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Patient-Centered Healthcare via Patient-Generated Health Data

Clarifiying the patient picture as the volume of consumer driven information increases

A Frost & Sullivan Executive Brief
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INTRODUCTION

Hospital and health system executives are developing and implementing new tactics to meet the healthcare industry's core strategic need: a higher value of care at lower cost. This objective has been aided by advanced technological solutions in medical-grade remote patient monitoring (RPM) and consumer-grade devices and apps that track a wide variety of factors including biometric indicators, activity, sleep, moods, and emergency response. As a result, patient-generated health data (PGHD) has increased the potential to change the practice of medicine from an episodic model to one based on a continuum of care – marked by the availability of real-time data that can be managed to create actionable intelligence about the patient. However, the U.S. healthcare system is facing a variety of challenges that make it difficult for patients and providers to benefit from the increased flow of PGHD.

DEFINING PGHD

PGHD includes the data from RPM devices that report various biometric readings, including blood glucose levels, blood pressure, heart rate, blood oxygen saturation levels of arterial blood, temperature, weight, respiratory rate, and brain activity. While patients have monitored many of these vital sign indicators for years, the breakthrough has been the ability to take these readings more easily and transmit the results to providers and caregivers. RPM offers a continuous stream of data that enables ongoing management of chronically ill or post-acute care patients. Medical-grade PGHD is beneficial when providers remain connected to the patient and are responsive to alerts that indicate a critical need for intervention. In this scenario, potential problems can be spotted as they occur in the patient's everyday life. This capability, if fully deployed, offers a way to reduce the length of hospital stays and eliminate the need for some readmissions. These benefits should result in lowering the cost associated with treatment and improving patient outcomes.

PGHD systems collect data that may be further analyzed to gain additional insights into improved ways to manage chronic conditions. The objective is to transform data into new, useful evidence for remote care management, population health management, and personalized medicine.

Consumer-grade activity trackers and other monitoring devices also transmit data that can be used to track wellness or spot worrisome patterns that can motivate a person to seek a medical opinion. Advances in sensor technology enable consumers to track additional parameters, such as mood or sleep patterns. Sensors that track posture can spot deviations that may lead to an alert to the care team that will prevent a serious fall from occurring. This outcome is far superior to early personal emergency response systems (PERS) that offer value only after a person has fallen while reducing the potential that some patients will suffer the debilitating results of serious falls.

Although the discussion around consumer-level devices often focuses on accuracy, also valuable is an emphasis placed on the patterns that may be revealed by consumer-generated data. For example, the fact that readings follow a pattern that is above normal targeted levels could be a trigger that alerts the consumer that they need to seek a medical evaluation. The timestamps associated with data could also provide valuable information that will help the physician reach an evidence-based diagnosis. The key takeaway is that ongoing consumer tracking could spot remarkable deviations from a patient's norm, even if the readings are a few points off. Connected, consumer-level PGHD would offer a continuum of data resulting in a more informed care team—including the patient—and outcomes that are far superior to biometric indicators based on episodic, in-person medical tests.

THE PATIENT, PHYSICIAN, AND NURSE DATA EXPERIENCE

Patients, physicians, and nurses have realized the benefits of PGHD in various trials and implementations, and as covered medical benefits. All medical practitioners can benefit from ongoing readings that can spot serious problems before they occur. The prevalence of smartphones, wearables and tablets across the population makes it much easier to capture and transmit PGHD. However, a major infrastructure-related challenge is the lack of a standard interface across all healthcare systems that creates a common data experience for all stakeholders. This is critical for providers to efficiently leverage PGHD within their existing workflows. In addition, and despite recent advancements in the release of new CPT codes from the Centers for Medicare and Medicaid Services (CMS), the lack of widespread reimbursement is a serious barrier to achieving the return on innovation achieved thus far. When these challenges are resolved, medical practitioners and patients will benefit.

THE FORCES IMPACTING THE U.S. HEALTHCARE SYSTEM

Today, the U.S. healthcare system is challenged to address growing populations of patients with more complex issues while leveraging fewer resources. However, value-based initiatives already in play within the industry are aiming to do address these concerns. Projections from the American Association of Medical Colleges indicate a doctor shortage of between 61,700 to 94,700, with a significant shortage visible among many surgical specialties.[2] As hospitals grapple with the challenges related to the shortage, they also struggle to develop strategies to manage the increasing demands of an aging population. According to a study from the U.S. Centers for Disease Control and Prevention (CDC), "Two factors—longer life spans and aging baby boomers—will combine to double the population of Americans aged 65 years or older during the next 25 years to about 72 million. By 2030, older adults will account for roughly 20% of the US population."[3] And, considering that "more than a quarter of all Americans and two out of every three older Americans have multiple chronic conditions, and treatment for this population accounts for 66% of the country's healthcare budget,"[3] it is clear that the healthcare system will continue to face challenges as a result of longer lifespans.

