Hypertension

HEALTHCARE QUALITY

Effect of a Physician/Pharmacist Collaborative Care Model on Time in Target Range for Systolic Blood Pressure: Post Hoc Analysis of the CAPTION Trial

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ABSTRACT: Longer time in target range (TTR) for systolic blood pressure (SBP) is associated with a lower risk of cardiovascular events. Team-based care improves SBP control but its effect on the consistency of SBP control over time is unknown. This post hoc analysis used data from a cluster-randomized trial of a physician/pharmacist collaborative model that randomized medical offices to either a 9- or 24-month pharmacist intervention or control group. TTR for SBP was calculated using linear interpolation and an SBP range of 110 to 130 mm Hg. TTR is reported as median values and group comparisons assessed using the Kruskal-Wallis test. Of the 625 participants enrolled, 524 had 9-month and 366 had 24-month SBP data. Participants were a median 59 years old, 59% female, and 52% minority. After 24 months, the median TTR for SBP was 31.9% and 29.8% for the 9- and 24-month intervention groups, respectively, compared with 19% in the control group (P=0.0068). This observation persisted in the subgroup of participants with diabetes or chronic kidney disease and minorities. A longer TTR was not associated with an increased risk of adverse drug events. Time to first observed SBP in the target range was shorter in the intervention group compared with control (270 versus 365 days; P=0.0047). A physician/pharmacist collaborative care model achieved longer TTR for SBP compared with control (usual care). **(*Hypertension*. 2021;78:966–972. DOI: 10.1161/HYPERTENSIONAHA.121.17873.)** • **Data Supplement**

Key Words: blood pressure ■ diabetes mellitus ■ kidney diseases ■ pharmacists ■ physicians ■ risk

Uncontrolled hypertension is a leading risk factor for cardiovascular events and mortality worldwide.[1] The burden of hypertension is significant in the United States, with over 100 million US adults having a diagnosis of hypertension. Yet, less than a quarter of adults with hypertension achieve blood pressure (BP) goals (less than 130 over less than 80 [<130/80] mm Hg) according to current practice guidelines.[2] Furthermore, BP control rates in the US significantly declined between 2013 to 2014 and 2017 to 2018,[3] which has been attributed to nonadherence to medication and lifestyle modifications, therapeutic (or clinical) inertia, racial and ethnic inequities, and issues related to health insurance status and access to care.[2,4,5]

The determination of BP control is largely based upon the BP obtained at a single clinical encounter and whether that BP reading is above or below 130/80 mm Hg.[2] A growing body of evidence, however, suggests that measures evaluating the consistency of BP control over time may be a better predictor of cardiovascular risk and mortality.[6,7] Time in target range (TTR) for systolic BP (SBP) is a novel measure of BP control found to have an inverse association with all-cause mortality.[8] A recent post hoc analysis of the SPRINT trial (Systolic Blood Pressure Intervention Trial)[9] identified a target SBP range of 110 to 130 mm Hg and demonstrated that a longer TTR was independently associated with lower cardiovascular event

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Novelty and Significance

What Is New?

- A physician/pharmacist collaborative care model achieved a longer time in the target range (110–130 mm Hg) for systolic blood pressure compared with usual care.
- A longer time in target range for systolic blood pressure was not associated with an increased risk of adverse drug events.
- Time to first observed systolic blood pressure in target range was shorter in the physician/pharmacist collaborative care model compared with usual care.

What Is Relevant?

- Team-based care is a guideline-recommended strategy to improve hypertension outcomes.
- Time in target range for systolic blood pressure is an emerging metric of the quality of blood pressure control over time.

Summary

A physician/pharmacist collaborative care model may provide more consistent control of systolic blood pressure than usual care.

Nonstandard Abbreviations and Acronyms

BP	blood pressure
CAPTION	Collaboration Among Pharmacists and Physicians to Improve Outcomes Now
IQR	interquartile range
SBP	systolic blood pressure
SPRINT	Systolic Blood Pressure Intervention Trial
TTR	time in target range

risk, providing additional evidence supporting the benefits of maintaining consistent BP control over time. Considerable uncertainty remains, however, regarding the practice models and interventions most likely to improve TTR.

