



ADVANCING INTEGRATED HEALTHCARE

Pharmacy QI Learning Collaborative: ProCGM & ABPM

Kickoff Meeting | August 23, 2022

Care Transformation Collaborative of RI

Agenda

Topic	Presenter/Facilitator	Timing
Welcome and Project Overview	Susanne Campbell / Kelley Sanzen	7:30-7:50
Data and Measurement	Stephen Kogut	7:50-8:00
Best Practices working with specialist – case example: ABPM	Dr. Ankur Shah	8:00-8:30
CGM Discussion and Brainstorming	Kelley Sanzen	8:30-9:00

Special thanks to:



For providing funding for this initiative



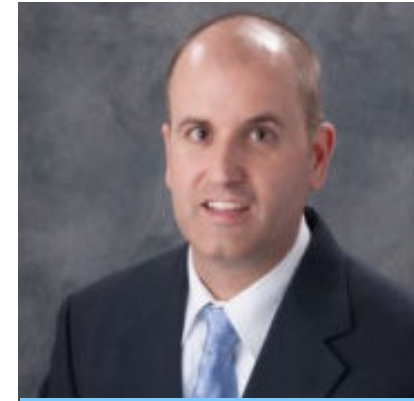
Meet the Pharmacy QI Team!



Susanne Campbell
CTC-RI



Pano Yeracaris
CTC-RI



Stephen Kogut
URI



Kelley Sanzen
CTC-RI
Brown Medicine



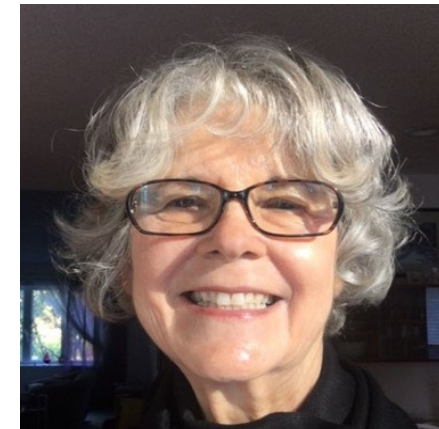
Deborah Newell
RI Dept of Health



Carolyn Karner
CTC-RI



Jayne Daylor
RI Dept of Health



Maureen Maigret
RI Long Term Care
Coordinating Council

thank you!

Welcome and Practice QI Team Introductions

Practice	Name	Email	Role
Anchor Medical	Kenny Correia	kcorreia3@lifespan.org	Practice Lead, PharmD
	Robyn Ostapow	rostapow@lifespan.org	Provider Champion
	Marna Heck-Jones	mheckjones@lifespan.org	EHR Coordinator
	Deborah Coutu-Cham	dkhounsavath@lifespan.org	NCM
	Emily Torres	etorres5@lifespan.org	NCM
	Michelle LaCroix	mlacroix@lifespan.org	Practice Manager
Coastal Medical	Kelsey Ryan	kryan@coastalmedical.com	Practice Lead, PharmD
	Jeffrey Cumplido	jcumplido@coastalmedical.com	Provider Champion
	Shay Olufowobi	solufowobi@coastalmedical.com	IT Associate
	Krystal Bevilacqua	kbevilacqua@coastalmedical.com	PharmD
	Caitlin Kennedy	ckennedy1@coastalmedical.com	PharmD
	Jennifer Cioffi	jcioffi@coastalmedical.com	Population Health Coordinator
	Roxanne DeBritto	rdebritto@coastalmedical.com	Practice Manager

Welcome and Practice QI Team Introductions (continued)

Practice	Name	Email	Role
Medical Associates of RI	Bradford Pease	bpease@marihealth.org	Practice Lead, PharmD
	Kathryn Banner	kbanner@marihealth.org	Provider Champion
	David Borges	dborges@marihealth.org	IT Manager
	Alexander Diaz de Villalvilla	adiaz@marihealth.org	MD
	Tom Isherwood	tisherwood@marihealth.org	NCM
	Pat Galvin	pgalvin@marihealth.org	NCM
	Ruth Malato	rmalato@marihealth.org	NCM
	Ann Quintin	Aquintin@marihealth.org	Practice Manager
Providence Community Health Centers	Lillian Nieves	lnieves@providencechc.org	Pharmacy Champion
	Magdi Salmon	msalmon@providencechc.org	Provider Champion
	Dan McGuire	dmcguire@providencechc.org	Director of Population Health
	Andrew Saal	asaal@providencechc.org	Executive Leadership
	Lea Diaz	ldiaz@providencechc.org	Pharmacy Technician
	Darianette Gonzalez	dkgonzalez@providencechc.org	

Welcome and Practice QI Team Introductions (continued)

Practice	Name	Email	Role
Miriam Hospital Ambulatory Clinic	Patricia Hoffman	Patricia.hoffman@lifespan.org	Practice Lead, PharmD
	Christine Duffy	cduffy@lifespan.org	Provider Champion
	Louis Palmisciano	lpalmisciano1@lifespan.org	Manager of Outcomes and Impact (Pharmacy)
	Pamela Kusiak	Pkusiak@lifespan.org	Project Implementation, NP
	Cathleen Whelan	cwhelan@lifespan.org	MD
	Vera Whalen	vwhalen1@lifespan.org	NCM
	Shaina Gardner	sgardner1@lifespan.org	Practice Manager
	Christina Siwy	csiwy@lifespan.org	RN CDOE
	Danielle O'Brien	dobrien2@lifespan.org	Social Worker

Welcome and Practice QI Team Introductions (continued)

	Name	Practice	Email	Role
RI Primary Care Physicians Co.	Stacey Ranucci		sranucci@ripccpc.com	Lead, BSPHarm
	Alex Gianfrancesco		agianfrancesco@ripccpc.com	Practice Lead, PharmD
	Diana Mercurio	University Family Medicine	dmercurio@ripccpc.com	BSPHarm
	Jennifer Leavitt	Fairlawn Primary Care	jleavitt@ripccpc.com	PharmD
	Brianna Kimball	Keith Callahan, MD	bkimball@ripccpc.com	PharmD
	Jessica Silva	Rhode Island Medicine, Woonsocket	jsilva@ripccpc.com	PharmD
	Anthony Lombardi	CNEMG Internal Medicine, Warwick	drtony418@gmail.com	Provider Champion
	Scott Gendron		sgendron@ripccpc.com	Director of IT
	Janis Rosa		jrosa@ripccpc.com	NCM
	Amy Lombardi		aolombardi@kentri.org	Practice Manager
	Kaylee Mehlman		kmehlman@ripccpc.com	PharmD

Project Goals

The goal of this pharmacy led team-based care initiative is to provide primary care practices with an interprofessional quality improvement learning opportunity with the aim of improving the management of hypertension and diabetes using Ambulatory Blood Pressure Monitoring (ABPM) or professional continuous glucose monitoring (proCGM), respectively.

All practices chose to focus on ProCGM

Pharmacy Milestone Summary

Milestone Document

Deliverable	Timeframe Due Dates	Notes
Identify members of the practice quality improvement (QI) team. The team should consist of 3 to 4 staff in different roles and include a pharmacy champion, practice clinical champion, an IT staff member, nurse care manager, practice manager	Identify as part of application	
Select ABPM or proCGM as topic of focus	Identify as part of application process	
Practice QI team participation in monthly meetings with the practice QI facilitator and quarterly with project data facilitator	August 2022 - July 2024 24 months	
Practice team participates in kick-off Learning Collaborative meeting (in person or virtual, TBD) - Content expert ABPM - Content expert pro-CGM	August 23 rd , 2022	
Project Planning and Preparation (Months 1-4): - Team reviews internal data and identifies population of focus. - Evaluate equipment options including integration with EMR. - Brainstorm workflow	September 2022	IT/EMR representatives recommended to be present at practice facilitation meetings
Project Planning and Preparation: (Months 1-4): - Team discusses proposed workflow and refines, as needed. - Evaluates and selects equipment including integration with EMR and places purchase order. - Discuss Patient Engagement plan/strategy, including method of evaluation. - Discuss Care Team Engagement plan/strategy, including method of evaluation - Collaborate with IT/EMR team re: structured data vs. other source to track data.	October 2022	PDSA to include rationale for selection.

