Vivifyhealth®

PATHWAY TO CONNECTED CARE, EVERYWHERE

Build a Foundation for Remote Patient Healthcare Services

THE VIVID SUMMARY

The ability to seamlessly connect clinicians to patients beyond the four walls of the hospital comprise a cornerstone for improved patient outcomes, reduced cost and resource allocation, enhanced care quality and other value-based care goals.

Many of the concepts and strategies that fall under the broad category of remote patient monitoring (RPM) have been around for years, but technological advancements, changes to reimbursement schedules and patients' desires to manage chronic conditions within the context of their daily lives have led to greater maturation of the RPM market.

This white paper will use a mix of peer-reviewed research and use cases to:

Review the evolution of connected and remote patient care;

Demonstrate its value to health plans, hospitals, self-insured employers, clinicians and patients; and

Provide a blueprint for implementation and adoption success of remote patient healthcare services.

Is RPM Rocket Science? Yes.

RPM (Remote Patient Monitoring) literally got its start in space, launched by NASA (National Aeronautics and Space Administration) in the 1960s[1]. As NASA's Directorate of Space Medicine explored the limitations space places on the human body, the agency expanded the bio measurement systems that first debuted on the Mercury and Gemini flights.

Today, a more comprehensive, industry-wide push for connected health began following the Great Recession and the passage of the American Recovery and Reinvestment Act (ARRA) of 2009. ARRA included health information technology (health IT) initiatives to help stimulate economic growth in specific businesses and provided significant investments to modernize the nation's health IT infrastructure.[2]

The following year, the Obama administration also proposed a national broadband plan that included a call to improve medical networks to "facilitate remote patient monitoring, electronic health records and other technology-based health services such as telemedicine." [3]

Over the past decade, the explosion of such consumer technologies such as smartphones and wearable devices combined with the buildout of broadband and health IT infrastructure to accelerate the adoption of connected health care initiatives. Other market forces—the rise of consumerism, the shift in focus in healthcare from volume to value, the decentralization of care, and a surge in interest in wellness programs—continued to transform healthcare and accelerate the need for connected, remote patient care.[4]

---

[1] Norris A.C. Essentials of Telemedicine and Telecare. John Wiley & Sons, Inc.; New York, NY, USA: 2001

[2] US National Library of Medicine, National Institutes of Health. "Crossing the Telemedicine Chasm: Have the U.S. Barriers to Widespread Adoption of Telemedicine Been Significantly Reduced?" 28 November 2013

[3] mHealth Intelligence, "The History of Remote Monitoring, Telemedicine Technology" 9 November 2015

[4] Becker's Hospital Review. "5 Forces Reshaping U.S. Healthcare". Gooch, K. 22 September 2016

The RPM Data Dilemma

Worldwide, 7.1 million patients were being remotely monitored in 2016, according to Berg Insight. That number is projected to grow at a compound annual growth rate of 47.9 percent to reach 50.2 million by 2021.

Market research firm Technavio projects the RPM market specifically to grow at a compound annual growth rate of 15% through 2021 to just shy of $1 billion—driven by an increasing consumer trend toward online medical purchases, jumps in the number of chronically ill and aging populations, and more demand for patient-friendly devices.

As these market numbers indicate, RPM plays an integral role in much of the interest surrounding healthcare IT today. Integrating data from wearables, medical devices, implants and other sources into healthcare systems' disparate, complex and costly technology platforms is a cornerstone of many of the industry's efforts in the Internet of Healthcare Things (IoHT). However, simply providing access to the voluminous amount of raw, rich data generated by remote patient monitoring in and of itself is not enough to fully realize the transformative benefits that IoHT promises in patient-centric care, lower healthcare costs and data-driven health decisions.

In an IoHT world, the hub of healthcare delivery is no longer in the hospital, clinic or physician's office, but in the patient's home. Part of that is being driven by patients using their own mobile devices, which are projected to be the preferred device for 22.9 million patients by 2021, according to Berg Insights. Well-designed RPM programs are proving to keep people healthy, allow older and disabled individuals to live at home longer and reduce the number of hospitalizations, readmissions and lengths of stays in hospitals.

Apps, sensors and wearables will continue to pump out streams and streams of patient-generated health data through remote patient monitoring systems. But to motivate patients to become highly engaged partners in their care, healthcare providers also need actionable analytics tightly integrated within their existing clinical workflows and accessible in real time to improve outcomes, treatment protocols, and, ultimately, population health.

If you think of the care pathway as the automated dialogue a clinician would have with a patient, there is a strong need for a well-designed, customizable content management platform to work behind the scenes.

