

April 2023

# Increasing Remote Patient Monitoring in the Veterans Health Administration

Presented by

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**Applied Policy Project**

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# Acknowledgements and Disclaimer

## Acknowledgements

I would first like to thank Professors Brian Williams and Ben Castleman for their mentorship and guidance throughout the past two semesters. I truly appreciate all of their help and advice that made me a better policy student, researcher, and academic. I would also like to thank the entire team at ReefPoint Group for taking a chance on me as both an intern and a partner in this project. I am so excited to continue to work in the health policy field with RPG after graduation. I especially want to thank Brad Smolek of RPG for being a great connection and resource throughout this entire process.

I would also like to thank my parents and my sister Megan for always supporting me throughout my five years at UVA. I could not have done this without you. Thank you to my friends who are my rocks and role models: Charlie Groscup, Haley Bartel, Elena Adams, and Amanda Meyers. I cannot thank each of you enough for being yourselves.

## Disclaimer

The author conducted this study as part of the program of professional education at the Frank Batten School of Leadership and Public Policy, University of Virginia. This paper is submitted in partial fulfillment of the course requirements for the Master of Public Policy degree. The judgments and conclusions are solely those of the author, and are not necessarily endorsed by the Batten School, by the University of Virginia, or by any other agency.

## Honor Pledge

On my honor as a student, I have neither given nor received aid on this assignment.

A handwritten signature in black ink, reading "Peyton Strehler". The signature is fluid and cursive, with the first name "Peyton" and last name "Strehler" clearly distinguishable.

# Executive Summary

Remote patient monitoring (RPM) is a type of digital healthcare that has been proven to be effective in managing chronic conditions by allowing patients to constantly monitor their health data and virtually communicate with their doctors and care teams using specific devices. Before the COVID-19 pandemic, new innovations in virtual care were beginning to increase the usage and accessibility of remote care. The use of RPM rose dramatically during the pandemic as the healthcare industry tried to reduce in-person care as much as possible, but this rise has begun to plateau. RPM is especially valuable in remote patient populations. About one quarter of the U.S. Veteran population lives in rural areas. As such, the Department of Veterans Affairs (VA) should capitalize on this surge in RPM and continue to push policy in order to increase access to RPM for eligible patients.

I propose four policy alternatives for the VA to encourage more eligible patients to take up RPM technologies. The first is to create a new government-run virtual platform to manage the RPM devices and communications between VA patients and their care teams. The second is to run a public outreach campaign encouraging eligible Veterans to consider RPM technology and talk to their doctors about incorporating appropriate RPM into their healthcare plans. The third is to expand insurance reimbursements by adding new CPT codes to account for the increasing types of RPM. The fourth option is to invest in healthcare infrastructure in rural areas. I use four criteria to rate these alternatives: effectiveness, cost/cost-effectiveness, feasibility, and equity. My analysis found that investing in rural infrastructure is the best option to increase RPM usage among patients in the VA healthcare network.

# Problem Statement

Poor and limited implementation of remote patient monitoring (RPM) in the Veterans Health Administration has reduced RPM's potential efficiency and benefits, which include lowering infection rates, hospital visits, and travel costs for patients, especially among rural Veterans.

## Client Overview



My client is ReefPoint Group, LLC, which I will commonly refer to as RPG. RPG is a service-disabled, Veteran-owned small business with office locations in Tysons, Virginia and Annapolis, Maryland. RPG is a federal healthcare consulting firm that has contracts with the Department of Veterans Affairs (VA) and the Navy Bureau of Medicine (BUMED). RPG is exploring a solutions design program for increasing the use of remote patient monitoring. RPG focuses on four capabilities within the healthcare sphere: health innovation and technology, data science and advanced analytics, tech integration & interoperability, and operational logistics and readiness. RPG recognizes remote patient monitoring as an up-and-coming sector of the healthcare sphere and is looking to expand its consulting services into facilities like hospitals, nursing homes, long-term care facilities, and skilled nursing facilities. Remote patient monitoring could be applicable and valuable to all of these establishments if implemented efficiently, but for the purpose of this project I will specifically focus on VA infrastructure.

RPG has the opportunity to introduce and propose a variety of policy solutions to the Department of Veterans Affairs (VA) and in order to increase the utilization of remote patient monitoring in the United States healthcare system among the Veteran and military communities.

