

Build Intelligent Remote Monitoring Initiatives

How Remote Monitoring Can Operate At Scale
to Improve Care Delivery and Patient Outcomes





Overview

This white paper shows how recent market developments are leading to increased adoption of remote patient monitoring (RPM) initiatives and assesses the critical components that make them most effective - both for clinical teams and patients. Importantly, the paper presents a review of RPM-associated outcomes and discusses how RPM can be successfully implemented

to support patients in their journey to better health while also minimizing administrative burden on clinical teams. The paper concludes by showing how Memora Health’s unique engagement-first approach enables RPM efforts to scale effectively, with measurable impact on patient health, experience, and clinical operations.

PART I: The What and Why of Remote Patient Monitoring	3
PART II: Accelerating Remote Patient Monitoring: Market and Reimbursement Tailwinds	5
PART III: What the Evidence Shows: Outcomes and Impact of Remote Patient Monitoring	8
PART IV: Memora’s Approach to Remote Patient Monitoring	9
PART V: RPM in Practice: An Example for Heart Failure Patients.....	13
PART VI: Key Takeaways	15
PART VII: References	16

PART I:

The What and the Why of Remote Patient Monitoring


Care Outside the Clinic Setting

Whether in-person or virtually, patients only spend a small fraction of their time in a clinic setting receiving care. While clinicians are able to assess a patient's status and provide immediate intervention or referrals with ease during a visit, there is tremendous coordination and patient commitment required to longitudinally improve a patient's health. This has most clearly manifested in the prevalence and management of chronic conditions, sustained behavior change, and the navigation of complex care plans.

When considering that the average per-visit face-to-face time with a primary care practitioner is approximately only 18.5 minutes (Young et al., 2018) and an average hospital stay is between 4.6 to 6.1 days (CDC National Center for Health Statistics, 2016; Agency for Healthcare Research and Quality, 2018), it is clear that patients spend many more hours managing their health conditions outside the formal care setting.

In fact, adults who engage in health-related activities outside the clinic setting, such as sorting and taking medications, wound dressing, testing blood sugar levels, changing oxygen, etc., report spending on average 90 minutes per day on those activities, with 21% reporting 2 hours or more spent per day (Jonas et al., 2011; Jowsey et al., 2012). Particularly, older adults with diabetes report spending more time on health-related activities, with the highest decile reporting over 100 minutes spent per day (Yen et al., 2013). Even looking very broadly at the U.S. population, adults spend an average of 9.62 hours per day on personal care activities, which include health-related activities, and sleep (U.S. Bureau of Labor Statistics, 2020).

As these numbers show, patient journeys do not end when a clinical encounter is over. It is therefore imperative to support patients outside the four walls of the clinic to improve outcomes. Notably, giving clinicians the ability to remotely anticipate patient needs and adjust interventions based on symptoms has been documented to improve clinical outcomes and a patient's awareness of their care (Noah et al., 2018). While this core principle has been understood for many years in medicine, incentive structures and urgency have hindered large-scale adoption until now. The market is rapidly shifting - the COVID-19 pandemic, a renewed urgency to adopt value-based care, and a focus on digital health strategies has altered the landscape in the last year. In fact, innovative virtual care delivery models, including remote patient monitoring (RPM), that support patients beyond the clinic setting are fast becoming table stakes (Li, 2020).



18.5 Minutes
Average face-to-face
time with provider
per visit

What is Remote Patient Monitoring

Remote patient monitoring involves the collection and analysis of patient physiologic data that are used to develop and manage a treatment plan related to a chronic and/or acute health illness or condition (Wein, 2020). The data is most commonly leveraged as real-time insights into patient performance while also helping to predict future care needs. While RPM strategies offer limited effectiveness when implemented independently, they can bring meaningful clinical and financial value as part of a broader digital health strategy that guides patients through their care journeys.

RPM data has been effectively captured through three methods:

1. “Smart” medical devices with wireless connectivity that stream data directly to a clinician
2. Medical devices without wireless connectivity that provide data to patients to manually report
3. Miscellaneous devices that patients utilize (i.e. cell phones) that collect physiological data for patients to manually report

Devices can be implanted, e.g. pacemakers or defibrillators, while others can be external, e.g. weight scales, blood pressure cuffs, glucometers, and pulse oximeters. Device-based RPM is most effectively leveraged when supplemented with validated patient-reported outcomes measures, allowing patients to provide self-reported, qualitative data on their symptoms and health status.

As RPM data is collected, measurements that proactively indicate an adverse event are flagged for clinicians to enable real-time intervention, broadly preventing readmissions or ED visits. Importantly, recently added codes that facilitate billing for RPM services have made reimbursement possible for clinicians (see Table 1).

RPM data has
been effectively
captured through
three methods.

