Executive Summary

Today’s healthcare organizations are challenged to make the most of their healthcare dollars by reducing the cost of care while also improving outcomes. To that end, many providers are focusing on patient populations with multiple chronic disease states as they consume the greatest percentage of health resources. And many of those patients are re-hospitalized soon after seeking treatment.

Better management of this population outside the hospital can reduce readmissions – or prevent a patient from being admitted at all. This paper focuses on remote patient monitoring (RPM) as a practical solution for providing efficient, near real-time care to the most resource-intensive patients.

Mobile solutions like RPM bridge the gap between limited clinical resources and the growing demand for them. At-risk patients and providers are virtually connected through interactive mobile devices. By empowering patients with mobile tools to manage their health at home, RPM encourages compliance with protocols that ensure long-term wellness. Caregivers can accelerate critical medical interventions to avoid acute health problems – especially those that can send patients back to the hospital – that compromise outcomes and increase costs. For these reasons, RPM offers an antidote to some of the most vexing issues facing today’s providers, patients and payers.
As reimbursement shifts from volume to value-based care, the fragmented nature of the U.S. healthcare system poses significant challenges for all stakeholders. But for the chronically ill—who often seek repeated treatment for numerous conditions—uncoordinated care hinders their progress toward wellness and taxes an already burdened system.

Chronic illnesses are responsible for 75%—or $1.5 trillion—of the $2 trillion spent annually in the U.S. on healthcare. Among the Medicare population, 70% of patients have two or more chronic conditions and account for more than 90% of Medicare spending, or about $500 billion a year.

The current structure of the U.S. health system has done little to curb the rise of chronic illness. For example, a 2012 report by the Centers for Disease Control showed that the prevalence of obesity-linked type 2 diabetes is increasing at an alarming rate. In 1995 only three states, the District of Columbia and Puerto Rico had diabetes prevalence rates of 6% or more; but by 2010, the diabetes rates in all 50 states had reached that level. Even more startling, the rates of diabetes doubled from 1995 to 2010, and in 42 states, the rate grew by 50%.

The situation is exacerbated by the fact that many chronic illnesses require treatment plans and careful management; yet noncompliance is common. Noncompliant patients easily become “lost” in a system where coordination, transitions of care and follow-up among physicians are weak at best. For example, patients with chronic conditions take just half of the prescribed doses of medications, on average. For some conditions, drug compliance is even lower. Rates of adherence among heart attack survivors to the medications prescribed to them ranged from 36% to 49% in one study.

Even for those chronically ill patients who visit their doctors regularly—perhaps once every three or six months—those sporadic contacts are “inadequate to maintain and reinforce complicated lifestyle modifications and pharmacologic regimens.”

Unfortunately, noncompliant patients become likely candidates for readmissions. An academic hospital found that patients who did not follow-up with a primary care physician within four weeks of discharge had a ten-fold greater risk for readmission with 30 days post discharge. And as the data show, readmissions are quite costly. The Centers for Medicare & Medicaid Services (CMS) estimate that $17 billion is spent annually on Medicare patients who are readmitted to the hospital within 30 days post-discharge.

Because these readmissions are one of the major factors driving up healthcare costs in the U.S., the Affordable Care Act (ACA) mandates financial penalties for providers experiencing excessive avoidable readmissions. CMS-imposed penalties cost 2,211 hospitals $280 million in 2012, or an average of $126,640 per hospital.

With all of the above information taken together, it is logical to conclude that chronically ill patients seeking treatment in a fragmented healthcare system create a perfect storm for excessive spending and less than optimal outcomes.

The Role of Remote Patient Monitoring

Fortunately, readmissions can often be avoided. The Medicare Payment Advisory Commission (MedPAC) analyzed Medicare claims data and concluded that three-quarters of readmissions within 30 days were potentially preventable. Providers certainly cannot control all readmissions; however, proactive measures can limit the number of patients who return to the hospital. According to the New England Healthcare Institute, 12% of 30-day hospital readmissions that occur each year are preventable.

To that end, RPM is a practical way to better manage the most resource-intensive patients by facilitating ongoing care management outside of the clinical setting. Not only can RPM potentially prevent readmissions, but it can go a long way toward preventing initial hospitalizations, improving the long-term health of the chronically ill and effectively managing costs. From every angle, RPM can have a powerful impact on the way healthcare is delivered, managed and perceived.