The cost of implementing electronic health record (EHR) systems is also formidable. Hospitals have invested large sums of money—some exceeding $1 billion—to fulfill regulatory requirements to utilize electronic patient records. The healthcare industry is facing considerable pressure to utilize digital technology, all while managing costs and continuing to address the needs of more patients with fewer doctors.

A variety of additional workflow-related regulatory requirements add to the pressure on hospitals. This involves the many codes and treatment protocols that must be followed to ensure that providers receive the reimbursements to which they are entitled and remain current with changes to regulatory standards. Any major healthcare-related legislative action includes the potential for profound effects on how physicians are paid and hospitals are reimbursed by private payers and under Medicare. In addition to the growth of value-based payment models, frequent modifications are being made to procedure and diagnostic codes, and standards for electronic patient records.

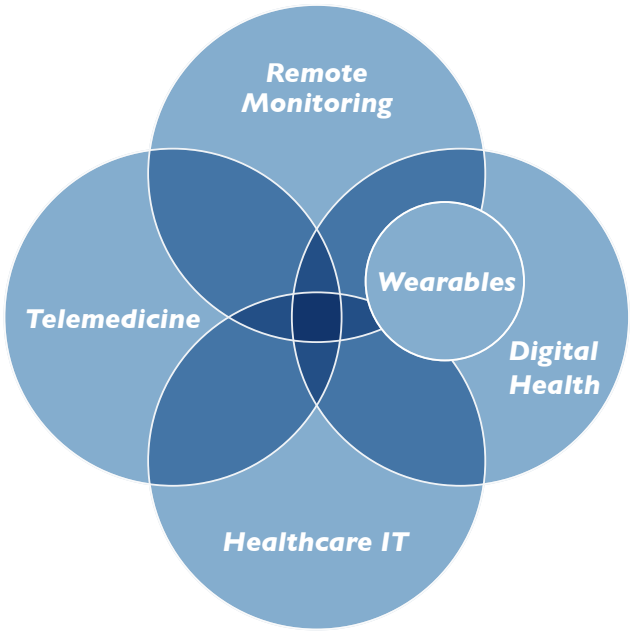
The industry's continued adoption of value-based initiatives is driving change in the way patient care is delivered. As of 2018, Accountable Care Organizations were covering 32.7 million lives.[4] With the continued evolution of Advanced Payment Models and the growth of Medicare Advantage plans in response to the compounding factors impacting providers, the healthcare system will continue to seek ways to deliver care leveraging the investments made into EHRs and innovative digital health tools which aid providers in offering more efficient, effective care to treat total health.

MARKET FORCES INFLUENCING THE FUTURE OF PGHD IN THE UNITED STATES

While there is a significant opportunity for the digital health-enabled ecosystem to drive progress for PGHD, the U.S. healthcare industry is plagued by accelerating costs. For example:

- Per capita spending for healthcare continues to rise. According to the CDC, in 2016 per capita national health expenditures reached $10,348.[5]
- National health spending is projected to grow at an average rate of 5.5% per year, reaching nearly $6 trillion by 2027.[6]
- Healthcare providers are also investing in a digital infrastructure. According to data from CMS, in 2018, over 4,600 hospitals were eligible for the EHR Incentive Programs and 96% of those hospitals are meaningful users.[7]

Digital Health Technology Ecosystem, US, 2017



Source: Frost & Sullivan

Concurrent with the continuing rise in healthcare spending, market indicators are revealing signs of progress for consumer willingness to participate in a digital infrastructure to improve health. For example:

- Forty-six percent of consumers are now considered active digital health adopters, according to a 2016 Rock Health study.[8]
- A recent report from the Consumer Technology Association on the remote patient monitoring industry indicates 52% of consumers say they would use a connected health device as part of their treatment if a doctor made the recommendation.[9]
- According to a 2018 Accenture study, 90% of consumers are willing to share their wearable health data with their doctor.[10]

Providers must be prepared to manage the impact of an increased volume and velocity of data on their workflow as consumer desires have changed. Forty-two percent of US consumers are using technology to measure fitness and health improvement goals, and 27% are using it to monitor health issues.

- Apps and wearable devices are poised to increase the momentum for PGHD to be a part of patients' EHRs. According to a Deloitte report from 2018, 42% of US consumers are using technology to measure fitness and health improvement goals, and 27% are using it to monitor health issues.[11]
- PGHD is often easy to manage at the consumer level. There are around 20,000 medical-grade apps and more than 325,000 health-related apps in the marketplace.
- mHealth technology will extend the range of PGHD to anywhere a patient travels. The influence of mHealth is apparent in a Frost & Sullivan forecast that the overall US mHealth market is expected to increase at an impressive compound annual growth rate (CAGR) of 33.3% from 2015 to 2021, fueled by demographic and technology trends along with changing medical reimbursement policies.[12]
- Another parameter that will continue to drive a growing network of connected healthcare devices will be the progress occurring in the wearables market. A Frost & Sullivan report stated: "The wearable market is at a nascent stage. The global market for wearables in healthcare is expected to reach revenue of $18.9 billion in 2020, growing at a CAGR of 29.9%."[13]

IMPACT OF MARKET INDICATORS

The combination of increased healthcare spending and increased consumer demand should lead to the conclusion that the best way to regain control of the spiraling costs is to ensure a fully interoperable digital infrastructure for healthcare. As the momentum for this vision grows, there will be an increase in both medical-grade patient data and PGHD. The remaining challenge will be to ensure that the healthcare industry can transform from an analog practice that coexists with innovative digital capabilities to a fully connected environment. PGHD will remain significant in the mission to create a truly connected healthcare infrastructure.

