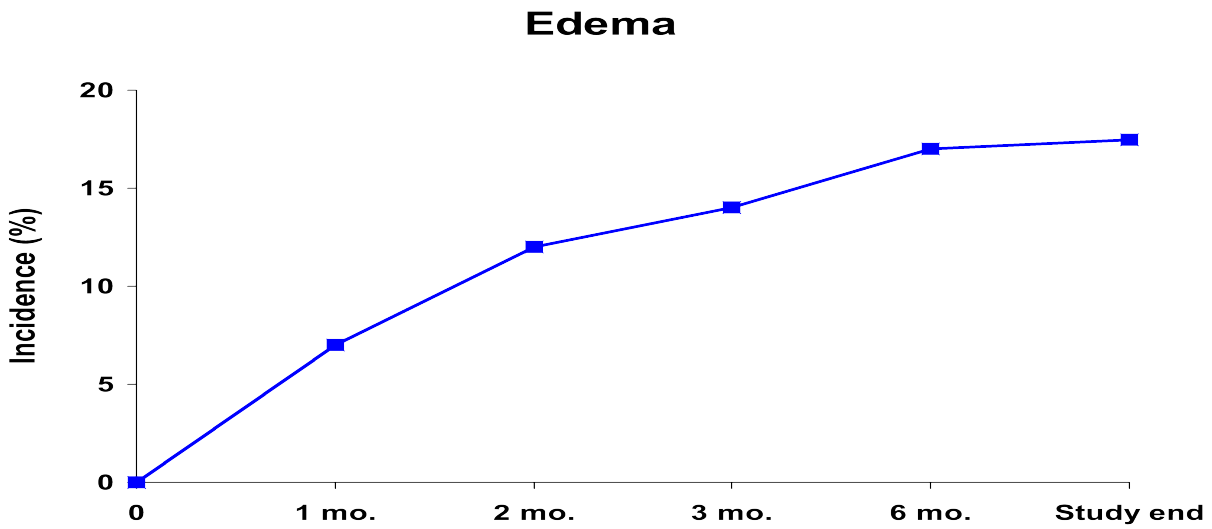
A 67 year old female with controlled hypertension on prinzide 20/25mg x 2, amlodipine 10mg, and atenolol 25 mg develops mildly bothersome 1+ bilateral pedal edema. You should advise her to:

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


CCB
ACEI



Edema rate over time for amlodipine

AJH 2002;15:932-940

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

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

Follow-up of Elevated BPs

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

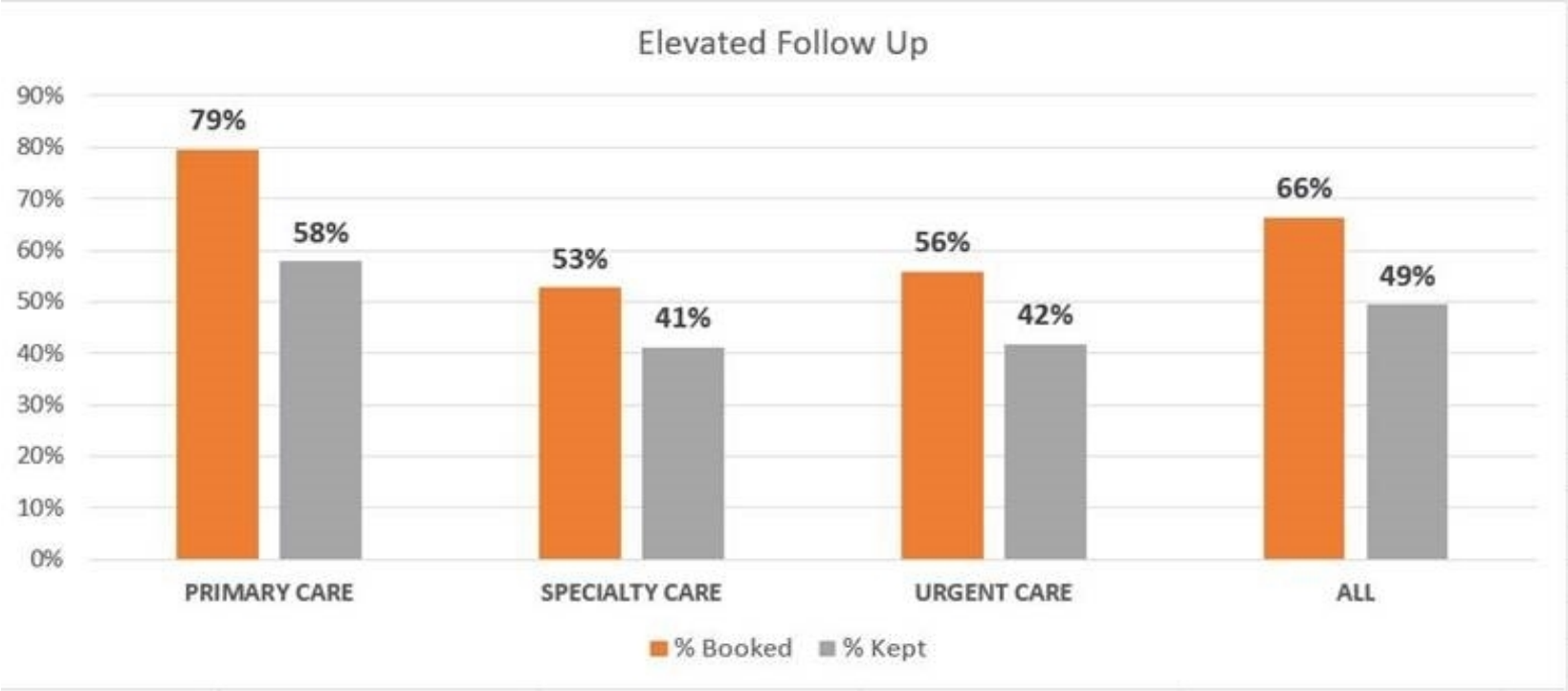
Automate: follow-up appointment can be booked before provider sees patient