Team-based care models that involve collaboration between physicians, pharmacists, and other health care professionals are an effective strategy to improve hypertension-related outcomes.[2] Such models have been shown to significantly reduce mean SBP and diastolic BP,[10,11] achieve higher BP control rates, and improve medication adherence to antihypertensive therapy.[12,13] Importantly, team-based care models are also cost-effective.[14,15] Reasons for the success of such models are likely multifactorial but are partly due to improved monitoring and follow-up, use of treatment algorithms that ensure consistent care, and increased access to care.[16] The impact of such models on other measures of BP control, such as TTR, has not been reported.

The objective of this analysis was to determine if a physician/pharmacist collaborative care model achieved a longer TTR for SBP compared with usual care using data from the CAPTION (Collaboration Among Pharmacists and Physicians to Improve Outcomes Now) cluster-randomized trial (URL: https://www.clinicaltrials.gov; Unique identifier: NCT00935077).[17]

METHODS

This study was a post hoc analysis of data from the CAPTION cluster-randomized trial.[17] The data used for this analysis is publicly available through the National Heart, Lung, and Blood Institute Biorepository Guide to Building Biospecimen Collections (BioLINCC). Program code used for the analysis can be obtained from co-author WLB (william.baker_jr@uconn.edu).

The CAPTION trial[17] was a prospective, multicenter trial involving 32 primary care practices across 15 states. Each primary care practice used clinical pharmacists that provided physician education and patient care. The primary care practices were randomized to either a brief (9 months) or sustained (24 months) pharmacist intervention or usual care (control group). The pharmacist intervention included a detailed medical record review, a structured interview with the study participant (including medication history, assessment of BP medication knowledge, and barriers to BP control), and structured follow-up including telephone and face-to-face visits. The pharmacist then created a care plan that was communicated to the managing physician. The primary outcome of CAPTION was BP control at 9 months. Both intervention groups were combined a priori for the 9-month analysis since the intervention was identical up to 9 months. Secondary outcomes included mean differences in BP measured at 9, 12, 18, and 24 months and differences between minority and nonminority participants; BP was also measured at the time of study enrollment and then at 6 months. Details on the BP collection methods are available elsewhere.[18] In brief, the study coordinator measured BP in the sitting position after appropriate rest using standard techniques and an automated device. Two BPs were measured a minute apart and averaged (if they were within 4 mm Hg). If >4 mm Hg different, another BP was obtained, and the 2 closest values were averaged. Adverse drug events (ADEs) were rated on a scale from 0 (none) to 4 (very much) at each visit, and medication adherence was assessed using the 4-item Morisky Medication Adherence Scale.[19]

Of 625 patients enrolled, 54% were self-identified minorities (239 Black and 89 Hispanic participants) and nearly half (49%) had annual incomes below $25 000. Half of the study population had concomitant diabetes or chronic kidney disease. BP control was defined as <130/80 mm Hg for individuals with diabetes or chronic kidney disease and <140/90

mm Hg for all other participants, according to current practice guidelines at the time of the study.[20] At enrollment, all patients had uncontrolled BP, and the mean baseline BP for all participants was ≈150/85 mm Hg. At 9 months, BP control was 43% in the intervention groups and 34% in the control group (*P*=0.052). Although the primary outcome did not reach statistical significance, the adjusted difference between groups for SBP (−6.1 mm Hg) and diastolic BP (−2.9 mm Hg) was significantly greater in the intervention compared with the control group. Furthermore, the mean reduction in SBP was slightly greater in the minority groups compared with the entire study population (−6.4 versus −6.1 mm Hg, respectively). This was an important finding given the well-known disparities in BP control observed among minority groups.[5] The CAPTION trial suggests that team-based care models that include pharmacists can reduce BP beyond what is achievable with usual care in a diverse population including high numbers of patients from minority groups.[21]

In the current post hoc analysis, we used the Rosendaal linear interpolation method to estimate TTR.[22] The primary analysis compared the effect of the physician/pharmacist collaborative care model to control on TTR for SBP at 24 months, regardless of whether individuals received the brief (9 months) or sustained (24 months) pharmacist intervention. We defined the therapeutic SBP range to be 110 to 130 mm Hg for the primary analysis given that current guidelines recommend a BP goal of <130/80 mm Hg.[2] In a secondary analysis, we used a therapeutic SBP range of 120 to 140 mm Hg for those without diabetes or chronic kidney disease since the goal BP at the time of the CAPTION trial was <140/90 mm Hg for patients without diabetes or chronic kidney disease.