Pharmacy Milestone Summary (Continued)

Milestone Document

Deliverable	Timeframe Due Dates	Notes
Project Planning and Preparation: (Months 1-4): Workflow outlined and submitted to CTC including the following: ✓ Identification of patients (ie: provider referral, prospective chart review, retrospective chart review) ✓ Scheduling of patients ✓ Care team member responsible for scheduling, facilitating office visit, troubleshooting technology issues. Communication and training plan developed and disseminated.	November 2022	PDSA to be submitted by 11/23/22. deliverables@ctc-ri.org
Submit initial PDSA project plan	2 weeks prior to learning collaborative	
Quarterly learning collaborative: present QI work plan with content expert as applicable - Coding and Billing expert CGM	December (Date: December 13, 2022)	
Implementation (Months 5-23): - Meet monthly with practice facilitator - Report metrics quarterly as specified on Data Tool and any additional metrics desired by team - Assess patient engagement strategy/plan at Implementation Phase as specified in Milestone Document. - Assess Care Team Engagement plan/strategy as specified in Milestone Document - Evaluate patients at risk for complications. Determine follow up plan and stratify patients based on risk. (ie: Which care team member follows, interval for repeat ABPM, pro-CGM, when to discharge from pharmacist/care management services, etc.)	December 2022- July 2023	
Submit updated PDSA	2 weeks prior to February learning collaborative	PDSA to be submitted by 2/14/23. deliverables@ctc-ri.org
Quarterly learning collaborative: present QI work plan with content expert as applicable - Coding and Billing expert ABPM	February 28, 2023	
Aggregate input from patients/care team for qualitative measures	March 2023	

Pharmacy Milestone Summary (Continued)

Milestone Document

Deliverable	Timeframe Due Dates	Notes
Submit updated PDSA including patient engagement and care team engagement data, key findings and adjustments necessary to project plan	2 weeks prior to May learning collaborative	PDSA to be submitted by 5/9/23. deliverables@ctc-ri.org
Quarterly learning collaborative: present QI work plan with content expert as applicable - SDoH & Risk Stratification?	May 23, 2023	
Submit updated PDSA	2 weeks prior to August learning collaborative	PDSA to be submitted by 8/8/23. deliverables@ctc-ri.org
Quarterly learning collaborative: present QI work plan with content expert as applicable	August 22, 2023	
Aggregate input from patients/care team for qualitative measures	September 2023	
Spread and sustainability (Months 13-14) - Identify plan to spread services to other providers/practices or offer to other populations of focus - Determine who's being missed by current workflow	September 2023-October 2023	
Submit PDSA with year 1 results and plan for spread and sustainability plan including risk stratification	2 weeks prior to Nov learning collaborative	PDSA to be submitted by 11/14/23. deliverables@ctc-ri.org
Quarterly learning collaborative: present QI work plan with content expert as applicable - Teams report out on Risk Stratification plan	November 28, 2023	
Spread and sustainability (Months 15-23)	November 2023 - July 2024	
Submit updated PDSA including patient engagement and care team engagement data, key findings and adjustments necessary to project plan	2 weeks prior to Feb learning collaborative	PDSA to be submitted by 2/13/24. deliverables@ctc-ri.org
Quarterly learning: present QI work plan w/ content expert, as applicable	February 27, 2024	
Aggregate input from patients/care team for qualitative measures	March 2024	
Submit updated PDSA	2 weeks prior to May learning collaborative	PDSA to be submitted by 5/7/24. deliverables@ctc-ri.org

Pharmacy Milestone Summary (Continued)

[Milestone Document](#)

Deliverable	Timeframe Due Dates	Notes
Quarterly learning: present QI work plan w/ content expert, as applicable	May 21, 2024	
Aggregate input from patients/care team for qualitative measures	June 2024	
Submit final Storyboard	2 weeks prior to final learning collaborative	PDSA to be submitted by 7/16/24. deliverables@ctc-ri.org
Final learning collaborative	July 30, 2024	

Qualitative assessment

Patient survey questions to be obtained after device use:

Scale items: Strongly disagree | disagree | unsure or neutral | agree | strongly agree

- My care provider clearly explained the benefit of using this device
- My questions about the device were sufficiently addressed
- Wearing the monitor was comfortable
- The information obtained from the device was useful to my medical care
- I was satisfied with my experience using the device

Open ended items:

- Please tell us what you liked about using this device
- Please tell us what you disliked about using this device
- What do you feel are the benefits of using this device?
- Please share any other information that you think would be useful for us to know.

Due Dates
March 2023
September 2023
March 2024
June 2024

Qualitative assessment

Care team questions to be reported at project midpoint and conclusion:

- In the pharmacist’s/clinician’s/practice manager’s view, what were the top barriers to using the modality effectively? How were these barriers overcome (if so)?
- What patient and practice-related factors were associated with the successful use of the device?
- Has this initiative impacted team satisfaction? Explain.
- What benefits of using the device were identified, particularly those that may not be captured by clinical quality measures?

Due Dates

March 2023

September 2023

March 2024

June 2024

Quantitative Metrics

Quantitative metrics will be guided by the project data facilitator (S. Kogut, URI), who will work with practices to develop a tool for participants to track key variables associated with items below.

Practices are not expected to be able to calculate all of these metrics at the start of the project. By participating in this initiative the practice will develop methods for collecting the required data and incorporating these measures into their care processes. The most successful practices will be able to aggregate standardized patient-level data and report these measures for their populations (e.g. percentage of participants who achieved glycemic variability of $\leq 36\%$). Please note that practices will be asked to provide results specific to UnitedHealthcare patients (in aggregate) by the end of the project.

Quantitative Metrics

Project Evaluation Measures (reported quarterly, starting year 1, Q3)

- # patients (referred/offered, declined, enrolled)
- # providers ordering the service
- # practice sites using the service, if applicable
- Demographics of patients utilizing the device: age; sex; race; ethnicity; primary diagnosis; Payer type, product (e.g. HMO, PPO) and insurer name (e.g. UHC))
- Pharmacist interventions (e.g. # and type of regimen modification, diet)
- Results of device use: #/% of patients diagnosed / w classification
- Follow up glucose / A1c readings (3, 6 mo.)
- Therapeutic goal achieved: yes/no; comment

Quantitative Metrics

Clinical Measures Derived from the Device (reported quarterly, starting year 1, Q3)

- Duration of device use
- Total # of valid measurements
- % time devices were active (average)
- Tracking of readings: average glucose, % of results within, above, and below range; Time in Range (TIR)
- Glucose Management Indicator (%)
- Glucose Variability/Coefficient of Variation (%)
- Relationship between proCGM and A1C

Ambulatory Blood Pressure Monitoring

Ankur Shah, MD

Assistant Professor of Medicine, Clinician Educator
Warren Alpert Medical School of Brown University

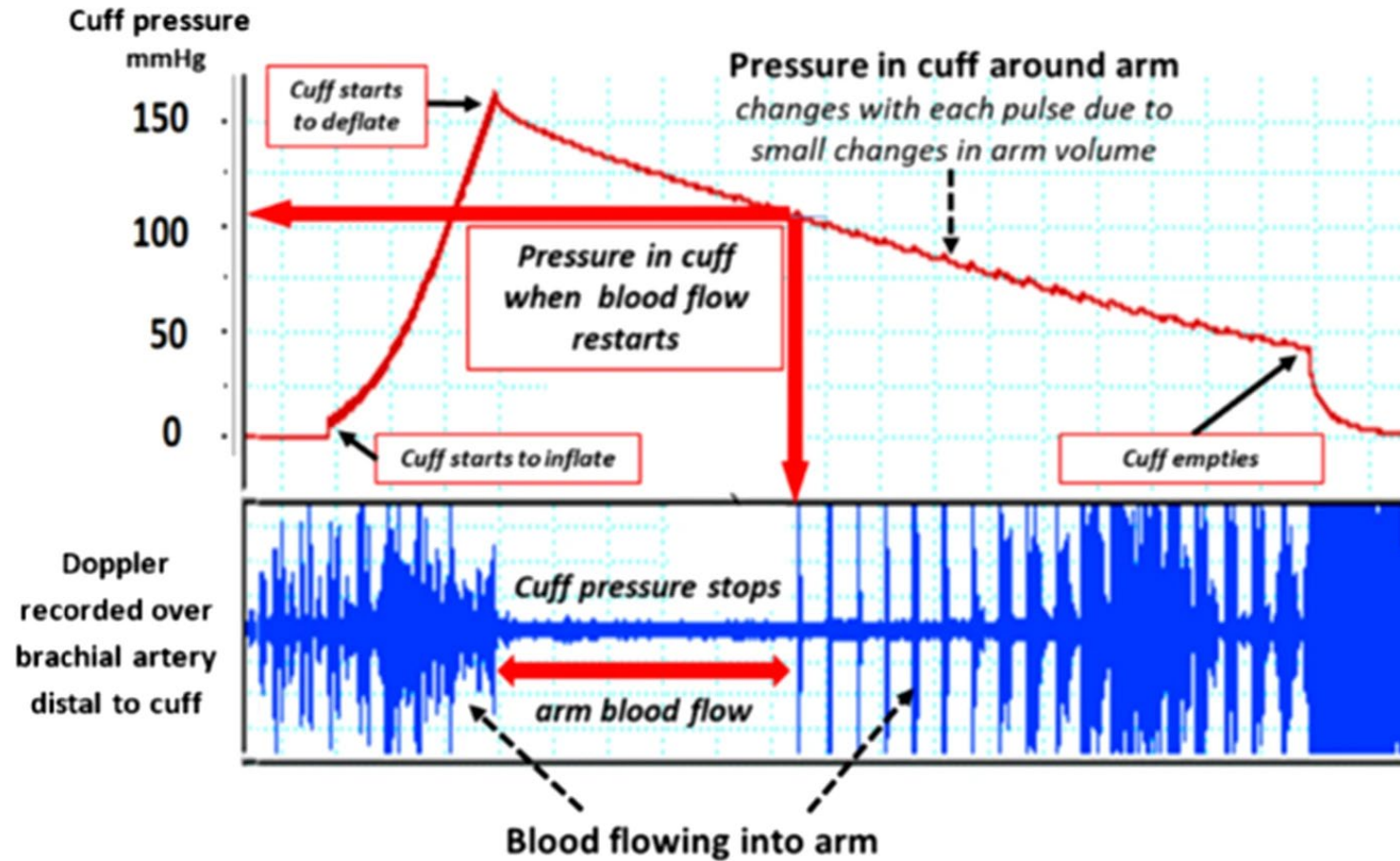
Disclosures

- ▶ Consulting - AstraZeneca, Otsuka/NephU
- ▶ Research Funding - Lifespan, Brown Physicians Inc
- ▶ Honoraria - JSOM

Introduction

The background features abstract geometric shapes in shades of blue and orange, overlapping and creating a modern, layered effect. The shapes are primarily triangles and polygons, with some semi-transparent areas that allow the colors to blend. The overall aesthetic is clean and professional.

