

Viewpoint

The State of Remote Patient Monitoring for Chronic Disease Management in the United States

Margaret M Paul, MS, PhD; Nandita Khera, MD; Praneetha R Elugunti, MHA, MBA; Kevin C Ruff, MD; Musab S Hommos, MD; Leslie F Thomas, MD; Vivek Nagaraja, MD; Ashley L Garrett, MD; Mari Pantoja-Smith, DHSc-RN; Nathan L Delafield, MD; Blanca C Lizaola-Mayo, MD; Molly M Kresin, DO; Mahesh Seetharam, MD; Sandhya R Nagarakanti, MD; Manreet Kaur, MD

Mayo Clinic in Arizona, Phoenix, AZ, United States

Corresponding Author:

Margaret M Paul, MS, PhD

Mayo Clinic in Arizona

5711 E Mayo Blvd

Phoenix, AZ, 85054

United States

Phone: 1 480 574 3045

Email: paul.margaret@mayo.edu

Abstract

Remote patient monitoring (RPM) increased exponentially during the COVID-19 pandemic. RPM programs commonly incorporate tools to capture and transmit health-relevant data from the home to the clinical space to augment the clinical decision-making process of health care providers. Given the potential to improve patient health outcomes, health care systems around the world are actively engaged in fashioning, implementing, and exploring the outcomes of various RPM program models. However, new challenges to health care systems include increasing RPM program enrollment, optimizing condition-specific RPM programs to best address the needs of specific patient groups, integrating new RPM-derived data streams into existing IT infrastructure, overcoming limited availability of desired remote monitoring technologies, and quantifying the health outcomes produced by RPM use. Herein, we identify stakeholders for RPM in the United States, summarize the landscape of RPM tools available for chronic disease management, discuss the current regulatory environment, delve into the benefits and challenges of integrating these tools into clinical practice, summarize aspects of coverage and reimbursement, and examine the knowledge and policy gaps regarding sustained use of RPM in clinical practice, along with associated opportunities.

(*J Med Internet Res* 2025;27:e70422) doi: [10.2196/70422](https://doi.org/10.2196/70422)

KEYWORDS

remote patient monitoring; chronic disease management; chronic disease; telemedicine; health information systems; reimbursement mechanisms

Introduction

The COVID-19 pandemic catalyzed a significant transformation in health care, marked by substantial advancements in telemedicine [1]. A recent study in the United States showed that Medicare patients in health systems with a relatively high proportion of telemedicine visits had more elective outpatient visits, less-frequent emergency department (ED) visits, and increased adherence to medications prescribed for certain chronic diseases, including diabetes mellitus and hyperlipidemia, as evidenced by the prescriptions filled for metformin and statins [2]. Beyond its potential to improve measures of use, clinical outcomes, cost, and operational efficiency, telemedicine produces higher satisfaction among both patients and health

care providers [3]. As the population of individuals with chronic medical conditions increases in the United States, innovation is needed to meet the demand for health care while improving population health. Moving beyond the traditional model of in-person clinical encounters will empower health systems to expand access to care and create new opportunities to improve health outcomes.

This paper examines remote patient monitoring (RPM) for chronic disease management in the United States, where its sustainability depends on uncertain health care payer support, despite a growing evidence base to support its benefits and appeal to users. RPM is a pivotal tool that helps bridge the home-office divide created by routine use of telemedicine. It involves the collection of individual health data outside of the

traditional clinical environment, the transmission of such individual health data to health care teams, and the analysis and interpretation of updated data within the context of new or existing care plans to facilitate more optimal disease management [4]. Although RPM existed prior to the COVID-19 pandemic, its incorporation into routine clinical care has expanded significantly since that time, enhanced by supportive legislation [5]. This expanded use has led to a growing knowledge base and new challenges associated with RPM integration and the downstream increase of asynchronous care into traditional clinical operations [1,6]. Still, RPM use continues to increase with innovative approaches to care emerging from the foundation of established tools and existing care delivery pathways. In the context of the US health care system, we identify relevant stakeholders, provide an overview of RPM tools available for chronic disease management across varying levels of patient acuity, discuss the current regulatory environment, delve into the benefits and challenges of integrating these tools into clinical practice, summarize aspects of coverage and reimbursement, and examine the knowledge gaps regarding sustained use of RPM in clinical practice, along with associated opportunities.

