

Digital Hypertension Management Solutions

HEALTH TECHNOLOGY ASSESSMENT | OCTOBER 2024



Clinical and Economic Impact for Patients with Hypertension

The Peterson Health Technology Institute (PHTI) provides evidence-based assessments of innovative digital health technologies to improve health and lower costs. PHTI assessed digital solutions for hypertension — also known as high blood pressure — using a systematic literature review that considered more than 2,500 journal articles and data sources, including information submitted by some companies with products under evaluation. PHTI also received input from clinical advisors, hypertension patients, and digital health purchasers.

Topic and Category Selection

PHTI uses a [published framework](#) to conduct its evaluations. For its latest report, PHTI selected digital hypertension management solutions that either extend traditional in-person care or enable self-management of hypertension. The goal of the technology is to improve the feedback loop between patients and healthcare providers to manage and control a patient's hypertension. All the solutions use internet-connected blood pressure cuffs that display feedback from daily readings and transmit data to a central repository for analysis, along with a platform for live or asynchronous interactions with providers or artificial intelligence (AI) coaches. Some solutions support medication management and adjustments, while others simply track adherence. Many solutions offer education and behavior-change coaching to enhance self-management of hypertension.

This category of digital offerings was selected for evaluation because:

- Hypertension affects nearly half of U.S. adults — nearly 120 million and growing;
- It is often undiagnosed because it can present without symptoms, yet it can progressively damage the heart, brain, and kidneys;¹
- Controlling hypertension requires active participation and communication between patients and physicians;
- Digital solutions to address hypertension have been on the market since the early 2000s, and are one of the most mature use cases for the technology;
- The solutions use an array of strategies to address hypertension, leading to differentiated results in clinical studies and economic analyses.

¹ Million Hearts, "Estimated Hypertension Prevalence, Treatment, and Control Among U.S. Adults," accessed August 16, 2024. <https://millionhearts.hhs.gov/data-reports/hypertension-prevalence.html>

How They Work

The solutions aim to use common technologies to better engage patients in their blood pressure treatment, improve self-management, and expand access to timely and responsive treatment from providers. Technologies provided by the companies include internet-connected blood pressure cuffs; smartphone apps that sync patient data; AI-powered trend analysis; and a platform for interactions with clinicians, experts, and educational content. Some are integrated into existing primary providers' workflows. Some focus on lowering patients' blood pressure and then maintaining blood pressure control,

while others target a range of conditions related to hypertension, such as obesity, diabetes, and mental health.

PHTI analyzed the market landscape and then grouped the digital hypertension management solutions into three general approaches to care:

- **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 using remote patient monitoring (RPM).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.
- **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.

Summary of Findings

Based on PHTI's review of clinical evidence, a subset of digital hypertension management approaches assessed in this report deliver clinically meaningful improvements in systolic blood pressure (SBP) compared with baseline for adults with high blood pressure; these solutions also increase the portion of patients in blood pressure control.³ Only the **Medication Management** approach, however, provides more rapid and clinically meaningful declines in SBP compared to usual care.

By delivering patient home-monitoring data to clinical teams, solutions using the **Blood Pressure Monitoring** approach improve SBP slightly greater than usual care, but the results are not clinically meaningful. In addition, any savings

from these health improvements are not sufficient to offset the increased healthcare costs associated with provider reimbursement through RPM codes at current reimbursement rates.

Creating dedicated care teams to help adjust prescribing, the **Medication Management** approach has the strongest evidence of superior clinical performance, showing clinically meaningful improvements in SBP that are achieved more quickly compared to usual care. Because hypertension risks accrue over the long term, these solutions increase spending in the three-year budget window but can reduce long-term healthcare costs over a decade by avoiding other cardiovascular risk factors and deaths.

Through patient education and coaching, the **Behavior Change** approach delivers limited incremental health improvements compared to usual care but may help close access and equity gaps in traditional care models by supporting patient hypertension self-management. The price of these solutions tends to be lower than that of the other approaches, but the small improvements in health outcomes are not enough to offset the cost of the product.

