

Digital Hypertension Management Solutions

HEALTH TECHNOLOGY ASSESSMENT | OCTOBER 2024



Executive Summary

Hypertension, also known as high blood pressure, is one of the most common chronic conditions in the United States, affecting an estimated 120 million adults and growing. It is also a contributing risk factor for potentially fatal diseases, such as heart disease, stroke, and chronic kidney disease. Hypertension affects all demographic groups, with a higher prevalence among Black people, men, and older adults.

Effective hypertension treatment often includes prescription medication, as well as recommended changes to diet and exercise. Patients are typically instructed to monitor their blood pressure at home to produce a series of readings at different times of day. Providers use those blood pressure data to adjust patients' care plan, including making changes to medications and dosage. The process of finding the right combination and dosage of medications can take time and usually requires several visits to the doctor's office, which can be a burden on patients and practices. It can also delay or prevent patients from attaining blood pressure control (BPC).

Digital hypertension management solutions aim to improve patients' self-management and expand access to timely, effective treatment. These solutions are centered around a connected blood pressure cuff that delivers more frequent and reliable home readings. In some solutions, these readings are delivered to care teams, allowing them to track patient progress and make changes to treatment plans. In other instances, the data are used to help patients make recommended behavior and lifestyle changes but are not automatically delivered back to clinicians.

These solutions also take varying approaches to medication management. Some allow patients to track medication adherence but have no direct involvement in prescribing or titration. Other approaches send prescribing recommendations to primary care team members, who may act on the alerts and suggestions. A third approach incorporates a virtual care team that includes a licensed prescriber empowered to adjust the patient's medication directly, with or without consultation with the primary provider.

The solutions reviewed in this report were grouped on the basis of their approach to guiding clinician and patient actions:

- 1 Blood Pressure Monitoring** solutions extend existing hypertension care beyond the clinical office by supporting patients' home monitoring and delivering data back to the healthcare provider. Companies with solutions in this approach include AMC Health, Health Recovery Solutions (HRS), and VitalSight (Omron Healthcare).
- 2 Medication Management** solutions employ dedicated, virtual care teams to coordinate patients' medication adjustments as a supplement to the patient's main primary care team. Companies with solutions in this approach include Cadence, Ochsner Digital Medicine, and Story Health.
- 3 Behavior Change** solutions deliver educational content, alerts, reminders, and virtual interactions with coaches (digital or human) or care teams to improve patient's self-management of their hypertension. Companies with solutions in this approach include DarioHealth, Hello Heart, Lark, Omada Health, and Teladoc Health (Livongo).

This report assesses the clinical effectiveness of these digital hypertension management solutions compared with usual care across 13 different outcome measures, including primary outcomes that focus on reducing systolic blood pressure (SBP) and increasing the proportion of patients achieving BPC. It also estimates the economic impact of these solutions over a three-year budget window. Findings are based on evidence from a systematic literature review and company-submitted information.

Stakeholder Engagement

PHTI solicits input and advice from a diverse set of stakeholders, including health plans, employers, providers, digital health developers, and investors. During the assessment process, PHTI partnered with clinical advisors, experts in health technology assessment, and health economists. PHTI also conducted interviews with 12 patients with hypertension. All companies included in the report were given an opportunity to submit clinical, economic, and other

commercial information to inform the assessment; eight of the 11 companies engaged with PHTI during the assessment process, and six submitted evidence for review.

PHTI Assessment Approach

This evaluation has two primary components: clinical effectiveness and economic impact. As described in the [ICER-PHTI Assessment Framework for Digital Health Technologies](#), the evaluation reviews the solutions' clinical effectiveness to understand how they perform on both primary and secondary outcomes of interest, as well as on measures of user experience and health equity. PHTI also conducts a budget impact model to estimate the net impact of the solutions on overall healthcare spending.

Clinical effectiveness: The evidence base was sizable and included many comparative studies with low risk of bias, which provide a clear picture of the clinical findings for digital hypertension management solutions as a whole and

by approach. The systematic literature review screened approximately 2,500 pieces of evidence, yielding a total of 73 articles, abstracts, and posters that met inclusion criteria for this assessment.

The primary clinical outcomes for hypertension are focused on blood pressure management and sustained control, including reductions in SBP and increasing the proportion of patients achieving BPC. Minimum clinically important differences (MCID) are reductions in SBP of 5 mm Hg or more compared with usual care. Secondary outcomes — including medication adherence and blood pressure measurement frequency — can play a supportive role in achieving and maintaining hypertension improvements.

Economic impact: The economic analysis was modeled on the basis of the SBP improvements for each approach, as identified in the clinical literature, as well as changes in utilization from the literature. It relies on 10-year estimates of cardiovascular risk based on the Pooled Cohorts Equations (PCE) from the American College of Cardiology (ACC) and American Heart Association (AHA).

The model estimates the number of adults with hypertension who regularly monitor their blood pressure across commercial, Medicare, and Medicaid plans. The model estimates the number of people who could be eligible for digital solutions, the gross reduction in expected healthcare spending resulting from improved BPC for patients enrolled in these programs, and the net impact on health system spending once such savings are offset by spending on the digital hypertension management solutions.

Summary of Findings

Based on PHTI's review of clinical evidence, digital hypertension management solutions that use the **Medication**

Management approach deliver clinically meaningful decreases in SBP relative to usual care, and they bring a greater proportion of patients into BPC than usual care. These solutions also support faster improvements in hypertension than what typically occurs under usual care.