Stakeholders in Digital Technology

A diverse array of stakeholders in the health care ecosystem are impacted by RPM programs. For patients, RPM offers increased convenience in monitoring of certain health metrics outside of the clinical space, allows for increased personal engagement in a portion of the health-monitoring process, and improves both communication and satisfaction related to their care [7]. The financial implications of RPM differ from in-person care, encompassing costs related to medical devices and asynchronous engagement with the care team. Health systems and payers are keenly interested in the degree to which RPM programs impact quality of care and outcomes, especially in the context of value-based care. These groups are also focused on monitoring health care use and cost changes resulting from RPM integration. In our experience, uncertainty in long-term RPM reimbursement creates financial unpredictability for these programs, posing barriers to patient and health system engagement.

Policy makers who regulate RPM at state and federal levels must consider sustainable reimbursement models beyond the

pandemic response and address population health implications, including challenges to providing fair access to RPM services to those who may be disadvantaged for varied reasons, including low health literacy, low socioeconomic status, or limited access to technology. Additionally, policy makers must craft reimbursement models that appropriately account for the crucially important “behind the scenes” efforts of the health care team to safely and effectively analyze, interpret, and react to real-time data streams continuously generated by participating patients. Reimbursement models should also be designed in a forward-thinking manner with the explicit realization that the number of chronic health conditions of patients in the US population is increasing while also becoming increasingly complex to effectively manage. Thus, with increasing complexity of the “average” patient within the United States using RPM over time, the safe and effective use of RPM may become more challenging to achieve. Like health systems, medical device companies’ investment in advancing RPM technology depends on effective and long-term reimbursement policies.

Digital Tools for RPM

RPM tools encompass a variety of technologies designed to remotely monitor patients’ health metrics in real time. Such tools enable patients to actively participate in their health management, generating personal health records and receiving just-in-time feedback from care teams that can enhance quality of care and adherence to treatment plans [8]. RPM tools can be categorized based on the relative frequency of data collection. Devices that collect data relatively infrequently or intermittently include blood pressure measurement devices, pulse oximeters, and handheld point of care glucometers. Devices that collect data at a higher frequency or operate continuously include wearable physical activity trackers, fall-detection sensors, electrocardiography monitors, and continuous glucose measurement devices. Many devices feature wireless data transmission. Table 1 summarizes popular devices by the clinical measures collected and the chronic conditions they are used to monitor. The US Food and Drug Administration (FDA) regulates these devices, many of which received emergency use authorization (EUA) during the pandemic, with a transition plan to normal operations now in place.

Table 1. Commonly used digital tools to support remote patient monitoring.

Parameter	Devices	Treatment target
Blood pressure monitoring	<ul style="list-style-type: none">• Blood pressure monitors	<ul style="list-style-type: none">• Chronic kidney disease• Heart failure• High-risk pregnancy
Blood glucose monitoring	<ul style="list-style-type: none">• Glucometers	<ul style="list-style-type: none">• Diabetes mellitus
Arrhythmia detection	<ul style="list-style-type: none">• Wireless electrocardiogram monitoring systems	<ul style="list-style-type: none">• Atrial fibrillation• Cardiac arrhythmia• Coronary artery disease
Seizure monitoring systems	<ul style="list-style-type: none">• Wearable electroencephalogram leads• Non-electroencephalogram physiological signal-based seizure monitoring systems	<ul style="list-style-type: none">• Seizure disorders
Sleep monitoring devices	<ul style="list-style-type: none">• Continuous positive airway pressure tracking systems	<ul style="list-style-type: none">• Obstructive sleep apnea
Airway	<ul style="list-style-type: none">• Peak flow meters• Pulse oximeters	<ul style="list-style-type: none">• Chronic obstructive pulmonary disease• Asthma• COVID-19 pneumonia
Body weight	<ul style="list-style-type: none">• Remote monitoring digital weighing scales	<ul style="list-style-type: none">• Heart failure• Decompensated cirrhosis
Body temperature	<ul style="list-style-type: none">• Remote monitoring digital thermometers	<ul style="list-style-type: none">• Broad applicability
Fall detection and prevention	<ul style="list-style-type: none">• Wearable activity and acceleration sensors• Ambient thermal sensors	<ul style="list-style-type: none">• Parkinson disease• Postoperative rehabilitation• Post-stroke rehabilitation
Postoperative rehabilitation	<ul style="list-style-type: none">• Smart phone app-based physical therapy rehabilitation programs	<ul style="list-style-type: none">• Post-orthopedic surgery care

