

# Telehealth Research Recap: Remote Patient Monitoring



## Remote Patient Monitoring and Access to Care

Remote patient monitoring (RPM) facilitates the real-time collection and transmission of health data from a patient to the health care provider. RPM supports the management of a range of conditions, from chronic diseases to managing health following hospital discharge.<sup>1,2</sup> RPM use is increasing; the number of Medicare enrollees using RPM was more than 10 times higher in 2022 than 2019.<sup>3</sup> RPM tools include technology to track blood sugar levels in real time for patients with diabetes, blood pressure monitors for patients with hypertension, and mobile health applications to track stress levels for individuals receiving behavioral health services. This technology enables patients to receive health care interventions without physical travel. By facilitating the remote transmission of patient data, such as vital signs, RPM allows health care providers to monitor patients and intervene promptly, when necessary, potentially reducing hospital admissions.<sup>4</sup> RPM also minimizes the need for frequent in-person visits and improves patient education and medication adherence, particularly when combined with other strategies such as telephone-based counseling.<sup>5</sup> These findings indicate that RPM is useful for a variety of conditions. Tailored approaches are necessary to ensure high-quality, accessible health care.

## Using RPM for Chronic Disease Management

RPM is particularly effective in managing chronic diseases, offering a robust approach for health care providers to regularly monitor patients with long-term health conditions.<sup>6</sup> Chronic diseases, such as diabetes and heart disease, require ongoing monitoring and management.<sup>7</sup> The continuous data stream from a patient to their health care provider creates a comprehensive picture of the patient's health

status over time. For example, sending regular blood pressure readings allows for timely adjustments to treatment plans and early intervention when needed.<sup>8</sup> RPM empowers patients to take an active role in their health management. In some cases, such as using an integrated RPM model for managing heart failure, RPM can help providers and their patients to manage acute health episodes, resulting in reduced readmissions and emergency department visits.<sup>9</sup> Figure 1 shows that while RPM for diabetes and hypertension was associated with lower HbA1c and blood pressure testing, it was not associated with lower HbA1c or blood pressure control.<sup>10</sup>

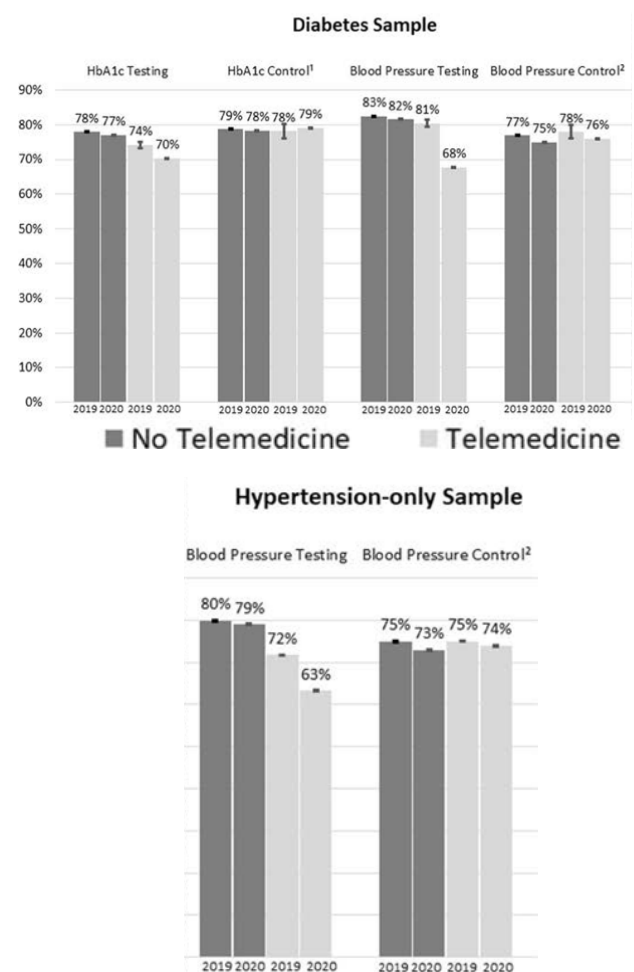
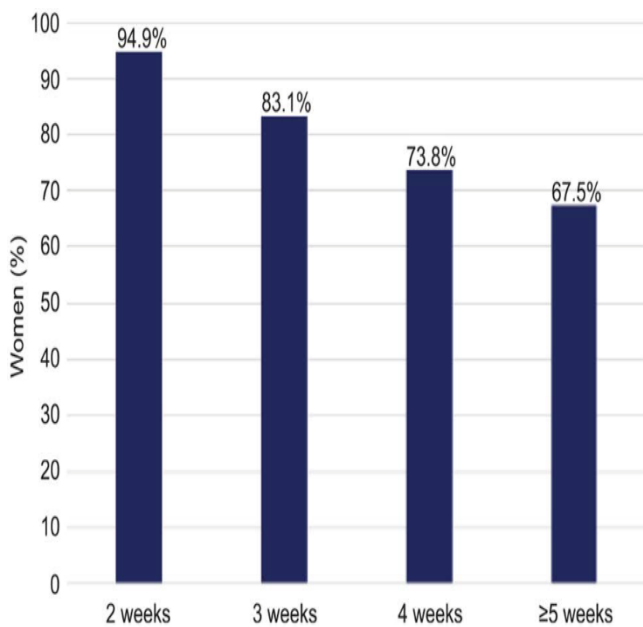