Facilitates Improved Outcomes

RPM systems are designed to improve the quality and experience of care for patients. An increasing number of studies show the RPM delivers on this promise. A few examples include:

- **Atrius Health**—an integrated delivery system serving 1 million patients in central Mass.—conducted a Home TeleHealth Project with the New England Healthcare Institute and the Massachusetts Technology Collaborative in 2011, reporting results in 2012. Over a nine-month period, researchers studied patients discharged from the hospital setting with a heart failure diagnosis within 12 months of enrolling in the study. One group was assigned to use RPM technology to monitor their condition while the other group received routine medical care. Patients using the RPM technology for monitoring and management of heart failure had fewer all-cause hospitalizations, fewer emergency room visits and fewer urgent care visits than the control group patients. Survey results from the RPM patient group showed positive trends, including better symptom control, reduced emotional burden of illness and increased satisfaction with physical capabilities.

- **At the Fuqua Heart Center at Piedmont Hospital in Atlanta**, patients self-managed their condition and provided nursing staff with information using a user-friendly touch screen monitor. For those patients who did not report back after an extended period of time, nurses reached out to gather patient data. As a result of the self-management program, 30-day readmission rates for heart failure patients were reduced from 5.85% to 1.45%, a 75% decrease.
• A November 2012 study published in *Journal of Managed Care Medicine* reported that an RPM program at New York City Health and Hospitals Corporation targeting patients with diabetes demonstrated a 1.8% reduction in the hemoglobin A1c levels of Medicaid patients with diabetes. “The decrease is significant because a 1% drop in HbA1c cuts the risk of stroke by 12%, heart attacks by 14%, heart failure by 16%, diabetes-related complications and mortality by 21%, and peripheral vascular disease – including amputations – by 43%,” said Nesim Bildirici, president and CEO, AMC Health, in *Becker’s Hospital Review.*12

• Bildirici also reports that a study by HealthPartners Institute for Education and Research published in the July 3, 2013 issue of the *Journal of the American Medical Association* demonstrated that pharmacists who used telemonitoring results were able to help patients better control their blood pressure (71.2%) than patients using telephone modem-based devices.16

**Promotes Self-Care**

Keeping chronic conditions in check requires ongoing management, especially once patients are discharged from the acute setting and resume the routines of daily life. As financial incentives shift toward patient wellness, new care models are emerging that encourage patients to take a much more active role in managing their health.

To do so, patients need a comprehensive understanding of their condition and the lifestyle choices that affect it. For example, a government-sponsored study found that 4,000 individuals screened for high cholesterol, only 40% who were diagnosed as having high cholesterol were aware of their condition. Of that 40%, only 14.5% were taking medication to reduce their cholesterol levels.14 Patients must also recognize the signs that indicate they should seek help in order to prevent issues from escalating. But many patients simply lack the knowledge and confidence to actively monitor their health. RPM offers a potential remedy for this problem.

Most RPM programs involve ongoing coaching and reminders to engage patients and make them active participants in their healthcare. At-home monitoring devices and care plans are typically user-friendly and interactive – designed with intuitive interfaces – and are accompanied by training for patients and caregivers alike. The near real-time, clinician-patient interaction RPM offers through options such as video conferencing or clinically-staffed call centers can:

- Increase patient education opportunities
- Strengthen patients’ ability to self-manage
- Support improved patient compliance

Centura Health at Home – part of Centura Health, the largest healthcare network in Colorado – examined its ability to decrease 30-day readmission rates and to increase the quality of life for older adults with chronic conditions by merging its telehealth and call center programs.13 At the end of the project, participating nurses reported that RPM enhanced opportunities to educate patients. Because monitoring nurses connected with patients in real time, they were able to capitalize on “teachable moments” and help patients make the connection between cause and effect, for example, if they failed to take their medications or consumed foods with high sodium contents.

A July 2013 study by the Center for Connected Health – a unit of Partners Healthcare in Boston – showed that the wireless mobile technologies used in RPM programs improved patient engagement, clinical outcomes and operational workflow. Patients using wireless mobile devices to collect and transmit their data to the Center’s secure database more frequently measured their blood pressure and uploaded their data, than patients using telephone modem-based devices.16

**Maximizes Resources**

With the population surge of adults older than 65 years and the ACA’s expansion of coverage, clinicians will not be able to meet the demand for the health services they provide. According to the Association of American Medical Colleges (AAMC), by the year 2020 the U.S. will experience a shortage of 45,000 primary care doctors and 46,000 specialists. Acute-care facilities will also struggle to provide the physical space and human resources for inpatient stays. No matter how large or well staffed a healthcare organization may be, continuous, personal monitoring of every patient is an unrealistic goal for any provider.