Considerations for Implementation

The literature on RPM implementation highlights common challenges. RPM correlates with increased in-patient messaging, necessitating updated workflows for electronic “in-basket” management and enhanced asynchronous nonvisit care [6]. Emerging artificial intelligence technologies, such as chatbots to respond to patient messages, promise to reduce staff burden related to these barriers. Patients may face technological barriers to device access and use [9], with broadband limitations further excluding some people [10,11]. RPM implementation and sustainment costs are significant and vary by care plan and device, and cost-sharing with patients poses an additional risk of inequitable program access among economically disadvantaged populations [10]. Implementation strategies to mitigate these common challenges are emerging. For example, a study on an RPM program for maternal hypertension in rural Mississippi addressed technological barriers by providing a comprehensive equipment kit and a one-on-one nurse-led remote education session [12]. Another study based at an urban community health center serving low-income patients found that having a strong physician champion facilitated many aspects of implementation and that developing printed, culturally appropriate educational materials in multiple languages and literacy levels tailored to their population was effective in overcoming initial access barriers for patients [13]. At the health

system level, new models of care, such as the RPM usability impact model [14], should be considered to guide implementation activities among patients, as well as caregivers, who play a key role in ensuring that accurate data is captured but are often excluded from targeted educational activities. Best practices have been developed to integrate data acquired via RPM devices into the electronic medical record system [15], though further research is needed to enhance data security [16] and prevent breaches [17].

Coverage and Reimbursement

In the United States, RPM services are covered by Medicare as communication technology-based services. As of September 2023, 37 state Medicaid programs also provide reimbursement for RPM. The Centers for Medicare and Medicaid Services (CMS), the federal agency that provides health coverage in the United States, has specific billing requirements for RPM. These include an established physician-patient relationship, physiological data monitoring for at least 16 days a month, and use of an FDA-approved device with secure and automated data upload. RPM reimbursement codes cover fees for initial enrollment (Current Procedural Terminology [CPT] code 99453), monthly data monitoring (CPT code 99454) and health care provider time for communicating with patients (CPT codes 99457 and 99458) [18].

Alongside the CMS, a growing number of commercial payers reimburse for RPM [19], albeit with disparities across plans. Inconsistencies in RPM reimbursement produce differential access to these programs, which are most readily accessible by patients capable of participating without insurance support (eg, to access devices and training without additional or significant costs). In addition, as these programs see wider implementation, reliable monitoring of the effort required by health care teams to manage them is needed and may in turn influence reimbursement mechanisms and out-of-pocket costs for patients. Reimbursement models that establish parity across modes of care are needed to incentivize RPM use, rather than penalize health care providers and patients for lack of the traditional in-person office visit.

Traditionally, RPM services are provided in conjunction with chronic care management for low-acuity care, with the goal of preventing disease exacerbation or hospitalization. Patients with chronic illnesses, such as congestive heart failure, advanced kidney disease, advanced liver disease, hypertension, and diabetes mellitus, are naturally suited for RPM programs. Similarly, patients recovering from an acute event (stroke, major surgery, or hospitalization for an exacerbation of a chronic illness) benefit from RPM programs that aim at preventing hospital readmission and that allow safe discharge planning. In addition to disease-specific groups, patients who are geographically isolated or have limited transportation and social support may benefit from the improved access to care RPM provides.

Regulatory Implications for Quality And Safety

The increasing uptake of RPM tools has prompted the creation of Health Insurance Portability and Accountability Act–compliant digital platforms capable of integrating data from multiple RPM data streams to generate a comprehensive patient profile. RPM devices and associated software are regulated by the FDA as medical devices, and in October 2023, the FDA issued updated guidelines for their approval and regulation [20]. The update reflects a transition from the EUA issued in March 2020 during the COVID-19 public health emergency, thereby reinforcing the FDA's commitment to maintaining enforcement policies for RPM tools beyond the pandemic.

FDA regulation applies to all devices that can measure physiological parameters accurately and noninvasively and that can be connected to a wireless network to transmit patient data securely to the health care provider. Medical devices in the United States are regulated under applicable parts of Title 21 of the US Code of Federal Regulations, which categorizes devices into one of three classifications (class I, class II, and class III), where the classification level depends on the specifics of the function of the device and its intended use and operators to assure the safety and efficacy of the device. Manufacturers of regulated devices are required to maintain a compliant quality management system covering design and development and premarket and postmarket activities related to the device and are subject to annual audits of regulatory compliance. Class I

nonexempt and class II devices are cleared by the FDA after review of a de novo submission supporting safety and efficacy of the device or after review of a 510(k) submission supporting substantial equivalence to an existing, legally marketed predicate device. As a point of reference, point-of-care capillary blood glucose measurement devices (ie, glucometers) are invasive, class II medical devices. Class III devices are approved by the FDA after a premarket approval submission demonstrating safety and efficacy of the device for its stated intended use and indications for use. In 2023, the FDA released guidance indicating that it does not enforce submission of additional regulatory applications for devices already in use that undergo minor modifications to their indication for use and functionality to enable them to be used for RPM [20].

