



HEARTS

IN THE AMERICAS



PAHO



HEARTS

IN THE AMERICAS

Taller Nacional de HEARTS en México

Kaiser Permanente: The Keys to a
Successful and Sustainable Program

Jeff Brettler, MD

Regional Physician Lead, KP SCAL Hypertension Program

Mexico City, February 20, 2020



PAHO

Key Elements of a Successful HTN Program

- **Comprehensive and accurate registry**
- Simple and clear guidelines
- Treatment algorithm using combination pill
- Performance feedback
- Team-based care
- Treatment intensification and medication adherence
- BP measurement competency
- EMR/decision support
- Patient education and engagement
- Data Integrity

Health System-Wide Hypertension Registry

- Hypertension Registry developed in 2000
- Elements used for identification:

Outpatient Diagnostic Codes

Pharmaceutical Utilization Data

Hospitalization Records

- Chart review audits of random samples of identified members were conducted

Hypertension Registry

2 outpatient visits within 365 days of each other with a diagnosis code for hypertension

1 outpatient visit with a diagnosis code for hypertension and 1 hospital discharge with a diagnosis code for hypertension within 365 days of each other

1 antihypertensive dispensing in the past 6 months and 1 outpatient visit with a hypertension diagnosis code within 365 days of the dispense date

1 outpatient visit with a code for hypertension AND a member of one of the following populations: Heart Failure, CAD, Diabetes, CKD, CVA (excluding subarachnoid, subdural and cardioembolic)

Hypertension Registry - Exclusions

Member deceased according to patient demographics or hospitalization information

Patient in hospice, under custodial care in a skilled nursing facility, or palliative care

Patients currently pregnant

Patients on dialysis (hemodialysis or peritoneal dialysis as identified in POINT CKD)

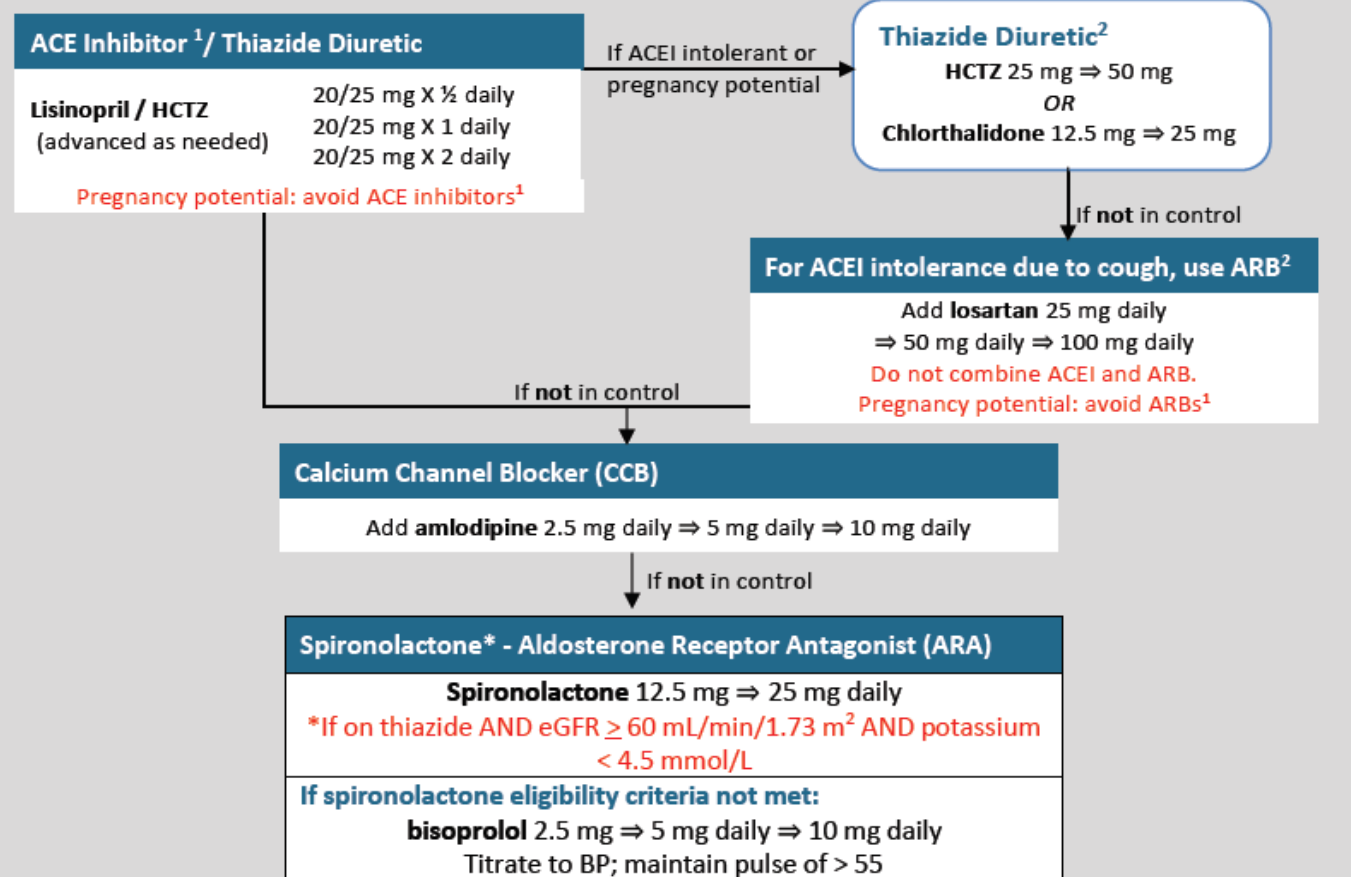
Key Elements of a Successful HTN Program

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

FIGURE 1: MANAGEMENT OF ADULT BLOOD PRESSURE (BP)

BP GOALS

- ▶ Treat adults with confirmed hypertension to a goal BP < 140/90 mm Hg.
- ▶ In adults with ASCVD, CKD, age ≥ 75 years, or 10-year ASCVD risk³ ≥ 10%, consider treating to a goal SBP < 130 mm Hg. (Exclude adults with eGFR < 20 from this lower target.)