Additional secondary analyses compared the effect of the physician/pharmacist collaborative care model to usual care on TTR for SBP in the minority participants only, the time to first observed SBP in the target range as well as the impact of ADE on the TTR for SBP. Data were taken at the 24-month visit, with any ADE assumed if they had an ADE rated as a 3 (quite a bit) or 4 (very much).

Categorical variables were summarized with percentages and analyzed using χ^2 tests, while continuous variables were summarized with the median and interquartile range (25th–75th percentile) and analyzed using the Kruskal-Wallis test. We performed all analyses using SAS 9.4 (SAS Institute, Cary, NC) with $P<0.05$ indicating statistical significance.

RESULTS

Patient Characteristics

Of the 625 participants enrolled in the CAPTION trial, 524 (84%) had 9-month and 366 (59%) had 24-month SBP data. The median age of the study population for this analysis was 59 years, 59% were female, 52% were minority (self-identified as Black, Hispanic, Native American, or Alaska Native or Pacific Islander in accordance with National Institutes of Health definitions of underrepresented minorities), 41% had diabetes, and 8% had CKD. As for socioeconomic factors, 49% reported an annual household income below $25 000 and 53% did not pursue education beyond high school, and 84% had health insurance coverage. A summary of all patient characteristics can be found in Table 1.

TTR for SBP

At 24 months, the median (interquartile range [IQR]) TTR for SBP was 31.9% (13.7%–58%) for the 9-month intervention group (n=113), 29.8% (10.9%–52.8%) for the 24-month intervention group (n=155), and 19% (0%–43.8%) for the usual care group (n=98; *P*=0.0068; Table 2, Figure S1 in the Data Supplement).

TTR for SBP: Diabetes/Chronic Kidney Disease Subgroup

In the 194 participants with diabetes or chronic kidney disease, the median (IQR) TTR for SBP was 37.8% (25.3%–63.1%) for the 9-month intervention group (n=62), 29% (12.4%–49.8%) for the 24-month intervention group (n=92), and 20.3% (0%–56.8%) for the usual care group (n=40; *P*=0.006). No differences in TTR were observed in the 172 participants without diabetes or chronic kidney disease using a target range of 120 to 140 mm Hg (Table 3, Figure S2).

TTR for SBP: Minority Subgroup

Of the 274 minority participants, 64% (n=176) had 24-month SBP data. The median (IQR) TTR for SBP at 24 months was 30.7% (16.0%–56.8%) for the 9-month intervention group (n=43), 30.0% (12.3%–44%) for the 24-month intervention group (n=90), and 10.6% (0%–43.6%) for the usual care group (*P*=0.0580; Table 4, Figure S3). Of the 199 that self-identified as a Black person, 74.4% (n=148) had 24-month SBP data. In this cohort, the median (IQR) TTR for SBP at 24 months was 29.7% (10.5%–54.5%) for the 9-month intervention group (n=33), 29.1% (10.6%–44%) for the 24-month intervention group (n=80), and 10.6% (0%–43.6%) for the usual care group (n=35; *P*=0.0524).

TTR for SBP: Education Subgroup

Of the 522 participants with a known education level, 70% (n=366) had 24-month SBP data. The median (IQR) TTR for SBP at 24 months was 25.3% (1.1%–53.7%) in those with a 12th-grade education or less (n=190) and 30.0% (11.9%–51.2%) in those with greater than a 12th-grade education (n=176; *P*=0.2241). In those with a 12th-grade education or less, the median (IQR) TTR for SBP at 24 months was 36.5% (16.0%–66.1%) for the 9-month intervention group (n=57), 25.0% (5.4%–52.3%) for the 24-month intervention group (n=82), and 9.2% (0%–43.6%) for the usual care group (n=51; *P*=0.0072). In those with greater than a 12th-grade education, the median (IQR) TTR for SBP at 24 months was