At the lowest level, the system needs to be able to handle branching logic in order to add questions based on answers and be able to insert educational content and then teach

back questions solely based on patient inputs. Sophisticated systems need to be able to deploy dynamic pathways which can automatically increase the level of care as appropriate, inserting entirely new clinical protocols based on clinical guidelines and patient responses. This enables a greater level of patient self-management, through dynamically changing automated coaching that is tailored to the individual and their changing conditions.

HOW TODAY'S RPM Works

Change is hard anywhere in healthcare, and this holds especially true when it comes to widespread integration of RPM systems within the clinical workflow. Health systems and health plans alike have struggled in the past to find a unified voice and technology platform that will optimize the benefits of remote patient care.

This is changing rapidly. RPM systems today allow care programs to be linked to specific care teams where only their patients are available for viewing. This allows a centralized approach to distributed care, plus maximum flexibility in the way these teams connect to patients remotely.

Is It Simple?

Simple RPM programs around a single condition are predominant, but the leading healthcare organizations are building virtual care competencies and call centers to support a wide range of virtual care and remote monitoring. Successful systems are thinking about reducing unplanned care for polychronic patients and patients from multiple disease care programs from within the health system and their accountable care organizations.

To accomplish this, the best connected care platforms, today, combine the existing mobile applications that previously operated in silos. They also consolidate the health-care organization's branding across telehealth, virtual care, remote monitoring, home health, hospital at home, marketing and patient engagement programs.

Smart technologies make data collection from remote patient monitoring more convenient than the traditional methods of the past that required physical, on-site visits to physician offices or medical centers. Consumers today can automatically transmit a wide range of their health data to a web portal or a mobile app, including readings on vital signs, weight, blood pressure, blood sugar, blood oxygen levels, heart rate and

even electrocardiograms, just to name a few biometrics. This remote patient monitoring not only enables consumers to monitor their own health, but it also offers clinicians miles away the opportunity to proactively assess red flags and recommend adjustments in treatment plans in real-time.

What Happened to Paper?

> After having to move from paper-based patient records to EHRs, clinicians today fully expect their remote patient monitoring systems to seamlessly integrate standard patient information into the clinical workflow. Remote patient monitoring offers healthcare professionals the opportunity to use data generated through multiple sources within and outside the enterprise to create continuous clinical workflow improvement.

To develop these integrated workflows, a truly collaborative approach is required—one that takes into consideration the needs of the patient as well as the concerns of clinicians and the ways in which they can best deliver quality care. The best remote patient monitoring systems become integrated within the organization and the workflow to achieve the greatest success—through collaboration among physicians, clinicians, patients and even administrators—to understand how to positively impact patient outcomes.

A significant obstacle to optimizing RPM is the continued existence of information islands across the healthcare enterprise—the subsets of patient data that are isolated from the bulk of a patient's historical data.

What About Data Overload?

> Unfiltered patient data may increase patient risk because physicians may be required to locate actionable data (signal) within an overwhelming amount of artifact (noise) including false positive alerts. In addition, inadequate or absent integration of data analytics and intelligent notification protocols into RPM platforms can undermine a wireless medical device or app's effectiveness by increasing physician workload, inefficiency, and risk. Unfiltered patient data increases risk to physicians who are tasked with finding actionable data within a stream of useless or faulty information.[1]

Today's RPM systems address these data challenges through an unprecedented commitment to share and analyze data, especially when it comes to more efficiently managing rising-risk, at-risk and aging populations. Frequent engagement with these populations,

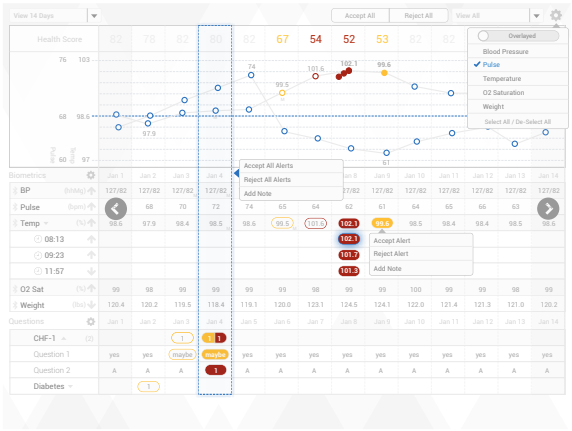
[1] HIMSS. "Remote Patient Monitoring (RPM) – Security and Other Adoption Barriers". Niksch, A.L; Davidson, S.J. 9 December 2014

paired with intelligent clinical escalation algorithms and intervention tools, leads to greatly improved outcomes.