Office Blood Pressure



Office Blood Pressure

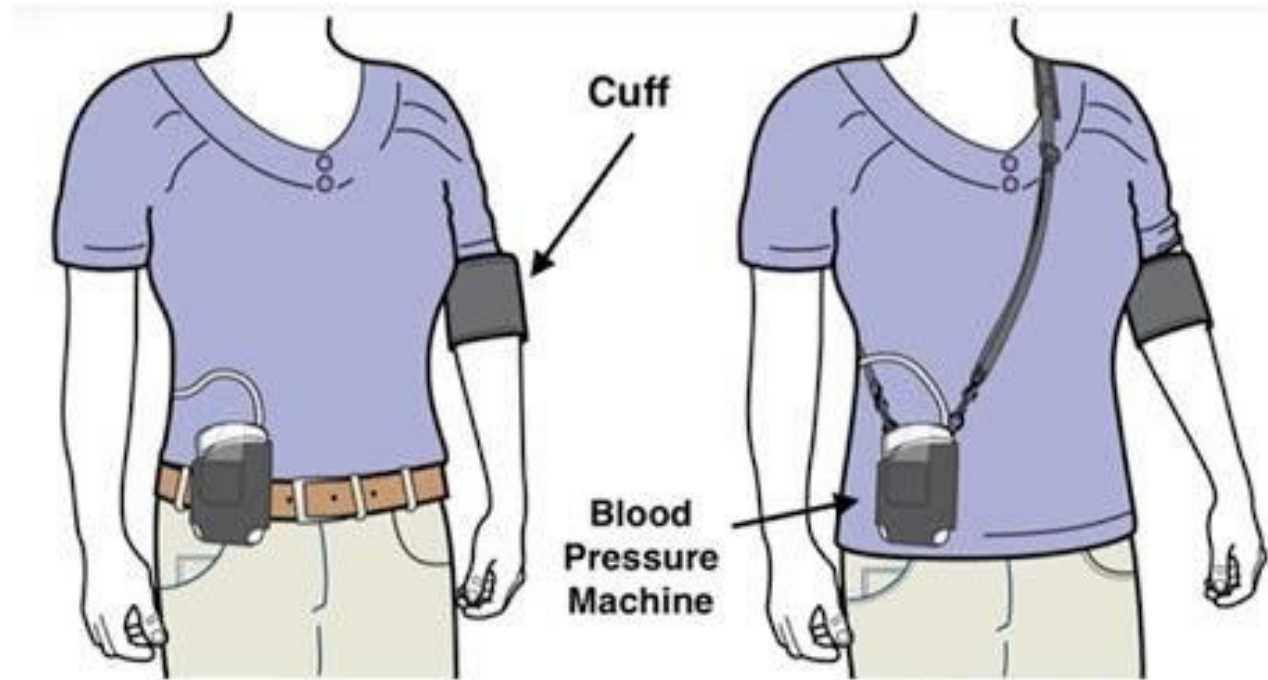


- ▶ Seated
- ▶ Back supported
- ▶ Arm supported, at level of heart
- ▶ No smoking or caffeine in 30 min
- ▶ 5 min of rest
- ▶ Appropriate cuff size
- ▶ 2 or more averaged readings

A Case

- ▶ A 46 year-old male presents to his PCP office for an annual physical.
- ▶ His history is only notable for hyperlipidemia, for which he is on a moderate intensity statin.
- ▶ In the office, his blood pressure is elevated at 142/68 using a standard oscillometric blood pressure cuff.

What is ABPM



Reasons to check ABPM



Hypertension Categories

Clinic Blood Pressure	Elevated	White Coat Hypertension	Sustained Hypertension
	Normal	Sustained Normotension	Masked Hypertension
		Normal	Elevated
		Ambulatory Blood Pressure	

Corresponding Values of SBP/DBP for Clinic, HBPM, Daytime, Nighttime, and 24-Hour ABPM Measurements

Clinic	HBPM	Daytime ABPM	Nighttime ABPM	24-Hour ABPM
120/80	120/80	120/80	100/65	115/75
130/80	130/80	130/80	110/65	125/75
140/90	135/85	135/85	120/70	130/80
160/100	145/90	145/90	140/85	145/90

Case Continues

- ▶ Our patient notes he has no history of hypertension, and is in excellent health, he asks if there is a way to be sure of his new diagnosis.
- ▶ He is started on losartan 25mg daily and referred for an ambulatory blood pressure monitor for elevated blood pressure without a diagnosis of hypertension.
- ▶ He feels lightheaded after starting losartan, and discontinues use while awaiting his ABPM

Superiority of Ambulatory Over Clinic Blood Pressure Measurement in Predicting Mortality

The Dublin Outcome Study

Eamon Dolan, Alice Stanton, Lut Thijs, Kareem Hinedi, Neil Atkins, Sean McClory, Elly Den Hond, Patricia McCormack, Jan A. Staessen, Eoin O'Brien

Abstract—The purpose of this study was to determine if ambulatory blood pressure measurement predicted total and cardiovascular mortality over and beyond clinic blood pressure measurement and other cardiovascular risk factors; 5292 untreated hypertensive patients referred to a single blood pressure clinic who had clinic and ambulatory blood pressure measurement at baseline were followed up in a prospective study of mortality outcome. Multiple Cox regression was used to model time to total and cause-specific mortality for ambulatory blood pressure measurement while adjusting for clinic blood pressure measurement and other risk factors at baseline. There were 646 deaths (of which 389 were cardiovascular) during a median follow-up period of 8.4 years. With adjustment for gender, age, risk indices, and clinic blood pressure, higher mean values of ambulatory blood pressure were independent predictors for cardiovascular mortality. The relative hazard ratio for each 10-mm Hg increase in systolic blood pressure was 1.12 (1.06 to 1.18; $P<0.001$) for daytime and 1.21 (1.15 to 1.27; $P<0.001$) for nighttime systolic blood pressure. The hazard ratios for each 5-mm Hg increase in diastolic blood pressure were 1.02 (0.99 to 1.07; $P=NS$) for daytime and 1.09 (1.04 to 1.13; $P<0.01$) for nighttime diastolic pressures. The hazard ratios for nighttime ambulatory blood pressure remained significant after adjustment for daytime ambulatory blood pressure. These results have 2 important clinical messages:

TABLE 1. Characteristics of Study Population

Parameters	Alive	Dead	
		Cardiovascular	Noncardiovascular
n	4646	389	257
Age, years	51.5 (14.2)	67.5 (11.9)*	64.4 (13.7)
Female, %	54.8	43.5*	48.7
Body mass index, kg/m ²	27.5 (3.6)	27.7 (3.4)	25.6 (4.1)
Current smoking, %	22.9	30.6*	29.1
Diabetes, %	4.9	7.7*	5.8
Previous cardiovascular complications, %	9.3	23.1*	15.2
Clinic SBP	161.1 (26.8)	173.7 (31.1)*	167.2 (32.2)
Clinic DBP	93.2 (14.6)	92.3 (16.1)	91.7 (17.8)
Daytime SBP	145.4 (18.4)	153.1 (22.8)*	148.1 (20.4)
Daytime DBP	89.1 (12.5)	88.2 (14.7)	87.7 (13.2)
Nighttime SBP	127.2 (18.7)	142.4 (25.3)*	135.6 (24.1)
Nighttime DBP	74.8 (12.8)	78.8 (15.2)*	77.6 (14.7)
24-hour SBP	137.1 (20.3)	146.3 (25.1)*	143.0 (23.6)
24-hour DBP	82.1 (11.2)	84.6 (13.1)*	83.1 (12.1)

DBP indicates diastolic blood pressure; SBP, systolic blood pressure.

All pressures in mm Hg.

Values are means (\pm SD) or n of subjects (%).

Body mass index is the weight in kilograms divided by the square of height in meters.

*Statistical significance ($P < 0.05$) of difference between alive group and cardiovascular dead group.

