

Research Article

# Effectiveness of a multidisciplinary intervention to improve hypertension control in an urban underserved practice



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## Abstract

Patient-centered, multidisciplinary interventions offer one of the most promising strategies to improve blood pressure (BP) control, yet effectiveness trials in underserved real-world settings are limited. We used a multidisciplinary strategy to improve hypertension control in an underserved urban practice. We collected 1007 surveys to monitor medication adherence and used weighted generalized estimating equations to examine trends in BP control. We examined 13,404 visits from patients with hypertension between August 2010 and February 2014. Overall, BP control rates increased from 51.0% to 67.4% (adjusted odds ratio, 1.58; 95% confidence interval, 1.44–1.74) by the end of the intervention phase and were maintained during the postintervention phase (adjusted odds ratio, 1.60; 95% confidence interval, 1.41–1.82). Medication adherence scores increased across the intervention (5.9–6.6;  $P < .001$ ), but were not sustained at the conclusion of the study (5.9–6.2;  $P = .16$ ). A multidisciplinary team approach involving registered nurses, pharmacists, and physicians resulted in substantial improvements in hypertension control in a real-world underserved setting. *J Am Soc Hypertens* 2015;9(12):966–974. © 2015 American Society of Hypertension. All rights reserved.

**Keywords:** Effectiveness; multidisciplinary; nurse-managed protocols; pharmacist; underserved.

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## Introduction

Hypertension is one of the most important preventable contributors to morbidity and mortality throughout the world.<sup>1,2</sup> In the United States, approximately one-third of the adult population has hypertension, increasing to 65% in those older than 60 years.<sup>3</sup> Effective treatments exist, and structured guidelines are widely available to support treatment, yet these are not optimally used.<sup>4</sup> It is estimated that the full implementation of current recommendations offers the potential to prevent 56,000 cardiovascular events and 13,000 deaths annually in the

United States, without increasing the cost to the health care system.<sup>2,5</sup>

Despite the high prevalence of hypertension and the known benefits of treatment, only about half of hypertensive patients reach accepted goals.<sup>3</sup> Suboptimal management of hypertension is likely related to numerous factors at every level of care, including patient-level factors (eg, lifestyle choices, medication nonadherence), clinician-level factors (eg, therapeutic inertia), and system-level factors (eg, insurance coverage, fragmented systems).<sup>6–10</sup>

Patient-centered, multidisciplinary interventions offer one of the most promising strategies to improve blood pressure (BP) control,<sup>11–25</sup> yet effectiveness trials in underserved real-world settings are limited. Nurse- and pharmacist-led interventions, using structured algorithms, telephone monitoring, and community outreach, have been shown to improve hypertensive control and medication adherence in structured study environments.<sup>14–20,26,27</sup> Similarly, multidisciplinary teams have improved BP control rates in large-scale health care systems.<sup>12,22</sup>

Although randomized controlled trials and meta-analyses demonstrate the benefit of the team-based approach in hypertensive management, real-world effectiveness and sustainability experience are limited.<sup>17</sup> Furthermore, one study of a public health center failed to demonstrate benefit of a comprehensive intervention to improve hypertension in the primary care setting.<sup>28</sup>

This article describes the implementation of a multistage intervention involving an education phase, a pharmacist-led

phase, and a nurse-led phase to improve hypertension control in an underserved urban practice. Our aim was to examine the effectiveness and sustainability of these interventions in an underserved urban setting. We hypothesized that a multidisciplinary team approach involving registered nurses, pharmacists, and physicians will result in improvements in hypertension control in a real-world urban setting.

## Methods

We used a multidisciplinary strategy aimed at improving hypertension control in an urban practice between August 2010 and February 2014. The strategy used multiple concurrent clinical approaches, which are detailed in [Table 1](#). Hypertension control was defined based on the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7).<sup>1</sup> The JNC 7 standards were used because these were the current recommendations at the initiation of the project and during most intervention.

### *Hypertension Identification and Definitions*

Hypertensive patients were identified based on either having hypertension on their problem list in the electronic health record or having three consecutive BP readings above goal that were not explained by another factor.

We considered a BP as controlled if it was less than 130/80 mm Hg in those with diabetes or chronic kidney disease

**Table 1**

Key components of clinical approaches

Key Components	Description
Baseline/educational phase	
Provider teaching	Case-based discussions surrounding hypertension
Nurse/staff education	Didactic and case-based discussions
Standardization	Standardization of office protocols (BP measurements, medication titration protocols)
Team building	Development of teams, alignment of goals
Virtual consults	Established relations with local cardiologists
Intervention phase—pharmacy component	
Consultations with patients	Counseling regarding medication adherence and side effects
Outreach to nonadherent patients	Phone calls to patients and pharmacies to facilitate adherence
Consultations with physicians	Reinforcement of JNC 7 standards
Patient assistance with meds	Care coordination with pharmacies
Intervention phase—registered nurse-managed component	
Direct patient care	Direct patient care included BP checks, visits to titrate medications, and visits to promote adherence
Outreach to uncontrolled patients without appointments	Phone calls and letters sent to uncontrolled patients without recent appointment
Population-level management of hypertensive patients	Physicians provided population-level reports to identify hypertensive patient not meeting goals. Physicians and nurse teams performed outreach to uncontrolled patients. Transparent reports of team control rates were posted.

BP, blood pressure; JNC 7, the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure.

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