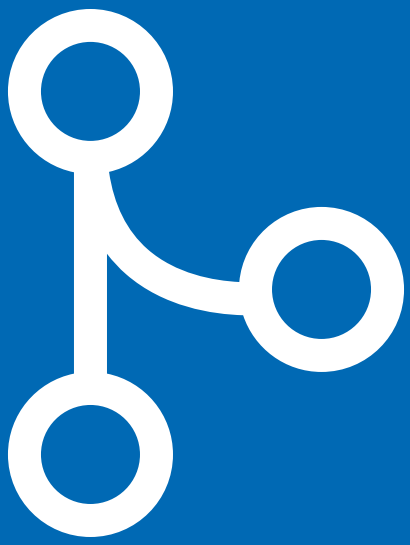
What About Customization?

These advanced platforms can now be easily customized to healthcare's unique business and reimbursement models, including chronic care management, bundled payments and ACOs. Population analytics incorporated within an RPM platform can also help determine where organizations should dedicate their engagement and remote care investments, while also helping to discover health status down to the patient level on a daily basis.

Disease-specific clinical protocols can also be modified for each patient, expanding community outreach and member marketing efforts simultaneously. This ongoing data stratification also drives business intelligence efforts with continual data streaming in from members, patients and employees.



Actionable analytics gleaned from remote patient monitoring systems today not only help improve patient and population health, but also enable providers to leverage that information through the EHR to more effectively triage patients who need early interventions. The next generation of clinical decision support tools on deck will leverage data from remote patient monitoring systems through machine learning algorithms, enabling providers to conduct and continuously improve upon in-depth analysis of protocols, interventions and outcomes data.



Technology and Change Management

Legacy technology platforms in healthcare organizations traditionally have presented significant obstacles when making the business case for implementing a remote patient monitoring system. EHRs store retrospective data, not the continuous streams of real-time patient data available from consumer devices in remote locations that healthcare professionals can then examine to proactively address a patient's treatment. There are also significant data privacy concerns that need to be addressed – especially for remote patient monitoring systems that may rely on data from consumer devices instead of the health system's branded and more secure devices. It is also important to have clear direction on which episode or encounter data should be attached, the "signing" authority within the provider organization, and standardized processes for data review prior to integrating the remote patient monitoring data within the EHR.

Workflow issues also need to be addressed on the front end. It is important for the pilot team to consider how the data will be managed and reviewed, what enterprise systems will have access to review the data and raise alerts, and ultimately how the tsunami of information will be managed to avoid clinicians from drowning in data.

Much of this can be achieved by adopting a cloud-based platform. In today's cloud world, the ability to scale has moved beyond the traditional enterprise technology infrastructure. An "IT-Light and Patient-Heavy" cloud approach to remote patient monitoring systems allows hospitals to stay focused on the patient instead of the technology.

A cloud-based solution also allows patients of any age, health status, or technical ability to easily participate in a remote care program. The days of elaborate in-home set-ups have dissipated into the cloud – today, a fully managed remote care kit program can be shipped to the home, providing plug-and-play capability instantaneously. These cloud-based kits have been thoroughly vetted prior to deployment to ensure they integrate seamlessly with the enterprise IT and clinical processes of provider and health plan organizations.

Cloud-based remote patient monitoring systems are also ideal for working in today's popular BYOD (Bring Your Own Device) environment of patient desktops, smartphones and tablets. By integrating BYOD into a remote patient monitoring system, providers and health plans can more easily expand their reach to even more sizeable populations – and ultimately better manage specific conditions, shape patient behaviors, and eliminate preventable hospitalizations.

Healthcare organizations are wise to customize their remote patient monitoring systems to best match a patient's technology savvy and the level of access they desire. System features that can help achieve this flexible approach include interactive voice response (IVR), fully managed kits, BYOD (bring your own device) integration, and video and web-based content that patients can access to self-manage their conditions when needed – avoiding unnecessary and costly interactions with the health system for minor changes in their conditions. The remote patient monitoring system can also build medication reminders into the technology platform, providing real-time alerts to the care team to follow up on any signs of noncompliance by the patient.