TABLE 4. Description of Fully Adjusted Models With All Relative Hazard Ratios Included for Cardiovascular Mortality

Parameter	SBP Daytime	SBP Nighttime	SBP 24-Hour	DBP Daytime	DBP Nighttime	DBP 24-Hour
ABPM	1.12 (1.06–1.18)‡	1.21 (1.15–1.27)‡	1.19 (1.13–1.27)‡	1.03 (0.99–1.07)	1.09 (1.04–1.13)‡	1.09 (1.02–1.11)†
Clinic SBP	1.02 (0.98–1.06)	1.01 (0.97–1.04)	1.00 (0.96–1.04)			
Clinic DBP				1.02 (0.99–1.06)	1.01 (0.97–1.04)	1.01 (0.98–1.05)
Gender	1.99 (1.62–2.44)‡	2.01 (1.64–2.47)‡	1.99 (1.62–2.45)‡	1.93 (1.57–2.37)‡	1.83 (1.49–2.25)‡	1.87 (1.52–2.30)‡
Age	1.10 (1.09–1.11)‡	1.09 (1.08–1.10)‡	1.09 (1.08–1.10)‡	1.10 (1.09–1.11)‡	1.10 (1.09–1.11)‡	1.10 (1.09–1.11)‡
Body mass index	0.97 (0.95–1.00)	0.98 (0.95–1.00)	0.97 (0.95–1.00)	0.97 (0.95–1.00)	0.98 (0.95–1.00)	0.98 (0.95–1.00)
Diabetes mellitus	1.33 (0.91–1.94)	1.30 (0.89–1.89)	1.31 (0.90–1.91)	1.37 (0.94–1.99)	1.38 (0.95–2.02)	1.37 (0.94–2.00)
History of cardiovascular disease	1.67 (1.31–2.13)‡	1.63 (1.28–2.07)‡	1.66 (1.31–2.12)‡	1.60 (1.26–2.04)‡	1.60 (1.25–2.03)‡	1.61 (1.26–2.05)‡
Smoking status	1.87 (1.48–2.37)‡	1.84 (1.46–2.32)‡	1.81 (1.43–2.29)‡	1.95 (1.54–2.46)‡	1.93 (1.53–2.43)‡	1.92 (1.52–2.42)‡

ABPM indicates ambulatory blood pressure measurement.

All models include ABPM, CBPM, gender, age, body mass index, presence of diabetes mellitus, history of cardiovascular events, and smoking status.

Relative hazard ratios (95 % confidence intervals) for each 10-mm Hg increase in SBP and 5-mm Hg increase in DBP, male gender, 1 year increase in age, 1 kg/m² increase in body mass index, the presence of diabetes mellitus, a positive history of cardiovascular events, and positive smoking status.

Significance of the hazard ratios: * $P < 0.05$, † $P < 0.01$, ‡ $P < 0.001$.

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Prognostic Value of Ambulatory Blood-Pressure Recordings in Patients with Treated Hypertension

Denis L. Clement, M.D., Ph.D., Marc L. De Buyzere, B.Sc.,
Dirk A. De Bacquer, Ph.D., Peter W. de Leeuw, M.D., Ph.D.,
Daniel A. Duprez, M.D., Ph.D., Robert H. Fagard, M.D., Ph.D.,
Peter J. Gheeraert, M.D., Luc H. Missault, M.D., Jacob J. Braun, M.D.,
Roland O. Six, M.D., Patricia Van Der Niepen, M.D.,
and Eoin O'Brien, M.D., Ph.D., for the Office versus Ambulatory
Pressure Study Investigators*

Table 2. Relative Risks Associated with Office and Ambulatory Measurements of Systolic and Diastolic Blood Pressure at Entry.*

Blood-Pressure Measurement	Fatal or Nonfatal Cardiovascular Event (N=157)	Fatal or Nonfatal Myocardial Infarction or Stroke (N=77)	Death from Any Cause (N=78)
<i>relative risk (95% confidence interval)</i>			
Systolic			
Office	1.48 (1.25–1.75)	1.22 (0.95–1.59)	1.40 (1.10–1.78)
24-Hr	1.50 (1.27–1.78)	1.51 (1.19–1.92)	1.18 (0.94–1.48)
Daytime	1.47 (1.24–1.74)	1.54 (1.21–1.96)	1.18 (0.94–1.50)
Nighttime	1.40 (1.20–1.65)	1.30 (1.03–1.65)	1.18 (0.94–1.49)
Diastolic			
Office	1.40 (1.16–1.68)	1.14 (0.86–1.52)	1.27 (0.98–1.64)
24-Hr	1.32 (1.11–1.57)	1.41 (1.10–1.80)	1.22 (0.96–1.55)
Daytime	1.35 (1.13–1.61)	1.45 (1.13–1.86)	1.22 (0.95–1.56)
Nighttime	1.26 (1.06–1.50)	1.28 (0.99–1.65)	1.22 (0.96–1.56)

* Relative risks are for each 1-SD increment in blood pressure and were adjusted for sex, age, body-mass index, smoking status, presence or absence of diabetes mellitus, serum cholesterol concentration, use or nonuse of lipid-lowering drugs, and presence or absence of cardiovascular complications at entry. Cardiovascular events include myocardial infarction or sudden death, stroke, new episodes of angina pectoris, congestive heart failure, and peripheral vascular disease (affecting the aorta or peripheral arteries). For 24-hour monitoring, nighttime was defined as midnight to 6 a.m., and daytime as 8 a.m. to 8 p.m.

Table 3. Relative Risks Associated with Ambulatory Blood-Pressure Measurements after Additional Adjustment for Office Blood Pressure at Entry.*

Blood-Pressure Measurement	Fatal or Nonfatal Cardiovascular Event (N=157)	Fatal or Nonfatal Myocardial Infarction or Stroke (N=77)	Death from Any Cause (N=78)
<i>relative risk (95% confidence interval)</i>			
Systolic			
24-Hr	1.34 (1.11–1.62)	1.52 (1.16–2.00)	1.03 (0.79–1.33)
Daytime	1.30 (1.08–1.58)	1.56 (1.19–2.05)	1.03 (0.79–1.34)
Nighttime	1.27 (1.07–1.51)	1.25 (0.97–1.62)	1.06 (0.82–1.36)
Diastolic			
24-Hr	1.21 (1.01–1.46)	1.41 (1.08–1.85)	1.16 (0.90–1.49)
Daytime	1.24 (1.03–1.49)	1.46 (1.11–1.92)	1.15 (0.89–1.49)
Nighttime	1.18 (0.98–1.40)	1.25 (0.96–1.64)	1.17 (0.91–1.50)

Diagnostic and Predictive Accuracy of Blood Pressure Screening Methods With Consideration of Rescreening Intervals: A Systematic Review for the U.S. Preventive Services Task Force

Margaret A. Piper, PhD, MPH; Corinne V. Evans, MPP; Brittany U. Burda, MPH; Karen L. Margolis, MD, MPH; Elizabeth O'Connor, PhD; and Evelyn P. Whitlock, MD, MPH

Background: Elevated blood pressure (BP) is the largest contributing risk factor to all-cause and cardiovascular mortality.

Purpose: To update a systematic review on the benefits and harms of screening for high BP in adults and to summarize evidence on rescreening intervals and diagnostic and predictive accuracy of different BP methods for cardiovascular events.

Data Sources: Selected databases searched through 24 February 2014.

Study Selection: Fair- and good-quality trials and diagnostic accuracy and cohort studies conducted in adults and published in English.

Data Extraction: One investigator abstracted data, and a second checked for accuracy. Study quality was dual-reviewed.

Data Synthesis: Ambulatory BP monitoring (ABPM) predicted long-term cardiovascular outcomes independently of office BP (hazard ratio range, 1.28 to 1.40, in 11 studies). Across 27 studies, 35% to 95% of persons with an elevated BP at screening remained hypertensive after nonoffice confirmatory testing. Cardiovascular outcomes in persons who were normotensive after confirmatory testing (isolated clinic hypertension) were similar to

outcomes in those who were normotensive at screening. In 40 studies, hypertension incidence after rescreening varied considerably at each yearly interval up to 6 years. Intrastudy comparisons showed at least 2-fold higher incidence in older adults, those with high-normal BP, overweight and obese persons, and African Americans.

Limitation: Few diagnostic accuracy studies of office BP methods and protocols in untreated adults.