Knowledge Gaps and Opportunities

RPM has the potential to fundamentally transform chronic disease management and patient–health care provider interactions. While its expanded use began as a pandemic response, its sustained integration into clinical practice suggests long-term viability [2]. Emerging evaluations of RPM programs indicate increasing acceptance among patients and health care providers, improved adherence to care plans by patients, and favorable impacts on health care quality and clinical outcomes in line with in-person care [1,13,21]. However, iterative improvements in RPM program designs are needed to enable more seamless application in heterogeneous patient populations, better cost-effectiveness, and improvements in quality of care and outcomes and patient and health care provider satisfaction. Additional research is needed to understand implementation strategies that account for access issues that, if left unresolved, could lead to inequitable access to these programs.

Health care is following in the footsteps of many other industries whose services reach consumers in their own homes. As we strive for increasing uptake and sustainability of these programs at the Mayo Clinic, we are expanding our virtual care offerings to encompass additional disease groups. Two challenges to accomplishing this in our own system are (1) a lack of interoperability and, relatedly, a significant administrative burden for our clinicians due to the need for manual information input and (2) the need to log in to two different systems, which could potentially lead to mistakes. The implementation of these initiatives has presented other considerable challenges, and we are actively identifying barriers to patient enrollment and exploring potential solutions in collaboration with our patients and health care providers. However, continued financial viability and equitable patient access will be determined by longer-term policy decisions. Further research is needed to explore data integration methods that address security concerns, identify implementation strategies to mitigate potential inequities in access, and examine how advancements in artificial intelligence can alleviate care team burdens associated with increased patient communication. Permanent reimbursement models like those established for behavioral and mental health services, which account for equity and quality of care, could ensure that RPM remains an accessible and sustainable option for all patient populations, including those in resource-constrained settings [22,23]. RPM has the potential to be transformative for chronic

and acute care as long as barriers and challenges facing RPM implementations can be addressed.

Conflicts of Interest

None declared.