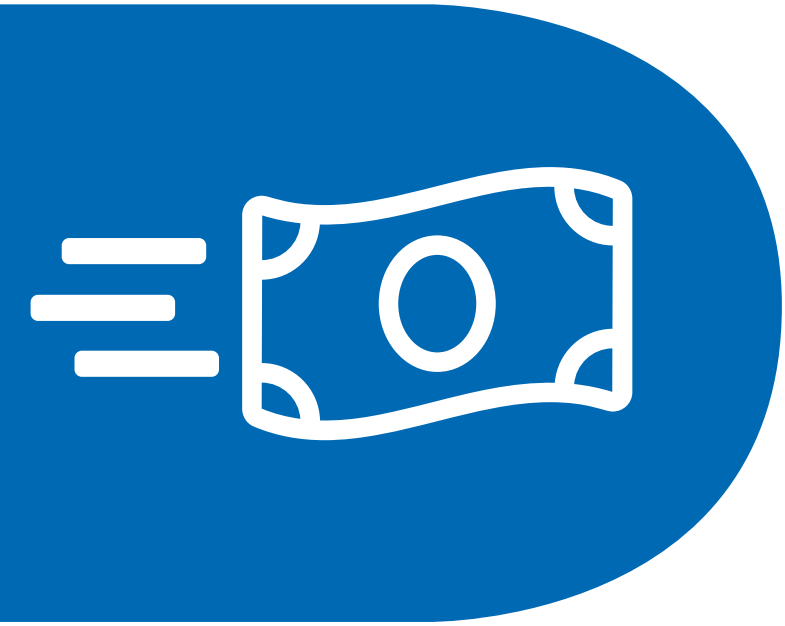
New codes, new reimbursement.

ROI rates could increase even more in the future as the Centers for Medicare and Medicaid Services (CMS) have made, and continue to make changes designed to improve reimbursement opportunities for remote patient monitoring. In an update to the 2019 Physician Fee Schedule and Quality Pay Program, CMS included three new Current Procedural Terminology (CPT) codes[1] for reimbursement of remote patient monitoring. Physicians can now be reimbursed for remote services that, previously, could only be billed for by physicians providing these services to patients on site.

The new CPT codes separate remote patient monitoring from telehealth, for which reimbursement policies remain strict. It marks a sea change in how CMS views the value of remote patient monitoring, as the group continues to notice and track how outcomes are improved by allowing doctors to keep tabs on patients between visits, lowering healthcare costs and remotely identifying complications with chronic conditions before they escalate and require an emergency room visit or or other patient care intervention.

Providers caring for chronic patients with two or more conditions can now realize up to $165.00 per month in additional reimbursement.

1 mHealth Intelligence. "CMS to Reimburse Providers for Remote Patient Monitoring Services" Wicklund, E. 2 November 2018.



RPM & Value-Based Care

Satisfied patients enrolled in RPM programs are typically more compliant patients, and compliance leads to better clinical and financial outcomes. When patients feel good about the care they're receiving, they are more likely to follow their individual care plans. That is why it is so important for care managers to develop a bond of accountability – from clinician to patient, and from patient to clinician – beginning with the first virtual visit. Throughout each subsequent care encounter, they can then focus on expanding the trust within the patient relationship. Contrary to the observation that technology removes the personal part of care, remote patient monitoring done right has proven to improve genuine connections between the care team and patients.

Make it Comfortable.

The best RPM system utilizes technology that is familiar and comfortable to the consumer, while enabling proactive automation and information-sharing with the patient's care team. With remote patient monitoring, healthcare systems are now able to more effectively close the patient engagement gap, completing the circuit of value-based care.

RPM In The Real World

In today's value-based care world, it is more critical than ever for providers to contain costs and avoid hospital readmission penalties, while still delivering on three key consumer expectations: access, convenience and choice. Digital platforms deliver on these expectations, removing distance barriers to provide the best possible quality of care. Trinity Health, CHRISTUS Health System, and the University of Pittsburgh Medical Center are three success stories that provide good insights on how to successfully roll out and benefit from a remote patient monitoring system and scale the deployment to support the modern healthcare system.

A MID STORY

Trinity Health At Home

One of Trinity's most important over-arching goals is to move 75% of its revenue to value-based reimbursement by 2020.

It's no secret that chronic conditions such as diabetes, congestive heart failure (CHF), chronic obstructive pulmonary disease (COPD), and cancer are pervasive in America – and on the rise. Patients with chronic conditions cost more, and take up significantly more healthcare resources, than those who do not have these conditions.

One reason for this inordinately high percentage of spending is the venue in which care is often provided. Patients with chronic conditions account for 81 percent of hospital admissions as well as continuing growth in unplanned emergency department (ED) visits.

In addition, social determinants of health have a significant impact on outcomes. Social and economic factors affect a wide range of health and quality-of-life issues that influence healthcare costs, as well as outcomes. As the industry continues to transition to value-based care models that reward providers for delivering high-quality, cost-effective care, providers must consider the social and economic conditions that impact the well-being of individual members.