PART II:

Accelerating Remote Patient Monitoring: Market and Regulatory Tailwinds

While COVID-19 accelerated the adoption and expansion of telehealth services, other market and regulatory tailwinds, including surging patient demand for consumerized medicine, growth in value-based care arrangements, and the larger portfolio of RPM-related reimbursement codes are accelerating the utilization of remote medical technologies (Wosik et al., 2020; Olayiwola et al., 2020).

Increased Patient Demand

The increased pervasiveness of consumer technology is also directly increasing the demand for virtual-first healthcare (Zuehlke Heuser, 2017). Even before the COVID-19 pandemic, an Advisory Board survey showed that up to 77% of respondents would be open to virtual care with just under 20% having already used it (Zuehlke Heuser, 2017). With the onset of COVID-19, patients' willingness to use telehealth services has increased even further while also improving awareness and attitudes towards virtual care (Lee, 2020).

For example, in a recent survey 2 in 3 respondents said that their willingness to use virtual care has increased and 88% of those who had their first virtual care encounter during the pandemic would do so again (Lee, 2020). Employers are also actively supporting the uptake of virtual care, with 86% of employers promoting telehealth benefits (Lee, 2020).

Furthermore, increased affordability of commercially available wearables and other monitoring hardware has made adoption more attractive for both patients and providers (Sharp & Buckley, 2018). Specifically, the industry has moved from a

proprietary RPM hardware model to one that is focused on commercially available hardware, evolving software solutions, flexible pricing, and logistics support for providers (Sharp & Buckley, 2018). From a financial and quality of life perspective, RPM can also offer ways to avoid costs associated with high-acuity events and give patients both physical and fiscal reassurance. These trends point to virtual solutions, including RPM programs, as tools to help providers retain existing patients, build high levels of patient satisfaction, and attract new patients.

Growth in Value-Based Care Arrangements

The COVID-19 pandemic exposed serious challenges with fee-for-service reimbursement. As elective procedures and outpatient volume declined in early 2020 to increase capacity for COVID-19 patients, provider revenue dropped precipitously nationwide. To increase resilience in the healthcare services sector, both private payers and the Centers for Medicare and Medicaid Services (CMS) have expanded commitments to value-based care (VBC) arrangements (Pifer, 2020; Centers for Medicare and Medicaid Services, 2020; Terry & York, 2020). Using RPM to effectively route patients to the right care facilities, take preventive measures to avoid acute—often costly—exacerbations of disease, and track quality measures is a critical capability that can support VBC success. Equipping patients with devices that can transmit physiologic information back to their provider has enabled better management and fewer adverse events, including fewer hospitalizations and ED visits, contributing to better overall success in value-based care arrangements (Sharp & Buckley, 2018; Hennick, 2020; Wicklund, 2016; Hummel et al., 2019).

Regulatory Changes Impacting Reimbursement

As part of the 2021 Medicare Physician Fee Schedule (PFS), CMS expanded reimbursement codes for RPM services that will extend beyond the pandemic-related Public Health Emergency (PHE) (85 FR 84472). CMS also clarified that RPM would no longer be limited to patients with chronic conditions and could be used to address and monitor both acute and/or chronic conditions (Healthcare Information and Management Systems Society, 2020).

Similarly, twenty-one states have created specific Medicaid RPM reimbursement provisions that allow providers to bill for these services beyond the COVID-19 pandemic (Center for Connected Health Policy, 2020). Because fully-insured health plans must comply with both federal and state coverage requirements, this expansion in reimbursement has also been a catalyst for private insurers to adopt similar coverage and benefits for members (Weigel et al., 2020). For example, United Healthcare, according to its RPM benefit guidance (UnitedHealthcare, 2021), covers RPM not only across its

Medicare Advantage plans but also provides plan-specific RPM coverage options for individual and group health plans and for Medicaid plans based on each state's guidelines.

Specifically, the 2021 PFS, provides guidance on how clinicians can bill for RPM services. To qualify for RPM reimbursement, a clinician must first obtain patient consent for RPM-supported treatment and the consent must be documented in the patient's medical record. The RPM device used as part of the reimbursable service must meet the definition of section 201(h) of the Federal Food, Drug, and Cosmetic Act and must be able to automatically record and upload patient physiologic data (Lacktman & Ferrante, 2020).

During the currently still ongoing PHE, RPM services can be initiated for new patients but once the PHE is lifted, RPM is only available for established patients who have had an Evaluation and Management visit. As with other reimbursable services, RPM must be reasonable and necessary for the patient's diagnosis or treatment protocol (Lacktman & Ferrante, 2020). Table 1 provides a summary of the most important RPM-related codes.