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Performance Feedback

Unblinded data with clear targets

Monthly reporting

Data drilled down to medical center, clinic, team, individual physician and nurse. Facilitates best practice identification and spread at all levels.

Overall control as well as process measures

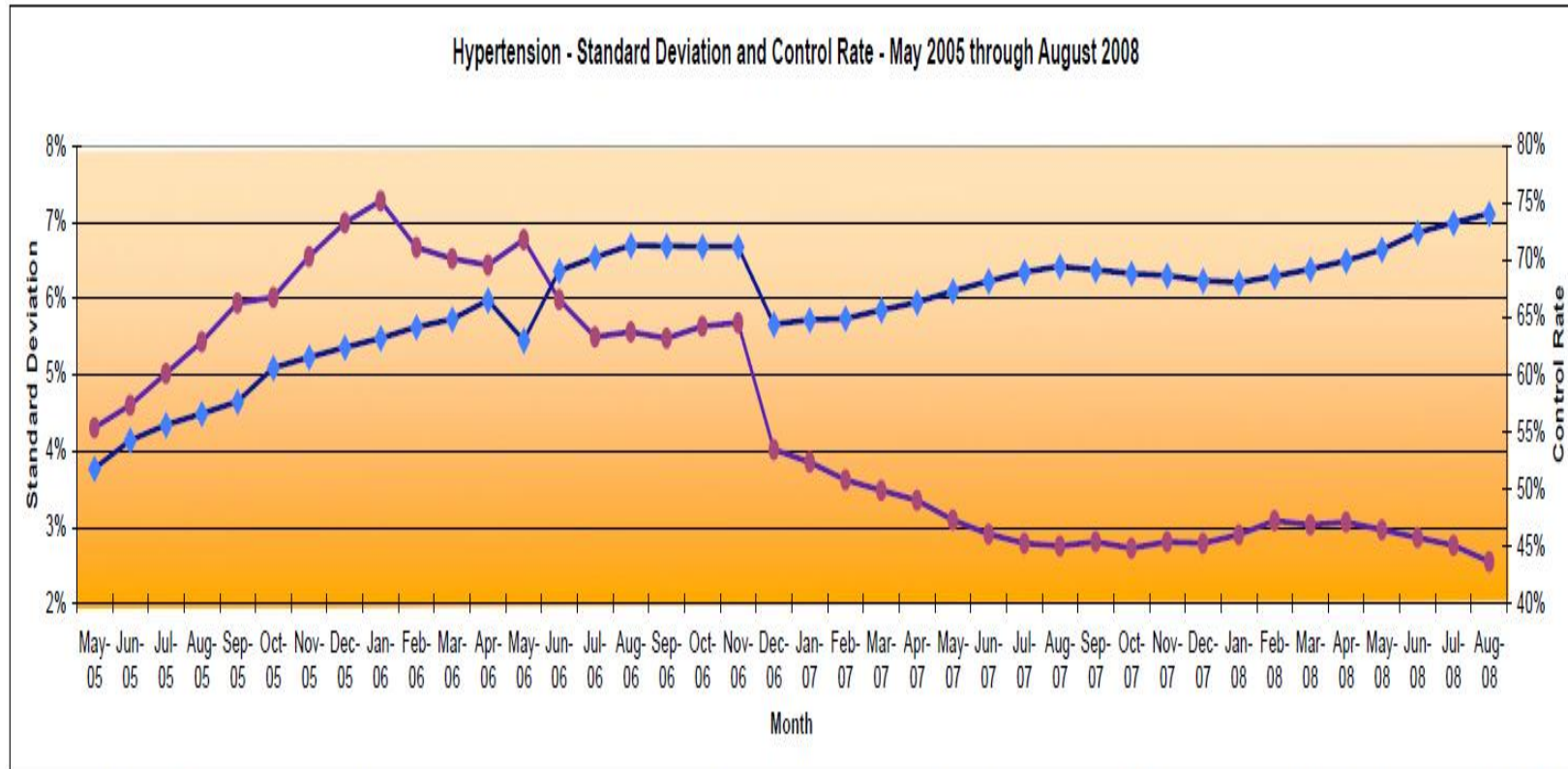
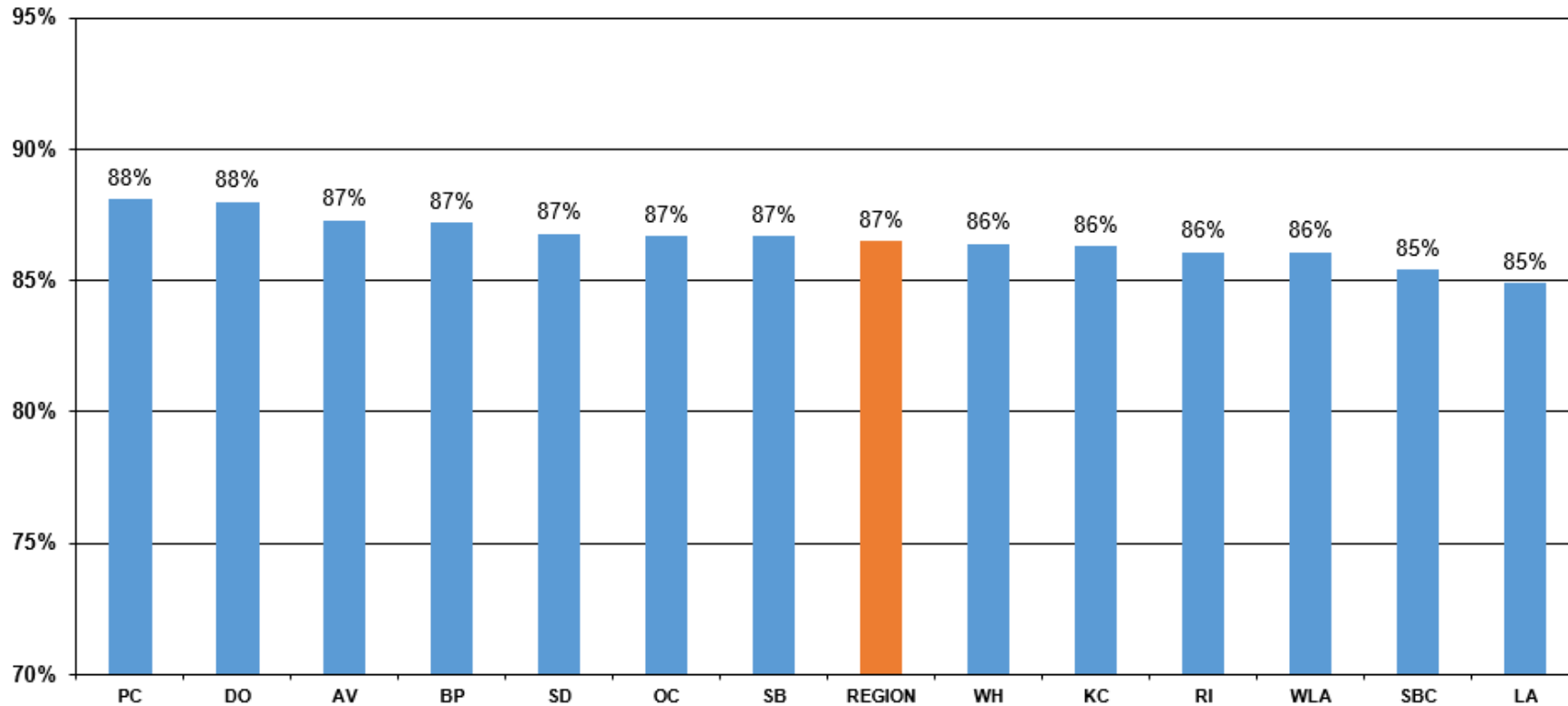