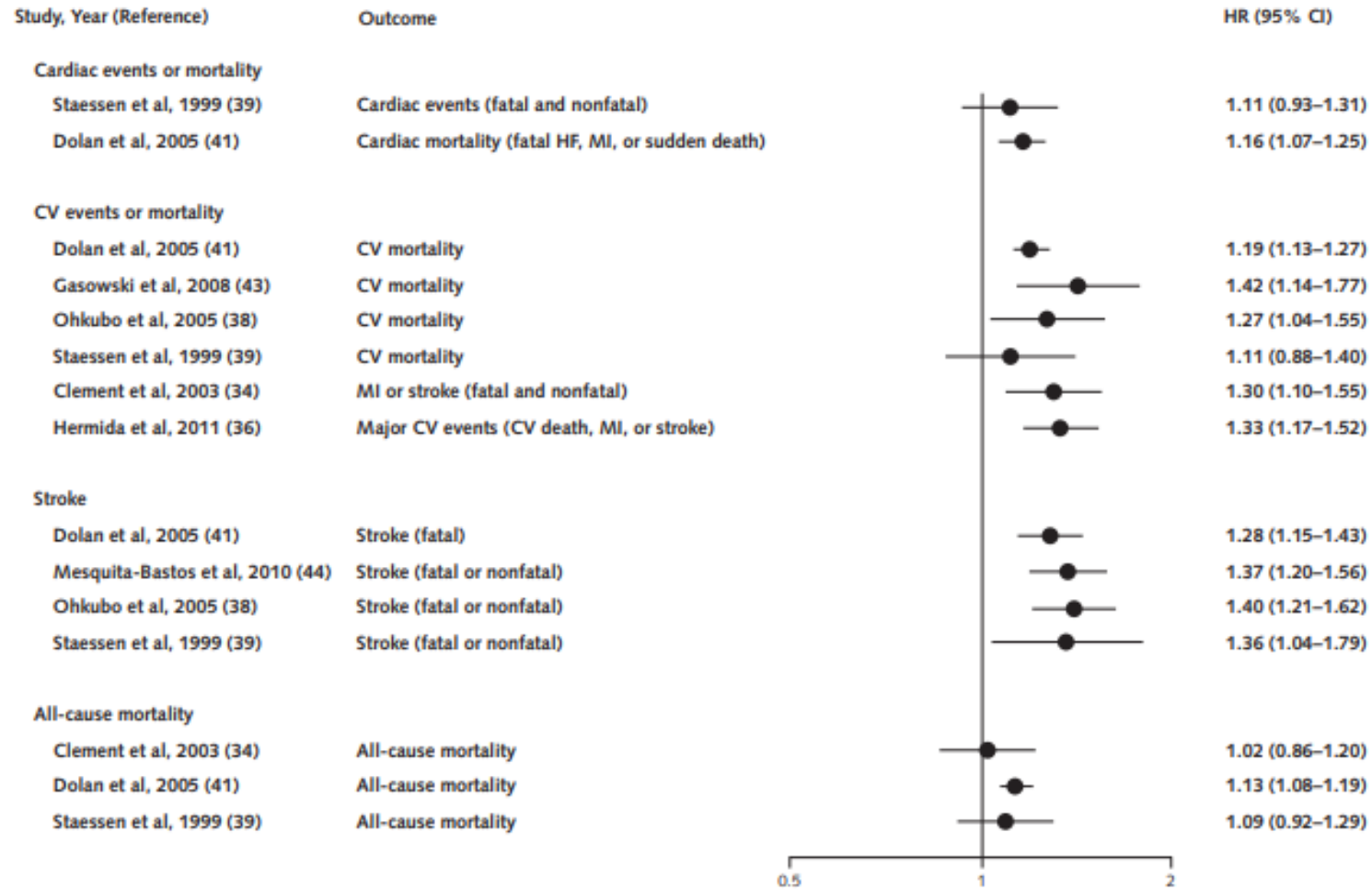
Conclusion: Evidence supports ABPM as the reference standard for confirming elevated office BP screening results to avoid misdiagnosis and overtreatment of persons with isolated clinic hypertension. Persons with BP in the high-normal range, older persons, those with an above-normal body mass index, and African Americans are at higher risk for hypertension on rescreening within 6 years than are persons without these risk factors.

Primary Funding Source: Agency for Healthcare Research and Quality.

Ann Intern Med. 2015;162:192-204. doi:10.7326/M14-1539 www.annals.org
For author affiliations, see end of text.

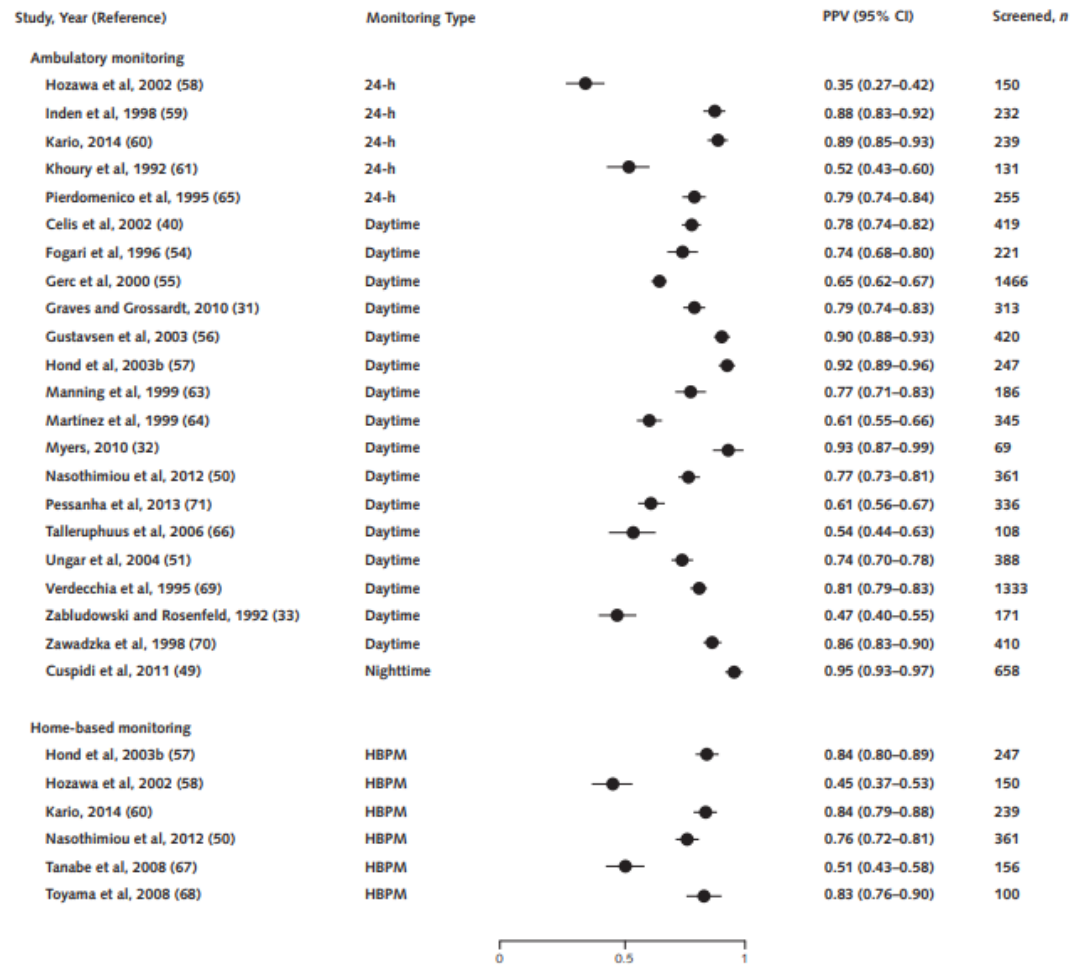
This article was published online first at www.annals.org on 23 December 2014.

Figure 1. Risk for cardiovascular and mortality outcomes: systolic 24-h ABPM, adjusted for OBPM.



Results of included studies for key question 3a. ABPM = ambulatory blood pressure monitoring; CV = cardiovascular; HF = heart failure; HR = hazard ratio; MI = myocardial infarction; OBPM = office blood pressure measurement.

Figure 2. Proportion of elevated OBPM results confirmed by ABPM or HBPM.



Results of included studies for key question 3b. ABPM = ambulatory blood pressure monitoring; HBPM = home blood pressure monitoring; OBPM = office blood pressure measurement; PPV = positive predictive value.

White Coat Hypertension

The background features abstract, overlapping geometric shapes in various shades of blue and orange, creating a modern, layered effect. The shapes are primarily triangles and polygons, some semi-transparent, set against a white background.

Cardiovascular Events and Mortality in White Coat Hypertension

A Systematic Review and Meta-analysis

Jordana B. Cohen, MD, MSCE; Michael J. Lotito; Usha K. Trivedi, BS; Matthew G. Denker, MD, MSCE; Debbie L. Cohen, MD; and Raymond R. Townsend, MD

Background: The long-term cardiovascular risk of isolated elevated office blood pressure (BP) is unclear.

Purpose: To summarize the risk for cardiovascular events and all-cause mortality associated with untreated white coat hypertension (WCH) and treated white coat effect (WCE).

Data Sources: PubMed and EMBASE, without language restriction, from inception to December 2018.

Study Selection: Observational studies with at least 3 years of follow-up evaluating the cardiovascular risk of WCH or WCE compared with normotension.

Data Extraction: 2 investigators independently extracted study data and assessed study quality.

Data Synthesis: 27 studies were included, comprising 25 786 participants with untreated WCH or treated WCE and 38 487 with normal BP followed for a mean of 3 to 19 years. Compared with normotension, untreated WCH was associated with an increased risk for cardiovascular events (hazard ratio [HR], 1.36 [95% CI, 1.03 to 2.00]), all-cause mortality (HR, 1.33 [CI, 1.07 to

1.67]), and cardiovascular mortality (HR, 2.09 [CI, 1.23 to 4.48]); the risk for WCH was attenuated in studies that included stroke in the definition of cardiovascular events (HR, 1.26 [CI, 1.00 to 1.54]). No significant association was found between treated WCE and cardiovascular events (HR, 1.12 [CI, 0.91 to 1.39]), all-cause mortality (HR, 1.11 [CI, 0.89 to 1.46]), or cardiovascular mortality (HR, 1.04 [CI, 0.65 to 1.66]). The findings persisted across several sensitivity analyses.