Figure 1. HbA1c and Blood Pressure Testing and Control with Remote Monitoring Use, 2018-2020<sup>11</sup>

## Patient Self-Management with RPM

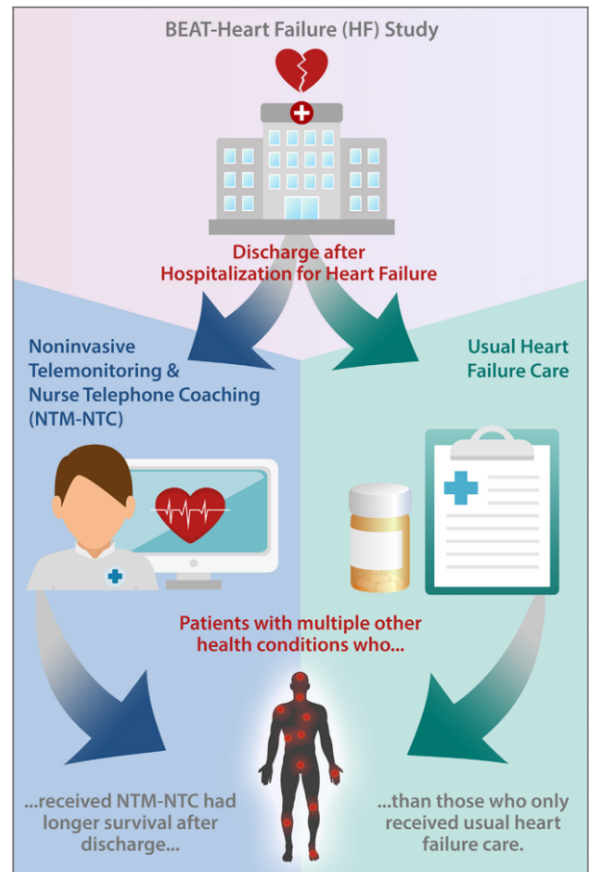
RPM significantly boosts patient self-management, which is a critical component in contemporary health care paradigms, particularly for those with chronic conditions.<sup>12</sup> By enabling patients to actively monitor their health metrics, such as blood glucose levels, blood pressure, and heart rate, RPM helps patients become active participants in their health care and facilitates shared decision-making.<sup>13</sup> This regular awareness fosters a sense of responsibility and control, motivating patients to adhere more closely to their treatment protocols and adjust their lifestyle to optimize their health.<sup>14</sup> For example, during the post-partum period, RPM for hypertension management can improve patient engagement and adherence to treatment, which may ultimately enhance clinical outcomes.<sup>15</sup> RPM data can also be used to personalize patient care plans, leading to tailored approaches for disease management.<sup>16</sup> This proactive approach can improve health outcomes, such as helping postpartum patients with hypertension better manage their condition.<sup>17</sup> Figure 2 shows the percentage of postpartum women with hypertension who continued to use RPM to manage their condition following delivery.<sup>18</sup> Nearly three-quarters of the patients continued to track their blood pressure three weeks post-partum, and more than two-thirds continued to do so a full month following delivery.<sup>19</sup>



