REMOTE PATIENT MONITORING TECHNOLOGY: BENEFITS, CHALLENGES, AND IMPLEMENTATION
Introduction

Technology continues to redefine every aspect of our lives. In this day and age, you can use a computer or mobile device to request a ride, buy groceries, or even find someone to walk your dog. Digital technology continues to disrupt every industry, and healthcare is no exception.

As telehealth companies continue to refine and advance themselves, it is becoming more common to meet with a doctor, counselor, or nurse practitioner using a mobile electronic device in lieu of visiting a practitioner's office for a face-to-face appointment. Although this is a convenient and cost-saving healthcare development, telehealth companies are taking this technology a step further by implementing remote patient monitoring.

Remote patient monitoring allows health care providers to gather useful data regarding a patient’s health outside of the traditional doctor’s office setting. RPM devices can track data such as blood pressure levels, respiratory flow rates, and weight. They can also be used to offer daily reminders to patients who struggle to keep up with their healthcare provider’s instructions regarding medication, sleep, exercise, and coping techniques.

Remote patient monitoring is highly beneficial when it comes to improving the quality of life and reducing the healthcare costs of individuals who suffer from chronic conditions like heart failure, COPD, diabetes, and various forms of cancer. In the past, conditions of this type have required frequent doctor’s visits and hospital stays to monitor the patient’s condition. Advances in remote patient monitoring are making care easier and more comfortable for chronic illness patients. And, because RPM allows healthcare providers to monitor these patients at all times, this technology makes fast treatment easier should something go awry.

All in all, implementing a remote patient monitoring program will provide a variety of benefits to both you and your patients.
Remote Patient Monitoring: Why Now?

Patient monitoring is not a new concept. In fact, it has been a staple function of hospital stays for decades. Technologies such as heart rate monitors, pulse oximeters, blood pressure monitors, and other devices have provided useful health data to physicians for years. However, there is a limit on the amount of data that these devices can provide due to the fact that they cannot follow the patient home to keep track of his or her progress and bodily conditions.

Over the past few years, wearable, monitoring devices like FitBits and Apple Watches have exploded in popularity. These types of devices are relatively inexpensive to manufacture and set up, and they have the ability to accurately monitor a person’s activity levels for fitness purposes.

As the Internet of Things, or IoT, market continues to explode the demand for new consumer-grade FDA-approved remote patient monitoring devices is simultaneously gaining steam. This market is expected to be worth $59.26 billion by 2021. As of now, there are a number of these devices available to track information such as blood pressure, blood oxygen levels, breathing, and posture. With RPM devices, patients can experience the convenience of a small, wearable device while also experiencing accurate, hospital-grade monitoring.
Healthcare Applications of Remote Patient Monitoring Technology

Remote patient monitoring technology makes healthcare more efficient, especially when it comes to saving time and money. RPM devices also make it easier for those experiencing sudden complications to receive timely advice and care. These benefits are most significant for individuals who are battling chronic diseases.

**Dementia Patients.** As the population continues to age, better care and treatment options for those battling dementia is becoming a more prominent priority. Remote patient monitoring devices are highly beneficial to this group of the population. These devices provide surveillance in order to prevent and respond to falls and provide daily reminders for everyday tasks. They can also be equipped with GPS monitors so that family members and physicians can keep track of the patient.

**Heart Patients.** Devices like pacemakers and heart resynchronization therapy can monitor and maintain the patient's heart rate while also monitoring the patient's physiological condition. Remote monitoring devices are especially beneficial for patients who are at risk of suffering from cardiac arrest. If the patient's wearable or implanted device detects abnormalities relating to cardiac arrest, they can alert the patient's healthcare provider and provide instructions for the best next steps.

**COPD Patients.** Continuous monitoring can reduce the rate of hospitalization and emergency room visits for COPD patients. Remote monitoring devices may also lower flare-up rates for these individuals. Overall, long-term remote monitoring of COPD patients tends to encourage them to take a more active role in managing this condition.

**Diabetes and Hypertension Patients.** Patients receiving care for diabetes or hypertension can benefit from remote monitoring of their blood pressure and blood sugar levels. The diagnostic software within these devices can detect abnormalities and ensure that the patient receives timely advice and treatment. These devices could also provide advice regarding diet and nutrition and medication to help the patient maintain normal blood sugar and blood pressure levels.