List of Expanded RPM CPT Codes, Description, and Price

CPT Codes	Description	2021 Medicare PFS Price (non-facility)*
99453	<ul style="list-style-type: none">Initial RPM set-up and patient education on use of deviceCan be billed once per episode of care	\$19.19
99454	<ul style="list-style-type: none">RPM device recordings or alerts collected on at least 16 daysCan be billed once every 30 days	\$63.16
99457	<ul style="list-style-type: none">RPM treatment management services provided by clinical staff, physician, other qualified healthcare professionalCounts time engaged in interactive communication with patient and non-face-to-face care management servicesFirst 20 minutes, can be billed once every 30 days	\$50.94
99458	<ul style="list-style-type: none">Same parameters as 99457Additional 20 minutes, billed once every 30 days	\$41.17
99091	<ul style="list-style-type: none">Collection and interpretation of transmitted physiologic data by physician or qualified healthcare professionalMinimum of 30 minutes of time, can be billed every 30 days	\$56.88

*Based on CMS's national average payment amount as specified in the Jan 2021 Physician Fee Schedule update. Regional prices, charges, and reimbursement may differ. Listed prices are an estimate and for general directionality. Source: <https://www.cms.gov/medicare/physician-fee-schedule/search>

While all codes are still in use, CPT Code 99091 was created in 2002 and has largely been replaced by codes 99453, 99454, 99457, and 99458 which allow for more accurate and flexible reimbursement for RPM related activities, including patient education and ongoing care management services.

There are two additional CPT Codes specifically designated for self-measured blood pressure (SMBP), 99473 and 99474, that round out the most prevalent RPM codes (Table 2).

For clinicians to obtain reimbursement under these codes, SMBP measurements must be reported by the patient or by the caregiver to the practice manually or electronically (American Medical Association, 2020).

With these market and regulatory changes, the willingness to adopt and expand RPM programs has never been greater. Providers have shown an increased interest to invest in digital health technologies, creating an ongoing shift in how care is delivered outside the clinic setting.

Self-Measured Blood Pressure (SMBP) CPT Codes, Description, Price

CPT Codes	Description	2021 Medicare PFS Price (non-facility)*
99473	<ul style="list-style-type: none"> SMBP using a device validated for clinical accuracy Patient education/training and device calibration Billed once per device 	\$11.52
99474	<ul style="list-style-type: none"> Self-measurements of two readings one minute apart, twice daily over a 30-day period (minimum of 12 readings) Data reports by patient/caregiver Report of average systolic and diastolic pressures Communication of a treatment plan to the patient Billed once per month 	\$15.00

*Based on CMS's national average payment amount as specified in the Jan 2021 Physician Fee Schedule update. Regional prices, charges, and reimbursement may differ. Listed prices are an estimate and for general directionality. Source: <https://www.cms.gov/medicare/physician-fee-schedule/search>

PART III:

What the Evidence Shows:

Outcomes & Impact of Remote Patient Monitoring

There have been several recent meta-analyses and peer-reviewed articles published on the impact of RPM on health outcomes and costs. Most of the published studies have focused on chronic disease management, in particular COPD, CHF, and diabetes, with some using implanted devices for the RPM intervention. Overall, the impact of stand-alone RPM programs has been mixed pointing to the need for added patient support and engagement strategies to realize the full RPM potential. The following brief overview discusses some of the more promising results of RPM programs.

Overview of Recent Literature

As discussed, the primary goal of RPM programs is to help patients better manage their specific health condition and to enable providers to detect any changes in physiologic data as early as possible for better management and lower intensity interventions. In particular, lower hospital admissions and readmissions, lower ED utilization, fewer complications, and higher patient satisfaction, which all tie to provider payment incentives and penalties, can be supported through successful RPM programs. Supporting these outcomes are several promising studies with directionally positive results. For example, a study led by Capital Blue Cross and Geneia for heart failure patients achieved over \$8,000 in savings per patient, a 45% reduction in acute hospital admissions, a 34% reduction in admissions directly linked to heart failure, and a 96% patient satisfaction score (Wicklund, 2016). In addition, in a 12-month study for heart failure patients that used an implanted defibrillator for the RPM program, hospitalizations and annual

costs decreased statistically significantly between the RPM intervention group and the control group (Capucci et al., 2017).

Hummel et al, also using an implanted cardiac defibrillator for the RPM program, found that the RPM intervention increased life expectancy by 6.85 years with lower readmissions rates and >\$550 hospital cost savings per patient per year (Hummel et al., 2019). Bolstering some of these results was a 2018 RPM intervention at UPMC for CHF patients which found that during the one-and-a-half years of remote patient monitoring period, patients had statistically significant decreases in hospital observation stays with adherence and satisfaction reaching over 90% (Siwicki, 2018). With less conclusive outcomes, a meta-analysis that included five studies of RPM interventions for heart failure and COPD patients found some positive directionality for hospitalization and ED visit reductions but the results were not statistically significant (Noah et al., 2018).