² RPM is the use of digital devices to monitor a patient's health, which may include remote physiological monitoring and remote therapeutic monitoring codes. This report refers to RPM as monitoring using remote physiological monitoring codes.

³ As per expert input from Clinical Advisors, in the hypertension context, interventions that reduce systolic blood pressure levels by 5 mm Hg or greater than usual care are considered to meet minimal clinically important difference.

AT A GLANCE: ASSESSMENT OF DIGITAL HYPERTENSION MANAGEMENT SOLUTIONS

<p>WHAT IS THE GOAL OF THE TECHNOLOGY?</p>	<p>Digital hypertension management solutions aim to improve patients' self-management and expand access to timely, effective treatment.</p>			
<p>WHICH APPROACHES ARE INCLUDED?</p>	<p>Blood Pressure Monitoring</p>	<p>Medication Management</p>	<p>Behavior Change</p>	
<p>WHAT ARE THE CLINICAL BENEFITS?</p>	<ul style="list-style-type: none"> • Blood Pressure Monitoring approaches provide slightly greater, but not clinically meaningful, declines in SBP compared to usual care, but improvements vary depending on how the care team acts on the data. • Medication Management approaches produce more rapid declines in SBP compared to usual care, which produce clinically meaningful health benefits. • Behavior Change approaches produce limited incremental declines in SBP compared to usual care but may help close access and equity gaps in traditional care models. 			
<p>WHAT IS THE BUDGET IMPACT?</p>	<ul style="list-style-type: none"> • Savings from health improvements due to Blood Pressure Monitoring approaches are not sufficient to offset the increased net health spending associated with provider reimbursement through remote patient monitoring (RPM) codes at current reimbursement rates. • Medication Management approaches increase net health spending in the initial three-year budget window but have potential to offset and reduce long-term healthcare costs due to savings from avoided cardiovascular events. • Behavior Change solutions have lower prices than the other approaches but the limited incremental improvements in health outcomes are not sufficient to offset the solution price. 			
<p>WHICH TARGET POPULATIONS COULD BENEFIT MOST?</p>	<p>Digital hypertension management solutions were found to be effective across demographic groups, including age, gender, and rural and urban settings. Studies exclusively focused on diverse and underserved groups found larger hypertension improvements with both digital solutions and usual care.</p>			
<p>WHERE ARE THERE OPPORTUNITIES TO OPTIMIZE THESE SOLUTIONS?</p>	<p>Integrate with usual care</p>	<p>Advance the evidence base</p>	<p>Recognize existing financial opportunities</p>	<p>Public financing</p>

Policy Implications of PHTI's Digital Hypertension Management Solutions Assessment

Overall, digital hypertension management solutions offer promising advancements to one of the nation's most pervasive public health challenges — high and uncontrolled blood pressure. In many ways, clinically effective remote hypertension management is an ideal modality compared with usual care, which typically involves frequent office visits to get consistent and reliable blood pressure readings to make medication










adjustments. Under usual care, blood pressure stabilization and control typically takes 12 months, whereas a digital solution that enables active medication management can see improvements in three months. While the clinical benefit of early medication management is clear, the cost savings from successful hypertension care accrues over a decade. In our public-private healthcare system, this is a frequent problem; the

purchaser that pays for the digital hypertension management solution may not see the benefit in the form of avoided future spending on inpatient or emergent care and improved worker productivity that controlled hypertension produces for the system.

The chart on the following page evaluates the solutions by category.

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.

The economic analysis shows that within the three-year budget window, assuming a 25% uptake in a one-million-member plan with annual RPM billing at \$725 per year, three-year net health spending would increase by \$62 million per one

million Medicare insured lives for **Blood Pressure Monitoring** solutions and by \$54 million per one million Medicare insured lives for **Medication Management** solutions. For **Behavior**

Change solutions, at a solution price of \$468 per year, three-year net health spending would increase by \$43 million per one million Medicare insured lives.