Trinity Health At Home

For example, under many value-based arrangements, providers are penalized when a patient is readmitted to the hospital within 30 days of discharge. To minimize this risk, hospitals must identify patients who are more likely to be readmitted and proactively take measures to keep those individuals healthy.

The typical industry solution to this issue has been to increase the frequency of visits to the primary care physician's office, where nurses can take regular readings and monitor changes. Yet while this method can help spot and correct negative trends in some cases, it lacks the capability to monitor in real time.

60-day readmissions have been reduced from 13-15% to roughly 8%.

However, with RPM, patients are provided with devices such as a digital scale, pulse oximeter, glucose meter, and a blood pressure device

that can be used to take daily readings. These readings are then reported to a centralized call center which monitors them for significant changes. If the data indicates a potential issue, clinicians are alerted so they can create the appropriate intervention to avoid the issue escalating into a hospital admission or ED visit.

RPM has tremendous potential to reduce the cost of caring for individuals with chronic conditions while lowering the disruption to patient and family lives an ED visit or hospital admission can create.

One organization that has been using RPM with great success is Trinity Health, one of the largest non-profit, multi-institutional Catholic healthcare delivery systems in the nation.

One of Trinity's most important over-arching goals is to move 75% of its revenue to value-based reimbursement by 2020. They understand that keeping patients out of the hospital and the emergency department by helping them stay healthier at home is critical to achieving this objective. They knew RPM technology could help, but they also understood that technology alone wasn't the solution.

The average age of the patients who eventually became part of the Trinity Health At Home program is 75. They didn't grow up on technology, so Trinity needed to find a program that could help them monitor the health of high-risk patients at home from a technical perspective, while being easy for the patients and their caregivers to understand and use.

Reducing Readmissions.

Trinity had very clear goals. One was to reduce preventable hospital readmissions. At the start of the program, readmissions were in the 13-15% range. This readmission rate was already much better than the industry average. However, they wanted to take that number down to the single digits, both to take advantage of current CMS readmission reduction incentives and to better position themselves to reduce their costs under value-based reimbursement arrangements in the future.

They also saw reducing readmissions as the right thing to do. Entering the hospital, or even going to the ED, is hugely disruptive to the lives of patients. If they could head off the events that lead to ED visits and hospital stays it would improve the quality of life for the patients and their families.

Finally, Trinity wanted to reduce the number of PRN (when necessary/unplanned) visits to the home by nurses. PRN visits are relatively expensive, and often time-consuming. In an era where there are already nursing shortages in many areas, the total time required for

an in-home visit to address issues that could have been avoided is time taken away from helping other patients.

Initially, Trinity started with a pilot program for proof of concept. The pilot's success quickly bloomed into a large-scale, highly successful, on-going program.

Easy Implementation.

The Home Care Coordinator identifies potential patients for the Trinity Health At Home program while the patients are still in the hospital. Trinity has been very aggressive in this pursuit, with the program being applied to more than 80% of Medicare episodic discharges that meet the criteria. The initial time period for use of the RPM technology is 60 days, although it can be extended where there is demonstrated need to continue.

Once eligibility has been confirmed, a nurse visits the patient prior to discharge to explain the program, provide a demo, seek consent, and enroll them. A logistics coordinator at Vivify then assigns a health kit and sets up an appointment for a Trinity Health At Home nurse to visit the patient at home, bring out and set up the health kit, and teach patients and/or caregivers how to use it.

This in-home visit has been critical to the success of the program. Rather than simply sending the technology to the home with instructions, the nurse is able to deliver a level of technology comfort while building a personal relationship.

Included in this initial meeting is showing patients and caregivers how to use the “call” button to make a video call. Encouraging patients to use video instead of voice-only calls has been huge in driving better health outcomes as well as saving time. For the nurses, being able to see what is going on with patients means they don’t have to rely as much on patient descriptions for information, and patients can’t hide certain conditions as easily because they’re afraid of hearing bad news.

Nurses also use this visit to determine if any changes/improvements need to be made in the home, such as adding an optional Wi-Fi connection, or assessing for potential social determinants which can be addressed at that time on a future visit. They then arrange for the changes to be made.

Each day, patients take readings, such as blood pressure and weight, and submit them through the tablet. They also answer a series of questions designed to obtain a more complete understanding of the patient’s health that might not show up in the numbers.

All of the information goes to the appropriate Trinity Health At Home nurse. Each nurse works from home, making more time available to monitor patient data. If a patient hasn’t

Trinity Health At Home

submitted data by 10:00 am local time, the tablet provides gentle reminders to do so. If the information hasn't been received by 10:30, the nurse will proactively make a video call to the patient to ensure everything is alright and remind him or her to get the data in.