# Background

Remote patient monitoring (RPM) is a form of telehealth focused on managing chronic conditions using personal medical devices. In a world with a growing aging population with increasing rates of chronic conditions, RPM is a cost-effective and reliable way to monitor patients including those with chronic conditions, mobility issues, pregnancy complications, disabilities, short-term illnesses, and post-surgery patients and the elderly (Telehealth and Remote Patient Monitoring | Telehealth.HHS.gov, 2023). By using tools such as weight scales, pulse oximeters, blood glucose meters, blood pressure monitors, physicians can monitor patients' health and call them into a medical facility if the tools indicate that they need to be seen in-person. More complicated technology that can be used by patients at home, such as apnea monitors, heart monitors, specialized monitors for dementia and Parkinson's disease, breathing apparatuses, and fetal monitors can increase the acuity of care through patient training. Some of the conditions that can be monitored remotely include high blood pressure, diabetes, weight loss or gain, heart conditions, chronic obstructive pulmonary diseases, sleep apnea, and asthma. The most common data points collected through RPM have strong correlations with several of the top RPM-applicable conditions, including electrocardiogram (ECG), electroencephalogram (EEG), heart beats and respiration rate, oxygen volume in blood or pulse oximetry, signals from the nervous system, blood pressure, body and skin temperature, and blood glucose level.

Remote patient monitoring technology can be especially useful in rural areas, where chronic health condition rates remain higher than urban regions (Centers for Disease Control and Prevention, 2019). Patients in rural areas are more likely than their urban counterparts to die from heart disease, cancer, unintentional injury, chronic lower respiratory disease, and stroke (Centers for Disease Control and Prevention, 2019). Using remote patient monitoring, many of these patients can be monitored on a more regular basis by physicians and receive care from specialized centers that they may otherwise not be able to access. Cardiac rehabilitation, diabetes management and prevention, epilepsy management, vision care, tobacco cessation and telestroke services are specific telehealth programs that have risen in popularity for rural areas in the last two decades and have been found to be effective in managing the targeted conditions (Centers for Disease Control and Prevention, 2019).

The foundational elements of an RPM system are the data acquisition system, data processing system, end-terminal at the hospital and the communication network (Malasinghe et al., 2019). The data acquisition system is made of devices with embedded sensors with wireless data transmission capability. A common form of these sensors are wireless sensor networks (WSN), which include wireless body area networks (WBAN), body area networks (BAN) or personal area networks (PAN). A data processing system includes a system with data receiving and transmitting capability and a processing unit or circuit. This allows the device to process information and deliver it to the intended user. The end-terminal at the hospital network can be technology at the hospital, a dedicated device or even a doctor's phone. The communication network connects these three systems and transmits data and conclusions to a healthcare professional.

As for recent study results, a COVID-19 specific RPM system was implemented in a 2020 study with 2,255 symptomatic COVID patients enrolled (Annis et al., 2020). The system provided educational materials and space for patients to voice concerns about their condition. A healthcare team of providers and medical students were alerted virtually to any concerns voiced by patients through the system. The RPM system was largely successful, resulting in 74 percent of the 300 satisfaction survey respondents replying that they would be “extremely likely” to recommend their doctor. Patients also reported strong feelings of safety while enrolled in the program and quick access for COVID-specific care.

A randomized control meta-analysis on RPM was conducted on chronic heart failure patients between 2003 and 2013 (Nakamura et al., 2014). The meta-analysis consisted of 13 studies. The sample of patients that used RPM to monitor their heart conditions resulted in a significantly lower mortality rate than the control group without RPM. Rapid intervention that was possible due to RPM turned out to be the most important aspect of producing this lower mortality rate.

RPM helps those with chronic conditions by keeping a patient's care team aware and up to date on any changes in vitals and symptoms even when they are not in the hospital or a physician's office. With these tools, patients have the potential to reduce hospitalizations, shorten hospital stays, decrease emergency room visits, increase health outcomes for patients in rural areas, improve preventative management for chronic conditions, and reduce the risk of COVID-19 exposure and other infectious diseases for all parties (Remote Patient Monitoring Improves Care for Chronic Disease, 2021). The increase in telehealth during the pandemic has led to studies to analyze the effectiveness of remote monitoring on patient outcomes. The FDA has been pushing to expand RPM since the beginning of the pandemic in order to reduce the number of in-clinic or in-hospital visits for patients (Enforcement Policy for Non-Invasive Remote Monitoring Devices Used to Support Patient Monitoring during the Coronavirus Disease-2019 (COVID-19) Public Health Emergency, 2020).

One concern with the implementation and growth of RPM is the rumored threat to physicians, nurses, and other healthcare jobs . This is far from the truth, and RPM and the artificial intelligence (AI) that is projected to enhance the impact of RPM is not meant to replace human contact and attention to patients. RPM is a tool meant to be used by medical professionals, not instead of them. The goal of RPM is not to reduce any necessary doctor-patient interaction, but to manage conditions at home remotely. Doctors, nurses, and hospitals will still be needed for when RPM data flags an issue and the patient needs attention from professionals. RPM can manage data collection processes that usually fall on lower-level medical professions, but total job loss is not very likely as trained professionals are still needed for care and facility management after data collection.

Another issue cited with the expansion of RPM is changing the healthcare provider structure. If problems are noticed through an RPM system, the first patient contact to be alerted, and in what fashion, is not standardized yet. This could be condition or location specific, depending on severity and remoteness. Whether the first point of contact should be a family member or caretaker, or whether an ambulance should be called immediately, or if the patient's doctor should be alerted to call the patient themselves are all examples of possible follow-up procedures for various conditions. Who reports and how they report is new to the RPM structure and is going to take time to study, perfect, and standardize.