Figure 1: Standard deviation of hypertension control among 13 medical centers in Southern California Permanente Medical Group (SCPMG) compared to overall hypertension control < 140/90. Blue line represents hypertension control; purple line represents standard deviation of hypertension control.

Handler J, Lackland DT. JASH 2011; 5: 197-207

HEDIS Controlling High BP Measure September 2018



Provider Level Feedback

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

Process Measures

Outreach – BP measurement needed every year

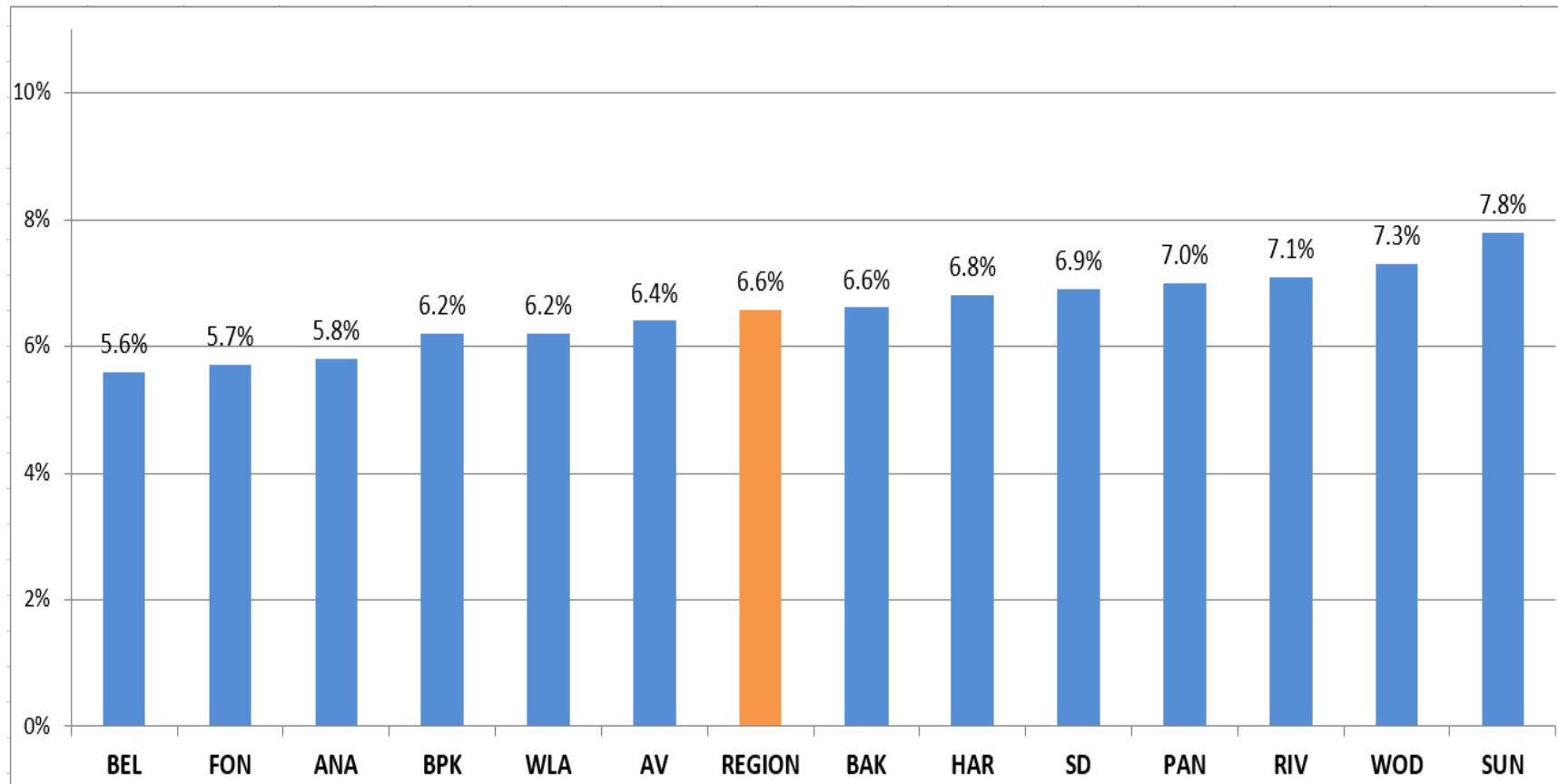
BP measurement: repeat if elevated, standing in older patients

