

## CARDIOVASCULAR PERSPECTIVE

# Helping Patients Manage Their Own Blood Pressures: A Strategy to Address Hypertension Control in the United States

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**H**ypertension is highly prevalent in the United States and is a leading cause of myocardial infarction, stroke, and death. Despite its importance and the widespread availability of medication treatment, less than half of patients with hypertension have controlled blood pressures.<sup>1</sup> National efforts, such as the Million Hearts initiative, have helped, but there remains much work to be done.

The prevalence of poor hypertension control is not surprising given that it is typically managed with episodic in-person visits for blood pressure measurement, laboratory checks, and medication adjustments. No-show rates for ambulatory visits can be high, and attended visits are still typically months apart. Blood pressure values are influenced by pain, exercise, and stress, which can make interpretation of office-based measurements difficult. Home blood pressure measurements can help, but systems to easily link home readings to the electronic health record are uncommon. Even with accurate blood pressure values, physicians frequently fail to intensify treatment when clinically indicated, often referred to as clinical inertia.<sup>2</sup>

Given the challenges with the current model of hypertension care, alternative strategies to manage blood pressure have emerged. Interventions combining home blood pressure monitoring with systematic medication titration, for example, by a pharmacist through collaborative practice agreements with physicians, results in greater blood pressure reductions compared with usual care.<sup>3</sup> However, establishing and maintaining these programs is still subject to human resource constraints, can

be costly, and the ability for pharmacists to prescribe varies by state.

## ANTIHYPERTENSIVE SELF-TITRATION

One approach that overcomes some of these limitations is to allow patients to manage their own blood pressures. Like insulin self-titration based on blood sugar values, hypertension management is inherently algorithmic. Self-titration of antihypertensives would involve patients checking blood pressures at home, following a limited number of preplanned steps to modify medications when indicated, and interacting with their care team when needed with questions or blood pressure values outside a safe range.

There is evidence that self-titration of blood pressure medications is effective<sup>4,5</sup> and cost-effective.<sup>6,7</sup> In the TASMING2 (Telemonitoring and Self-Management in Hypertension 2) trial, conducted in the United Kingdom, patients monitored blood pressures at home each month and followed an action plan, agreed upon with their physicians, to increase medication dosage or add a new medication if their blood pressures were persistently elevated. With this intervention, patients achieved a mean systolic blood pressure 5 mmHg lower at 12 months than patients treated with usual care.<sup>4</sup> In the subsequent TASMING-SR (Targets and Self-Management for the Control of Blood Pressure in Stroke and at Risk Groups) trial among patients with cardiovascular disease, diabetes, or chronic kidney disease, improvements in blood pressure control were even greater.<sup>5</sup> More recently, parts of this process were leveraged in a related trial utilizing a digital intervention.<sup>8</sup>

**Key Words:** blood pressure ■ health care ■ hypertension ■ prevalence

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Follow-up qualitative studies after the TASMINH2 trial reported that patients felt more confident in their blood pressure measurements and liked having greater control. Many wanted to continue home monitoring after the trial was complete.<sup>9</sup> Interviews with providers revealed that most were happy with patients' increased understanding of hypertension care, the reduced in-clinic workload, and their ability to more easily identify white coat syndrome.

## IMPLEMENTATION CONSIDERATIONS

If evidence of this intervention's potential has existed for years, what would it take for this to become part of routine hypertension care? In addition to ensuring that a US-focused, self-management approach is based on contemporary guidelines, several factors would need to be overcome.

First, >95% of participants in the UK self-management trials were White, but US patients with hypertension are dramatically more diverse. A US-based self-management approach would need to reflect this diversity, both as it relates to treatment recommendations but also the varied cultures, languages, socioeconomic factors, levels of health literacy, and patient preferences that are relevant to hypertension care in our country. Additionally, barriers to health care access are commonplace in the United States and, along with the long-standing effects of racism, have contributed to racial and ethnic disparities in blood pressure control. These factors would need to be explicitly addressed in self-management strategies. For example, the cost of home blood pressure devices and antihypertensive medications is prohibitive for many. Increased insurance coverage could help but is unlikely to be a comprehensive solution. Recommended medication intensification steps could also be based on inexpensive options; for example, only medications on the \$4 list available at many pharmacies or known to be in an insurer's least expensive tier. Implementation of a self-management strategy without directly addressing factors that contribute to health disparities could have the unintentional consequence of exacerbating these inequities. However, done correctly, self-management could have a positive impact on blood pressure disparities by making treatment more patient-centered, building self-efficacy and disease knowledge, and increasing trust in treatment decisions.

Second, there are logistical considerations for the successful implementation of antihypertensive self-titration in US primary care. For example, a method for getting patients increased doses or new medications when indicated by their treatment plan would need to be established. Because most prescriptions are valid for 1 year after the date written, one option would be giving patients paper prescriptions for each intensification step to fill when needed. Patients would also need easy ways to communicate with their treatment teams about questions, concerns, and blood pressure values outside of a

safe range. Existing patient portals, paired with telemedicine contact for urgent issues, could be used. Additionally, the use of telemedicine has become much more common since the start of the coronavirus disease 2019 (COVID-19) pandemic. Leveraging this care modality could make self-management interventions more scalable and may help address limitations in primary care supply and visit availability that exist in some parts of the United States.

Third, given the liability concerns that are ever-present in US health care, physicians may be worried about their legal risk if, for example, patients experience side effects or deviate from the instructions. Blood pressure medications do carry risks, but significant adverse events were similar between intervention and control arms in the UK self-management trials. There are always differences when translating an intervention from a clinical trial to real-world practice, but this is not different from the implementation of other self-management approaches like home prandial insulin regimens or an asthma action plan. With the potential for significant cardiovascular risk reduction from sustained blood pressure control, for many patients, the benefits of antihypertensive self-titration would likely outweigh the risks.

## CONCLUSIONS

Even with thoughtful implementation, self-titration will not work for everyone. The UK trials recruited from primary care practices, and among these consented patients, adherence to the study protocol still decreased considerably over the year of follow-up.<sup>10</sup> Thus, it would be important to include antihypertensive self-titration as one of several tools available to enable out-of-office blood pressure management, to redirect clinical time and resources liberated by patients who can titrate their own medications toward assisting patients who need more intensive support, and to identify and use strategies to enhance patient engagement over time.

That said, self-titration of antihypertensives has received comparatively less attention than other out-of-office blood pressure management strategies but has the potential to allow more patient-centered care and offload our health care system. Several issues of implementation would need to be addressed, but many of these considerations are relevant to the successful implementation of most out-of-office blood pressure management strategies. None of the barriers are insurmountable, and many of the tools needed already exist. Given the failure to achieve good control of many chronic diseases in the United States with existing care models, including blood pressure, it is time to try new approaches.

## ARTICLE INFORMATION

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Dr Choudhry reports grants/contracts from Boehringer Ingelheim, Humana, Inc, and National Institutes of Health; ownership of stock in RxAnte; and a position as a consultant to Veracity Healthcare. The other author reports no conflicts.

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