The price of RPM can vary widely from patient to patient depending on a wide variety of factors including: condition, status of the patient, equipment, location, etc. On average, RPM equipment purchasing, servicing and monitoring ranged from USD \$275 to USD \$7,963 annually per patient (Peretz et al., 2018). As the software systems for RPM improve, some components of RPM have become cheaper for providers and patients to use. Previously, the RPM interfaces were challenging, complex, and had major accessibility issues especially for untrained patients. Software costs used to run into the thousands, but now some software options price as low as \$1.00 to \$8.00 per patient per month (Berry, 2021). Data visualization has also improved in RPM software, allowing patients and providers to monitor health data more effectively. As smartphones, FitBits, Apple Watches, and similar technologies become more applicable in RPM systems, the costs of running RPM technologies are likely to become more affordable and accessible, as well as multi-use. Logging, storing, transferring, and keeping records of data are all vital to the RPM process. Privacy remains a concern, but blockchain-based smart contracts are being explored to help protect patient privacy in RPM systems (Griggs et al., 2018).

RPM can be used for several different health conditions and has shown relatively positive impacts on its subjects. Though the beginning of its implementation has been met with some uncertainty and hesitation about privacy, accuracy, and efficiency, the studies that have been conducted so far, especially since the beginning of the pandemic, have yielded hopeful and positive results.

## Status Quo

In terms of the status quo, RPM usage has grown dramatically in the past three years during the pandemic. From January 2019 to November 2022, RPM adoption rose 1,294 percent, according to a report by Definitive Healthcare (Vaidya, 2023). While this increase shows great progress towards a more streamlined and accessible healthcare system, this increase will likely plateau as the pandemic draws to an end. As this rate naturally slows down as people return to more in-person healthcare and adjust to their current use of RPM, it is important for the VA to continue to enable and promote RPM use among its patients.

## Alternatives

### Alternative 1: Virtual Care Platform

The first of the four policy alternatives is the creation of a virtual RPM care platform for patients that are eligible for RPM. A major factor as to why remote patient monitoring (RPM) is not used to its full extent is because patients do not know what types of RPM technology are available to them or do not feel comfortable using a new technology or device to monitor their health. Creating a user-friendly virtual platform for patients to interact with their doctors, nurses, and other various possible care teams could help patients ease into the transition of using RPM on a regular basis. This resource could be a one-stop shop for patients to see their own health data, communicate with their care team, and learn about any new updates or changes to their own healthcare system. This virtual platform could be created by a private company contracted by the VA instead of being a government-created platform, which may be a more efficient method of creation and implementation. One potential challenge of this option is that patients that currently use RPM without such a platform may not be incentivized enough to begin using a new platform if they do not see a problem with their current care system. Thus, this option would be attractive mainly to patients that begin using RPM after the platform was created, making the effect of the policy on current RPM users more difficult to evaluate. Another potential problem is access and user error. Patients with poor access to certain types of technology, disabilities that make using an online platform challenging, or those who struggle with the technological aspects of RPM may not be incentivized or able to use this platform correctly. In an ideal scenario, for this policy to be implemented, all current RPM patients would be able to seamlessly transfer into using this platform and all new patients would be encouraged to engage with it by their care team, moving the entire RPM community, both patients and care teams, onto one universal platform.

## Alternative 2: Public Outreach Campaign

A second potential option is a patient outreach and information campaign. Through a public health campaign style of information sharing, the VA could create an information campaign to educate both patients and their care providers on the types of RPM that may be available to them. Public health campaigns have been proven to be successful in changing population health behavior, both in increasing positive changes and reducing negative behaviors. A successful health campaign that encourages patients and doctors to try out RPM technology may be an effective policy intervention that spreads the word about RPM, increases patients' and doctors' confidence in the value of RPM, and encourages people to try new solutions to manage their health issues. This public education campaign could be planned, conducted, and implemented by a federal administration, government contractor, or federal consulting firm. One drawback to this approach is the challenge of reaching veterans who do not regularly use the internet or do not have access to online resources.

