

# Pharmacist Led Team-Based Care to Improve Hypertension Management Among Veterans in Primary Care

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**H**igh blood pressure (BP) is a leading risk factor for cardiovascular disease and stroke associated with increased morbidity, mortality, costs, and healthcare utilization.<sup>1-4</sup> Poor medication adherence and failure to intensify medication therapy by health care professionals (HCP) contributes to poor BP control.<sup>5</sup> Although physicians and midlevel practitioners are responsible for diagnosing, prescribing, and monitoring patients with hypertension, other HCP, such as pharmacists, can aid in hypertension management.

Many team-based approaches to hypertension management have been implemented, with increasing emphasis on the pharmacist as a key member of the healthcare team.<sup>6-8</sup> The pharmacist-physician team approach has been crucial to managing medication therapy and is a cost-effective strategy to optimize healthcare resources.<sup>3,9</sup> At the William S. Middleton Memorial Veterans Hospital, team-based, patient-centered care is integrated through Patient Aligned Care Teams (PACT). Teams rely on four main components: partnership with veterans, enhanced access to care via various technologies, coordinated care, and implementation of team-based care.<sup>10</sup> PACT consists of a primary care provider (PCP), clinical pharmacy specialist (CPS), registered nurse case manager (RNCM), licensed practical nurse (LPN), and medical support assistant (MSA).<sup>11</sup>

This model builds upon the patient-centered medical home (PCMH) model, which focuses on an ongoing relationship between the provider and patient and emphasizes patient safety and care quality.<sup>12</sup> The PACT model reinforces these attitudes, with additional opportunities

## Abstract

**Background:** Team-based approaches to hypertension management can optimize medication therapy and improve blood pressure (BP) control. The Veterans Affairs (VA) primary care clinics integrate team-based care using multidisciplinary Patient Aligned Care Teams (PACT). This quality improvement project assessed the change in the proportion of patients with BP above goal or without an annual BP measurement following pharmacist intervention.

**Methods:** Patients with no annual BP, or a BP above goal, from four primary care provider (PCP) panels were included. Over one month, one Clinical Pharmacy Specialist (CPS) assessed each patient and made interventions. The proportion of patients with a BP above goal or no annual BP measurement was then determined at four time points. Fischer's exact test was used to determine statistical significance.

**Results:** A total of 339 patients were identified. The CPS initiated and documented interventions for 106 patients; 166 patients were not eligible for immediate intervention and 67 patients had no documented intervention. The change in proportion of patients with BP above goal or with no annual BP measurement was generally statistically significant across all four PCP panels.

**Discussion:** The interventions performed and documented by a single CPS significantly reduced the overall proportion of patients with BP above goal or patients with no annual BP measurement. Future initiatives should include an assessment of pharmacist time required and the outcome of interventions.