In looking at RPM programs specifically focused on type 2 diabetes patients, a 2018 meta-analysis of randomized control trials found that telehealth interventions, including automatic transmission of self-monitored blood glucose levels and phone-based interventions, led to statistically significant improvements in patients' HbA1c levels compared with usual care (Lee et al., 2018). Similarly, in a 2020 review of RPM-based interventions for patients with type 2 diabetes, the RPM-supported treatment components were associated with statistically significant lower levels of patients' HbA1c levels (Salehi et al., 2020).

PART IV:

Memora's Approach to Remote Patient Monitoring

Memora takes a patient-centric engagement-first approach to successfully implement and sustain RPM programs while fully supporting patients in their care journey. This engagement-first approach coupled with advanced natural language processing (NLP) technical capabilities allows Memora to overcome the three main barriers that often prevent stand-alone RPM programs from delivering on their promise. Three important reasons that can lead to limited RPM success include:

1. Low patient activation, adoption, and engagement
2. Overwhelming volume of device data and poor signal-to-noise ratio or clinicians
3. Lack of qualitative patient context to supplement device data

Here is how Memora uniquely overcomes these challenges:

High Patient Activation, Adoption, and Engagement

Because high patient activation and engagement play a critical role in leading to more successful RPM programs (Su et al., 2019; Alencar et al., 2020), Memora uses a patient-centric approach to support patients in fully adopting and engaging in their RPM program. In particular, Memora uses an engagement-first approach based on motivational interviewing techniques to develop trust and patient activation. Memora uniquely supports patients throughout their care journey by meeting them where they are, taking into account each patient's goals and adjusting messaging based on individual preferences,

including 109 different language options and four different communication channels (SMS, WhatsApp, IVR, and email). Memora also collaborates with clinical teams to map customized patient interactions to care pathways that include specific outreach points, e.g. tip sheets, goal setting, medication reminders, pain assessment, symptom reporting, condition and device-related FAQs, appointment reminders, and more.

The frequency and type of interactions can be automatically increased or decreased based on patient needs, keeping patients engaged and activated while also creating an excellent experience. For clinicians, this approach creates a unified view into all patient interactions and helps identify potential care gaps to anticipate areas of need proactively.

Through this approach, Memora consistently attains a patient satisfaction score of over 90% from patients who use the platform and has shown a 60-day patient engagement rate of 74%. Patients' health literacy, as measured through KAP scores, has been clinically validated to improve by just under 35% with Memora. These engagement successes have also carried over to clinical success – Memora has shown a 16% reduction in 30-day readmission rates and a 62% increase in treatment adherence.

Improved Signal-to-Noise Ratio for Clinicians

Continuous data reporting from RPM devices can create “data noise” for clinicians, requiring added time to assess and understand all of the transmitted data. Sifting through this data to know which reported values are important clinical indicators, i.e. the signal, for particular patients can increase administrative burden, uncompensated time, and delay in the actual follow-up process. Memora makes data actionable through escalated concerns that can be configured based on patients’ clinical status, disease progression, and patient-reported information.

Memora can push escalated concerns directly into the electronic medical record to provide actionable information to the clinical team in real-time. This not only saves time in sifting through noisy device data, it also allows clinicians to follow-up timely while having the option to trigger additional automated workflows to help patients return to a more normal or managed state in their care journey. To that end, Memora has shown a 64% reduction in clinical messages allowing clinicians to more effectively focus on those patients who need their intervention. Memora also receives high clinician satisfaction marks ranging up to 96% on average.

Patient Context for Better Clinical Decisions

Oftentimes devices can transmit readings that might be out of a patient’s normal range and thereby trigger alerts for clinicians. Unfortunately, by just examining the device data alone, any qualitative information or context from the patient about the reading is missing and could lead to unnecessary outreach or misinterpretation by the clinical team.

Memora combines device data with real-time patient input and context to help further focus interventions and narrow outreach to those patients who are in fact in need of additional clinical care. For example, if a patient’s accelerometer data is unusually low and prompts an alert for the clinical team, it is helpful for the clinical team to know whether the patient is truly sick, e.g. experiencing shortness of breath that is causing the inactivity, or whether the patient is voluntarily choosing to limit activity, for example watching several football games in a row.

Memora helps to provide that context. Having additional information surrounding the transmitted data can allow for a more tailored clinical team follow-up, save staff time, and create a better experience for patients. Similarly, if patients have instances where device data fails or is not accurately transmitted, Memora provides an additional option for the clinical team to check in on patients in real time using the patient’s preferred communication and engagement channel, e.g. SMS messages.

Memora's Flexible Approach

Using these approaches allows Memora to work with clinical teams to effectively match patients to the right level of monitoring intensity, taking into account patients' condition status and reported symptoms and outcomes (Figure 1).

For example, patients at lower risk for complications can start a deviceless monitoring program reporting symptoms and responding to check-ins as a way to manage their chronic conditions, such as diabetes and high blood pressure. Memora uses patients' reported outcomes to help identify patients whose risk level for complications is rising. Those patients can then be assessed by the clinical team for a higher intensity monitoring program that includes device-supported monitoring and reporting. For those patients with worsening symptoms and high-risk condition status, an integrated, device-based approach can be used as a third, high-intensity management step.