## Alternative 3: Insurance Reimbursements

A third policy alternative is to expand insurance reimbursements for RPM. The billing and regulatory landscape of RPM has been changing drastically throughout the past three years. About 50 percent of state Medicaid programs reimburse for RPM use, but many have restrictions that go along with this reimbursement coverage (State Telehealth Policies Remote Patient Monitoring, 2023). The most common of these restrictions are offering reimbursement strictly to home health agencies and limiting the clinical conditions for which symptoms can be monitored and the type of RPM device and information that can be collected. CMS used to require an established relationship between patient and physician for RPM coverage, but waived that requirement during the pandemic (Vaidya, 2022). RPM used to only be considered “medically necessary” for chronic conditions by CMS until the pandemic, when it became inclusive of acute conditions as well. States have varying amounts of coverage, but CMS increased its coverage for various types of RPM during the pandemic by adding new Current Procedural Terminology (CPT) codes for reimbursement (Vaidya, 2022). The expansion of CPT codes also required more specific requirements for reimbursement, leaving some types of RPM to fall through the cracks and not quite meet the minimum requirements for reimbursement. For example, two of the more recent CPT RPM payment codes require 16 days of data for every 30 days of remote monitoring to be collected and submitted. For acute conditions that require less than 16 days of RPM, patients would be left without reimbursement from CMS. Expanding CPT codes to cover all the newly introduced types of RPM that can manage different conditions will help patients to uptake RPM without the fear of not being reimbursed by their insurance.

## Alternative 4: Infrastructure Investments

The fourth and final proposed policy alternative is the expansion of infrastructure investments in connectivity and technology in areas where this infrastructure might be lacking. Rural patients are one of the demographic groups that could benefit the most from widespread implementation of RPM. Of the 4.7 million rural and highly rural Veterans in the United States, 58 percent (2.7 million) are enrolled in the VA system (Office of Rural Health, n.d.). 58 percent of rural, enrolled Veterans have at least one service connected condition. Within this population of rural and enrolled Veterans, 8 percent are women, 10 percent are minorities, 55 percent are over the age of 65, 44 percent earn less than \$35,000 annually, and 27 percent do not access the internet at home (Office of Rural Health, n.d.). This population is more likely to be diagnosed with diabetes, obesity, high blood pressure and heart conditions, all of which RPM can help with because of the consistency and frequency of care. VA investments in technological infrastructure in rural areas could potentially lead to a greater and more geographically widespread use of RPM. While this option does not cover all demographics of patients that the VA are looking to expand RPM towards, it specifically focuses on one pertinent part of the problem for a group that is especially vulnerable to experiencing problems with the implementation of RPM. While this method may be more expensive and time-consuming than other policy options to implement, its specific focus and direct goals make it a viable option to accomplish the goal of increasing RPM usage. My specific proposal is for a large-scale tablet distribution program. Similar tablet programs have been administered on small scales in the past and were shown to be successful in managing chronic conditions.

# Criteria

The four criteria that are most appropriate for evaluating these policy alternatives are effectiveness, cost, feasibility, and equity. These criteria encompass several of the most important impacts of a potential policy. I will evaluate each policy as ranking as either low, medium, or high in terms of each criterion and propose my recommendation based on these scores. These four criteria are commonly used to evaluate and analyze the effects of policies and are applicable to the proposed policy alternatives in the following contexts.

In order to encourage more patients, medical teams, hospitals, and insurance companies to support the widespread use and implementation of RPM, any proposed solution should have a strong chance of achieving its goal of increasing RPM use across doctor and patient communities. The effectiveness of a policy in this case means that RPM usage will increase due to the implementation of a policy, despite other factors like cost or time. If RPM usage increases, then the policy is effective in accomplishing its end goal.

For a policy option to succeed in the cost criteria, some type of financial return or benefit over time should be possible. This may be a direct measure of cost, such as the program itself making a profit off of consumers, or indirect, such as decreasing the costs of in-person care over time. In this context, it is much more likely that the cost of the policy will be measured indirectly by the costs saved over time, but some of the policy options may have the potential to become monetized in another way.

For a policy option to be feasible, it must have the potential to withstand the bureaucracy of the healthcare system. While the healthcare sector acts with both private and public agencies, specifically focusing on military and Veterans' healthcare systems narrows the political scope even more. Feasibility would most likely be determined by what the VA is willing to consider and implement within its healthcare system and what stakeholders, including patients, doctors, and other healthcare professionals are willing to uphold. This largely ties to if healthcare professionals and patients are responsive to the policy. Policies would not be feasible if those directly involved in the healthcare industry do not adapt to the new policy and implement it as a part of a routine. If a policy option is feasible, it may be similar in structure or scope to previous healthcare policy and legislation that has been passed previously in these agencies.

Equity in the context of this type of health policy means that the proposed policy alternative should be equally accessible to different types of patients, including but not limited to: urban and rural populations, various age groups, and those with a diverse range of medical conditions. Equity is difficult to measure, but conducting a study on the usage of RPM while controlling for demographic factors like race, location, and medical conditions may help to paint a clearer picture of an equitable impact.