These are just a few examples of the many ways in which remote patient monitoring technology can be implemented to improve patient care, longevity, and quality of life.
Exploring the Benefits of Remote Patient Monitoring Technology

The further advancement of remote patient monitoring technology will result in a variety of benefits for healthcare patients and providers. This technology saves time, cuts costs, and enables a better quality of care to be provided. For individuals who suffer from chronic conditions or who are at risk for sudden onset health complications, remote patient monitoring devices can be life-saving. Let’s take a more detailed look at the immense benefits that this technology can provide:

Benefits for Patients

Easier Access to Care
A recent study concluded that nearly 30 million Americans live more than one hour away from a trauma care center (Carr, 2017). In rural areas, it can be both challenging and costly to transport a patient to a doctor’s office, and specialists are even less accessible. For those Americans who live in “hospital deserts” and those who live without access to a car or public transportation, remote patient technology makes receiving timely and efficient care much more possible. The ability to digitally connect with care providers gives these patients the opportunity to receive quality care from any location.

Reduced Time and Cost Constraints
A survey conducted by Medicare Advantage found that 44% of its respondents had not visited a primary care physician in the past year (2018). This may be due to the fact that, for many Americans, finding time to visit a healthcare provider is a challenging task. In order to schedule a doctor’s appointment, patients must request time off from work, make arrangements for their children and families, and spend time and money transporting themselves to their provider’s location. Advancements in telehealth and remote patient monitoring allow patients to reduce their costs and save time by receiving care from the comfort of their own homes.

Remote patient monitoring technology can also make healthcare more affordable for patients. Because each patient’s conditions are being monitored by a healthcare professional at all times, this technology leads to savings in regards to transportation costs, co-pays for appointments, and unnecessary emergency room visits.
Early Detection of Abnormalities and Complications
Timely care is a matter of life and death. Remote patient monitoring improves healthcare outcomes by giving healthcare providers the ability to detect abnormalities and the onset of complications almost instantly. This technology enables healthcare practitioners to make real-time diagnoses and suggest options for treatment. If a patient is beginning a new medication or treatment plan, then the provider can track the patient's progress and side effects and make instant adjustments. This frees the patient from having to suffer from these side effects until their next doctor's visit.

"Love the staff reaching out. I believe my COPD is getting better."
60 year old male COPD patient

“Was going to call 911 but a nurse reached out and I feel better”
65 year old female CHF and COPD patient

Patient Engagement and Education
The constant assurance and support that remote patient monitoring provides empowers patients to become more involved in their own care. This technology provides a high level of real-time interaction between the patient and the healthcare provider. Many RPM devices display data for the patient to analyze and understand. For many, this provides an opportunity to learn more about health conditions, the human body, and the signs and symptoms that accompany abnormalities and complications. Patients also tend to be more motivated to make healthier lifestyle choices and follow their provider’s treatment orders while being monitored remotely. According to a recent survey, RPM programs can improve patient compliance rates by up to 44%.
Benefits for Providers

Easier Access to Patient Data
Maintaining consistent and accurate patient data allows healthcare practitioners to provide patients with more advanced care. This technology gives physicians the ability to perform routine tests and monitor the patient's conditions in real-time. For patients who are seeing a number of doctors and specialists throughout the duration of their treatment, remote patient monitoring devices prevent the loss of patient data and allow for each provider to remain up to date on the patient's condition. The medical data collected by RPM devices can also be analyzed by healthcare professionals to provide insight on ways to improve patient care.

Better Care with Reduced Burnout
A study conducted by the American Academy of Family Physicians found that healthcare practitioners see an average of 19 patients each day. Seeing this many face-to-face patients each day can be challenging, especially in areas with a limited supply of primary care doctors. In an effort to reduce waiting room times and fit enough appointments into their daily schedules, many doctors rush through visits. The fast-paced environment of busy offices can lead to burnout for many healthcare professionals. Remote patient monitoring can help to alleviate this stress by limiting face-to-face visits to those with critical medical needs. It can prove to be more efficient for appointments regarding patient check-ups and updates that do not require physical contact between the patient and the provider to be transitioned across remote channels including virtual visits and remote patient monitoring.

More Time and Attention for Chronic Care Patients
With doctors seeing dozens of patients each day and waiting room times continuously increasing, there is a chance patients suffering from chronic conditions may not be receiving adequate time and attention from their providers. Remote patient monitoring can help healthcare providers maximize the time spent with each patient by eliminating the need to check the patient’s vital signs and complete lifestyle questionnaires. This allows the provider and the patient to spend more time addressing questions and concerns and discussing treatment options.
Lower Care and Operations Costs
According to the Healthcare Intelligence Network, 69% of healthcare providers named remote patient monitoring technology as their top cost saver (2017). This research also predicts that remote patient monitoring technology will save up to $200 billion in global healthcare costs over the next 25 years.