Blood Pressure Monitoring:

By delivering patient home monitoring data to clinical teams, solutions using the **Blood Pressure Monitoring** approach deliver slightly greater declines in SBP compared with usual care, but improvements do not consistently achieve MCID. The cost savings from these health improvements are not sufficient to offset the increased costs associated with provider reimbursement through remote patient monitoring (RPM) codes at current reimbursement rates.

Medication Management: Creating dedicated care teams to help adjust prescribing, the **Medication Management** approach has the highest quality

evidence showing clinically meaningful improvements in SBP that are achieved more rapidly than with usual care. The review concluded that these solutions increase net health spending in the initial three-year budget window, but — because hypertension risks accrue over the long term — they have the potential to offset costs over a decade because of savings from avoided cardiovascular events.










Behavior Change: Through patient education and coaching, the **Behavior Change** approach provides limited incremental benefit in SBP compared with usual care. By supporting patient hypertension self-management, these solutions may help close access and equity gaps in traditional care models. Our review determined that while the price of these solutions tends to be lower than the other approaches, the small improvements in health outcomes are not enough to offset the added cost of the product.

Based on these results, despite modestly increasing healthcare spending in the short term, **Medication Management** solutions warrant broader adoption, given their ability to provide clinical benefits in hypertension care, potential long-term savings, and improvements to population health. The best opportunity to optimize digital hypertension management may be a combined approach that includes monitoring, medication management, and patient education.

Health Equity: Across the evidence base, studies targeting historically underserved groups — including racial and ethnic minority groups and low-income populations — showed larger declines in SBP across both digital intervention and usual care arms. This suggests that underserved populations can especially benefit from focused hypertension management and that digital solutions may be effective in closing gaps in healthcare access and equity.

PHTI RATINGS BY DIGITAL HYPERTENSION MANAGEMENT APPROACH

- Positive ● Moderate ● Negative
- Higher Clinical Evidence Certainty ○ Lower Clinical Evidence Certainty

Approach	Clinical Effectiveness ^a	Economic Impact	Summary Rating ^b
Blood Pressure Monitoring AMC Health HRS VitalSight	 Results: Slightly greater, but not clinically meaningful declines in SBP compared with usual care Evidence Certainty: Higher	 Increases net health spending at current RPM reimbursement rates	 Evidence may support adoption for providers who consistently act on monitoring data
Medication Management Cadence Ochsner Digital Medicine Story Health	 Results: Clinically meaningful and more rapid declines in SBP compared with usual care Evidence Certainty: Higher	 Increases net health spending initially, with potential to offset costs over the long-term because of savings from avoided cardiovascular events	 Evidence supports broader adoption due to clinical benefits, potential long-term savings, and improvements to population health
Behavior Change Dario Hello Heart Lark Omada Teladoc (Livongo)	 Results: Limited incremental declines in SBP compared with usual care Evidence Certainty: Lower	 Increases net health spending because limited health improvements do not offset solution price	 Current evidence does not support broader adoption for most patients

Source: PHTI, Digital Hypertension Management Solutions Assessment, October 2024. See PHTI.org for complete report, methods, and recommendations.

Notes: SBP = systolic blood pressure. RPM = remote patient monitoring. ^a Not all solutions have clinical data that meet the inclusion standards for this report. Based on the similarity of approaches, it is fair to assume that companies without solution-specific data perform in line with the category. Purchasers and users will have to make their own assumptions about performance. ^b Summary rating reflects the combination of clinical and economic results.

Next Steps

Given the number of patients with hypertension in the United States, achieving and maintaining hypertension control must be a national priority. Yet, over the past decade, key indicators of hypertension progress have worsened.¹ In this context, digital hypertension management solutions have an important role to play in helping patients lower their blood pressure and improve their long-term cardiovascular health. This outcome depends on improving the clinical impact of digital tools by integrating the best components of existing solutions and aligning payment models with the long-term financial benefits of improved hypertension management.

PHTI's recommendations include:

- Study the effects of combining blood pressure monitoring, goal-driven

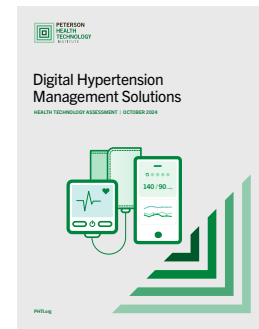
medication management, and behavior change for improved clinical outcomes and to close access and equity gaps for underserved patient populations.

- Increasingly integrate digital medication management into usual care and into other digital hypertension management solution types.
- Study the long-term impact of digital hypertension management solutions on clinical outcomes and healthcare utilization.
- Encourage greater investment in hypertension management by building short- and long-term budgets in the context of relevant quality improvement programs, such as Medicare Advantage Star Ratings or value-based payment arrangements.

These findings are based on the criteria set forth in the ICER-PHTI Assessment Framework and the currently available evidence. Please see the [full PHTI report and appendix](#) for complete assessment, methods, and recommendations.

Accessing PHTI's Full Report

You can access the full report [here](#).



¹ Muntner, Paul, Miriam A. Miles, Byron C. Jaeger, et al., "Blood Pressure Control Among US Adults, 2009 to 2012 Through 2017 to 2020," *Hypertension* 79, no. 9 (2022): 1971–1980. <https://doi.org/10.1161/HYPERTENSIONAHA.122.19222>