Table 1. Patient Characteristics

Characteristic	9-month, N=169 (32.3%)	24-month, N=180 (34.4%)	Usual care, N=175 (33.4%)
Age, y	60 (52–67)	57 (48–64)	61 (53–70)
Sex			
Male	68 (40.2%)	73 (40.6%)	72 (41.1%)
Female	101 (59.8%)	107 (59.4%)	103 (58.9%)
Ethnicity			
Non-Hispanic White	88 (52.1%)	67 (37.2%)	88 (50.3%)
Minority	77 (45.6%)	111 (61.7%)	86 (49.1%)
Declined to answer	4 (2.4%)	2 (1.1%)	1 (0.6%)
Marital status			
Never married	23 (13.6%)	39 (21.7%)	34 (19.4%)
Married	98 (58.0%)	66 (36.7%)	86 (49.1%)
Divorced or separated	31 (18.3%)	53 (29.4%)	31 (17.7%)
Widowed	17 (10.1%)	18 (10.0%)	23 (13.1%)
Annual household income			
<$10 000	32 (18.9%)	63 (35.0%)	33 (18.9%)
$10 000–$24 999	33 (19.5%)	45 (25.0%)	52 (29.7%)
$25 000–$39 999	28 (16.6%)	23 (12.8%)	26 (14.9%)
$40 000–$54 999	12 (7.1%)	7 (3.9%)	16 (9.1%)
$55 000–$79 999	17 (10.1%)	6 (3.9%)	21 (12.0%)
$80 000–$99 999	16 (9.5%)	11 (6.1%)	6 (3.4%)
>$100 000	22 (13.0%)	1 (0.6%)	13 (7.4%)
Refused to answer	9 (5.3%)	24 (13.3%)	8 (4.6%)
Education			
1–5 y	6 (3.6%)	4 (2.2%)	10 (5.8%)
6–8 y	11 (6.5%)	12 (6.7%)	6 (3.5%)
9–12 y	69 (40.8%)	86 (47.8%)	73 (42.2%)
Technical/associate degree	34 (20.1%)	52 (28.9%)	47 (27.2%)
Bachelor's degree	32 (18.9%)	13 (7.2%)	26 (15.0%)
Master's degree	15 (8.9%)	6 (3.3%)	7 (4.1%)
Doctoral degree	2 (1.2%)	7 (3.9%)	4 (2.3%)
Insurance coverage	134 (79.3%)	145 (80.6%)	160 (91.4%)
Current alcohol intake			
None	96 (56.8%)	103 (57.5%)	101 (58.1%)
<1 drink per day	53 (31.4%)	57 (31.8%)	58 (33.3%)
1–2 drinks per day	15 (8.9%)	13 (7.3%)	10 (5.8%)
3+ drinks per day	5 (3.0%)	6 (3.4%)	5 (2.9%)
Smoking status			
Current smoker	23 (13.7%)	41 (22.8%)	27 (15.5%)
Former smoker	54 (32.1%)	59 (32.8%)	55 (61.6%)
Never smoked	91 (54.2%)	80 (44.4%)	92 (52.9%)
Missing	1 (0.6%)	0 (0%)	1 (0.6%)
Duration of high BP, y	5 (4-5)	4 (4-5)	4 (3-5)
Coronary artery disease	9 (5.3%)	13 (7.2%)	8 (4.6%)
Asthma or COPD	28 (16.6%)	33 (18.3%)	27 (15.4%)
Depression	47 (27.8%)	57 (31.7%)	49 (28.9%)
Diabetes	47 (27.8%)	93 (51.7%)	74 (42.3%)
Congestive heart failure	4 (2.4%)	6 (3.3%)	4 (2.3%)
Hyperlipidemia	101 (59.8%)	103 (57.2%)	119 (68.0%)
Chronic kidney disease	9 (5.3%)	14 (7.8%)	18 (10.3%)
Stroke or TIA	9 (5.3%)	11 (6.1%)	5 (2.9%)

BP indicates blood pressure; COPD, chronic obstructive pulmonary disease; and TIA, transient ischemic attack. Continuous data shown as median (25th-75th percentile).

30.0% (12.7%–53.0%) for the 9-month intervention group (n=56), 34.0% (17.1%–47.0%) for the 24-month intervention group (n=73), and 22.3% (8.0%–48.3%) for the usual care group (n=47; *P*=0.2821).

Time to First Observed SBP in Target Range

Median (IQR) time to first observed SBP in target range was 270 (185–365) days in the 9-month intervention group, 270 (180–540) days in the 24-month intervention group, and 365 (180–730) days in the usual care group (*P*=0.0009).

Adverse Drug Events

At the 24-month follow-up, ADE data were available for 366 participants and any ADE (level 3 or 4) occurred in 239 (65.3%) of participants. There was no difference in any ADEs between the intervention (n=181) and the usual care group (n=58; 67.3% versus 58.6%; *P*=0.1209). The median (IQR) TTR for SBP was 35.2% (11.1%–63.3%) in those who did not report an ADE and 25.2% (7.5%–47.2%) in those who reported a level 3 or 4 ADE (*P*=0.0384).