Memora supports the clinical team and guides patients through the progression of monitoring intensity. If patient-reported symptoms worsen, Memora alerts the clinical team to ensure patients can be assessed for a higher intensity monitoring approach. As the indicated monitoring intensity increases, Memora helps patients use their device appropriately so that reporting is completed timely and accurately and monitoring is effective. To ensure appropriate levels of engagement and activation continue, Memora supports dynamic increases in the level of wrap-around engagement support to help patients through their care journey, complementing the device-based monitoring.

Memora's Adjustable Approach to Remote Patient Monitoring

Highest Intensity:

Automated Device-Based Monitoring

Patients physiologic data is reported automatically through an integrated device. Highest intensity monitoring for cohort at high risk for complications.

Higher Intensity:

Device-Supported Monitoring

Patients use a device to measure physiologic data and self report outcomes on device readings. Higher intensity monitoring for patients who are at risk for complications.

Low Intensity:

Deviceless Monitoring

Patients follow deviceless care pathways to monitor symptoms and outcomes. Low intensity monitoring for patients whose conditions are well managed.

Memora Supports Clinical Teams in Launching a Successful RPM Program

To launch a successful RPM program, Memora works with the clinical team to determine the patient identification and enrollment criteria as well as the associated care management protocols (Figure 2). Memora then digitizes and automates these workflows, supporting the clinical team in managing the RPM program. Memora also has the ability to procure devices, distribute them to patients, and support patients as they begin using the device. Memora’s signature engagement-first approach allows patients to engage in their care journey at a deeper behavioral and social level, making the intervention more successful and sustained.

Once patients are onboarded with RPM, device generated data can flow to the Memora dashboard as well as the EMR. Customizable concern escalations coupled with patient-reported information can trigger automated alerts for clinicians, separating true intervention needs– or signals– from noise.

Based on on these inputs, Memora can proactively identify patients at risk for adverse events. As patients return to a lower risk status, Memora can support them in their ongoing care journey through automated guidance and engagement support. Memora has tested this approach in several clinical settings. For example, in a radiation oncology RPM program, identified patients use accelerometers as part of their care plan and in a separate medical oncology RPM program, patients use smart pill bottles, or MEMScaps, to support better medication adherence.

Memora’s Approach to Launching RPM Programs

Plan Program and Procure Devices	Activate Devices and Drive Adoption	Analyze Data and Support Members
Set program goals	Support member enrollment	Access device data and identify at-risk members in real-time
Set program goals	Distribute and activate device (as necessary)	Automatically adjust support based on member responses
Procure devices and plan rollout	Teach device use via custom NLP-powered SMS	Embed care management escalation workflows
Create customized content	Drive adoption with automated check-ins	

PART V:

Remote Patient Monitoring in Practice: An Example for Heart Failure Patients

Heart failure is a great candidate for a focused RPM program to support patients in their health journey. Heart failure continues to be a significant cause for morbidity and mortality in the United States affecting approximately 6.2 million adults (Centers for Disease Control and Prevention, 2020) and was the primary or contributing cause of death for approximately 380,000 people, or 13.4%, in the US in 2018 (Centers for Disease Control and Prevention, 2020). To manage heart failure effectively, patients need to monitor their body weight daily so fluid retention can be detected early to avoid complications (American Heart Association, 2017). Patients can be supported in that health behavior and can accurately record their daily weight by using a smart scale. A smart scale automatically sends weight readings to clinicians, alerting them of any concerning changes.

Operationalizing a Smart Scale RPM Program

For patients diagnosed with heart failure, a RPM strategy using a smart scale coupled with Memora's engagement and patient-outcome reporting workflows can create a highly effective program. For patients who agree to participate, clinicians can provide the following reimbursable services.

Initial RPM Set-up and Patient Education

To initiate a patient on the smart scale, the clinician must first obtain patient consent and document the consent in the medical record. As a next step, the clinician needs to provide patient education on how to set up and use the scale on a daily basis. Memora will also reinforce any educational

messaging through its engagement program. The clinician can bill a one-time device set-up and patient education code for these services.

Billing Component

CPT Code
99453

Average Price*
\$19.19

(*Based on CMS's national average payment amount as specified as part of the Jan 2021 Physician Fee Schedule update. Source: <https://www.cms.gov/medicare/physician-fee-schedule/search>)

Monthly RPM Physiologic Data Transmission

As weight data gets transmitted to the clinician on a daily basis, the clinician can monitor the data and any alerts for weight fluctuations and associated clinical complications. Memora will remind patients about their weight tracking and message patients for other symptom reporting and any needed support. The clinician can bill a monthly base rate for remote monitoring of physiologic parameters.