# Evaluation

## 1. Virtual Platform

Virtual platforms for RPM data collection and usage have grown in the last decade in the commercial sector, but there is not a current government version. The VA has invested more time and resources into monitoring electronic health records in Cerner, the VA's current electronic health records system, but through this has missed opportunities to invest in newer technologies. Medocity and Datos Health are two major commercial health data platforms that are geared towards managing chronic conditions with RPM. These digital platforms help patients to use RPM devices and sensors, collect data, and communicate information on their conditions. The platforms can include portals to conduct telehealth visits with their doctors, as well as advanced analytics that can show patients their health data in easily measurable and trackable formats. Medocity and Datos Health have been largely successful, both in revenue and use. In a Medocity platform for diabetes, 79 percent of patients utilize the virtual care platform nearly four out of every five days, with over 90 percent of patients reporting high usability scores. There are three realistic paths to follow if the VA were to create its own RPM virtual platform. The first is for the VA to create this platform completely from scratch. The second would be for the VA to pay to get in on the commercial side, creating a partnership with a company like Medocity or Datos Health. The third would be to create a customized VA platform built on the structure of existing platforms.

The platform alternative would likely rank as medium on effectiveness. Citing the success of platforms like Medocity and Datos Health, a VA version of this platform would already have a ready and available consumer base and likely increase the use of RPM among the targeted population, as the VHA could automatically enroll patients into the platform with an opt-out option. There may be challenges in adding current users into the system if they do not want to adjust to a new digital platform, but based on the acceptance of Medocity, I predict at least 60 percent of enrolled users would begin to regularly engage with the platform. The VA has made progress on the creation of its own platforms, but is seeking help to expand and innovate its methods of RPM delivery. The VA Connect app, which hosts video calls, had a 235 percent rise in video visits from 2018 to 2019 alone (mHealthIntelligence, 2021). The VA versions of digital platforms have been successful in generating telehealth use, but this increase points to the VA needing more help in keeping up with demand. This option also may not be as accessible for those without adequate internet access, making this option rated as medium on the effectiveness criterion.

# 1. Virtual Platform

This alternative would also be costly in the beginning stages, but potentially also save money in the future. Implementing a new digital system can be an expensive task upfront, but could save money in the long run by reducing in-person doctor visits and visits to monitor simple health statistics. The VA budgeted \$1 billion in 2021 to expand its digital platforms with four new ones, so I will use \$1 billion as the baseline budget for the development of such a program. Proposals for the expansion could include hub-and-spoke telehealth platforms, call centers, audio telehealth support, and RPM devices, all of which are aimed at streamlining RPM processes (Wicklund, 2021). The \$1 billion budget for this program earns a medium cost score.

Based on previous actions by the VA to explore such a type of platform, this option is feasible. The VA has multiple routes to go about creating such a platform so the flexibility that this option offers is a positive element and makes it more likely to be seriously considered by the VA. In 2021, As stated previously, the VA sought proposals for four new RPM digital platforms, each funded for two years with options for six more years, again with the potential total cost around \$1 billion (Wicklund, 2021). However, little progress has been reported on the creation and implementation of such a platform. The development of such a program earns a medium score on feasibility because of previous considerations but failures to progress on proposals.

Finally, this option raises one main concern about equity to rural RPM users that may not have sufficient network access to use this program effectively at home. This program would be accessible to all users with internet access, but users with poorer internet connectivity may see some lapses in accessibility. RPM continues to be exceptionally important to achieving equity between rural and urban Veteran populations, as 2.6 million American Veterans live in remote locations (mHealthIntelligence, 2021). A new digital platform would make little difference to those who would have difficulty accessing it in the first place. However, the streamlining of RPM processes may make RPM more accessible to others. Therefore, it earns a medium score on equity.

## 2. Public Health Campaign

Public health outreach campaigns can be effective in changing behavior. A recent White House campaign to reduce Veteran suicides with the DoD and the VA was successful in reducing suicide deaths (The White House, 2023). A similar outreach campaign directed towards increasing RPM usage conducted with the same agencies, namely the VA, could be a potentially viable policy option.

Due to the previous success of VA and government public health outreach campaigns, the predicted effectiveness of a campaign is substantial. Other international public health campaigns have had notable impact on the outcomes they seek to achieve. For example, an HIV prevention campaign increased condom use for protection against pregnancy among young women from 5 percent to 18 percent (Wakefield et al., 2010). A national campaign to reduce the risk of sudden infant death syndrome by putting babies to sleep on their backs instead of on their stomachs reduced deaths from SIDS by 50 percent (Wakefield et al., 2010). Road safety campaigns targeted were associated with a 7 percent reduction in vehicle crashes and a 13 percent decrease in alcohol-impaired driving (Wakefield et al., 2010). A public health campaign targeted towards increasing RPM usage is likely to have a positive impact on patient behaviors and choices, making it an effective option. Based on these previous studies, I estimate that an outreach campaign, if implemented effectively by both the VHA and individual care teams, could increase RPM adoption by 5 to 15 percent. This policy option earns a medium effectiveness score.