Limitation: Paucity of studies evaluating isolated cardiac outcomes or reporting participant race/ethnicity.

Conclusion: Untreated WCH, but not treated WCE, is associated with an increased risk for cardiovascular events and all-cause mortality. Out-of-office BP monitoring is critical in the diagnosis and management of hypertension.

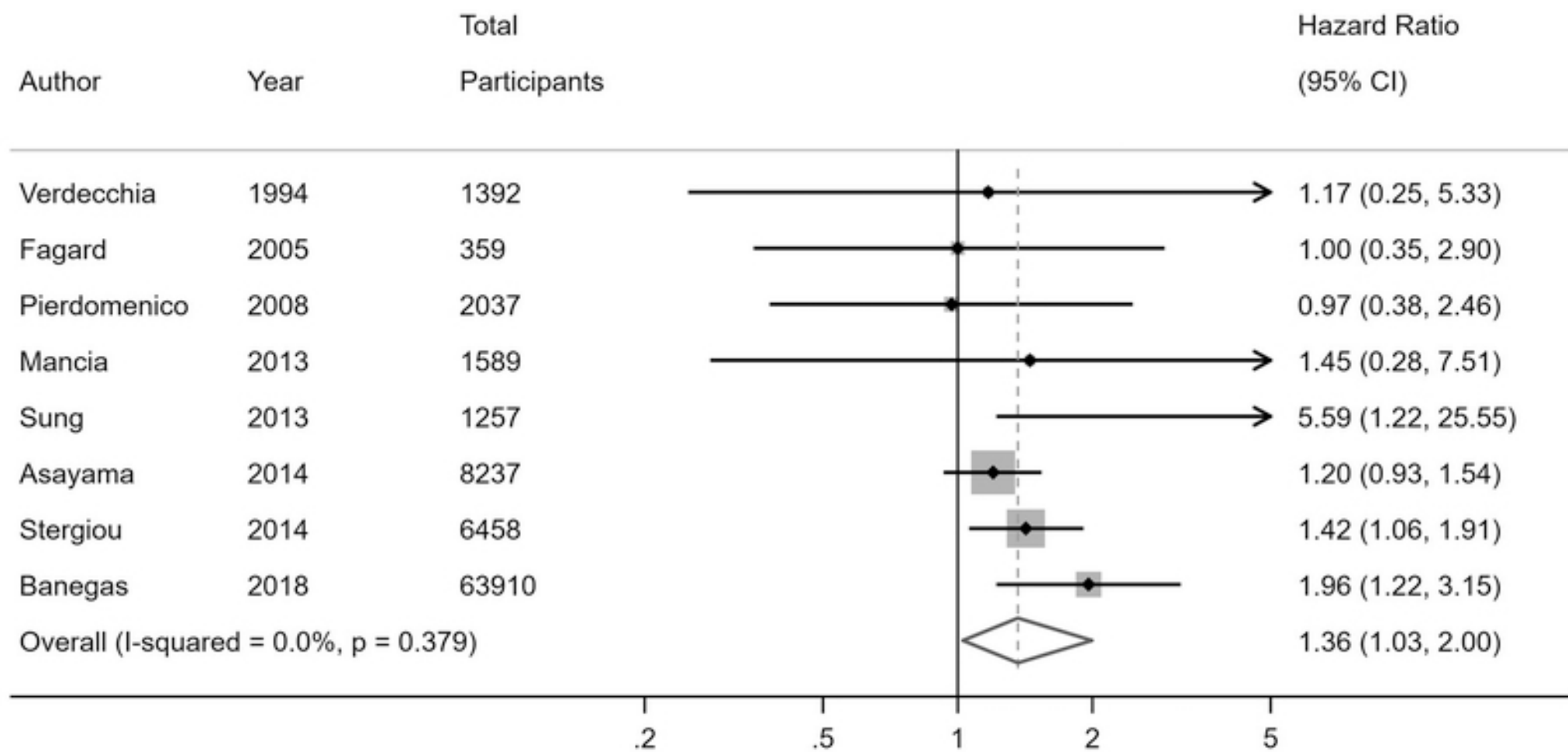
Primary Funding Source: National Institutes of Health.

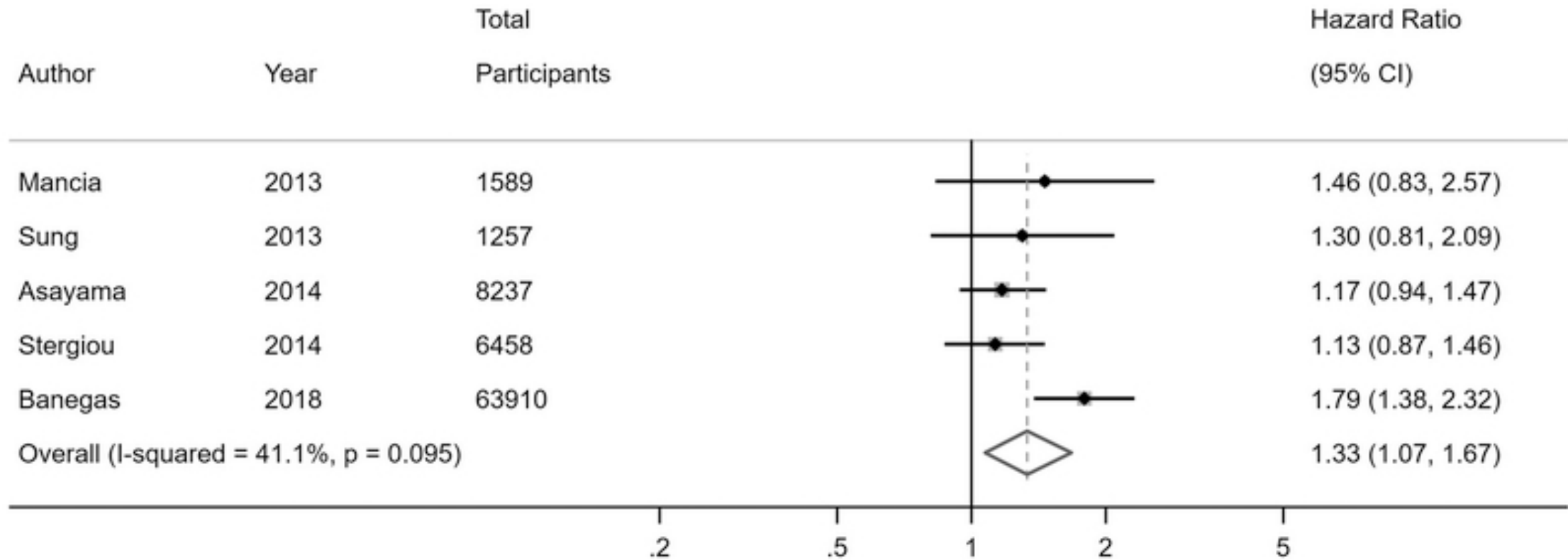
Ann Intern Med. 2019;170:853-862. doi:10.7326/M19-0223

For author affiliations, see end of text.

This article was published at Annals.org on 11 June 2019.

Annals.org





Case Continues

- ▶ A 24 ambulatory blood pressure is obtained, showing a daytime average of 116/78, night time average of 102/66. A diagnosis of white coat hypertension is made, and antihypertensives are held.
- ▶ He obtains a home blood pressure cuff, which is confirmed to be accurate in the office, and starts HBPM for one week a month, every month.
- ▶ After 3 years, he notices his blood pressures are in the 140-150s, and has a repeat ABPM confirming sustained hypertension. He is enrolled in a co-management program with his nephrologist and pharmacist, who have a collaborative practice agreement.

Pharmacist Integration

The background features abstract, overlapping geometric shapes in various shades of blue and orange, creating a modern and professional aesthetic.

Comparative Effectiveness of Implementation Strategies for Blood Pressure Control in Hypertensive Patients

A Systematic Review and Meta-analysis

Katherine T. Mills, PhD; Katherine M. Obst, MS; Wei Shen, MS; Sandra Molina, MPH; Hui-Jie Zhang, MD, PhD; Hua He, PhD; Lisa A. Cooper, MD, MPH; and Jiang He, MD, PhD

Background: The prevalence of hypertension is high and is increasing worldwide, whereas the proportion of controlled hypertension is low.

Purpose: To assess the comparative effectiveness of 8 implementation strategies for blood pressure (BP) control in adults with hypertension.

Data Sources: Systematic searches of MEDLINE and Embase from inception to September 2017 with no language restrictions, supplemented with manual reference searches.

Study Selection: Randomized controlled trials lasting at least 6 months comparing the effect of implementation strategies versus usual care on BP reduction in adults with hypertension.

Data Extraction: Two investigators independently extracted data and assessed study quality.