Billing Component

CPT Code
99454

Average Price
\$63.16

Monthly Treatment Management Services

Clinical staff, physicians, or other qualified healthcare professionals will need to allocate time for RPM treatment management services, which include interactive communication with the patient and non-face-to-face care management services. Memora supports clinicians in these activities by providing consolidated dashboard views, exportable data, SMS transcripts, and escalated concerns to support RPM assessments. Clinicians can bill for these services in 20 minute increments on a monthly basis.

Billing Component

CPT Code
99457, 99458

Average Price
\$50.94, \$41.17

Combining these components (Table 3), a clinician can expect up to approximately \$215 in reimbursement in the first month for initiating an RPM smart scale program for a patient with heart failure. While these reimbursement levels will vary by payer, geography, and possible co-pays, these figures provide a general scope of impact.

It is worth repeating that these recent changes in reimbursement opportunities for clinicians show CMS' recognition of the importance of digital health solutions and its commitment to supporting patients throughout their entire care journey. Memora can be a highly effective and collaborative partner for clinicians who are considering or expanding their RPM program and help make it a sustained success.

Reimbursable RPM Program Components

Activity	Initial RPM Set-Up (non recurring)	Monthly RPM (base rate)	Treatment Management Services (1-20 mins)	Add-on Treatment Management Services (21-40 mins)	Add-on Treatment Management Services (41-60 mins)
CPT Code	99453	99454	99457	99458	99458
Per CPT Code Price*	\$19.19	\$63.16	\$50.94	\$41.17	\$41.17
Cumulative Total	\$19.19	\$82.35	\$133.29	\$174.46	\$215.63

PART IV: Key Takeaways

RPM initiatives are here to stay and are rapidly expanding. Even though more evidence about the potential clinical improvements of RPM should continue to be studied and established, current market dynamics make the adoption of sophisticated digital strategies – and in particular RPM – an area of growing interest and expansion across many providers and stakeholders.

While COVID-19 has rapidly accelerated this expansion, other market forces have also added to this shift, including regulatory changes, a continued progression toward more value-based care, and a recognition that comprehensive patient journeys outside the clinic setting are critical to effectively manage patients' health and costs.

Rooted in an engagement-first approach, Memora has developed comprehensive patient journeys that proactively anticipate patient needs and that support patients outside the care setting. As Memora Health has demonstrated, modernizing care delivery using technology solutions coupled with comprehensive engagement journeys is a critical path to improve clinical outcomes for patients and to create more coordinated and efficient workflows for providers.