In terms of cost effectiveness, a campaign like this could be cost-effective if conducted through efficient means. One study for an anti-smoking campaign in Australia found that online display (OD) was the most cost-effective method of achieving campaign outcomes, above television and online video formats (Allom, 2018). OD is also the least expensive method to implement compared to the others and was the most cost-effective at \$230 AUD per page view, which equates to \$154.60 USD today. The results of this study could be largely generalized to other health campaigns focused on changing behavior. 2.6 million Veterans live in remote locations. Using 2.6 million as a baseline, if each \$154.60 per page view was distributed among 2.6 million Veterans, the minimum cost of distributing the program would be roughly \$401,960,000. Additional costs are expected in the development and implementation of this program, earning it a medium score in the cost category.

## 2. Public Health Campaign

A campaign to increase RPM usage may be the most appealing to the VA because it requires the least amount of systematic change for the VA. It comes as more of a one and done program that can be planned and conducted in a specific time period, not a program that comes with a lot of upkeep like the virtual platform or big system changes like the following two options. The VA has completed other public health advocacy campaigns in the past, such as the “Reach Out” campaign, which encouraged Veterans to seek mental health support in conjunction with Suicide Prevention Month (“Reach Out” Campaign Highlights Programs and Assistance for Veterans During Suicide Prevention Month, 2021). This program would be highly feasible based on previous federal public health outreach campaigns.

This option raises concerns about equity if it were to be implemented by the VA. Disparities in reach may change according to the methods the campaign is conducted through. Communities without broadband or internet access may be less likely to view the campaign as much as those who spend more time online, which are exactly the communities that a policy to increase RPM should target.

### 3. Insurance Reimbursements

During the COVID-19 pandemic, the use of telehealth and RPM technologies rose drastically and quickly. In June 2022, the VA created the Office of Integrated Veterans Care, formerly known as the Community Care Network (CCN) as a move to streamline care through one office instead of multiple VA systems. With this transition, the insurance reimbursement rules within VA healthcare have changed in the past year. The CCN was established to allow Veterans to access care from community healthcare providers outside of the VA network when VA facilities are not available or cannot provide the appropriate healthcare services that the patient needs. With the rise of RPM, billing codes and processes have not caught up to the rate of usage, and therefore the codes apply to less specific coverage than typical, in-person healthcare. Current Procedural Terminology (CPT) codes are numeric codes for healthcare providers to use to uniformly identify different procedures and medical services. CMS has been using CPT codes to update the billing system with RPM technologies, but has faced several flaws, such as time restraints specific to different conditions and devices, in its implementation. In 2018, the CPT code 99091 was created to encompass all digital health measures. In 2019, three more specific codes were added to set up, supply, and monitor RPM technology. By 2022, six more codes were added for more specific functions, totaling ten new CPT codes in four years. Some problems have arisen with this expansion of codes. For example, certain codes require data to be collected for a certain amount of time before being applicable to the CPT code under CMS rules. If patients only need to use an RPM device for under that amount of time, then it may not be covered by insurance, and therefore not reimbursable. Continuing to expand and update CPT codes to account for the uptake and upkeep of RPM technology will make RPM more accessible and affordable for patients.

The effectiveness of expanding insurance reimbursements using CPT codes could potentially increase the use of RPM by making it easier to bill for, and thus less intimidating for patients to try RPM devices. However, the CPT code process has not been shown to be a current major deterrent for patients to uptake RPM in the first place. CMS will likely to continue to expand CPT codes as time progresses without policy intervention or VA action. Thus, expanding these codes will likely have a minimal effect on whether patients choose to take up RPM or not, giving it a low effectiveness score.

### 3. Insurance Reimbursements

The costs associated with this program are lower than others, because it is a program mostly associated with institutional and administrative change rather than an investment in a program or infrastructure. The American Medical Association Board of Trustees compiles the CPT Editorial Panel, which revises, updates, and modifies CPT codes, descriptors, rules and guidelines as needed. No taxpayer money has been spent to develop or maintain the CPT code set (The CPT® Code Process, 2019). The CPT code set is completed yearly at no cost to the government. Therefore, this option receives a high cost score, but not in terms of its cost-effectiveness as the results are minimal.

This policy alternative is highly feasible, as it allows CMS to continue its process of adding CPT codes to align with RPM procedures. It focuses on filling the gaps left by other codes and catching up to new RPM technology as it is implemented in the system. It focuses on the insurance part of the healthcare process, which condenses the area of implementation, but a more complicated one. CMS is an easier institution for the VA to work with, as it does not have the competitive nature against the VA that private insurance companies may hold.

In terms of equity, this policy is equally equitable among those who have insurance through the VA/CMS, but does not affect any patients who are not insured at all. However, this project is specifically focused on increasing RPM usage among VA-enrolled patients. We are not taking into consideration other populations as it would make the scope of the solution too broad. Thus, this option scores relatively medium on equity, as it affects all insured patients equally, but does not work to close any disparity gaps.

