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Understanding the Value of Remote Patient Monitoring

Overview

Remote patient monitoring (RPM) uses digital technologies to collect medical and other health data from a patient in one location and electronically transmits that information securely to a health care provider in a different location.[1] A subset of telehealth, RPM can empower patients to participate in and better manage their health care by generating their own data (blood pressure, glucose levels, heart rate, temperature, etc.). Patient-generated data[2] collected outside of a clinical setting (typically the patient's home) provides a more comprehensive view of a patient's health over time, while also allowing providers to track treatment progress and initiate timely interventions when needed.[3]

RPM is typically used post-discharge (from a hospital or nursing home) for chronic care and high-risk patients. Data is collected using devices, such as biosensors, wearables, smartphones, and implantables, and then transmitted to providers in primary care settings, hospitals, nursing homes, and other care management programs. This helps to keep patients healthy and reduce the number of hospitalizations, which can improve quality of life and contain costs. It also allows older and disabled patients to live at home longer. In addition, some RPM technologies allow for real-time audio and video interactions between patients and providers.

How to Use RPM

RPM data can be collected by medical devices or through software interfaces installed on smartphones, tablets, or smartwatches. Medical applications are common clinical tools as they can be stored on smart devices, use other sensors on these devices (e.g., camera to capture and share images), and provide patient education through videos or touch-based teaching methods, among other things.[4] These applications can capitalize on the ability of smart devices to synchronize with other peripheral devices or systems (e.g., mobile ECG devices, wireless scales, medication adherence systems, etc.) and wearables (e.g., activity trackers) through an Internet connection.[5]

The variety of patient-generated data collected through RPM can provide insight into health, activity, diet and exercise, the environment, and social determinants of health. Primary care providers may track patients with chronic conditions to enhance care management, share educational materials about their conditions, and send treatment reminders.[6] For example, continuous glucose monitoring in patients with diabetes can alert abnormal readings and enable a provider consultation to adjust treatment.[7] RPM can be used for post-discharge care to reduce avoidable in-person visits from post-

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[1] Center for Connected Health Policy, *Remote Patient Monitoring (RPM)*. Available at: www.cchpca.org/about/about-telehealth/remote-patient-monitoring-rpm.

[2] Data created, recorded, or gathered by or from patients (or family members or other caregivers).

[3] American Heart Association, Using Remote Patient Monitoring Technologies for Better Cardiovascular Disease Outcomes Guidance. Available at: www.heart.org/-/media/files/about-us/policy-research/policy-positions/clinical-care/remote-patient-monitoring-guidance-2019.pdf?la=en&hash=A98793D5A043AB9940424B8FB91D2E8D5A5B6BEB.

[4] American Society of Health-System Pharmacists, *Evaluating Mobile Medical Applications*, 2014. Available at: store.ashp.org/Default.aspx?TabID=251&productId=327756434.

[5] Health Tech Magazines, *Technology and Telemedicine*. Available at: www.healthtechmagazines.com/technology-and-telemedicine/.

[6] AdvancedMD, *Will Remote Patient Monitoring Benefit Physicians and Patients?* Available at: www.advancedmd.com/learn/will-remote-patient-monitoring-benefit-physicians-patients/.

[7] mHealth Intelligence, *Remote Patient Monitoring Brings mHealth Care Management Into the Home*. Available at: mhealthintelligence.com/features/remote-patient-monitoring-brings-mhealth-care-management-into-the-home.

surgical complications, adverse medication effects, among other things.[8] Providers treating patients for behavioral health and substance use conditions may facilitate care coordination with other specialists involved in treatment, identify early warning signs of relapse, or address shifts in patients' moods or activities through RPM.[9] Patient management and communication can also be supported by RPM during a public health emergency. Providers may develop and adapt care plans at a distance, as well as triage and refer patients to the hospital as needed.[10]

Key Elements of RPM Implementation

Define the Program

Prior to deployment, providers must identify their RPM objectives and how these align with organizational goals. The initiative should prioritize use cases and target appropriate patients, including those most likely to benefit from RPM, to optimize value to the organization and patients served.[11] The RPM program should have a definitive length (i.e., how long patients will be monitored) in accordance with their condition and symptoms, and identify data to be collected that can be accurate and complete to effect clinical care decisions.[12]

Vendor Selection

Comparing RPM vendors enables providers to identify the operational and clinical benefits that best meet their needs and the needs of patients. Key considerations may include health indicator measurement, ease of use, customizability, reporting capabilities, EHR integration, clinical and technical components, service support, and cost, among other things.[13]

Privacy and Security

Providers and health care organizations are responsible for protecting the privacy and security of patient data to the same standards as in-patient visits.[14] Roles must be appropriately defined to determine whether a vendor is acting as a provider (covered entity) or business associate. The latter requires a business associate agreement to outline things like data ownership and disclosure.[15] Special attention must be given to ensure safeguards are in place for mobile device security that includes peripherals procured to the patient and the patient's personal devices (e.g., smartphone,

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[8] Aetonix, *10 Remote Patient Monitoring Programs from 10 Different States*, December 2019. Available at: aetonix.com/2019/12/17/10-remote-patient-monitoring-programs-from-10-different-states/.

[9] mHealth Intelligence, *Telehealth Gives Patients a Real-Time Link to Mental Health Support*, January 2019. Available at: mhealthintelligence.com/news/telehealth-gives-patients-a-real-time-link-to-mental-health-support.