As described above, RPM extends clinicians’ reach to their patients and accelerates critical medical attention by providing near real-time interventions at home. Yet at the same time, RPM conserves valuable and scarce clinician time, as demonstrated by the Centura Health at Home project. In a traditional home care model, patients similar to the chronically ill, older adults studied in the Centura Health at Home RPM project require a nurse visit two to three times per week during a 60-day episode of care. But those patients participating RPM study required only three visits during the 60-day study period – a significant savings in nurses’ time – which saved between $1,000 and $1,500 per patient per episode.17

Similarly, Vidant Health, one of the largest health systems in North Carolina, implemented a telehealth program that positively affected hospitalizations.18 During the first year, 1,197 cardiovascular and pulmonary disease patients participated in the program. Vidant extracted data for participating patients three months before they enrolled in the telehealth program, during the three months of participation, and then three months post-discharge from the program. During the first year, hospitalizations decreased by 550 admissions, resulting in a 67% reduction in hospitalizations because of participation
in the telehealth program. During the telehealth program, the number of hospital bed days decreased by 2,596 days as compared to before enrollment in the telehealth program, thus limiting the opportunity for capacity issues in the inpatient setting.

**Reduces Medical Costs**

Chronic conditions and readmissions are two of the most significant drivers of excessive healthcare costs. RPM has proven to be an antidote for both. CHRISTUS St. Michael Health System in Texarkana, Texas, conducted a yearlong RPM pilot project in patients with an average age of 81 who had chronic illnesses. Participants in the program were provided a tablet, weight scale, blood pressure cuff and a pulse oximeter. Prior to enrollment in the study, the average cost of care for each of the 44 patients who completed the pilot program was $12,937; after participation, the cost for treating those patients fell to $1,231.

**CHRISTUS St. Michael Health System**

- Prior to enrolling to RPM Program, cost per patient was $12,937
- After participation in RPM program, cost per patient was $1,231

**Brookhaven Memorial Hospital Home Health Agency**

- Experienced a 19% reduction in hospital readmissions and an annual savings of $254,486 for 181 COPD patients
- Experienced a 26% reduction in hospital readmissions and an annual savings of $177,008 for 92 pneumonia patients

**Lee Memorial Health System**

- Since 2010, telehealth helped the system avoid 950 readmissions to the hospital, resulting in savings of more than $5.3 million

In July 2013, the American Telemedicine Association (ATA) reported evidence-based outcomes for home telehealth and remote monitoring from demonstrations from four states. The Home Care Association of New York State determined that telehealth was critical to the success of its transitions programs. In four of its agencies alone, the organization used telehealth for high-risk patients and saved over $1 million in averted hospitalizations. For example, the Brookhaven Memorial Hospital Home Health Agency experienced a 19% reduction in hospital readmissions and an annual savings of $254,486 for 181 COPD patients annually. The agency also saw a 26% reduction in hospital readmissions and annual savings of $177,008 for 92 pneumonia patients who were enrolled.

The LeadingAge Center for Aging Services Technologies reports that The Lee Memorial Health System – the largest public healthcare system in Florida – launched an RPM program to improve patient care transitions post-discharge. In the two years since the program's 2010 inception, it helped the system avoid 950 readmissions to the hospital, resulting in savings of more than $5.3 million, based on average hospital system costs of $5,600 per hospital admission or readmissions (which is much lower than the national average of $9,600 according to CMS).

**Provides a Potential Return on Investment**

Some providers question whether RPM can provide a return on their investment. Because funding weighs heavily on many providers’ minds, The Center for Connected Health and the Center for Technology and Aging collaborated to develop a Web-based tool that can assess an organization’s return on investment (ROI) for RPM. The two organizations, using funding from the California Healthcare Foundation, tested and validated the tool using five California medical groups.

According to the study, all five of those organizations demonstrated positive ROI over five years, using pilot study data. The organization with the largest ROI, Los Angeles-based Healthcare Partners, used RPM with patients with chronic obstructive pulmonary disease. Healthcare Partners based its sample size on 70 patients using a five-year projection. The results showed that if its RPM program were gradually scaled up, the ROI in year one would be 1.3 but would reach 18.9 by the fifth year. Most of the returns came primarily from reductions in hospital readmissions. The developers of the tool hope that if providers can demonstrate an ROI, payers will be more willing to cover remote monitoring for patients with chronic illnesses.

**Challenges of RPM**

For patients and providers, RPM is a revolutionary way of approaching healthcare. Because the current system places high value on the patient-provider relationship, widespread adoption of RPM will require participants to recalibrate their mindset. Some patients, especially older adults, may approach telehealth with trepidation, wary of the technology involved. Providers will be challenged to help the senior population view RPM as a complement to, rather than a substitute for, clinician interaction.

RPM is not automated and as such, requires some output of resources for installation, implementation, and patient training. Staff involvement is also necessary to triage false positives and inform caregivers. Some providers are concerned about interoperability across health systems and vendors, and how the data gathered through RPM programs will integrate with their clinical analytics and decision support.