## 4. Infrastructure Investments

While over 80 percent of the country has access to broadband high speed internet, around 19 million Americans do not have access to high-speed internet, including around a quarter of the U.S. rural population (Realizing the Potential of Remote Patient Monitoring, 2023). RPM usage is often lower and less accessible in rural areas where internet connection and broadband is poorer. Rural populations also tend to have more low-income patients, who may not have affordable access to some RPM devices and technologies, like FitBits and Apple Watches. RPM usage was shown to vary significantly by region according to the previously mentioned Definitive Healthcare report. In 2022, the Southeast accounted for 26.9 percent of all claims for RPM-related procedures and diagnoses, followed by the Northeast at 22.6 percent, the Midwest at 21.7 percent, the West at 16.5 percent, and finally the Southwest with 12.1 percent (Realizing the Potential of Remote Patient Monitoring, 2023). Per capita, the Southeast and the Southwest are the largest RPM users. The Southeast also leads in raw RPM usage with 37 percent of all coded procedures. The VA has shown signs of looking to expand infrastructure investments in three main areas. The first would be to provide devices like phones and tablets that patients can use to monitor their health data and communicate with their doctors. The second is the bluetooth “widgets” that harvest data, like scales, heart monitors, etc. The third is the hospital infrastructure that would need improvements to handle an increase in video and telehealth visits. Some hospitals do not have the wi-fi capacity to handle more telehealth, so expanding that it is vital to providing more RPM. The VA has allocated funds to expand infrastructure, but has only used a small portion of it. I propose that the VA opts for the first type of infrastructure expansion in the form of distributing tablets to rural veterans that they can then use to monitor their health and communicate with their doctors.



## 4. Infrastructure Investments

This method would be highly effective because it targets a specific piece of the problem and population that is most vulnerable to having poor access to RPM and healthcare in general. Investing in rural communities addresses a vulnerable population and can help close gaps in the usage of RPM. We can use the Bay Pines VA Healthcare System (BPVAHCS) as a case study. BPVAHCS added a telehealth program called TeleCC to their intensive care unit; subsequently, the proportion of video visits among all telehealth appointments rose from 4.8 percent in December 2020 to 10.3 percent in April 2021. Implementing this program more than doubled the rate of telehealth appointments. We can assume that not every hospital that implements a program like TeleCC will more than double their usage, especially if they start at a higher usage rate, but it is safe to assume that these programs have been largely effective across VA healthcare systems. Another example of infrastructure investment success was in the VA's distribution of tablets to 13,180 rural veterans who had experienced at least one visit through VA mental healthcare services. As a result, there was a 36 percent reduction in suicide-related emergency room visits, as well as an increase in mental health care via video. Increasing infrastructure investments have been proven to be effective through a few different models, allowing the VA to explore several different methods of implementation.

This alternative would be costly to implement, but could result in saving money on healthcare and travel costs in the future. The costs of implementing this could range drastically based on the types of infrastructure chosen to implement, but overall would be more of an investment in the rural Veteran community for the VA instead of a sunk cost. One tablet experiment in San Diego distributed tablets to VA nurses that conducted home visits to rural Veterans. The study showed that each tablet unit cost around \$900, and the program was estimated to save about \$50 billion annually in terms of reducing chronic non-healing wound care treatment (Wicklund, 2017). While many of these rural Veterans may already have their RPM technology and sufficient internet access, or do not need either, for the sake of the example I will use 2.6 million as a baseline number for a cost estimate. If all 2.6 million Veterans were given a \$900 tablet each, the program would cost \$2.34 billion up front. If the estimate of costs saved were comparable to the San Diego experiment of \$50 billion annually, the program would be extremely cost effective. The high upfront prices of this program earn it a low score on cost, but the potentially higher cost-effectiveness of this program should be noted separately.



## 4. Infrastructure Investments

Infrastructure investments are also relatively feasible, because the VA has already shown interest in similar options; the VA has allocated around 1.6 billion dollars to improve health technology infrastructure. Only around 10 million of this budget has been used so far. Most of this hesitation falls in the large upfront costs of implementation and coordination between patients and healthcare systems. In implementing this infrastructure, the VA expands its reach to rural communities and this technology can be used to address other areas of concern for the VA, like suicide hotlines and emergency services. However, this option does leave room for user error in the distribution, training, and subsequent use of the devices, threatening the overall feasibility of the program and leaving it with a medium score on feasibility.

This investment also addresses communities that are particularly vulnerable to inequalities in the healthcare system. This means that it scores high on the equity factor, as it works to close an equity gap in the healthcare system.

# Outcomes Matrix

In the following outcomes matrix, each alternative will be scored from low to high, with low being least appealing and high being the most appealing.