References

- Shaver J. The state of telehealth before and after the COVID-19 Pandemic. *Prim Care*. Dec 2022;49(4):517-530. [FREE Full text] [doi: [10.1016/j.pop.2022.04.002](https://doi.org/10.1016/j.pop.2022.04.002)] [Medline: [36357058](https://pubmed.ncbi.nlm.nih.gov/36357058/)]
- Nakamoto CH, Cutler DM, Beaulieu ND, Uscher-Pines L, Mehrotra A. The impact of telemedicine on medicare utilization, spending, and quality, 2019-22. *Health Aff (Millwood)*. May 2024;43(5):691-700. [doi: [10.1377/hlthaff.2023.01142](https://doi.org/10.1377/hlthaff.2023.01142)] [Medline: [38630943](https://pubmed.ncbi.nlm.nih.gov/38630943/)]
- Nguyen M, Waller M, Pandya A, Portnoy J. A review of patient and provider satisfaction with telemedicine. *Curr Allergy Asthma Rep*. Sep 22, 2020;20(11):72. [FREE Full text] [doi: [10.1007/s11882-020-00969-7](https://doi.org/10.1007/s11882-020-00969-7)] [Medline: [32959158](https://pubmed.ncbi.nlm.nih.gov/32959158/)]
- Sanders SS, Stern AD, Gordon W. How to make remote monitoring tech part of everyday health care. *Harvard Business Review*. Jul 2, 2020. URL: <https://hbr.org/2020/07/how-to-make-remote-monitoring-tech-part-of-everyday-health-care> [accessed 2025-04-10]
- Mecklai K, Smith N, Stern AD, Kramer DB. Remote patient monitoring - overdue or overused? *N Engl J Med*. Apr 15, 2021;384(15):1384-1386. [doi: [10.1056/NEJMp2033275](https://doi.org/10.1056/NEJMp2033275)] [Medline: [33853209](https://pubmed.ncbi.nlm.nih.gov/33853209/)]
- Matulis JC, McCoy R, Liu SK. Moving away from chaos: intentional and adaptive management of the non-visit care river. *J Gen Intern Med*. Feb 2023;38(3):784-788. [FREE Full text] [doi: [10.1007/s11606-022-07959-7](https://doi.org/10.1007/s11606-022-07959-7)] [Medline: [36443630](https://pubmed.ncbi.nlm.nih.gov/36443630/)]
- Mooney K, Beck SL, Wilson C, Coombs L, Whisenant M, Moraitis AM, et al. Assessing patient perspectives and the health equity of a digital cancer symptom remote monitoring and management system. *JCO Clin Cancer Inform*. Jul 2024;8:e2300243. [doi: [10.1200/CCl.23.00243](https://doi.org/10.1200/CCl.23.00243)] [Medline: [39042843](https://pubmed.ncbi.nlm.nih.gov/39042843/)]
- Tan SY, Sumner J, Wang Y, Wenjun Yip A. A systematic review of the impacts of remote patient monitoring (RPM) interventions on safety, adherence, quality-of-life and cost-related outcomes. *NPJ Digit Med*. Jul 18, 2024;7(1):192. [FREE Full text] [doi: [10.1038/s41746-024-01182-w](https://doi.org/10.1038/s41746-024-01182-w)] [Medline: [39025937](https://pubmed.ncbi.nlm.nih.gov/39025937/)]
- Alvarez P, Sianis A, Brown J, Ali A, Briasoulis A. Chronic disease management in heart failure: focus on telemedicine and remote monitoring. *Rev Cardiovasc Med*. Jun 30, 2021;22(2):403-413. [FREE Full text] [doi: [10.31083/j.rcm2202046](https://doi.org/10.31083/j.rcm2202046)] [Medline: [34258907](https://pubmed.ncbi.nlm.nih.gov/34258907/)]
- Hirko K, Kerver J, Ford S, Szafranski C, Beckett J, Kitchen C, et al. Telehealth in response to the COVID-19 pandemic: implications for rural health disparities. *J Am Med Inform Assoc*. Nov 01, 2020;27(11):1816-1818. [FREE Full text] [doi: [10.1093/jamia/ocaa156](https://doi.org/10.1093/jamia/ocaa156)] [Medline: [32589735](https://pubmed.ncbi.nlm.nih.gov/32589735/)]
- Mapping broadband health in America. Federal Communications Commission. URL: <https://www.fcc.gov/health/maps-overview> [accessed 2024-12-15]
- Zhang Y, Lin Y, Lal L, Swint JM, Tucker T, Ivory DM, et al. Feasibility of remote blood pressure monitoring for detection and management of maternal hypertension in a predominantly Black, rural and Medicaid population in Mississippi. *Telemed J E Health*. Jun 2024;30(7):e2096-e2102. [doi: [10.1089/tmj.2023.0426](https://doi.org/10.1089/tmj.2023.0426)] [Medline: [38563767](https://pubmed.ncbi.nlm.nih.gov/38563767/)]
- Gunn R, Watkins SL, Boston D, Rosales AG, Massimino S, Navale S, et al. Evaluation of a remote patient monitoring program during the COVID-19 pandemic: retrospective case study with a mixed methods explanatory sequential design. *JMIR Form Res*. Jul 09, 2024;8:e55732. [FREE Full text] [doi: [10.2196/55732](https://doi.org/10.2196/55732)] [Medline: [38980716](https://pubmed.ncbi.nlm.nih.gov/38980716/)]
- Baumann S, Stone RT, Abdelall E. Introducing a remote patient monitoring usability impact model to overcome challenges. *Sensors (Basel)*. Jun 19, 2024;24(12):3977. [FREE Full text] [doi: [10.3390/s24123977](https://doi.org/10.3390/s24123977)] [Medline: [38931760](https://pubmed.ncbi.nlm.nih.gov/38931760/)]
- Abdolkhani R, Gray K, Borda A, DeSouza R. Recommendations for the quality management of patient-generated health data in remote patient monitoring: mixed methods study. *JMIR Mhealth Uhealth*. Feb 24, 2023;11:e35917. [FREE Full text] [doi: [10.2196/35917](https://doi.org/10.2196/35917)] [Medline: [36826986](https://pubmed.ncbi.nlm.nih.gov/36826986/)]
- Mishkin AD, Zabinski JS, Holt G, Appelbaum PS. Ensuring privacy in telemedicine: ethical and clinical challenges. *J Telemed Telecare*. Apr 2023;29(3):217-221. [doi: [10.1177/1357633X221134952](https://doi.org/10.1177/1357633X221134952)] [Medline: [36349356](https://pubmed.ncbi.nlm.nih.gov/36349356/)]
- Choi P, Walker R. Remote patient management: balancing patient privacy, data security, and clinical needs. *Contrib Nephrol*. 2019;197:35-43. [FREE Full text] [doi: [10.1159/000496312](https://doi.org/10.1159/000496312)] [Medline: [34569516](https://pubmed.ncbi.nlm.nih.gov/34569516/)]
- Abbey DC. Medicare physician fee schedule. In: *Healthcare Payment Systems*. Boca Raton, FL. CRC Press; 2010.
- Future of health: commercial payer coverage for digital medicine codes. American Medical Association. 2023. URL: <https://www.ama-assn.org/system/files/issue-brief-commercial-payer-coverage-digital-care.pdf> [accessed 2025-04-10]
- Enforcement policy for non-invasive remote monitoring devices use to support patient monitoring: guidance for industry and FDA staff. US Food and Drug Administration. 2023. URL: <https://www.fda.gov/media/136290/download> [accessed 2025-04-10]
- Taher M, Yule C, Bonaparte H, Kwiecien S, Collins C, Naylor A, et al. Telehealth versus self-directed lifestyle intervention to promote healthy blood pressure: a protocol for a randomised controlled trial. *BMJ Open*. Mar 03, 2021;11(3):e044292. [FREE Full text] [doi: [10.1136/bmjopen-2020-044292](https://doi.org/10.1136/bmjopen-2020-044292)] [Medline: [33658261](https://pubmed.ncbi.nlm.nih.gov/33658261/)]