**Figure 2. Percentage of Patients Continuing Postpartum Hypertension Management Using RPM from 2-5 Weeks and Beyond<sup>20</sup>**

## Using RPM for Real-Time Data Collection

Real-time data collection and timely intervention are significant advantages of RPM systems. Such capabilities are particularly beneficial for managing chronic conditions and post-surgical recovery, where sudden changes in health status can necessitate immediate medical attention.<sup>21,22</sup> One study shows that having patients communicate with health care professionals outside of a traditional care setting is helpful for patient engagement.<sup>23</sup> For example, by providing early warning signs of potential health issues for patients managing heart failure, RPM enables health care providers to intervene before conditions worsen, thereby reducing hospital admissions.<sup>24</sup> A proactive health care approach using telehealth and RPM for cardiovascular disease is comparable to in-person care for disease management and may provide additional benefits through increased communication and engagement.<sup>25</sup> Figure 3 shows the effectiveness of a noninvasive telemonitoring and nurse telephone coaching program on reducing mortality for patients with multiple comorbid conditions.<sup>26</sup>



**Figure 3. Non-invasive Monitoring- Nurse Telephone Coaching Program Impact on Mortality<sup>27</sup>**

## Resources

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- <sup>2</sup> Kimchi, A., Aronow, H.U., Ni, Y.M., et. al. Post-Discharge Noninvasive Telemonitoring and Nurse Telephone Coaching Improve Outcomes in Heart Failure Patients with High Burden of Comorbidity. *J Card Fail* 2023 May; 29(5):774-783. doi: 10.1016/j.cardfail.2022.11.012
- <sup>3</sup> Office of Inspector General, Additional Oversight of Remote Patient Monitoring in Medicare Is Needed. (OEI-02-23-00260) Office of Inspector General, Department of Health and Human Services, Sept 2024.
- <sup>4</sup> Lynch, K.A., Ganz, D.A., Saliba, D., et. al. Improving Heart Failure Care and Guideline-Directed Medical Therapy Through Proactive Remote Patient Monitoring-Home Telehealth and Pharmacy Integration. *BMJ Open Quality* 2022 Jul;11(3):e001901. doi:10.1136/bmjopen-2022-001901
- <sup>5</sup> Lee, S.G., Blood, A.J., Cannon, C.P., et. al. Remote Cardiovascular Hypertension Program Enhanced Blood Pressure Control During the COVID-19 Pandemic. *Journal of the American Heart Association.* 2023 Mar;12(6): e027296. doi:10.1161/JAHA.122.027296
- <sup>6</sup> Jackson, T.N., Sreedhara, M., Bostic, M., et. al. Telehealth Use to Address Cardiovascular Disease and Hypertension in the United States: A Systematic Review and Meta-Analysis, 2011-2021. *Telemedicine Reports.* 2023 May;4(1):67-86. doi:10.1089/tmr.2023.0011
- <sup>7</sup> Rodriguez, H.P., Ciemins, E., Rubio, K., et. al. Telemedicine use and decrements to type 2 diabetes and hypertension care during the COVID-19 pandemic. *BMC Digital Health.* 2024 <https://doi.org/10.1186/s44247-023-00056-7>
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- <sup>12</sup> Lee, S.G., Blood, A.J., Cannon, C.P., et. al. Remote Cardiovascular Hypertension Program Enhanced Blood Pressure Control During the COVID-19 Pandemic. *Journal of the American Heart Association.* 2023 Mar;12(6): e027296. doi:10.1161/JAHA.122.027296
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- <sup>21</sup> Arkerson, B.J., Finneran, M.M., Harris, S.R., et. al. Remote Monitoring Compared with In-Office Surveillance of Blood Pressure in Patients with Pregnancy-Related Hypertension. *Obstet Gynecol.* 2023 Oct; 142(4) doi: 10.1097/AOG.0000000000005327
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