Another challenge of RPM is security. Under federal HIPAA regulations, healthcare providers and their business associates are responsible for the security and privacy of protected health information. When patients use their personal devices to monitor their conditions, providers must be vigilant to ensure regulatory compliance.

**Marketplace Response**

Globally, RPM has already taken hold. Approximately 2.8 million patients worldwide were using a home monitoring service based on equipment with integrated connectivity at the end of 2012, according to a research report from telecom industry analyst firm Berg Insight. In the United Kingdom, based on the positive results of a major demonstration project there, the National Health Service mandated that 100,000 additional patients be monitored with telehealth solutions by March 2014. In France, a new mandate on compliance monitoring ensures remote monitoring for all new sleep therapy patients, resulting in more than 600,000 connected sleep therapy devices by 2016.
The U.S. marketplace is also responding to the promise of RPM to deliver more efficient and effective outpatient care. More than half (55%) of 43 accountable care organizations surveyed by Spyglass Consulting Group in 2013 have deployed RPM or are considering deploying. According to a recent report from Kalorama Information, the remote patient monitoring market grew nearly 20%, just from 2011, to $10.6 billion, and Kalorama officials expect market value to reach $20.9 billion by 2016.

Payers, providers and government entities in the U.S. are rapidly creating policies to enable and promote the use of telehealth, with state government the most active branch for telehealth policy development. In addition, an increasing number of private payers cover the use of RPM, and public entities are also reimbursing. “Nineteen states require private insurers to cover and reimburse for telemedicine comparable to that of in-person services. Forty-four states reimburse for telehealth-provided services under their Medicaid plans,” said Jonathan Linkous, chief executive officer of the American Telemedicine Association (ATA) in a published ATA report.

Conclusion: The AT&T Difference
As the options multiply in the RPM market, selecting a partner who can meet the challenges posed by the changing healthcare and technology landscapes is crucial. AT&T can help facilitate the implementation of reliable solution for providers, payers, caregivers and end users through two distinct RPM solutions.

RPM: Software as a Service
AT&T Remote Patient Monitoring Software as a Service (SaaS) solution uses a cloud-based platform to connect customer-provided, bluetooth-enabled peripherals with mobile devices and caregivers’ monitoring systems. Participants receive automated coaching and reminders, and are able to conduct video conference calls that are initiated by caregivers through an intuitive user interface. Patients with chronic illness can engage and adhere to their care plan via easy-to-use monitoring devices and simple-to-follow care plans — all from home.

The data gathered from patient monitoring is collected automatically from wireless peripherals and sent to a cloud-based system. Or, data is entered manually into the portal by a caregiver through the program’s Care Management Service. Providers can then access information and receive alerts through a highly secure portal designed to comply with the Health Insurance Portability and Accountability Act (HIPAA) Security Rule requirements. This information can also be shared among multiple hospital care teams through a highly secure infrastructure.

Hospital and health systems can enhance their existing call-monitoring services, medical device logistics and inventory functions through the AT&T Remote Patient Monitoring SaaS solution. Existing health IT systems can be integrated into a scalable RPM platform to accommodate additional devices applications, disease states and more. The SaaS solution also augments care planning and delivery. Clinical caregivers have access to robust reporting through the caregiver portal for actionable data, advanced analytics and comprehensive patient data views to help improve patient outcomes.

With AT&T behind the Remote Patient Monitoring SaaS solution, users can feel comfortable at both the SIM and device level that patient data will be kept highly secure and that device use is limited to RPM purposes only.

RPM: End-to-End Solution
Like the SaaS solution, the AT&T Remote Patient Monitoring End-to-End solution helps providers better allocate resources to those patients who truly need them. Peripheral medical devices collect biometric data in near real time from at-risk patients in their homes. However, as a turnkey solution, the End-to-End solution includes installation, training and monitoring.

Staffed by trained nurses, an around-the-clock Care Center monitors and triages alerts triggered by the in-home monitoring devices based on each patient’s individualized care plan. Clinicians and caregivers access a highly secure online portal to monitor their patients’ status. Care Center representatives communicate with caregivers and clinicians by email, phone or fax as appropriate to alert them to situations that require their intervention.

The Care Center helps improve the efficiency of the clinical team by dramatically reducing or eliminating “false positive” alerts and the need to follow up on minor or irrelevant issues. Clinicians receive alerts and regularly scheduled updates in the way most convenient and relevant for them.

With either solution, AT&T uses its expertise and experience in the telecommunications and healthcare industries to facilitate telehealth system adoption and use by caregivers and patients.

For more information contact an AT&T Representative or visit www.forhealth.att.com/solution/provider/telehealth.
Notes


8. Ibid.


13. Ibid.


18. Ibid.


24. Ibid.

25. Ibid.