Specialty measurement

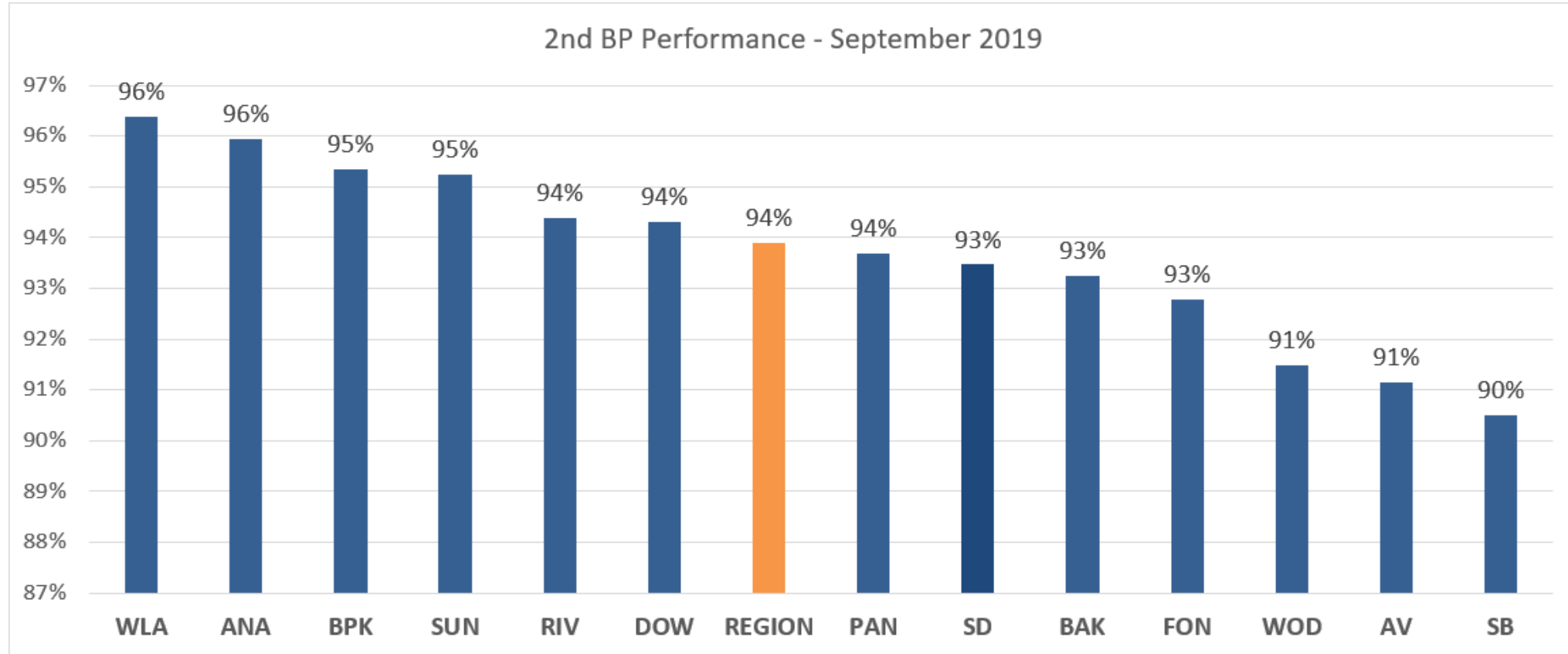
Treatment intensification, adherence

Follow-up

No BP February 2019



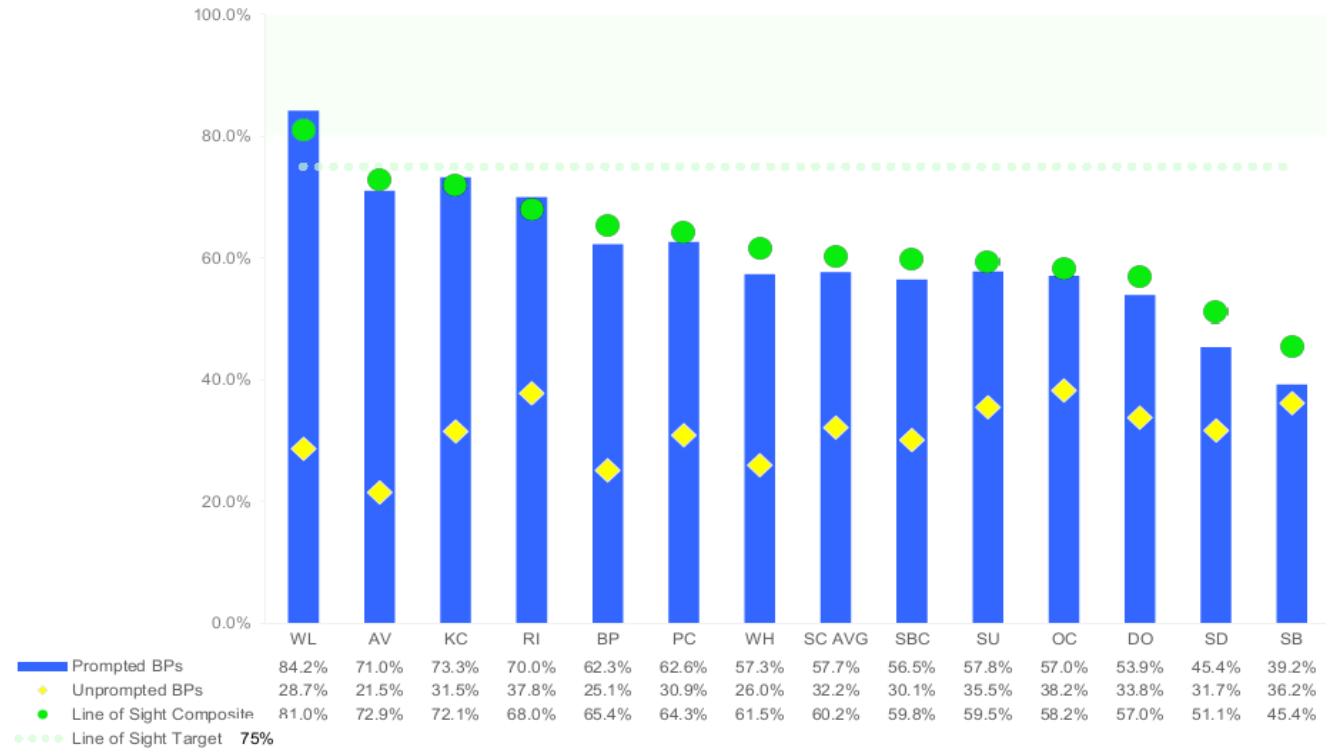
2nd BP Report



Specialty BP Report

BP Excellence + Efficiency = Value: Results by Medical Center Area – March 2019 (2019 75:25 Weighted LOS Composite)

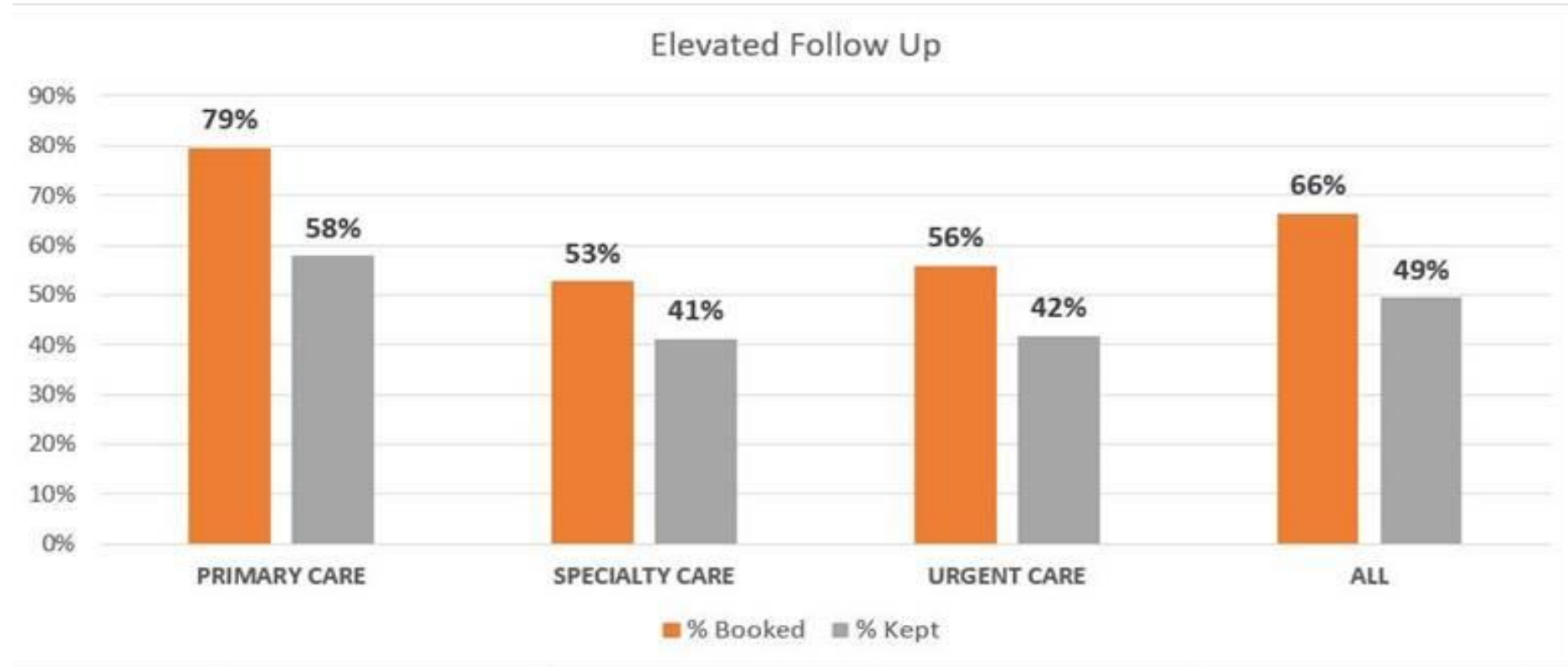
↑ Maximize Prompted BPs
↓ Minimize Unprompted BPs
↑ Drive Line of Sight BP Composite



Response to the KP HealthConnect Proactive Care Tab prompt for a BP entry at Specialty office visits when there is no recent, normal BP on file
Unprompted Pre-Op & Consult visits with patients who have a have recent , normal BP in KPHC are excluded from these data

Data Source: KP HealthConnect/Clarity
Merry Meyers,
Business Systems & Reporting

Follow-up BP Report



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Team-Based Care – HEARTS

- Expanded access to care
- Better patient support
- Improved team member collaboration
- Better follow-up
- Cost efficient
- Improved patient and physician satisfaction
- Improved outcomes