	<b>Alternative 1: New VA RPM Virtual Platform</b>	<b>Alternative 2: Public Outreach Campaign</b>	<b>Alternative 3: Insurance Reimbursements</b>	<b>Alternative 4: Infrastructure Investments</b>
<b>Effectiveness</b>	Medium: Would help current users and potentially entice new users, but lack of such a platform has not been a deterrent of uptake	Medium: Would target those who are not already considering RPM, but reach to rural vets with poor internet access remains an issue	Low: Insurance reimbursements are not usually a main factor preventing uptake for chronic conditions	High: Targets most vulnerable population and addresses their main factors preventing uptake
<b>Cost</b>	Medium: ~ \$1 billion	Medium: ~ \$4.2 million	High: \$0	Low: ~\$2.34 billion
<b>Feasibility</b>	Medium: VA has considered this option previously, but has not made tangible steps towards creating a platform outside Cerner	High: The White House and the VA have executed similar campaigns in the past	High: CPT code expansion will happen organically over time without policy intervention	Medium: While expensive upfront, investments help to achieve multiple VA goals and target a main source of RPM deterrence
<b>Equity</b>	Medium: Streamlines RPM management for patients, could make management more accessible	Low: Lacks ensured reach to vets with poor internet access	Medium: Affects all VA-enrolled vets equally	High: Addresses rural Veterans, works to close gap between urban and rural healthcare access

## Recommendation

Using the four criteria of effectiveness, cost, feasibility, and equity, expanding infrastructure investments in rural areas seems to be the most viable option for increasing RPM usage among VA healthcare users. This option would target a major weakness among a marginalized community to improve access to healthcare. By implementing this strategy, the VA could capitalize on the funds already allocated towards this goal, as well as invest in the work towards other goals of the VA outside of increasing RPM usage, like increasing access to emergency services.

## Implementation

If the VA were to implement infrastructure investments across the country to increase RPM usage, a successful program would be effective, reasonably costly, feasible, and equitable. The proposed program of infrastructure investment reasonably aligns with all four of these criteria, making it a practical option for the VA to take on and implement. Outside of ReefPoint Group, the VA is the most important stakeholder in the implementation of this program. The funding for this program would primarily stem from the VA and federal funding mechanisms. Ideally, RPG would be a contractor for this program and work alongside subcontractors, VA employees, VA patients, and care teams to implement technology advancements and put RPM devices into the hands of patients that need them. Veteran interest and advocacy groups would likely be in favor of this type of program and its expansions in health infrastructure for Veterans, so it is unlikely to face resistance or backlash from Veteran interest groups.

In order to move forward with this recommendation, RPG would need to seek a contract award with the VA. Some of the biggest challenges that RPG may face in seeking a contract award would be competition from other consulting firms and federal contractors, particularly those with a larger workforce and possibly larger geographic presence. RPG is based in Annapolis, Maryland and Northern Virginia. The VA is likely to target this program more towards rural areas, so it may favor companies with a larger presence in rural areas or history of working with rural communities. Due to the VA's previous exploration of this type of investment, it is likely that the VA will be willing to consider a similar policy.

As for the main challenges in the implementation of the infrastructure investments themselves, distribution and user error remain a significant issue. One solution to address the difficulty in distributing technology to rural communities is to wait for patients to come into their usual healthcare facilities for regular appointments, whether it be a VA hospital or another facility in the VA Community Care Network (CCN), and allow trained healthcare professionals to propose appropriate RPM technology if applicable. If the patient agrees to try the RPM system, the facility should have the devices supplied in the facility, ready to set up for the patient to take home with them. Another option is to allow patients to request this type of technology to be delivered to them through an online portal that could be added onto the VA website. This would likely be more expensive than the previous option, as factoring in driver and fuel costs adds up, but it could reach Veterans who do not usually go to healthcare facilities outside of medical emergencies.

A worst case scenario analysis for RPG is the VA not choosing to undertake this proposal with RPG or undertaking it with another firm. Nothing significant would change for RPG outside of a missed opportunity with a major client, making the risk of initial steps to implement the program low. However, if the VA did choose to undertake this policy with RPG, RPG would likely need to contract multiple subcontractors in order to assemble the capacity for implementation. RPG does not have the labor and resource capacity to implement this program on a large scale completely by itself, as it is only around 100 employees as of 2023. RPG could entice other subcontractors that it has worked with before to accompany them on this program, such as Booz Allen Hamilton, Guidehouse, AbleVets, VetsEZ, Ancilla Technologies and Services, Sehlke Consulting/Aeyon, and Huron Consulting Services. Overall, RPG faces a great and profitable opportunity to engage with the VA in this potentially long-term venture with low risk for itself.

## Conclusion

Remote patient monitoring technology is the future of healthcare. RPM allows patients to manage both chronic and acute conditions from the comfort of their own homes, as well as save costs on travel, hospital visits, and in-person physician care. The addition of RPM into the mainstream healthcare system is expected to save billions of dollars over time. Rural, VA-enrolled Veterans stand to benefit significantly from implementing RPM into their healthcare systems, but lack of proper infrastructure and funding prevents many from uptaking new devices and technologies to manage their conditions. Investments in RPM would likely save costs over time, but the upfront costs can be a deterrent for many low-income Veterans. VA investments in technology infrastructure in rural areas will work to bridge the gap between rural and urban Veterans, providing better access to quality healthcare.

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