RPM technology reduces costs for both providers and patients by reducing the number of unnecessary visits. As we have previously mentioned, the cost of driving to and from the doctor's office or hospital is costly for many Americans. The same is true for healthcare practitioners who perform home visits. RPM can also reduce overhead costs for practitioners by allowing them to downsize their office spaces or work remotely.
Challenges Facing Remote Patient Monitoring Technology

Remote patient monitoring technology is a promising technological advancement, however, there are a few challenges facing this innovative market:

Accessibility
Although telehealth and remote patient monitoring make access to care easier for many Americans, it can still be inaccessible to some. The use of this technology requires broadband connectivity with high bandwidth. This can be a challenge for small healthcare centers and providers and patients in rural areas.

EHR Integration
Another challenge that needs to be tackled in order to implement remote patient monitoring on a wider scale is the fact that many traditional healthcare data systems are not equipped to support RPM. Because the current EHR system records data based on episodic care, there is some confusion surrounding the best methods for integrating ongoing RPM data into the existing system. This roadblock requires a decision from healthcare industry leaders regarding the best practices for integrating third-party RPM data.

Data Security
As with any digital enhancement, hacking and data breaches are a threat. For this reason, it will be important for remote patient monitoring device manufacturers to find innovative ways to protect patient privacy. Security breaches can be costly to both providers and patients in regards to billable healthcare costs, identity theft, and legal actions taken against healthcare organizations as a result of data breaches. When selecting an RPM device manufacturer, security should be a top priority.
Getting Started: Implementing a Remote Patient Monitoring Program

A recent study by the Consumer Technology Association concluded that nearly 68% of all healthcare providers plan to implement a remote patient monitoring program at some point in the future. The following section provides an overview of important information that providers should understand before getting started.

The Technological Components of Remote Patient Monitoring Technology

The advancement of wearable devices that provide physiological data to healthcare providers has made remote patient monitoring a more common method of long-term patient care. However, this care option requires multiple technological components. Remote patient monitoring technology consists of the following key features:

**Input Devices**
These devices remain with the patient throughout the duration of their care. Input devices include sensors that enable each patient’s condition to be transmitted to a healthcare provider in real time. They can also assist with delivering alerts, reminders, and communication between the healthcare provider and the patient. Input devices usually come in the form of a wearable device, but there are also input devices that can be implanted within the patient’s body.

**Diagnostic Software**
Diagnostic software is useful for those who suffer from chronic conditions with a risk for complications. This technology can assess the patient’s conditions in the event of an urgent complication and provide actionable advice regarding the best next steps. This function of
remote patient monitoring is especially beneficial for those who are at risk for sudden complications such as cardiac arrest, strokes, and anaphylactic shock.

Local Data Storage
The physiological data that is collected by the input device needs to be stored for later analysis. This information is useful in determining the progress of the patient’s care. Any relevant health data that is collected should be stored in such a way that it can be easily extracted and accessed by the provider’s or hospital’s central repository.

Network
The ability to track patients’ conditions in real time requires a network connection. This allows the remote patient monitoring device to connect with the healthcare provider’s EHR system. In most cases, companies that manage remote patient monitoring devices provide a reliable network that connects the patient with the doctor. Access to these networks can usually be achieved through the use of Wi-Fi, mobile data, or Bluetooth technology.

Provider Reimbursement for Remote Patient Monitoring Services
In late 2018, the Centers for Medicare and Medicaid Services made the decision to begin reimbursing healthcare providers for particular telehealth and remote patient monitoring services. Three additional CPT codes were added to differentiate between remote patient monitoring for chronic condition patients and general telehealth services:

- **CPT Code 99453**
  - Initial Set-Up and Patient Education

- **CPT Code 99454**
  - Device & Transmission

- **CPT Code 99457**
  - Patient Management
CPT Code 99453
This code covers remote monitoring of physiological conditions including the patient’s blood pressure levels, respiratory flow rate, pulse oximetry, and weight. Providers are now reimbursed approximately $21 for initial consultations, set-up, and patient education regarding the use of these remote patient monitoring devices.

CPT Code 99454
This code covers similar parameters to CPT Code 99453. Under this code, providers are reimbursed approximately $69 per each 30-day period to cover the cost of the device as well as the cost of transmitting daily recordings and patient alerts.

CPT Code 99457
Under this code, providers are reimbursed approximately $53 per month for spending 20 minutes of time analyzing the data from remote patient monitoring devices and communicating their findings with patients.