Team-Based Care

Allows team members to work up to their scope of practice

- MAs or LVNs
- RNs under protocol
- NPs with supervising MD mentor
- Pharmacists independently

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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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

Key Elements of a Successful HTN Program

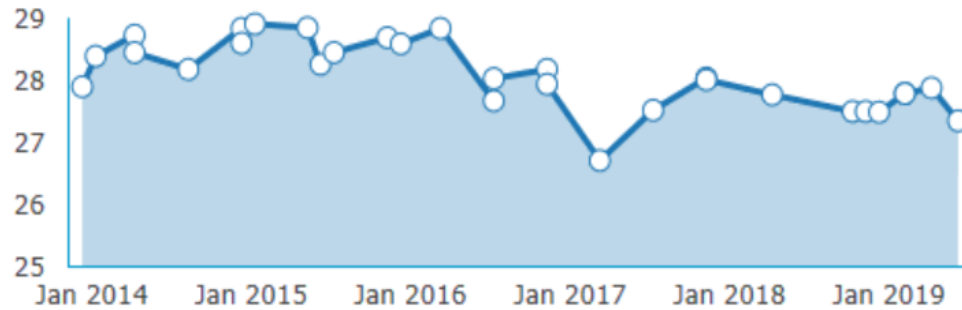
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Patient Education

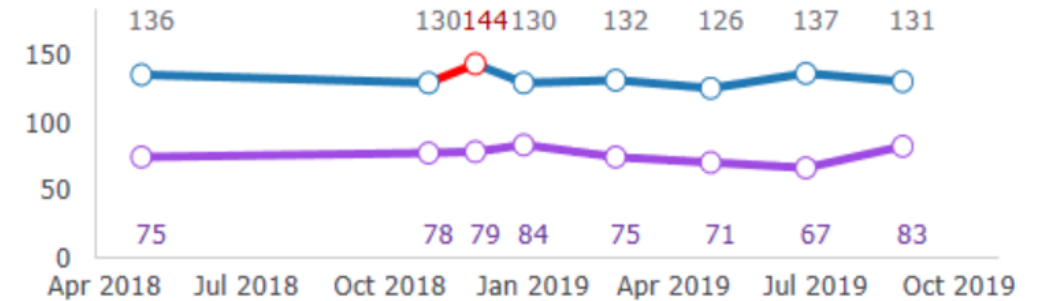
- Formal in-person classes
- On-line educational modules
- Home BP monitoring
- Educational handouts at all sites of contact: general HTN, low sodium, DASH diet

Patient Engagement

Body Mass Index(BMI)



Blood Pressure



Blood pressure (BP)

Last result date:

9/5/2019









Last result: 131/83

Good job! No action needed.

** If you are at higher risk because of certain chronic conditions, you might benefit from a lower systolic goal.*

Your last blood pressure result was within the healthy range.

Patient Engagement

Medications you take regularly		
Medication	Adherence Rate	Days Left
 <p>amLODIPine (NORVASC) 10 mg Oral Tab Good job! Our records indicate that you are taking your medication regularly as prescribed.</p>	Adherence rate = 99.7%	37 days left 
 <p>Isosorbide Mononitrate (ISOSORBIDE MONONITRATE) 30 mg Oral 24hr SR Tab Good job! Our records indicate that you are taking your medication regularly as prescribed.</p>	Adherence rate = 99.2%	43 days left 
 <p>Lisinopril (PRINIVIL/ZESTRIL) 20 mg Oral Tab Good job! Our records indicate that you are taking your medication regularly as prescribed.</p>	Adherence rate = 99.4%	43 days left 
 <p>Atorvastatin (LIPITOR) 80 mg Oral Tab Good job! Our records indicate that you are taking your medication regularly as prescribed.</p>	Adherence rate = 96.9%	87 days left 

Remote BP Telemonitoring

← → ▾

Remote Pt Data

?

← → ! ↻ Print Preview

v 87.6.2

Member: [Redacted]

Program: **Hypertension SCAL** ▾

📅 Data timespan

1 Week (1/29/2020 - Today) ▾

Program summary

Blood pressure

Systolic mmHg	Diastolic mmHg	Average BP mmHg
Range	Range	
118-161	85-115	143 / 100

Program status

Active

Blood pressure source status

Connected

Last upload: 2/4/2020 - 8:10 AM

Last reading: 2/4/2020 - 8:06 AM

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- **Data Integrity**

Sources of Inaccurate Data or Error

- System – identification, prevalence
- Patient-related
- Device-related
- Procedure-related
- Observer-related

System

- Prevalence – CDC estimator, comparison to NHANES
- Trend analysis at the larger population level
- Monthly reporting with data drilled down to medical center and race/ethnicity - allows us to identify unusual patterns in trending

System

- Annual submission of data for external quality review (HEDIS). We look at both chart review and administrative data. Opportunity to compare fallouts.
- Local quality teams at each medical center provide another check on data. Care managers and physicians work on lists – escalate data issues regarding misclassification of patients.

Patient-related Error

Potential source of inaccuracy	Range of reported significant mean effects (in mmHg) unless specified	
	SBP	DBP
Patient-related		
1. Acute meal ingestion [16,17]	-6 ^a	-5 to -1.9
2. Acute alcohol use [18-35]	-23.6 to +24	-14 to +16
3. Acute caffeine use [40-74]	+3 to +14	+2.1 to +13
4. Acute nicotine use or exposure [70,75-103]	+2.81 to +25	+2 to +18
5. Bladder distension [104-106]	+4.2 to +33	+2.8 to +18.5
6. Cold exposure [107-115]	+5 to +32	+4 to +23
7. Paretic arm [116,117]	+2 ^a	+5 ^a
8. White-coat effect [120-160]	-12.7 to +26.7	-8.2 to +21

Kallioinen, J of HTN March 2017

Patient-related



Cómo tomar la presión de la sangre en la casa

Compre un monitor de la presión de la sangre de precisión.