Obtaining the data is rarely a problem, however. Trinity Health At Home reports a better than 90% compliance rate among patients participating in the program.

Video Calls... a Difference-Maker.

The use of video calls that are available 24 hours a day has been particularly key to helping Trinity Health At Home reduce PRN nurse visits. Prior to the start of the RPM program, Trinity Health At Home was averaging six PRN visits per 60-day period. That number has already been reduced to five, with a goal of reducing it further to four.

An example of the utility of video visits occurred when a patient made a video call saying his catheter had stopped dripping. Normally, a nurse would drive to the patient's home and check the catheter for problems. In the meantime, the nurse would be unavailable to help others for anywhere from 1-2 hours, depending on the distance.

With the video call, the nurse instructed the patient to move the tablet to his side, where she could see that the stopcock was closed. She explained how to open it and the problem was solved in a few minutes.

Then Success Came.

The Trinity Health At Home RPM program has also led to two other significant measurements of success. The first was in 60-day readmissions, which have been reduced from 13-15% to roughly 8%.

The second is in patient satisfaction with the program, which is currently in the 90%+ range. Patients are getting answers faster, staying healthier, and avoiding more disruptive trips to the ED or inpatient stays. They are very appreciative of it, and Trinity expects this high level of satisfaction will be reflected in its HEDIS scores and Medicare Star ratings.

A MID STORY

CHRISTUS Health System

CHRISTUS used the Vivify Remote Patient Monitoring System (RPMS) to teach patients to view their care management more holistically, instead of through a siloed, reactionary event-focused periscope.

The CHRISTUS Health Care Transition Program was designed to reduce the hospital readmissions of high-risk patients diagnosed with a primary diagnosis of Congestive Heart Failure (CHF). Many of the patients' chronic conditions were also exacerbated by other commonly related conditions, including Coronary Artery Disease (CAD), Hypertension, Diabetes, Myocardial Infarction (MI), Pneumonia, and Chronic Obstructive Pulmonary Disease (COPD). Patients with these diseases commonly have complications that result in readmissions to the hospital within 30 days of discharge and are a targeted population for this community-based program.

CHRISTUS used the Vivify Remote Patient Monitoring System (RPMS) to teach patients to view their care management more holistically, instead of through a siloed, reactionary event-focused periscope. With RPMS, the patients established an immediate remote link to their care team, which could then regularly monitor their health conditions. Patients found that the RPMS program enabled them to benefit from timely interventions as needed to prevent adverse events from occurring or from incurring costly trips to the hospital.

For example, the mission of the Care Transition Intervention Program at St. Michael Hospital in Texarkana, TX is to teach patients to apply new skills that enable them to improve their ability to care for themselves when transitioning from the hospital and at home. This program relies on a trained and certified Care Transition Nurse (CTN) who identifies appropriate patients for the program, enrolls the patients, and begins their care cycle.

Prior to discharge, the CTN visits the patient to begin the successful transition from hospital to home, including medication review and

CHRISTUS achieved a 65% reduction in hospital readmissions along with a 95% patient satisfaction rate.

preparing the patient to begin self-management at home. Post discharge, the CTN makes an initial visit to the home to review medication orders, educates patients about their condition and warning signs, reviews the Personal Health Record, and communicates with family caregivers.

While already successful, the Care Transitions program prior to incorporating RPM still had a few challenges that the team sought to address:

- **Some patients did not want a CTN to come to their home and refused to consent to the CTN visit – the main reason patients declined to participate in the Care Transition Program.**
- **Some patients live up to 50 miles away from the hospital, requiring the CTN to spend approximately 500 hours annually traveling to and from patient homes, reducing the amount of time for actual patient care. This reduces the number of patients for which the CTN can transition and deliver care.**
- **The CTN has limited interaction time with patients enrolled in the program because of the time spent driving to and from the initial home visit, thus limiting patient engagement and satisfaction.**

CHRISTUS used Vivify Healthcare's Remote Patient Monitoring System (RPMS), a cloud-based platform utilizing consumer electronics, including an Android Tablet and several Bluetooth-enabled personal health devices: weight scale, blood pressure monitor, and pulse oximeter.

Patient protocols and care plans were easily customized for each patient, and the intuitive user interface was simple and easy for almost all patients to use. Patients could answer questions, send biometric data, and view educational videos. With appropriate wireless connectivity, patients could engage in real time interactive videoconferencing with caregivers. Data from personal health devices at the patient's home was sent by RPMS through the cloud and then securely logged into by authorized caregivers via any browser.