## Acronyms

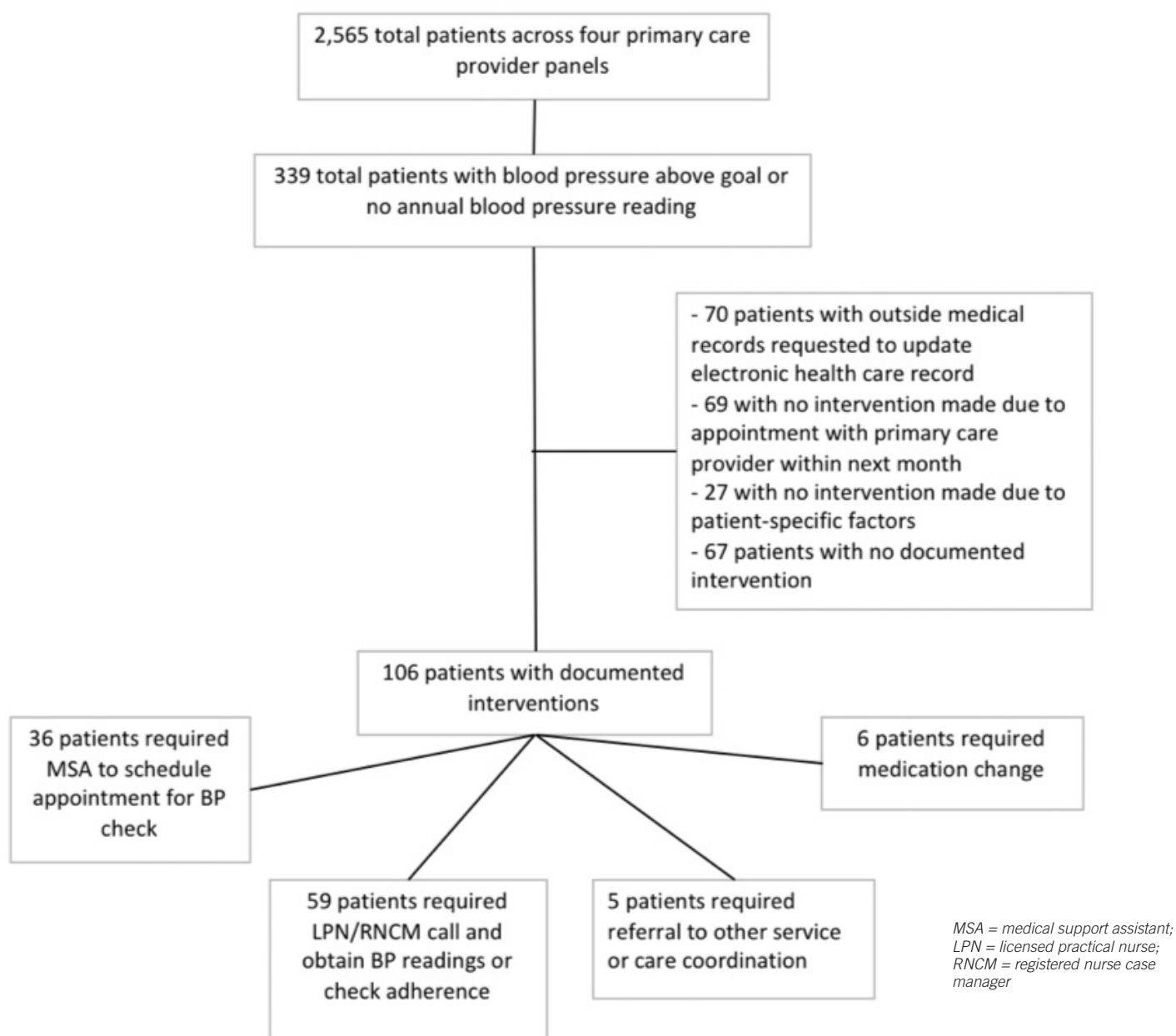
<b>BP</b>	Blood pressure	<b>RNCM</b>	Registered nurse case manager
<b>HCP</b>	Health care provider	<b>MSA</b>	Medical support assistant
<b>PACT</b>	Patient aligned care team	<b>PCMH</b>	Patient centered medical home
<b>PCP</b>	Primary care provider	<b>QI</b>	Quality improvement
<b>CPS</b>	Clinical pharmacy specialist	<b>VA</b>	Veterans affairs
<b>LPN</b>	Licensed practical nurse	<b>EHR</b>	Electronic health record

**TABLE 1. Description of Interventions by Type and PCP Panel**

Description of Intervention	Panel 1	Panel 2	Panel 3	Panel 4	Total number of interventions by intervention type
LPN/RNCM call and obtain BP readings or adherence check	17	8	12	22	59
Medication change (e.g., dose change, start new agent)	2	0	1	3	6
MSA to schedule patient appointment for BP check	13	10	3	10	36
Patient referred to other service or care coordination	0	0	1	4	5
<b>Total number of interventions by panel</b>	<b>63</b>	<b>39</b>	<b>28</b>	<b>46</b>	

LPN = licensed practical nurse; RNCM = registered nurse case manager; BP = blood pressure; MSA = medical support assistant

**FIGURE 1. Description of Included Patients and Eligibility for Interventions**



**TABLE 2. Proportion of Patients with BP Above Goal or with No Annual BP Measurement**

<i>Proportion of Patients with Blood Pressure Above Goal</i>							
	Pre to post-intervention				Post-intervention to 3 months later		
Panel	Pre-intervention	Post-intervention	Change	p-value	3 months post-intervention	Change	p-value
1	8.12	2.57	-5.55	<0.001	6.96	+4.39	<0.001
2	7.24	1.85	-5.39	<0.001	6.45	+4.60	<0.001
3	9.42	0.49	-8.93	<0.001	8.17	+8.17	<0.001
4	15.96	4.01	-11.95	<0.001	8.56	+4.55	0.017
Total	9.02	2.22	-6.80	<0.001	7.28	+5.06	<0.001
<i>Proportion of Patients with no Annual Blood Pressure Measurement</i>							
	Pre to post-intervention				Post-intervention to 3 months later		
Panel	Pre-intervention	Post-intervention	Change	p-value	3 months post-intervention	Change	p-value
1	5.15	0.53	-4.62	<0.001	3.98	+3.45	<0.001
2	2.27	0.14	-2.13	<0.001	2.35	+2.21	<0.001
3	2.90	0.97	-1.93	0.074	2.97	+2.0	0.045
4	6.51	1.23	-5.28	<0.001	2.08	+0.85	0.41
Total	4.16	0.58	-3.58	<0.001	3.09	+2.51	0.001

annual BP as result of a CPS intervention at a single Veterans Affairs (VA) primary care clinic.