[10] Healthcare Ready, *Telehealth's Applications for Preparedness and Response*. Available at: higherlogicdownload.s3.amazonaws.com/AMERICANTELEMED/3c09839a-fffd-46f7-916c-692c11d78933/UploadedImages/Disaster%20Response/HCR_Telehealth_White_Paper_SCREEN[1].pdf.

[11] American Medical Association, *Digital Health Implementation Playbook*. Available at: www.ama-assn.org/amaone/ama-digital-health-implementation-playbook.

[12] See n. 3, *Supra.*

[13] Mid-Atlantic Telehealth Resource Center, Remote Patient Monitoring (RPM) Toolkit. Available at: www.matrc.org/wp-content/uploads/2019/09/ACFrOgAZizRQ3oro_iD9OoBp9GrOvXRY_sSudMMnn26bNFPfBq8Pij1saJ4ZkbY0tzsfPDnqLmzNENJpvnIYMFQUMZKGHFmG77pWea5prJkm3rTDJwJnYgeC5vz7k6M.pdf?2c4bc8&2c4bc8.

[14] Applicable federal and state laws and regulations pertaining to the security, privacy, and exchange of protected health information (PHI)14, including compliance with the Health Insurance Portability and Accountability Act of 1996 (HIPAA)14 must be met.

[15] U.S. Department of Health & Human Services, *Business Associate Contracts*, January 2013. Available at: hhs.gov/hipaa/for-professionals/covered-entities/sample-business-associate-agreement-provisions/index.html.

tablet).[16] Cybersecurity best practices for proper device management include but are not limited to regularly updating anti-virus and malware software, using multifactor verification, and identity proofing.[17] Protecting the confidentiality of health information ensures that patients seek care appropriately and timely, and that they are open and honest with their providers regarding their health.

Integrate Technology

The integration of RPM technology should be designed to support delivery of existing services and maximize resources. Data collected through RPM should be documented within the electronic health record (EHR) system. This provides easier and faster access to patient data, protects patient safety, and allows for well-informed decision making. Procedures should be developed for patient documentation tracking and communication. Workflows should also include protocols for referral, enrollment, delivery and installation of equipment at the patients' homes, and remote device management.[18]

Patient Education

Patient understanding of the technology is crucial to the success of an RPM program, particularly if patients have to collect and report data. Inaccurate readings or insufficient amounts of data can lead to misleading results.[19] Training and support (initial and ongoing, as needed) should be available and tailored to patients' capabilities, including device and proper technique demonstrations for taking home readings. The onboarding process should include an assessment of patient health literacy level for diagnosis and management, and patient willingness to participate in the program.[20] Equally important is the explanation of the purpose of the program, what data will be collected, who will have access to the data, and how it will be used.

Assess Program Success

Setting program goals and evaluating metrics regularly is essential to understand overall program success, determine areas in need of improvement, and assess readiness for program expansion. Program assessment includes measurable objectives, such as utilization of the technology (e.g., frequency of interactions, alerts, and readings), patient and provider satisfaction (e.g., ease of use of the technology), and health outcomes (e.g., weight, blood pressure, blood oxygen levels).

Leveraging RPM During a Public Health Emergency

In the wake of the coronavirus disease (COVID-19) pandemic, providers are leveraging telehealth to help patients remain in their homes, reserve scarce and critical health system resources, and lower the infection rate. These efforts are reinforced with expanded coverage and reimbursement for

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[16] Healthcare Information and Management Systems Society, *Protecting Patients and Providers: IT security in remote patient monitoring*, September 2018. Available at: www.connectedhealthconf.org/boston/2018/news/protecting-patients-providers-it-security-remote-patient-monitoring.

[17] Health IT Security, *Best Practice Cybersecurity Methods for Remote Care, Patient Portal*, March 2020. Available at: healthitsecurity.com/news/best-practice-cybersecurity-methods-for-remote-care-patient-portals.

[18] See n. 13, *Supra.*

[19] See n. 11, *Supra.*

[20] See n. 3, *Supra.*

telehealth by government[21] and private payers.[22] Broadening access to RPM during a disease outbreak can relieve the health care system when providers, hospital beds, and equipment may be in short supply. Of note, Providence, a national health system[23], launched an RPM program in March 2020 to manage patients positive or presumptive positive for COVID-19. The program provides care for patients who do not currently require hospitalization.[24] Providence engages patients through a mobile application where they can receive secure text messages about their health status, reminders to input responses, and review educational videos. Patients are given a thermometer and pulse oximeter to measure breathing, temperature, and oxygen saturation. The program initially deployed in Washington, an epicenter of the pandemic, continues to expand to other states including Oregon, Alaska, and Montana to address rising patient volumes.

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[21] mHealth Intelligence, *CMS to Reimburse Providers for Remote Patient Monitoring Services*, November 2018. Available at: mhealthintelligence.com/news/cms-to-reimburse-providers-for-remote-patient-monitoring-services.

[22] Maryland Health Care Commission, *Broadening Access to Telehealth During a Public Health Emergency*, March 2020. Available at: mhcc.maryland.gov/mhcc/pages/hit/hit_telemedicine/documents/HIT_Telehealth_COVID_19_Flyer.pdf.

[23] Providence operates multiples hospitals across Washington, Alaska, Oregon, California, Montana, New Mexico, and Texas.

[24] Twistle, *Lessons from Behind the Frontlines: Rapid Deployment of Tele-home Monitoring of COVID-19 Patients*. Available at: www.twistle.com/providence-covid-case-study/.