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Empowering Patients: Remote Monitoring Improves Hypertension Outcomes

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March 2025

Hypertension has been known as the “silent killer” for decades. This medical condition may exhibit no symptoms, making it difficult to diagnose. It is often only discovered during a clinic visit.

The World Health Organization reported in 2023 that 1.28 billion adults met the criteria for a diagnosis of hypertension, but less than 50% were aware of their condition. They estimated 7.5 million deaths were related to hypertension just in 2023.

Treatment can be challenging due to patients not adhering to medication regimens, as the side effects can impact their quality of life. Providers need repeat readings to determine if medications are effective. Clinics may have limited appointment availability, and professional or personal commitments may make it difficult to get those checks done.

Recent advances in digital devices and technology have provided an avenue to improve treatment. In this article, we will delve into the benefits and difficulties of Remote Patient Monitoring (RPM).

Beyond the Clinic: Importance of BP Monitoring

The traditional process of monitoring and treating BP has been patients going into the clinic for readings. Some conditions may cause inaccurate readings, which can be detrimental to the patient.

White Coat Syndrome and Masked Hypertension

These conditions can cause serious harm to the patient if the provider is not aware of them. Spot checks in the clinic are not sufficient to recognize these issues.

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White Coat Syndrome is defined as blood pressure of 140/90mmHg or higher in clinic readings but results within normal range below 120/80mmHG when checked by patients at home or with a remote BP monitoring system.

Masked hypertension has been identified as having normal readings in clinic but elevated above 140/90mmHg outside of the clinic setting.

Medical providers believe these findings may be attributed to the effects of stress, anxiety, and fear. They may pose a serious health risk if treated inappropriately.

Blood pressure categories

Category	Systolic mmHg	Diastolic mmHg
Normal	<120	<80
Elevated	120-129	<80
HTN stage 1	130-139	80-89
HTN stage 2	140>	90>
Crisis (ER needed)	>180	>120

American Heart Association

White Coat patients may be prescribed medications to lower their BP, when in fact, they do not need them. This could cause severe hypotension, requiring emergency care.

Masked hypertension is harder to detect. If there are not out of clinic BP checks, this condition may not be diagnosed. The severity of the hypertension increases health risks. Kidney damage, stroke, heart attack, and even death are possible outcomes if not treated.

Potential Barriers to Medication Compliance

Even when patients are accurately diagnosed and started on BP medication, many are not successful at reaching their goals. Blood pressure medications can have some significant side effects that interfere with quality of life. Some of the side effects are:

- Dizziness
- Fainting
- Erectile problems
- Heart palpitations

These being just a few of the possible side effects, it is easy to see why patients are often non-compliant. In 2018, the American Heart Association reported only 43.8% of patients had their hypertension controlled. Along with medications, these patients may need special diets and lifestyle modifications which can be difficult to maintain. Trying to adhere to the treatment plan without sufficient support is difficult, causing many patients to give up.

There have been studies conducted which showed how RPM, along with patient and provider engagement, could improve BP and overall health.

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RPM + Provider = Decrease in Hypertension

This innovative technology has revolutionized data collection and inspired more patient-provider communication. It provides real-time readings, via digital transmission, directly to the medical record for review. This gives the clinician the information needed to determine an appropriate treatment plan. The device platform provides a foundation for patient education. Seeing the data and asking questions empowers patients to be more confident in managing their health.

Technology Improving Patient Outcomes

We are in a time of great innovation and progress. New devices and improvements in software are happening all the time.

The gold standard for hypertension treatment is utilizing a Home Based Patient Monitoring system (HBPM). In studies, this process has proven to yield the most accurate data, cost less, and increase patient engagement.

Benefits to Home Based Patient Monitoring (HBPM):

- Obtains multiple readings over time
- Eliminates White Coat Syndrome
- Data is highly reproducible
- Improves accuracy in predicting morbidity and mortality
- Detects variations in blood pressure
- Provides opportunities for clinicians to review data
- Increases patient understanding of hypertension and risk factors

When patients understand the data being collected and how it relates to their health, they may become more engaged in learning about self-management through their clinician. This can improve hypertension control and overall patient health.

Clinical Cardiology, February 2019 edition, published an expert clinical study which monitored BP data on patients using HBPM. They found that 91% of patients were able to achieve a target BP below 135/85mmHg. This demonstrates that RPM can be highly effective in treating hypertension.

Another benefit is decreased clinic visits. This limits potential exposure to other illnesses that could negatively affect BP and health.

Provider Choice: HBPM

Ease of use and excellent data collection make this the providers first choice for remote monitoring. It is comprised of a BP cuff connected to the monitoring device. The machine gives step-by-step instructions once it is turned on. It explains how and where

to place the cuff, how to start BP reading, and steps to transmit the data to the medical record.

Another advantage of this system is the ability to obtain multiple, random readings. This additional data improves clinician ability to track trends in BP results and make informed decisions on care.

Predictive analytics is an AI algorithm built into programing that assists clinicians with analysis of enormous amounts of data. It quickly identifies potentially life-threatening readings and flags the provider immediately, thus reducing the risk of adverse events and/or long-term deficits.

Potential Barriers to Effective HBPM

Digital literacy, especially in older generations, can be a challenge. Unfamiliarity with internet and digital software can be frustrating. Affordability of the monitoring device can be problematic. Connectivity challenges may also be encountered. Confirm patients have internet access or cellphone app to transfer data.

Processes for securing data and maintaining privacy need to be transparent. Ensuring system compatibility between software and provider electronic record is essential. The Health Insurance Portability and Accountability Act (HIPAA) consents need to be completed and signed by patients and providers.

Reimbursement from insurance carriers is critical for many patients, as they may be on a fixed income. Insurance companies frequently require healthcare professionals to justify the necessity for the device and submit paperwork prior to approval.

Promising Future for RPM

The promising outcome from RPM is just the start on the path to better patient health. The ability to make clinical decisions in real-time, incorporating current data, is changing the landscape of healthcare.

Healthcare will continue to use AI to expand capabilities and improve patient outcomes. Insurance companies will need to expand policies to cover state-of-the-art care that will decrease negative outcomes while saving money.

Patient engagement is crucial. Making technology easy to use and understand is essential. When patients are engaged, there is a shift to self-management and desire to keep themselves healthy, which will increase longevity and decrease healthcare costs.

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Expert Roles Moving Forward

Experts are at the forefront of technological innovations to improve patient care. Collaboration between all disciplines is needed for safe outcomes. AI will be a major part of any digital software. Clinicians need to remain up-to-date and/or be change agents in the journey forward. Professional associations need to support discussions on expanding health insurance coverage for remote patient monitoring. Continued research and data trending will be helpful to determine just how effective RPM can engage patients in their care and decrease costs along the way.