Data Synthesis: A total of 121 comparisons from 100 articles with 55 920 hypertensive patients were included. Multilevel, multicomponent strategies were most effective for systolic BP reduction, including team-based care with medication titration

by a nonphysician (−7.1 mm Hg [95% CI, −8.9 to −5.2 mm Hg]), team-based care with medication titration by a physician (−6.2 mm Hg [CI, −8.1 to −4.2 mm Hg]), and multilevel strategies without team-based care (−5.0 mm Hg [CI, −8.0 to −2.0 mm Hg]). Patient-level strategies resulted in systolic BP changes of −3.9 mm Hg (CI, −5.4 to −2.3 mm Hg) for health coaching and −2.7 mm Hg (CI, −3.6 to −1.7 mm Hg) for home BP monitoring. Similar trends were seen for diastolic BP reduction.

Limitation: Sparse data from low- and middle-income countries; few trials of some implementation strategies, such as provider training; and possible publication bias.

Conclusion: Multilevel, multicomponent strategies, followed by patient-level strategies, are most effective for BP control in patients with hypertension and should be used to improve hypertension control.

Primary Funding Source: National Institutes of Health.

Ann Intern Med. 2018;168:110-120. doi:10.7326/M17-1805

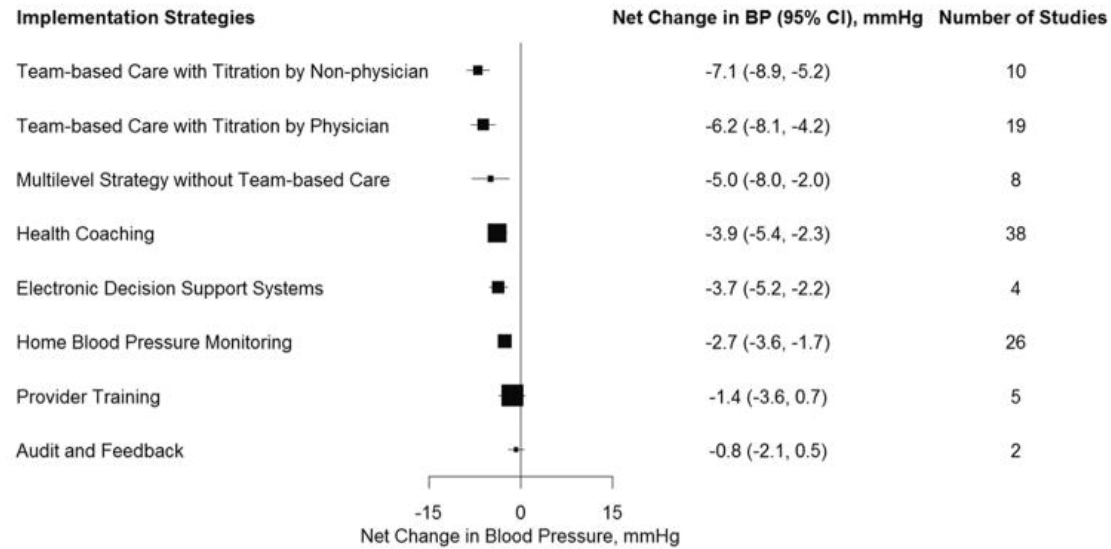
Annals.org

For author affiliations, see end of text.

This article was published at Annals.org on 26 December 2017.

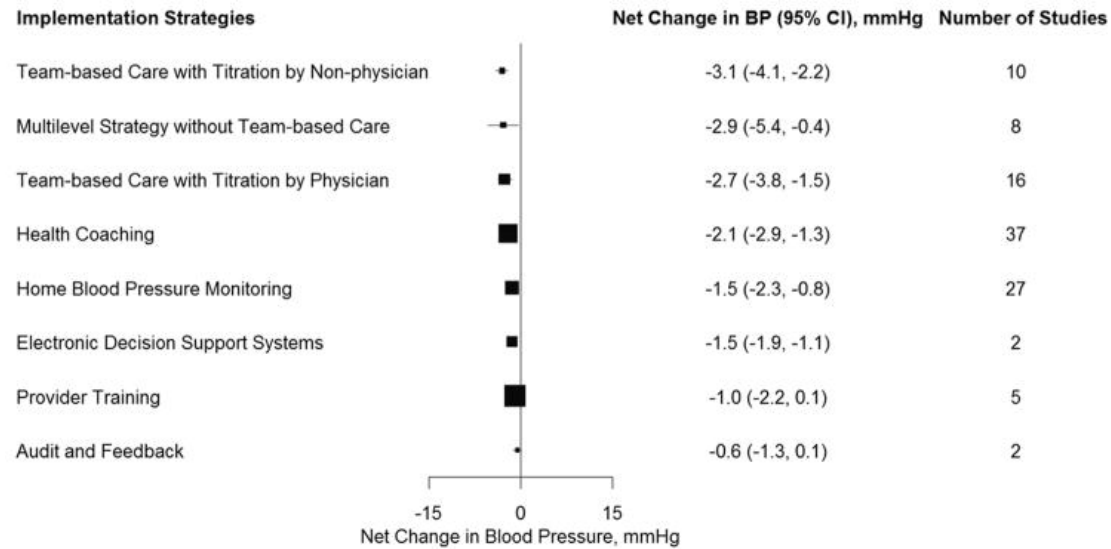
Systolic Blood Pressure

Implementation Strategies



Diastolic Blood Pressure


Implementation Strategies





Effect of Home Blood Pressure Telemonitoring and Pharmacist Management On Blood Pressure Control: The HyperLink Cluster Randomized Trial

- ▶ Context—Patients with high blood pressure (BP) visit a physician 4 times or more per year on average in the U.S., yet BP is controlled in only about half. Practical, robust and sustainable models are needed to improve BP control in patients with uncontrolled hypertension.
- ▶ Objectives—To determine whether an intervention combining home BP telemonitoring with pharmacist case management improves BP control compared with usual care and to determine whether BP control is maintained after the intervention stops.
- ▶ Design—A clinic-randomized trial with 12 months of intervention and 6 months of postintervention follow-up. Patients and Setting—450 adults with uncontrolled BP recruited from 14,692 patients with electronic medical records across sixteen primary care clinics in an integrated health system in Minneapolis-St. Paul, MN.
- ▶ Interventions—Eight clinics were randomized to provide usual care to their patients (n = 222) and 8 were randomized to provide the telemonitoring intervention (n = 228). Intervention patients received home BP telemonitors and transmitted BP data to pharmacists who adjusted antihypertensive therapy accordingly.
- ▶ Main Outcome Measures—BP control to <140/90 mm Hg (<130/80 mm Hg in patients with diabetes or kidney disease) at 6 and 12 months. Secondary outcomes were change in BP, patient satisfaction, and BP control at 18 months.

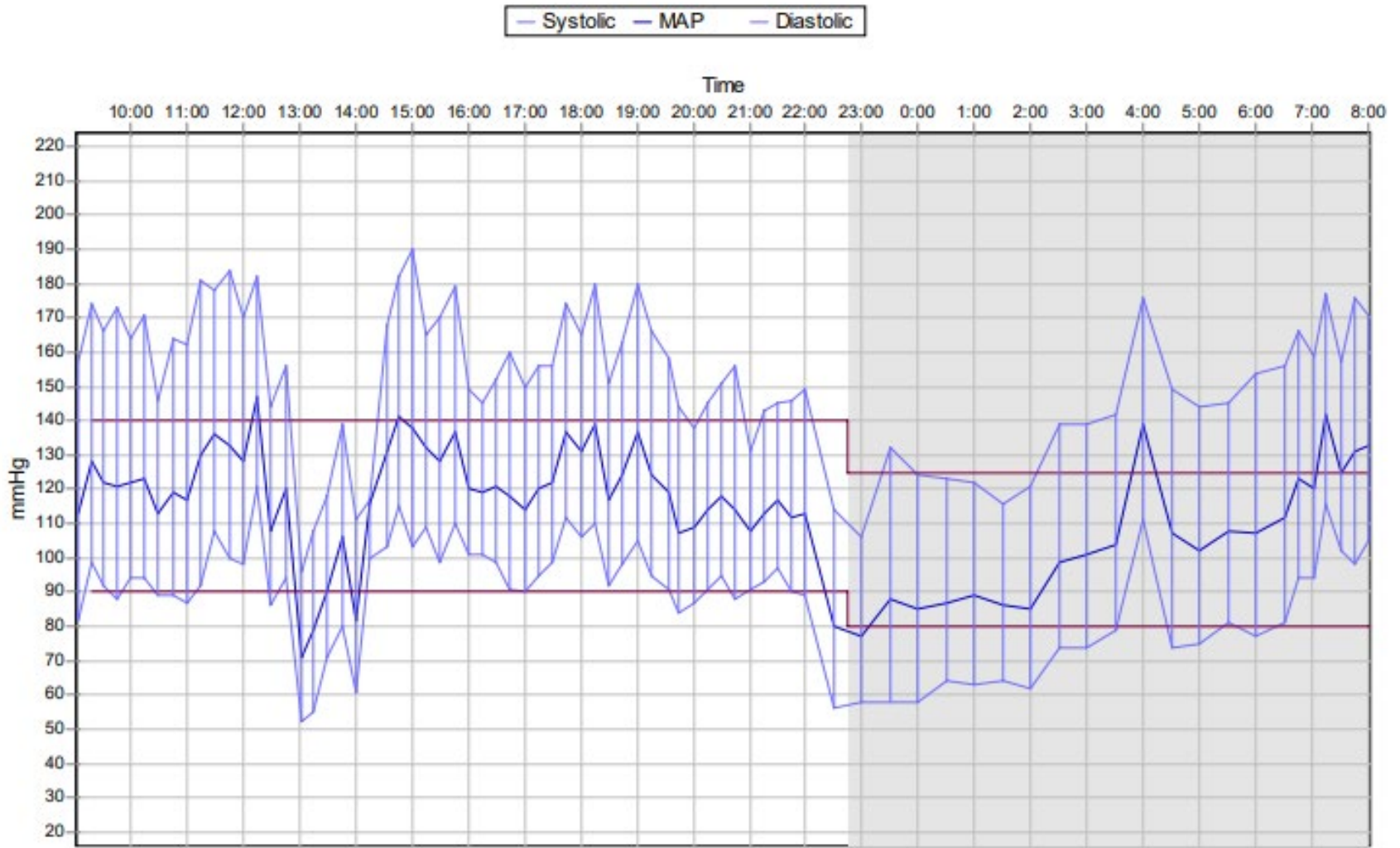
- 
- ▶ Systolic BP decreased from baseline more among Telemonitoring Intervention than Usual Care patients by 10.7 mm Hg (95% CI, 7.3-14.3) at 6 months, 9.7 mm Hg (95% CI, 6.0-13.4) at 12 months, and 6.6 mm Hg (95% CI, 2.5-10.7) at 18 months, all $P < .001$. Diastolic BP decreased from baseline more among Telemonitoring Intervention than Usual Care patients by 6.0 mm Hg (95% CI, 3.4-8.6) at 6 months, 5.1 mm Hg (95% CI, 2.8-7.4) at 12 months, and 3.0 mm Hg (95% CI, -0.3-6.3) at 18 months, all $P < .001$.