The Care Transition staff had a couple of reservations about implementing Vivify's RPMS:

- **They wanted to continue making an initial home visit to establish and strengthen a personal relationship with the patient and assess the patient in the home living environment**
- **They questioned whether patients would use and benefit from the RPMS system, since the majority of patients enrolled were over the age of 65 and not very technologically savvy.**

However, the simple and intuitive process patients used with the tablet quickly answered those concerns. The Care Transition staff and hospital administrators realized the elderly population would not only be able to operate the equipment, but also to highly benefit from it. In addition, they felt the number of patients they could impact would dramatically increase as time went on.

The average ROI for 44 patients who completed the initial program was $2.44 for every $1.00 spent. Additionally, prior to enrollment in the program, the average cost of care for the 44 patients was $12,937; after participation, that figure dropped to $1,231, thus reflecting an approximate 90% decrease in cost of care. CHRISTUS also achieved a 65% reduction in hospital readmissions along with a 95% patient satisfaction rate. Following the initial pilot program, it was calculated that overall ROI could approach $40 for every single dollar invested in RPM with full utilization of possible reimbursement. [1]

From No to Go.

Existing processes at CHRISTUS that contributed to less than ideal rates of patient participation were also reduced or eliminated. With RPMS, the patient took the solution kit home with them from the hospital and began using it. The training and familiarization of the RPMS home kit given to the patients before they left the hospital eliminated the need for the initial CTN visit. The medical devices acquired and transmitted biometric data on site in the home, while patients could answer survey questions presented to them on the tablet and view educational videos about their condition. For the CTN, the need for the initial in-home visit is greatly reduced, while the patient is monitored much more consistently. The CTN can more effectively care for patients, maintain efficient workflow, and spend more time with each patient.

1 iHIMSS IRB Case Study, September 2013.

UPMC

A MMD STORY

University of Pittsburgh Medical Center (UPMC)

UPMC, as both a provider organization and a health plan, has a particular interest in keeping patients healthy, at home, on a continual basis.

Another organization that has benefited from remote patient monitoring is the University of Pittsburgh Medical Center (UPMC). UPMC is using remote patient monitoring for high-risk patients suffering from conditions such as congestive heart failure, and also for low-risk patients receiving tobacco treatment services. UPMC reports that it is realizing a statistically significant decrease in observation status utilization for congestive heart failure patients who use Vivify's RPMS.

With the use of biometric data submitted through RPMS from at-home patients, providers are now available to intervene more quickly, before a long road trip to the emergency room is required. The results are impressive:

- **Medicare patients in the remote patient monitoring program are 76% less likely to be readmitted to UPMC.**
- **Patient satisfaction in more than 1,500 patients is over 90%, as is compliance.**
- **Remote caregivers have reported a growing number of anecdotal and documented cases of avoided emergency room visitors, including the filling of critical prescriptions for sick patients and finding seriously ill patients at home who had not answered RPMS requests for updates.**[1]

UPMC LIFE CHANGING MEDICINE

The RPMS at UPMC includes a call center portal, equipment monitoring, reporting features, EHR integration, and delivery of the equipment to the patient. Patients simply open a box and turn on a tablet device or respond to a text message to access remote patient monitoring. On a daily basis, RPMS collects key biometric data from at-home patients through scales, blood pressure cuffs and pulse oximeters. RPMS also provides patients with information through survey questions, educational videos and live video visits. [2]

As CHRISTUS and UPMC demonstrate, remote patient monitoring enables healthcare organizations to provide the "care everywhere" approach mirroring the consumer experience that long ago transformed industries such as banking, shopping and travel. The

[1] UPMC Enterprises <Reply All> Newsletter. "UPMC's remote monitoring programs with Vivify are improving patient outcomes". June 2018.

[2] Healthcare IT News. "At UPMC, remote patient monitoring helps reduce ER utilization and hospital readmissions". Siwicki, B. 24 May 2018.

engagement and marketing power of RPM is exponentially increased through the use of tools that were first developed for social platforms such as Facebook, LinkedIn and Twitter to empower greater connections among audiences with common interests.

For example, care teams can offer not only medical guidance, but personal outreach such as Happy Birthday messages. For patients who are remotely monitored on a Monday-through-Friday schedule, care teams also provide the extra touch of checking in with patients just prior to a long weekend – confirming the patients have everything they need to get through the weekend without incident. Questions can be better anticipated and answered, and procedures are always in place within the care team to respond to any emergencies.