22. D'Amico R, Schnell PM, Foraker R, Olayiwola JN, Jonas DE, Brill SB. The evolution of primary care telehealth disparities during COVID-19: retrospective cohort study. *J Med Internet Res*. May 17, 2023;25:e43965. [FREE Full text] [doi: [10.2196/43965](https://doi.org/10.2196/43965)] [Medline: [37146176](https://pubmed.ncbi.nlm.nih.gov/37146176/)]
23. Tang M, Chernew ME, Mehrotra A. How emerging telehealth models challenge policymaking. *Milbank Q*. Sep 2022;100(3):650-672. [FREE Full text] [doi: [10.1111/1468-0009.12584](https://doi.org/10.1111/1468-0009.12584)] [Medline: [36169169](https://pubmed.ncbi.nlm.nih.gov/36169169/)]

Abbreviations

CMS: Centers for Medicare and Medicaid Services

CPT: Current Procedural Terminology

ED: emergency department

EUA: emergency use authorization

FDA: Food and Drug Administration

RPM: remote patient monitoring

Edited by A Mavragani; submitted 20.12.24; peer-reviewed by F Opia, M-GC Iwunwa, E Gavor; comments to author 20.01.25; revised version received 31.03.25; accepted 03.04.25; published 26.06.25

Please cite as:

Paul MM, Khera N, Elugunti PR, Ruff KC, Hommos MS, Thomas LF, Nagaraja V, Garrett AL, Pantoja-Smith M, Delafield NL, Lizaola-Mayo BC, Kresin MM, Seetharam M, Nagarakanti SR, Kaur M

The State of Remote Patient Monitoring for Chronic Disease Management in the United States
J Med Internet Res 2025;27:e70422

URL: <https://www.jmir.org/2025/1/e70422>

doi: [10.2196/70422](https://doi.org/10.2196/70422)

PMID:

©Margaret M Paul, Nandita Khera, Praneetha R Elugunti, Kevin C Ruff, Musab S Hommos, Leslie F Thomas, Vivek Nagaraja, Ashley L Garrett, Mari Pantoja-Smith, Nathan L Delafield, Blanca C Lizaola-Mayo, Molly M Kresin, Mahesh Seetharam, Sandhya R Nagarakanti, Manreet Kaur. Originally published in the *Journal of Medical Internet Research* (<https://www.jmir.org/>), 26.06.2025. This is an open-access article distributed under the terms of the Creative Commons Attribution License (<https://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work, first published in the *Journal of Medical Internet Research* (ISSN 1438-8871), is properly cited. The complete bibliographic information, a link to the original publication on <https://www.jmir.org/>, as well as this copyright and license information must be included.