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

Cycle Time

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

Elevated BP Follow-up - Sep 2019



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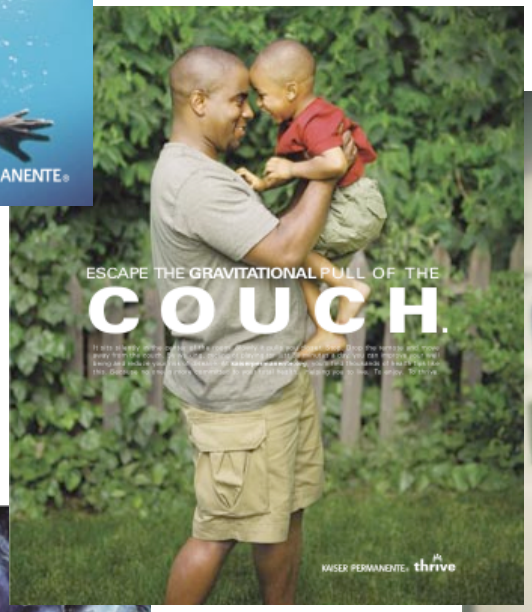
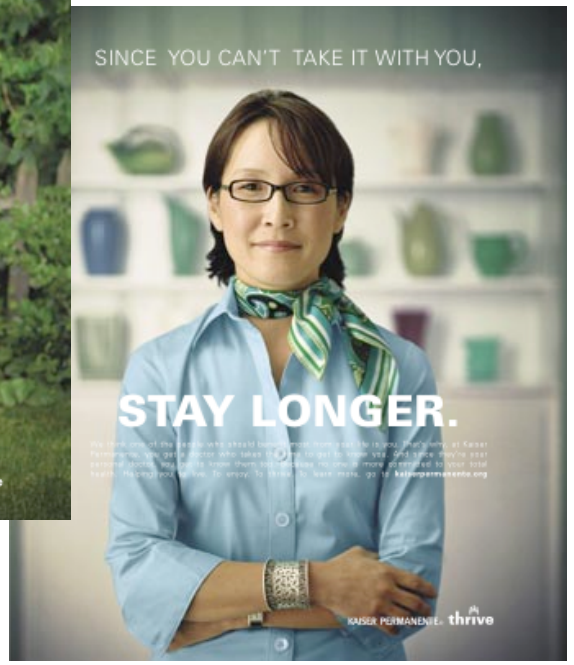
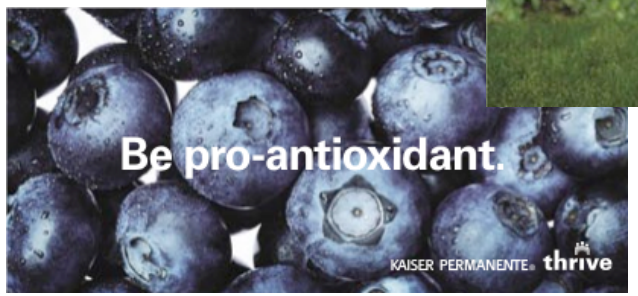
Thank you!







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