PART V: References

- Agency for Healthcare Research and Quality. (2018, December). Overview of U.S. Hospital Stays in 2016: Variation by Geographic Region. Healthcare Cost and Utilization Project. Retrieved January 10, 2021, from <https://www.hcup-us.ahrq.gov/reports/statbriefs/sb246-Geographic-Variation-Hospital-Stays.jsp>
- Alencar, M., Johnson, K., Gray, V., Mullur, R., Gutierrez, E., & Dionico, P. (2020, March). Telehealth-Based Health Coaching Increases m-Health Device Adherence and Rate of Weight Loss in Obese Participants. *Telemed J E Health*, 26(3), 365-368. 10.1089/tmj.2019.0017
- American Heart Association. (2017, May 31). Managing Heart Failure Symptoms. *Heart Failure*. Retrieved February 10, 2021, from <https://www.heart.org/en/health-topics/heart-failure/warning-signs-of-heart-failure/managing-heart-failure-symptoms>
- American Medical Association. (2020). SMBP CPT® coding. AMA. Retrieved January 15, 2021, from <https://www.ama-assn.org/system/files/2020-06/smbp-cpt-coding.pdf>
- Capucci, A., De Simone, A., Luzi, M., & Calvi, V. (2017, September 1). Economic impact of remote monitoring after implantable defibrillators implantation in heart failure patients: an analysis from the EFFECT study. *Europace*, 19(9), 1493-1499. 10.1093/europace/eux017
- CDC National Center for Health Statistics. (2016). Hospital admissions, average length of stay, outpatient visits, and outpatient surgery, by type of ownership and size of hospital: United States, selected years 1975–2014. Trend Tables. Retrieved January 10, 2021, from <https://www.cdc.gov/nchs/hsr/content2016.htm#082>
- Center for Connected Health Policy. (2020). Current State Laws & Reimbursement Policies.
- Center for Connected Health Policy. Retrieved January 20, 2021, from <https://www.cchpca.org/telehealth-policy/current-state-laws-and-reimbursement-policies?jurisdiction=72&category=All&topic=5>
- Centers for Disease Control and Prevention. (2020, September 8). Heart Failure. CDC. Retrieved February 12, 2021, from https://www.cdc.gov/heartdisease/heart_failure.htm
- Centers for Medicare and Medicaid Services. (2020, September 15). CMS Issues New Roadmap for States to Accelerate Adoption of Value-Based Care to Improve Quality of Care for Medicaid Beneficiaries. CMS Newsroom. Retrieved January 25, 2021, from <https://www.cms.gov/newsroom/press-releases/cms-issues-new-roadmap-states-accelerate-adoption-value-based-care-improve-quality-care-medicare-centers-for-medicare-and-medicare-services>
- (2020, December 28). 85 FR 84472. *Federal Register*. Retrieved 20 January, 2021, from <https://www.federalregister.gov/documents/2020/12/28/2020-26815/medicare-program-cy-2021-payment-policies-under-the-physician-fee-schedule-and-other-changes-to-part>
- Grustam, A., Severens, J., & Van Nijmegen, J. (2014, February 4). Cost Effectiveness of Telehealth Interventions for Chronic Heart Failure Patients: A Literature Review. *International Journal of Technology Assessment in Health Care*, 30(1), 59-68
- Healthcare Information and Management Systems Society. (2020, March 31). Remote Patient Monitoring: COVID-19 Applications and Policy Challenges. HIMSS. Retrieved January 26, 2021, from <https://www.himss.org/news/remote-patient-monitoring-covid-19>
- Hennick, C. (2020, April 27). How Remote Patient Monitoring Programs Are Beneficial. *Health Tech Magazine*. Retrieved January 25, 2021, from <https://healthtechmagazine.net/article/2020/04/how-remote-patient-monitoring-programs-are-beneficial>
- Hummel, J. P., Leipold, R. J., Amorosi, S. L., & Bao, H. (2019, July). Outcomes and costs of remote patient monitoring among patients with implanted cardiac defibrillators: An economic model based on the PREDICT RM database. *Journal of Cardiovascular Electrophysiology*, 30(7), 1066–1077. 0.1111/jce.13934
- Jonas, D. E., Ibuka, Y., & Russell, L. B. (2011, July). How Much Time Do Adults Spend on Health-related Self-care? Results from the American Time Use Survey. *Journal of the American Board of Family Medicine*, 24(4), 380-390. 10.3122/jabfm.2011.04.100260
- Jowsey, T., Yen, L., & W, P. M. (2012, December 3). Time spent on health related activities associated with chronic illness: a scoping literature review. *BMC Public Health*, 12, 1044. 10.1186/1471-2458-12-1044
- Lacktman, N. M., & Ferrante, T. B. (2020, August 5). Top Ten Medicare Remote Patient Monitoring FAQs for 2021. Foley & Lardner LLP. Retrieved January 20, 2021, from <https://www.foley.com/en/insights/publications/2020/08/ten-medicare-remote-patient-monitoring-faqs-2021>
- Lee, E. (2020, July 28). How COVID-19 accelerated the push toward telehealth. Kaiser Permanente. Retrieved January 26, 2021, from <https://business.kaiserpermanente.org/insights/telehealth/covid-19-accelerated-telehealth>
- Lee, P. A., Greenfield, G., & Pappas, Y. (2018, June 26). The impact of telehealth remote patient monitoring on glycemic control in type 2 diabetes: a systematic review and meta-analysis of systematic reviews of randomised controlled trials. *BMC Health Services Research* volume, 18(1), 495. 10.1186/s12913-018-3274-8
- Li, J. (2020, December 16). RPM's role in COVID-19. *Healthcare Business & Technology*. Retrieved January 22, 2021, from <https://www.healthcarebusinessstech.com/rpms-role-in-covid-19/>
- Nixon, C. (2018, January 11). How to get paid for Remote Patient Monitoring with CPT Code 99091. Nixon Gwilt Law. Retrieved January 25, 2021, from <https://nixongwiltlaw.com/nlg-blog/2018/1/9/reimbursement-for-remote-patient-monitoring-cpt-99091>
- Noah, B., Keller, M. S., & Mosadeghi, S. (2018, January 15). Impact of remote patient monitoring on clinical outcomes: an updated meta-analysis of randomized controlled trials. *npj Digital Medicine*, (20172). <https://doi.org/10.1038/s41746-017-0002-4>
- Olayiwola, J. N., Magaña, C., & Harmon, A. (2020, June 25). Telehealth as a Bright Spot of the COVID-19 Pandemic: Recommendations From the Virtual Frontlines ("Frontweb"). *JMIR Public Health Surveillance*, 6(2), e19045. 10.2196/19045