Case Continues

- ▶ Our patient enrolls into a remote blood pressure monitoring platform, and over the next 6 months he is started on losartan 25mg daily, titrated to 100mg daily and chlorthalidone 12.5 daily and his average blood pressure is 126/76.

How to read an ABPM report

The background features abstract, overlapping geometric shapes in shades of blue and orange, creating a modern, layered effect on the right side of the slide.



OVERALL STATISTICS, Samples = 60 of 60 (100%)

	Maximum	Time	Minimum	Time	Average	Std.Dev.
Systolic (mmHg)	166	(17:40)	108	(03:00)	142	+/- 14.7
Diastolic (mmHg)	121	(12:40)	60	(01:58)	95	+/- 13.2
Heart rate (BPM)	94	(19:43)	59	(01:58)	72	+/- 7.0
MAP (mmHg)	131	(12:40)	77	(01:58)	111	+/- 13.2

Overall BP Load: 63% Sys, 72% Dia > 140/90 mmHg while awake and 120/80 mmHg while asleep

AWAKE STATISTICS, Samples = 52 of 60 (87%)

	Maximum	Time	Minimum	Time	Average	Std.Dev.
Systolic (mmHg)	166	(17:40)	119	(07:06)	146	+/- 11.1
Diastolic (mmHg)	121	(12:40)	66	(07:06)	99	+/- 9.9
Heart rate (BPM)	94	(19:43)	62	(13:58)	73	+/- 6.4
MAP (mmHg)	131	(12:40)	84	(07:06)	114	+/- 9.7

Awake BP Load: 69% Sys > 140 mmHg, 81% Dia > 90 mmHg

ASLEEP STATISTICS, Samples = 8 of 60 (13%)

	Maximum	Time	Minimum	Time	Average	Std.Dev.
Systolic (mmHg)	127	(06:07)	108	(03:00)	116	+/- 6.8
Diastolic (mmHg)	89	(23:06)	60	(01:58)	72	+/- 8.5
Heart rate (BPM)	82	(03:00)	59	(01:58)	66	+/- 8.4
MAP (mmHg)	101	(23:06)	77	(01:58)	87	+/- 7.2

Asleep BP Load: 25% Sys > 120 mmHg, 12% Dia > 80 mmHg

- ▶ Patient underwent a 24-hour ambulatory blood pressure monitor (ABPM) study from *** to ***. The ABPM was requested for ***. There were *** valid readings.
- ▶ The daytime loads are as follows:
 - ▶ Systolic Load (> or = 130 mmHg) ***% of *** readings
 - ▶ Diastolic Load (> or = 80 mmHg) ***% of *** readings
- ▶ The nighttime loads are as follows
 - ▶ Systolic Load (> or = 110 mmHg) ***% of *** readings
 - ▶ Diastolic Load (> or = 65 mmHg) ***% of *** readings
- ▶ The average of the day readings was *** mmHg; the night average was *** mmHg. The overall average 24-hour blood pressure was *** mmHg.
- ▶ Sleep suppression is defined as a 10% reduction in nighttime compared to daytime readings. The patient *** show nighttime sleep suppression.
- ▶ My impression is that the day, night, and 24-hour blood pressure readings are ***. This *** white coat effect. The patient's diagnosis is consistent with ***.

Case Concludes

- ▶ The patient returns to see his PCP who finds that his home blood pressures are once more elevated, frequently in the 140/90s. He is asked to increase to chlorthalidone 25 and revisit his nephrologist.
- ▶ A repeat ABPM demonstrates an average blood pressure of 128/62, but systolic load of 54%. His lisinopril is changed to qhs, decreasing his systolic load and resulting in excellent blood pressure control.

- ▶ If you are interested in implementing ABPM, don't hesitate to reach out
- ▶ Ankur.Shah@brownphysicians.org
- ▶ If you are interested in referring for ABPM
- ▶ **Brown Medicine Division of Kidney Disease and Hypertension**
- ▶ [**\(401\) 649-4060**](tel:4016494060)
- ▶ **375 Wampanoag Trail Suite 402, East Providence, RI 02914**

Thank You!



Professional Use Continuous Glucose Monitoring (pro-CGM)



Comparison of Professional CGM Devices Currently Available

Comparison of CGM

Features	Abbott Freestyle Libre Pro	Dexcom G6 Pro	Medtronic iPro2
Blinded or Unblinded	Blinded	Either	Blinded
Wear Time	14 days	10 days	6 days
Calibration Required?	0	0	3-4 times daily
Components	Disposable wired sensor/transmitter Separate touchscreen reader device that does not go home with the person with diabetes	Disposable wired sensor/transmitter Separate touchscreen reader device that does not go home with the person with diabetes	Disposable wired sensor Data transmitter attached to the sensor
Care Between Use	Disposable sensor/transmitter	Disposable sensor/transmitter	Transmitter must be cleaned and disinfected
Insertion	Single step process with auto-inserter	Two-step process which includes inserting sensor and attaching transmitter	Multi-step process which includes inserting and taping both the sensor and transmitter
Site	Upper Arm	Abdomen	Abdomen
Downloading/ Data Reports	LibreView	CLARITY	Carelink

Best Practice Sharing

- CGM discussion
- Best practice sharing
- Meet and greet with local reps and resources
- [Libre Billing Resources](#)
- [ADCES ProCGM Playbook](#)

Next Meeting:
December 13th
7:30-9:00AM

Discussion Questions

- 3 Polling Questions
- Discussion Questions
 - Where are the patient gaps using ProCGM?
 - What barriers have you encountered with personal use CGM?
 - What barriers have you encountered with professional use CGM?
 - What are you hoping to gain from this learning collaborative?



Meet your local reps

Freestyle Libre

- Pete Danko
- peter.danko@abbott.com



Dexcom

- Bill Woods
- bill.woods@dexcom.com





Resource Guide

Resources can be found at

<https://www.ctc-ri.org/other-programs/pharmacy-qi-initiative>

- [ADCES ProCGM Playbook](#)
- <https://www.freestyleprovider.abbott/us-en/freestyle-libre-14-day-system.html>
- [Libre Billing Resources](#)
- https://www.medtronicdiabetes.com/products/guardian-connect-continuous-glucose-monitoring-system?utm_source=bing&utm_campaign=CGM+-+BRAND+-+Core+-+Exact&utm_medium=cpc&ds_rl=1298299&msclkid=f9c6cae08cdf1a606c13a9e32c6e7db6

Dexcom resources

- [Getting Started G6 Pro PowerPoint](#)
- [GEMCO Account Setup Instructions](#)
- [G6 Pro Work Flow](#)
- [Dexcom G6 Pro User Guide](#)
- [Dexcom G6 Pro UnBlinded CGM Patient Handout](#)
- [Dexcom G6 Pro Patient Tracking Form](#)
- [Dexcom G6 Pro Daily Log Sheet](#)
- [Dexcom G6 Pro Blinded CGM Patient Handout](#)
- [2022 CPT Billing CGM Reference](#)