- Puede comprarlo en una farmacia o una tienda Vida Sana de Kaiser Permanente.
- Los dispositivos de muñeca y de dedo no son precisos y no se deben usar.

Si tiene su propio aparato para tomar la presión de la sangre, tráigalo a una cita. Pídale al personal que le tome la presión de la sangre con su aparato y con el aparato del consultorio para comparar las lecturas y validar su aparato.



Cómo prepararse para una lectura de precisión.

QUÉ DEBE HACER

- Para estar cómodo, use el baño antes de tomarse la presión de la sangre.
- Siéntese en una silla con respaldo y los dos pies apoyados en el suelo.
- Flexione el brazo a la altura del codo y apóyelo sobre una mesa u otra superficie plana.
- Coloque el brazaletes en **contacto directo** con la piel del brazo.
- Tómese la presión de la sangre en un cuarto tranquilo.

QUÉ NO DEBE HACER

- No cruce las piernas.
- No ponga el brazaletes sobre la ropa.
- No hable mientras se está tomando la presión de la sangre.
- No fume, consuma bebidas con cafeína ni haga ejercicio por lo menos durante los 30 minutos antes de tomar la presión de la sangre.

¿Cuáles son los mejores momentos para tomar la presión de la sangre?

- **Temprano por la mañana.** Mida la presión de la sangre dentro 1 hora que se despierte y antes de tomar las medicinas que debe tomar por la mañana.
- **Por la noche.** Mida la presión de la sangre 1 hora o más después de la cena, pero antes de tomar las medicinas que debe tomar por la noche.

Nota: Para muchas personas, las lecturas de la mañana son más altas que las lecturas de la noche. Por este razón, es importante que al menos la mitad de las lecturas de la presión de la sangre se hagan por la mañana.

¿Cuántas lecturas se deben hacer?

Para los mejores resultados, tómelas 3 veces por la mañana y 3 veces por la noche. En cada grupo de tomas deberá incluir entre 2 a 3 lecturas.

Use el Registro de la presión de la sangre en la casa que se encuentra en el reverso de esta página para anotar las lecturas de la presión de la sangre.

Registro de la presión de la sangre en la casa

- Tome la presión de la sangre 3 mañanas durante la semana entre las 6 a.m. y las 10 a.m. y 3 noches, entre las 6 p.m. y las 10 p.m.
- Las lecturas de la mañana y de la noche se pueden hacer el mismo día o en días separados.
- Tome entre 2 a 3 lecturas cada vez que se tome la presión de la sangre. Deberá esperar al menos 1 minuto antes de tomar la siguiente lectura.

1. Descanse unos 5 minutos antes de tomar la presión de la sangre por primera vez.
2. Espere 1 minuto después de la primera lectura, y luego tome la segunda.
3. Espere 1 minuto otra vez, y luego tome la tercera lectura.
4. Anote las 2 a 3 lecturas. Asegúrese de escribir la fecha y las horas.

Domingo/Fecha:	
Hora	Sistólica/Diastólica
a.m.	/
a.m.	/
a.m.	/
p.m.	/
p.m.	/
p.m.	/

Lunes/Fecha:	
Hora	Sistólica/Diastólica
a.m.	/
a.m.	/
a.m.	/
p.m.	/
p.m.	/
p.m.	/

Martes/Fecha:	
Hora	Sistólica/Diastólica
a.m.	/
a.m.	/
a.m.	/
p.m.	/
p.m.	/
p.m.	/

Miércoles/Fecha:	
Hora	Sistólica/Diastólica
a.m.	/
a.m.	/
a.m.	/
p.m.	/
p.m.	/
p.m.	/

Jueves/Fecha:	
Hora	Sistólica/Diastólica
a.m.	/
a.m.	/
a.m.	/
p.m.	/
p.m.	/
p.m.	/

Viernes/Fecha:	
Hora	Sistólica/Diastólica
a.m.	/
a.m.	/
a.m.	/
p.m.	/
p.m.	/
p.m.	/

Sabado/Fecha:	
Hora	Sistólica/Diastólica
a.m.	/
a.m.	/
a.m.	/
p.m.	/
p.m.	/
p.m.	/

Notas:

Fuente: Handler, Joel. "Managing White-Coat Effect." Journal of Clinical Hypertension 10 (2008): 649-54. Esta información no pretende hacer ningún diagnóstico ni sustituir los consejos médicos ni el cuidado que recibe de su médico o de profesional del cuidado de la salud. Si tiene problemas de salud persistentes o si tiene más preguntas, consulte a su médico.

How to Take Your Blood Pressure at Home
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 Centro para una Vida Sana
 MH1643 (7/16) kp.org/espanol

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Device-related Error

Potential source of inaccuracy	Range of reported significant mean effects (in mmHg) unless specified		Suppl. Table number
	SBP	DBP	
Device-related			
9. Device model bias			
Mercury models			
vs. invasive criterion [167–170]	–10.6 to –4	+1.9 to +4	9A
Aneroid models			
vs. invasive criterion [162,171,172]	–9.7 to –4.0	+5.1 ^a	9B
vs. noninvasive criterion [173–179]	–0.8 ^a	–1.7 ^a	9C
Automated models			
vs. invasive criterion [162,167,168,171,182–189]	–23 to +6	–3 to +5.6	9D
vs. noninvasive criterion [167,176,190–227]	–3.7 to +16.53	–8 to +9.71	9E
10. Device calibration error			
Mercury [229–238]	0–61.8% of individual devices > ±3 mmHg calibration error		10A
Aneroid [229–237,239–247]	1.4–69.7% of individual devices > ±3 mmHg calibration error		10B
Automated [229–231]	4.5–26% of individual devices > ±3 mmHg calibration error		10C