- Pifer, R. (2020, June 25). North Carolina BCBS seeks to keep primary care practices afloat, nudge to value-based care. *Healthcare Dive*. Retrieved January 25, 2021, from <https://www.healthcaredive.com/news/north-carolina-bcbs-seeks-to-keep-primary-care-practice-s-afloat-nudge-to-v/580477/>
- Remetric Health. (2019, February 18). Private Insurance Providers Follow Medicare in Reimbursement for Remote Patient Monitoring. Remetric Health. Retrieved January 26, 2020, from <https://remetrichealth.com/2019/02/private-insurance-providers-follow-medicare-in-reimbursement-for-remote-patient-monitoring/>
- Salehi, S., Olyaeemanesh, A., Mohammadreza, M., Nasli-Esfahani, E., & Riaz, H. (2020, June). Assessment of remote patient monitoring (RPM) systems for patients with type 2 diabetes: a systematic review and meta-analysis. *J Diabetes Metab Disord*, 19(1), 115–127. 10.1007/s40200-019-00482-3
- Sharp, B., & Buckley, C. (2018, October 2). Remote Patient Monitoring 2018. KLAS Research. Retrieved January 24, 2021, from <https://klasresearch.com/report/remote-patient-monitoring-2018/1273>
- Siwicki, B. (2018, May 24). At UPMC, remote patient monitoring helps reduce ER utilization and hospital readmissions. *Healthcare IT News*. Retrieved January 26, 2021, from <https://www.healthcareitnews.com/news/upmc-remote-patient-monitoring-helps-reduce-er-utilization-and-hospital-readmissions>
- Su, D., Michaud, T. L., Estabrooks, P., & Schwab, R. J. (2019, October). Diabetes Management Through Remote Patient Monitoring: The Importance of Patient Activation and Engagement with the Technology. *Telemed J E Health*, 25(10), 952-959. 10.1089/tmj.2018.0205
- Terry, D., & York, B. (2020, October 7). Value-based Care After COVID-19: What Healthcare Leaders Need to Know. *Medical Economics*. Retrieved January 25, 2020, from <https://www.medicaleconomics.com/view/value-based-care-after-covid-19-what-healthcare-leaders-need-to-know>
- United Healthcare. (2021, January 11). Remote Patient Monitoring. United Healthcare Remote Patient Monitoring. Retrieved February 4, 2021, from <https://www.uhcprovider.com/en/resource-library/news/Novel-Coronavirus-COVID-19/covid19-telehealth-services/covid19-telehealth-remote-patient-monitoring.html>
- U.S. Bureau of Labor Statistics. (2020). Average hours per day spent in selected activities by sex and day. American Time Use Survey. Retrieved 12 February, 2021, from <https://www.bls.gov/charts/american-time-use/activity-by-sex.htm>
- Weigel, G., Ramaswamy, A., Sobel, L., Salganicoff, A., Cubanski, J., & Freed, M. (2020, May 11). Opportunities and Barriers for Telemedicine in the U.S. During the COVID-19 Emergency and Beyond. Kaiser Family Foundation. Retrieved February 4, 2021, from <https://www.kff.org/womens-health-policy/issue-brief/opportunities-and-barriers-for-telemedicine-in-the-u-s-during-the-covid-19-emergency-and-beyond/>
- Wein, E. H. (2020, December 7). 2021 Medicare Remote Patient Monitoring FAQs: CMS Issues Final Rule. *National Law Review*. Retrieved January 25, 2021, from <https://www.natlawreview.com/article/2021-medicare-remote-patient-monitoring-faqs-cms-issues-final-rule#>
- Wicklund, E. (2016, June 15). mHealth Study: Remote Monitoring Cuts Costs, Hospitalizations. *Health Intelligence*. Retrieved January 8, 2021, from <https://mhealthintelligence.com/news/mhealth-study-remote-monitoring-cuts-costs-hospitalizations>
- Wosik, J., Fudim, M., & Cameron, B. (2020, June). Telehealth transformation: COVID-19 and the rise of virtual care. *Journal of the American Medical Informatics Association*, 27(6), 957–962. 10.1093/jamia/ocaa067
- Yen, L. E., McRae, I. S., Jowsey, T., & Bagheri, N. (2013). Time spent on health related activity by older Australians with diabetes. *J Diabetes Metab Disord*, 12, 33. 10.1186/2251-6581-12-33
- Young, R. A., Burge, S. K., Kumar, K. A., Wilson, J. M., & Ortiz, D. F. (2018). A Time-Motion Study of Primary Care Physicians' Work in the Electronic Health Record Era. *Family Medicine*, 50(2), 91-99. Retrieved January 10, 2021, from <https://journals.stfm.org/familymedicine/2018/february/young-2017-0121/>
- Zuehlke Heuser, E. (2017, April 27). What do Consumers Want from Virtual Visits? The Advisory Board. Retrieved January 22, 2021, from <https://www.advisory.com/topics/consumerism/2017/04/virtual-visits-briefing>



About Memora Health

Memora Health is the leading technology platform for virtual care delivery and complex care management. Memora partners with leading health systems, health plans, life science companies, and digital health companies to transform the care delivery process for patients and care teams.

The company's platform digitizes and automates complex care workflows, supercharging care teams by intelligently triaging patient-reported concerns and data to appropriate care team members and providing patients with proactive, two-way communication on their care journeys.

Learn what Memora Health can do for you

info@memorahealth.com

memorahealth.com