## Methods

This QI project utilized a population health management database to extract a list of patients across four PCP panels. Patients were included if they had no BP measurement in the electronic health record (EHR) from the past year or their most recent BP was above goal. BP goals were defined as 140/90 mmHg for patients less than 60 years old, 150/90 for patients 60 years or older, and 140/90 mmHg for patients of any age with chronic kidney disease or diabetes.<sup>13</sup> Of note, the updated 2017 American College of Cardiology/ American Heart Association guidelines were not available at the time of this evaluation.

The CPS is responsible for managing patient's primary care disease states and medication therapies for provider panels as a part of PACT. Over a one month period, a single CPS incorporated an assessment of BP for each patient and made one of

the following interventions: (1) alerted the LPN or RNCM to call the patient and obtain recent BP readings or check adherence, (2) optimized medication therapy via dose adjustment, addition, substitution, or deletion, (3) alerted the MSA to schedule the patient for a clinic appointment to obtain a BP measurement, or (4) referred the patient to another service or facilitated care coordination with other VA departments. The majority of communication occurred with patients via telephone, including medication-related changes communicated directly to the patient by the CPS.

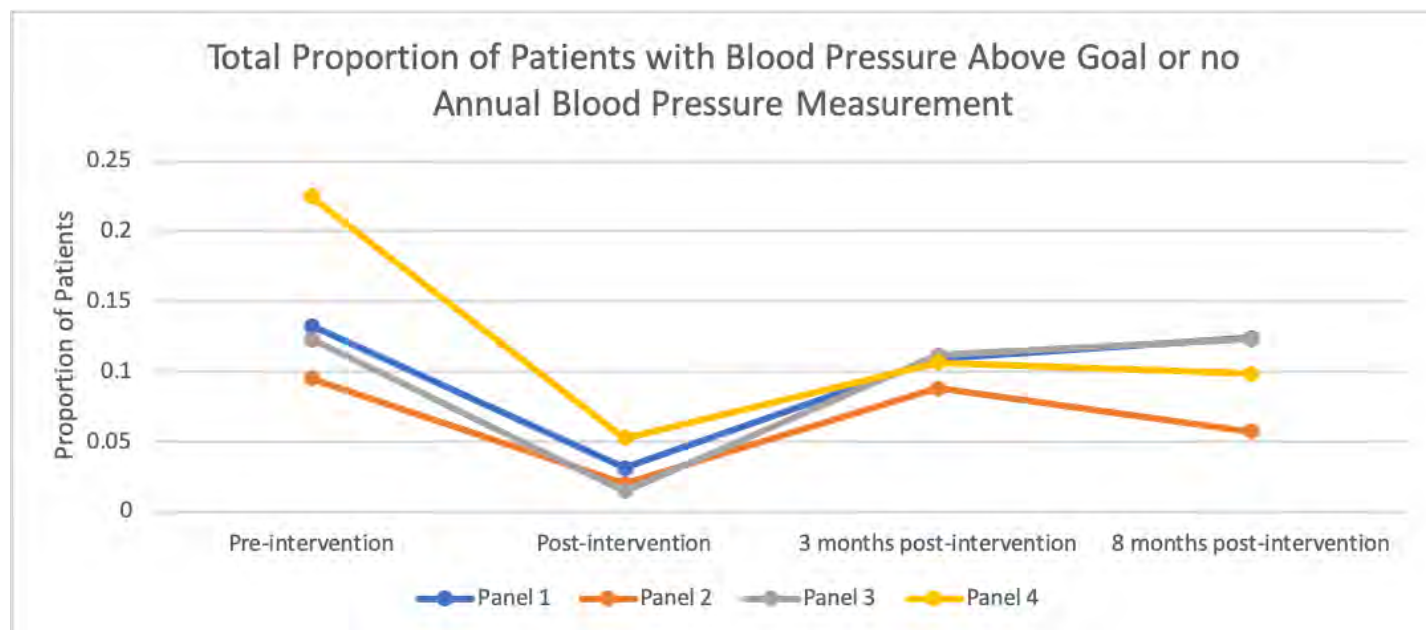
Some patients were deemed ineligible for an intervention, including patients who had an appointment scheduled with their PCP or the CPS-led Medication Management Clinic within the next month, patients who refused medication therapy, patients transferred to an alternate PCP panel, VA system, or non-VA system, or those that the CPS determined to have adequate BP control based on patient-specific characteristics (e.g., age,

comorbidities, etc.). A large proportion of patients seek care at other facilities in addition to the VA, and the CPS requested outside medical records to supplement the BP measurements within the EHR. These patients were not included in the total CPS interventions.