DISCUSSION

In this post hoc analysis of the CAPTION trial, adults with hypertension managed by a physician/pharmacist collaborative model achieved a longer TTR for SBP compared with usual care. This observation was most significant in those with diabetes or chronic kidney disease. Additionally, the time to first observed SBP in the target range was shorter in the physician/pharmacist collaborative model than usual care. A longer TTR for SBP was associated with fewer ADEs. These results suggest a physician/pharmacist collaborative model may achieve more consistent SBP control over time. Furthermore, the TTR for the brief (9 months) intervention was similar to the sustained (24 months) intervention implying the effect of the intervention on TTR persisted even after discontinuation of the intervention.

Since the publication of the CAPTION trial, several randomized clinical trials have demonstrated the

Table 2. Time in Target for Systolic Blood Pressure

TTR	9-mo intervention	24-mo intervention	Usual care	*P* value
9-Mo TTR	15.2 (0–46.9), N=169	6.3 (0–42.6), N=180	0 (0–25.8), N=175	0.0027
	Combined intervention groups			
	10.6 (0–44.8), N=349		0 (0–25.8), N=175	0.0015
24-Mo TTR	31.9 (13.7–58.0), N=113	29.8 (10.9–52.8), N=150	19.0 (0–43.8), N=98	0.0068
	Combined intervention groups			
	30.1 (12.0–53.7), N=268		19.0 (0–43.8), N=98	0.0023

Data shown as median (25th–75th percentile). TTR indicates time in target range.

effectiveness of pharmacist interventions to improve hypertension outcomes in community pharmacy settings,[23] telemedicine,[24] and community-based settings, such as barbershops,[25] across diverse populations. However, TTR for SBP has not been evaluated in these clinical trials. The only available comparative data come from an analysis of a small retrospective cohort study[26] that compared TTR for SBP in a physician/pharmacist collaborative model at an urban safety-net, free clinic with usual care (health system-based program for the underserved). In this largely Black (73%) population of 112 adults with hypertension (n=56 per group), TTR for SBP was 46.2% in the physician/pharmacist collaborative model and 24.8% in the usual care group ($P<0.0001$). While the TTR for SBP was slightly longer in the present analysis, the target range was defined as 120 to 140 mm Hg given that the BP goal at the time was <140/90 mm Hg.

Important differences in achieved TTR for SBP were observed in specific subgroups. The TTR in patients that self-identified as a Black person was nearly 3 times longer in the intervention groups than usual care, although this narrowly missed statistical significance ($P=0.0524$). This further supports the notion that incorporating pharmacists into the care team may help improve disparities in BP control in this population.[5] The finding that TTR for SBP in those with diabetes or chronic kidney disease was lower than patients without diabetes or chronic kidney disease was somewhat expected given that individuals with diabetes or chronic kidney disease were treated to a more intensive BP goal of <130/80 mm Hg, while everyone else was treated to a standard BP goal of <140/90 mm Hg.[18] However, the TTR for SBP was significantly longer in the intervention group compared to control. This may be due to the inherent higher risk of uncontrolled BP in these groups,[27,28] which may have led pharmacists in the intervention group to focus more on these patients. The shorter TTR for SBP observed in the control group could be attributable to provider, as well as patient, reluctance to treat more aggressively and the inherent difficulty treating to the more intensive <130/80 mm Hg goal.[4,29] Even today, there remains ongoing debate concerning recommended BP goals in current practice guidelines, which likely influences clinicians' decision as to whether or not to uptitrate antihypertensive therapy.[30] Education level was not found to be a major factor but those with a 12th-grade education or less did achieve significantly longer TTR in the intervention groups compared with usual care. This is an important finding given that BP control rates are significantly lower in those with less than a high school education and may represent a subgroup that could benefit from the additional education and support from pharmacist interventions.[3,5]

The finding that time to first observed SBP in target range was significantly shorter in the physician/pharmacist collaborative model compared with usual care is important given that delays in the intensification of antihypertensives to achieve SBP control have been associated with increased risk of cardiovascular events and mortality.[8] A retrospective cohort study[31] of primary care practices in the United Kingdom (1986–2010) including 88 756 adults with hypertension found a progressive increase in the outcome of acute cardiovascular event or mortality with the lowest (0–1.4 months) to the highest (>2.7 months) fifth of time to antihypertensive intensification. Therefore, the timeliness of optimizing antihypertensive regimens to achieve SBP control and ensuring adequate follow-up are key in improving long-term