THREE-YEAR NET SPENDING IMPACT OF DIGITAL HYPERTENSION MANAGEMENT SOLUTIONS FOR A ONE-MILLION-MEMBER PLAN

	Commercial	Medicare	Medicaid
Blood Pressure Monitoring	\$57.3M	\$61.9M	\$13.9M
Medication Management	\$52.2M	\$54.2M	\$12.9M
Behavior Change	\$21.8M	\$42.7M	\$13.4M

The cost increases to pay for the digital solutions or RPM billing occur only in the initial year, and then improvements in blood pressure from digital solutions produce healthcare savings over the next decade by avoiding other

cardiovascular risk factors and deaths. Over a 10-year window and assuming a 25% uptake in a one-million-member Medicare plan, improvements in hypertension control can lead to \$64M in cardiovascular costs avoided for

Blood Pressure Monitoring solutions, \$133M for **Medication Management** solutions, and \$19M for **Behavior Change** solutions.

Across the evidence base for these categories of solutions, 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 these populations can especially benefit from focused hypertension management and that digital hypertension management solutions may be effective in helping to close gaps in access to care that can perpetuate uncontrolled blood pressure.

Given the clinical efficacy and long-term positive budget impacts, policymakers should prioritize deployment of these tools broadly and creatively through public health channels and in Medicare and Medicaid. Public health interventions funded by local or state health departments or as part of a hospital's community benefit programming could work to deploy these digital tools in culturally competent ways to improve heart health within hard to reach

populations. Medicaid managed care organizations that cover relevant patient populations should be required to focus on achieving hypertension control.

Hypertension management and controlling blood pressure are encouraged in Medicare — both traditional fee-for-service and Medicare Advantage (MA) — via quality measure sets that serve to incentivize clinician and health plan focus. In MA, the HEDIS measure for controlling blood pressure has been prioritized by the Center for Medicare and Medicaid Services, by being given a triple weighting in the quality bonus program, which creates a strong incentive for plans and network clinicians to control blood pressure. Digital hypertension management tools may play an important role in performing well on the measure.

For the digital hypertension management solutions that involve RPM, the duration of coverage and level of reimbursement should follow the evidence of clinical impact. Evidence suggests that the

highest value clinical interactions are those that accelerate the adjustment of medicines to achieve blood pressure control, and such prescribing changes occur in the first several months of engagement with the solution.⁴

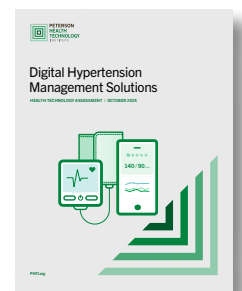
For commercial payers, particularly those who retain their covered populations for an extended time or who cover a patient population with fair to poor hypertension control, a natural incentive may already exist to offer these solutions. Given the long-term accrual of benefit to future expenditures in Medicare, public policy could encourage all commercial payers to offer these solutions. Policymakers should look for novel ways (in-benefit design, consumer-oriented financial incentives) to encourage commercial payers to achieve blood pressure control across their enrolled populations, which should mean Medicare inherits a greater proportion of new enrollees during their eligibility enrollment transition with controlled hypertension.

About the Peterson Health Technology Institute

The Peterson Health Technology Institute (PHTI) provides independent evaluations of innovative healthcare technologies to improve health and lower costs. Through its rigorous, evidence-based research, PHTI analyzes the clinical benefits and economic impact of digital health solutions, as well as their effects on health equity, privacy, and security. These evaluations inform decisions for providers, patients, payers, and investors, accelerating the adoption of high-value technology in healthcare. PHTI was founded in 2023 by the Peterson Center on Healthcare.

Accessing PHTI's Full Report

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



⁴ Tang, Mitchell, Carter H. Nakamoto, Ariel D. Stern, et al., "Effects of Remote Patient Monitoring Use on Care Outcomes Among Medicare Patients with Hypertension," *Annals of Internal Medicine* 176, no. 11 (2023): 1465–1475. <https://doi.org/10.7326/M23-1182>