Procedure-related Error

Range of reported significant mean effects
(in mmHg) unless specified

Potential source of inaccuracy	SBP	DBP
Procedure-related		
11. Insufficient rest period [249,250]	+4.2 to +11.6	+1.8 to +4.3
12. Body position		
Standing [251,252]	-2.9 to +5	+7 ^a
Supine [251-259]	-10.7 to +9.5	-13.4 to +6.4
13. Legs crossed at knees [260-266]	+2.5 to +14.89	+1.4 to +10.81
14. Unsupported back [267]	No significant effects reported	+6.5 ^a
15. Unsupported arm [268-270]	+4.87 ^a	+2.7 to +4.81
16. Arm lower than heart level [255,269,271-278]	+3.7 to +23	+2.8 to +12
17. Incorrect choice of cuff size		
Smaller cuff [279-283]	+2.08 to +11.2	+1.61 to +6.6
Larger cuff [279-283]	-3.7 to -1.45	-4.7 to -0.96
18. Cuff placed over clothing [284-287]	No significant effects reported	No significant effects reported
19. Stethoscope under cuff [288,289]	+1.0 to +3.1	-10.6 to -3.5
20. Talking during measurement [290-295]	+4 to +19	+5 to +14.3
21. Use of stethoscope bell (vs. diaphragm) [267,296-299]	-3.8 to +1.54	-1.61 ^a
22. Excessive pressure on stethoscope head [300]	No significant effects reported	-15 to -9
23. Fast cuff deflation rate [301-303]	-9 to -2.6	+2.1 to +6.3
24. Short interval between measurements [304-306]	No significant effects reported ^b	No significant effects reported
25. Reliance on a single measurement [147,258,259,275,307,308]	+3.3 to +10.4	-2.4 to +0.6
26. Interarm variability [311-325]	[3.3] to [6.32]	[2.7] to [5.06]

Procedure-related

- Education of MAs, LVNs, RNs. **Should be ongoing.**
- Audits: observed vs unobserved
- AOBP: SPRINT protocol - mandates 5 minute rest and multiple measurements.
- Patient engagement: patients know their numbers, get printed copy on visit summary and posted on their portal.

Blood Pressure Spot Check March 2016

Aggregated Data Received From:

Antelope Valley, Baldwin Park, Downey, Fontana, Kern County, Los Angeles, Orange County, Panorama City, Riverside, San Diego, South Bay, West Los Angeles and Woodland Hills

CRITERIA	TOTAL # YES	TOTAL # NO	% CORRECT
BARE ARM	3854	108	97.27%
CORRECT PB CUFF SIZE	3938	23	99.42%
ARM SUPPORT AT HEART LEVEL	3912	48	98.79%
NOT TALKING DURING BP	3879	87	97.8%

Antelope Valley:

- Remove clothes from arm
- Reminders to pull sleeves of shirt up
- Shirt sleeve too tight, advised could take shirt off

Fontana:

- Patient had to be told to keep feet flat on the floor

BP Observations and Spot Check Results

WLA Blood Pressure Technique Observations (2016 RESULTS)

Depts	Procedure Explained	Bare Arm	Patient Legs Uncrossed/Flat on Floor	Back Supported	Correct Cuff Size Chosen	Arm at Heart Level	No Talking During BP	Elevated? Proper Procedure Taken
A	89	91	99	100	96	85	92	96
B	96	90	99	100	99	88	98	94
C	90	93	97	100	98	88	98	94
D	92	100	98	100	96	91	90	98
E	89	90	99	100	95	90	89	99
F	90	87	96	100	98	89	87	98
G	88	89	98	100	100	87	92	97
H	89	92	95	100	99	88	99	97
I	94	92	98	100	95	92	94	99
Spring	63	68	72	92	74	59	65	78
Year End	91	92	98	100	97	89	93	97

Observer-related Error

Potential source of inaccuracy	Range of reported significant mean effects (in mmHg) unless specified	
	SBP	DBP
Observer-related		
27. Observer hearing deficit [328]	-1.55 to -0.11	+1.05 to +4.32
28. Korotkoff Phase IV (vs. V) for DBP [334,335]	N/A	+12.5 ^a
29. Terminal digit preference for zero [8,275,334,336-366]	1-79% over-representation of terminal zero	3-79% over-representation of terminal zero

Observer-related

- Encourage automatic (vs. manual)
- Terminal digit preference for zero: KPSC survey in 2009 - 22% of recorded BPs ended in zero (Handler, Permanente Journal, 2009).
- Value bias – e.g. recording a DBP of 88, instead of 90. Never formally studied in KP SCAL.
- Telemonitoring – data directly transmitted to EMR. SCAL KP began late 2019.

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Lessons Learned - Key Drivers for BP Control*

Blood pressure competency

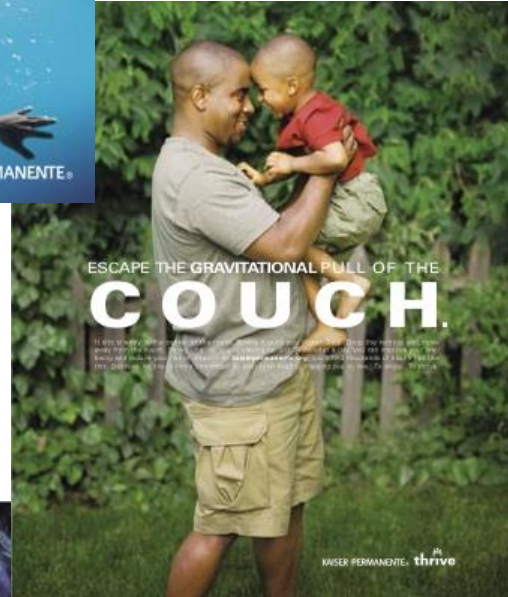
Treatment intensification

Elevated BP follow-up

*Registry

*Treatment Algorithm

Thank you!



Questions:
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