Table 3. TTR for Systolic Blood Pressure–Diabetes/Kidney Disease Subgroup

TTR	9-mo intervention	24-mo intervention	Usual care	*P* value
9-Mo TTR	27.9 (3.9–50.7), N=86	6.0 (0–43.8), N=100	0 (0–25.1), N=84	0.0003
	Combined intervention groups			
	20.2 (0–47.7), N=186		0 (0–25.1), N=84	0.0011
24-Mo TTR	37.8 (25.3–63.1), N=62	29.0 (12.4–49.8), N=92	20.3 (0–56.8), N=40	0.0060
	Combined intervention groups			
	34.0 (16.0–54.5), N=154		20.3 (0–56.8), N=40	0.0217

Data shown as median (25th–75th percentile). TTR indicates time in target range.

Table 4. TTR for Systolic Blood Pressure–Minority Subgroup

TTR	9-mo intervention	24-mo intervention	Usual care	*P* value
9-Mo TTR	9.7 (0–47.7), N=77	2.0 (0–38.6), N=111	0 (0–21.3), N=86	0.0175
	Combined intervention groups			
	5.1 (0–41.0), N=188		0 (0–21.3), N=86	0.0057
24-Mo TTR	30.7 (16.0–56.8), N=43	30.0 (12.3–44.0), N=90	10.6 (0–43.6), N=43	0.0580
	Combined intervention groups			
	30.0 (12.6–47.0), N=133		10.6 (0–43.6), N=43	0.0380

Data shown as median (25th––75th percentile). TTR indicates time in target range.

outcomes in adults with hypertension. This evidence also reinforces the concept of a protocolized approach to hypertension management using pharmacists to focus on making necessary and timely adjustments to antihypertensive medications.

This study is not without limitations. This was a post hoc analysis of a cluster-randomized clinical trial, so these findings should be viewed as hypothesis-generating only. Additionally, we did not analyze the data based on the cluster randomization as this information was not available in the dataset. Cardiovascular event data were also not available; therefore, we could not evaluate whether the longer TTR for SBP observed in the intervention group reduced cardiovascular events. Although the majority of participants in the pharmacist intervention groups had 24-month SBP data available (84% of the 9-month and 59% of the 24-month intervention group), there was missing SBP data. Variation in medication adherence could have influenced these findings; however, there was no significant difference in the proportion of participants reporting good adherence between the intervention and usual care group at 24 months (90.7% versus 93.9%; P=0.3221).[17] There was also variability in the role of the pharmacist within each medical office, thus, some pharmacists may have had greater autonomy to independently adjust antihypertensive therapies compared with others. Last, given the timing of the BP measurements in the CAPTION trial, we were unable to evaluate TTR and time to therapeutic BP with greater precision. As a result, the true time to therapeutic BP in this trial may be shorter than what we have demonstrated. Reaching BP control within as early as 1 month after treatment initiation may be beneficial.[32]

Perspectives

There is increasing evidence suggesting that the consistency of SBP control may be a more robust measure of the quality of BP control. One such measure is TTR for SBP, which has been shown to predict major adverse cardiovascular events.[9] It is well documented that team-based care models improve standard measures of BP control; however, the impact of such models on the consistency of BP control has not been previously evaluated. In this post hoc analysis of the prospective, cluster-randomized CAPTION trial, we show, for the first time, that adults with hypertension managed in a physician/pharmacist collaborative model achieved a longer TTR for SBP compared with usual care. This finding was most robust in patients with diabetes or chronic kidney disease where the SBP goal was <130/80 mm Hg and suggests that these groups may benefit more from such models. It should be noted, however, that even in physician/pharmacist collaborative model patients were in the target range only about a third of the time. Thus, there remains significant room for improvement and further research is needed to determine how to achieve longer TTR for SBP.

Conclusions

Physician/pharmacist collaborative care models achieve more consistent control of SBP by achieving a longer TTR for SBP, which has been associated with a lower risk of cardiovascular events. Additional research is warranted to understand why such models may be more effective in maintaining more consistent BP control.

ARTICLE INFORMATION

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Disclosures

None.

Supplementary Materials

Online Figures I–III

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