Billing for these services through Medicare or Medicaid requires the use of a remote patient monitoring device that has been approved by the FDA. The patient receiving care must opt-in for the service, and it should be prescribed by a qualified healthcare practitioner. RPM can be billed alongside Chronic Care Management (CCM).
Questions to Consider When Designing an RPM Program

There are quite a few questions that providers need to answer before implementing a remote patient monitoring program:

**Which patients should be monitored?**
The best candidates for remote patient monitoring are those with ongoing health issues that can be improved by monitoring data gathered by RPM devices. If you are seeking to measure the effectiveness of your RPM program with a trial run, then it is best to select patients who are open to remote monitoring as those individuals will be more apt to comply and provide consistent data. Non-compliant patients will be more likely to terminate the program early and negatively impact your results.

**How long will the program last?**
For patients battling chronic conditions like heart disease, COPD, and diabetes, a remote patient monitoring program can last throughout the duration of the patient’s life. Programs for non-chronic conditions can begin with set deadlines based up readmission rates and penalties. Keep in mind that in order to bill Medicare or Medicaid patients for remote patient monitoring services, the program must last for at least 16 days.

**What data will be gathered?**
The best data to collect and analyze includes the patient's vital signs, activity levels, and dietary habits. Providers should focus primarily on data that can be charted with accuracy and ease that can be used to affect clinical care decisions.

**Which devices will be used?**
Sleek, reliable devices that can seamlessly fit into the patient's home environment are the best fit for remote patient monitoring programs. Avoid selecting wearables and devices that are clunky and uncomfortable.

**Who manages care coordination?**
It is best to design an efficient workflow by delegating certain aspects of patient care to your on-premise staff. Nurses are well-equipped to manage daily or weekly care coordination and management tasks. Doctors and specialists should step in only as needed. It is important to establish a stable foundation for success at the beginning of the program. For the best results, your program should anticipate disruptions and set actionable goals rather than reacting to events as they arise. Keep in mind that implementing a successful remote patient monitoring program takes time.
Implementing a successful remote patient monitoring program depends highly on patient utilization. In fact, this is one of the key determinants of program success. Active and engaged RPM patients yield positive results including improved patient outcomes and significantly lower readmission rates. These results can save millions of dollars in healthcare costs each year and make treatment more cost-effective overall.

Patient engagement also has the potential to decrease unnecessary initial hospital visits for chronic disease patients. By keeping up with your patients’ conditions through wearable monitoring devices, you will be alerted to any abnormal vitals or complications. This will enable you to assess the patient’s condition and offer treatment suggestions before the patient heads to the emergency room.

You can encourage higher levels of patient engagement by selecting devices and processes that are useful, comfortable, and easy to use. Patients should also be encouraged to actively participate in the care process. It is also important to provide your patient with continuous, personalized support and daily contact. Each of these suggestions should result in an increase in patient utilization and the success of your remote patient monitoring program.
What’s Next for Remote Patient Monitoring?: Trends and Future Outlook

*Increased patient demand, steady growth, device consolidation, and the application of collected analytics and data are the expected trends for this market over the next 3-5 years.*

The future of remote patient monitoring technology appears to be fruitful at this time. This market is expected to grow exponentially over the coming years, reaching a value of $59.26 billion by the year 2021. As this industry continues to evolve, here’s what you can expect over the next five years:

**Increased Demand for Remote Patient Monitoring As a Care Option**
Throughout the 21st century, industries have been disrupted due to the population’s desire for comfort and convenience. As this trend continues to spill over into the healthcare industry, access to telehealth services like remote patient monitoring programs will be expected as a common care option.

**Device Consolidation**
As these devices continue to become staples in patient care, many will become consolidated to create devices that can monitor a variety of conditions and diseases. Analytics. In the Information Age, it should come as no surprise that data collected from remote patient monitoring technology will likely be used to contribute to medical studies regarding patient conditions and care assessments.

**Applied Analytics**
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When it comes to providing advance remote patient monitoring technology to patients suffering from chronic obstructive pulmonary disease (COPD), SynsorMed is leading the way.

Although our transformative remote patient monitoring platform primarily focuses on COPD patients, we also have the ability to monitor other chronic conditions including obesity, diabetes, congestive heart failure, and pneumonia.

When you partner with SynsorMed, you'll enjoy a seamless experience and a high level of patient compliance. Our solution offers a sleek and simple design that is easy for elderly patients and those who do not interact with technology regularly to use and understand.

SynsorMed puts patients first. Our HIPAA compliant app also features a variety of third-party partners who can assist patients with non-medical needs. We are dedicated to reducing readmissions by offering solutions to social determinants of health including a lack of transportation, food insecurity, and housing. Providing answers to these challenges has been proven to reduce readmission rates by up to 50%.

Visit www.synsormed.com to request a free demo.
Sources


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