READY, SET...

How to Get Started

The proactive, automated care that remote patient monitoring helps create is the future of healthcare. Data coming from such a large population of engaged patients in post-discharge settings is proving to be some of the freshest data in all of healthcare – making it an ideal source of relevant healthcare data to leverage to generate even better population health outcomes through the use of machine learning, neural networks and artificial intelligence platforms. With AI or machine learning, it becomes possible to improve clinical monitoring rules and create greater efficiencies for care teams by comparing claims data as the "truth data" with reported outcomes from the system. A learning monitoring system can provide more time for clinicians to respond when a patient begins to decompensate in their clinical condition, often before the patient, loved ones or care teams can "see" the health deterioration.

The best approach to better remote engagement with patients is through regular, purpose-driven outreach in the least intrusive modalities available. Easy-to-use remote patient monitoring systems can reach patients in ways that work and at times where the impact of that engagement is maximized. These systems offer an easier path for patients to connect directly to their care teams from remote locations, while the platform itself can deliver streams of their health data in real time back to the care team.

Here are some tips to get started on the road to remote patient monitoring:

Keep It Simple.

Health systems which have been ahead of the curve are incorporating remote patient monitoring for as many as 20+ clinical conditions being monitored across multiple service lines. If you are just getting started, don't shoot for the moon. Most initial remote care pilot programs aim simply to reduce lengths of stays or improve outcomes for one chronic condition. That makes heart failure patients an ideal population to test remote patient monitoring. The outcomes for heart failure patients are quickly clear – the remote patient monitoring system can measure reductions in 30-day readmissions, reductions in short- and long-term mortality, and even patient satisfaction.

From there, consider extending remote patient monitoring for patients suffering from conditions such as COPD, hypertension or diabetes, or by incorporating into existing wellness and prevention-based treatment programs to support core use cases.

Easy Does It.

Your patient population has widely diverging comfort levels when it comes to using technology. That's why it is crucial to make it easy for patients to get started. Ensure your remote patient monitoring system is purpose-built for specific patient populations. Older patients being treated for heart failure, for instance, may not be tech savvy, or they may resist learning new or complex technologies. It's important to meet those patients where they are in life – with pre-configured devices that are easy to use. Such devices have proven to be between 20% and 30% more effective in daily compliance and adherence to remote care activities. For younger, rising-risk patient populations, a BYOD approach may be more appropriate, letting patients use their personal smart-phones and tablets. And don't forget the land-line – although most folks have "cut the cord," many older patients still rely on the old phone on the wall. By keeping patients' familiarity with devices and adaptability to user interfaces in mind, care teams can help overcome any initial anxiety their patients may have to remote patient monitoring.

(Consumable) Content is King.

Seeing is believing…and understanding. YouTube has proven this to any amateur Mr. FixIt trying to make a DIY repair of a leaky sink or a faulty light switch. Compelling educational videos can help reduce unnecessary clinical visits for basic questions, or times spent on the phone explaining simple care concepts to patients. Videos, health tips, and teach-back questions can often minimize or even eliminate situations where patients feel they need to interact directly with the care team – allowing the care time to dedicate its time to patients with more important care issues.

"For younger, rising-risk patient populations, a BYOD approach may be more appropriate, letting patients use their personal smartphones and tablets."

Communication Is Key.

It is not enough to view remote patient care as just a way to reduce unnecessary, costly readmissions or clinical visits. To truly empower patients within their care plan, it is imperative that they can also take advantage of features such as embedded video conferencing to share information with their providers more frequently. Embedded

video communications unleash the full power of patient engagement – where the patient becomes a true partner of the care team.

Proactive vs. Reactive.

Post-discharge clinical pathways traditionally have been executed in a reactive manner – waiting for the opportunity to interact directly in person with the patient on site, calling them, or asking them to log in to a patient portal to answer questions about their condition. Social engagement capabilities within a remote patient monitoring system radically transform the entire consumer-facing conversation. Low-cost engagement solutions such as secure text messages open a survey through a smart-phone browser so the patient can answer post-discharge questions through a secure, app-like experience.

Closing the Loop.

The remote patient monitoring system should not operate in a vacuum. It is important to close the loop by integrating the platform with your healthcare enterprise's portal and app strategies. Using a simple text, patients can be guided through a remote patient monitoring system to access even more information through other health system apps, or even connected directly to the secure EHR patient platform that contains their personal record. The benefit to your care teams? They won't have to spend valuable time chasing down the 85% of patients who struggle to access those services on their own.

Different.

Vivid.

The difference is vivid.™

Vivifyhealth®

20181214