## Analysis

The total patient population was determined by the average patient census on each PCP panel during the intervention period. The proportion of patients with a BP above goal or no annual BP measurement was determined at four time points: pre-intervention, post-intervention (1 month post-intervention), 3 months post-intervention, and 8 months post-intervention. Fischer's exact test was used to determine statistical significance in the proportion of patients from pre-intervention to post-intervention, and post-intervention to 3 months post-intervention. A p-value of less than 0.05 was considered statistically significant with no adjustments for repeated testing. Statistical analysis was completed using

**FIGURE 2. Proportion of Patients with BP Above Goal or No Annual BP Measurement at Various Time Points**



STATA version 14.2. As this project was undertaken for programmatic evaluation it was determined not to meet the federal definition of research and IRB review was not required per the University of Wisconsin-Madison Health Sciences IRB Not Research Determination Decision Tool.

## Results

The four PCP panels enrolled 2,565 total patients, with 339 patients (13.2%) identified as having BP above goal or no annual BP measurement. From this, 106 patients (31.3%) had interventions initiated by the CPS and documented within the EHR. The remaining patients were not eligible for immediate intervention (n=166) or had no documented intervention (n=67) (Figure 1). The most common intervention was alerting the LPN or RNCM to call the patient and obtain recent BP readings or check adherence (Table 1).

The change in proportion of patients with BP above goal or patients with no annual BP measurement was generally statistically significant across all four PCP panels with decreases pre- to post-intervention ( $p < 0.001$ ). A subsequent increase was observed post-intervention to 3-months later ( $p \leq 0.001$ ) as the intervention period was completed (Table 2). One panel showed a non-significant

change for the proportion of patients with no annual BP measurement from pre- to post-intervention (panel 3;  $p = 0.074$ ) and one panel showed a non-significant change in proportion of patients with BP above goal from post-intervention to 3-months later (panel 4;  $p = 0.41$ ). The trend for proportion of patients is visualized in Figure 2.

## Discussion

The objective of this quality improvement (QI) project was to assess the change in proportion of patients with BP above goal or without an annual BP as a result of a CPS intervention at a single VA primary care clinic. The overall proportion of patients with BP above goal or patients with no annual BP measurement was significantly reduced.

The most common intervention (alerting the LPN or RNCM to obtain recent BP readings or check adherence) was expected, as multiple, reliable BP readings are needed to assess BP control prior to making medication adjustments. The large number of patients not eligible for immediate intervention reflects the team-based care model within the VA health system, in which the CPS deferred changes due to upcoming appointments with the PCP or CPS, or excluded patients who had been transferred to different parts of the VA system. Patient-centered care was

also considered, as patients who refused medication therapy were not eligible for intervention. Although the interventions involving LPN, RNCM, or MSA could be done independently, the facilitation of these activities by the CPS represents the team-based approach to BP management, while highlighting the role of pharmacists to direct these collaborative activities.

The nonsignificant change in proportion of patients with no annual BP measurement from pre- to post-intervention in panel 3 may have been due to a greater proportion of patients not eligible for immediate intervention or with no documented intervention within the EHR. Panel 4 showed a significant change from pre- to post-intervention but did not show a significant change from post-intervention to 3 months later. This panel also had the greatest number of interventions made by the CPS. Inconsistent monitoring and failure to intensify medication therapy contribute to poor BP control, and if medication therapy was not fully optimized by the CPS by the end of the intervention, this may have resulted in a nonsignificant change in proportion of patients with BP above goal. Overall, changes in BP and significance of changes in the proportion of included patients is multifactorial and likely due to specific characteristics of patients on each panel.

## Limitations

This QI project has several limitations. First, the time spent by the CPS completing interventions was not captured. We cannot assess the amount of time needed for a CPS to participate in similar interventions as a long-term solution to improve hypertension management. However, because each CPS is assigned to specific PCP panels, we hypothesize that the CPS could include this activity in medication management activities with minimal time burden. Pharmacy students or residents could also support the CPS in performing population health management activities. Second, data from this evaluation only includes information pertinent to the initial intervention. This intervention captured a short one-month time period during which the initial interventions were implemented. Several patients were followed for weeks to months as a result of medication changes that were made, or interventions initiated after obtaining additional BP readings. Therefore, the outcome of the initial intervention and secondary interventions are not captured, and we cannot claim for certain that BP improvement within goal is only attributable to the CPS intervention. However, due to the short one-month time period of the project, we suspect that the significant change in the proportion of patients with BP above goal or no annual BP is largely attributable to the CPS interventions.

## Conclusion

Pharmacists can play a significant role in interdisciplinary hypertension management. Future initiatives should include an assessment of pharmacist time required to complete the intervention. Utilization of project results to inform future services or opportunities for pharmacists would benefit from a more thorough assessment of the outcome of each intervention and impact on patient care. Similar population health initiatives driven by pharmacists could be performed for a variety of disease states that are controlled in part through medication management.

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