FUTURE STATE AND DATA EXPERIENCE

Frost & Sullivan believes that the vision of connected health will prevail. However, achieving this will require medical professionals' willingness and ability to leverage and act upon the massive increase of patient-related data from inside the provider domain as well as PGHD. Physicians and providers must be prepared to manage the effect of an increased volume and velocity of data on their workflows. As the digital health market progresses, the safe and secure transport of patient information from both clinical-grade and consumer-level medical devices will be a critical success factor in the growing ecosystem of device makers, patients, providers, and payers; all stakeholder groups are concerned about security and privacy. The industry will also need to focus on interoperability, starting with EHRs. And, the value of standard interfaces that will enable communication across provider networks between patients, providers, and peer-to-peer medical experts, will continue to grow.

DEMONSTRATING THE VALUE OF PGHD

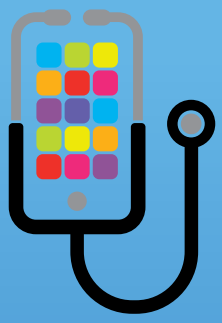
Despite the progress that has been achieved, there remains a need to demonstrate how these technologies which generate and leverage PGHD work in a real-world setting. Although recent studies have shown positive results, they have also demonstrated how patients are enduring unnecessary setbacks in their attempts to rely on data to address their health-related problems.

Validic™, a leading provider of patient-generated health data solutions for healthcare, was selected to collaborate on a federal pilot demonstration to determine the how PGHD can be delivered to care teams and researchers, identify best practices for the use and integration of such data, and ultimately demonstrate how PGHD can improve care and outcomes of patients.

In regards to this project, Validic CEO Drew Schiller described an interesting and representative example regarding a diabetic patient who was struggling to achieve his targeted HbA1c levels through conventional office visits with his endocrinologist. Continuous monitoring of the patient revealed an overlooked daily snacking habit that affected condition management. This created an opportunity for the provider to intervene as part of a follow-up. As a result of using real-time PGHD, a previously unidentified problem was easily spotted and the patient was able to adjust his lifestyle to achieve his target HbA1c. Today, that patient has lowered his HbA1c by over two points and has lost more than 50 pounds.

According to Schiller, this case represents an important instance of how a connected RPM solution can exceed traditional practices that are unable to acquire the ongoing data needed to spot significant anomalies. And, despite recent advancements on the part of CMS in terms of financial support for these programs, the regulatory infrastructure to support RPM does not yet exist across the board in the U.S. Unless a standard interface is in place which allows patients and providers to easily share data, simply collecting PGHD is not enough.

A discussion with Dr. Martin Entwistle, president and CEO at Ares Health Systems, provided additional insights about the study. He stated that while the program deployed RPM and retrieved a great deal of PGHD, the data encouraged meaningful lifestyle changes among participants: "In addition to collecting PGHD, we tried to modify people's behavior in order to shift those clinical endpoints to a desired target," he said. "We were also able to influence patients to modify things like levels of activity or managing their food intake. These examples illustrated the importance of engaging the patient by presenting them with actionable data."



"I think that the common misconception is that providers aren't interested. And really, that's not the truth—providers are very interested, but they are completely challenged as to how to provide this level of care inside today's healthcare model."

— Drew Schiller, Validic CEO

CALL TO ACTION

Schiller said the challenge facing a wider adoption of PGHD is not innovation. Rather, he believes a serious barrier to success is the lack of the consistent interface that brings the provider and patient closer together. He pointed to research that revealed that many

patients who monitor their progress must transfer the data to a portable USB drive, wait for an available time slot, and personally bring their PGHD to a physician's office for the doctor to gain a reimbursable visit. "We need to get to the point where you can just live your life and the healthcare becomes invisible," said Schiller. "We need to focus our efforts on integration and design, rather than putting all our energy into what's new and what's next."

Entwistle added that great progress has been achieved and that this federal pilot demonstration project has proven that remote monitoring can be an operational success. He also observed that the major barrier to success remains the issue of reimbursement models along with some complex connectivity challenges that he expects to be addressed by communications engineers.

"We've run this operationally, collecting the data and feeding it back to a variety of prevention programs that show how medical outcomes can be improved via patient engagement and in a cost-effective way," said Entwistle.

A review of the current state of the healthcare industry can be summarized as a complicated scenario. One group of variables features an industry experiencing accelerating per capita costs while coping with a shortage of doctors and an increasing demand for healthcare across the general population, along with the fact that our population is aging with many patients living with two or more chronic conditions. The other variables are that this same population of patients is increasingly using smart devices in their daily lives, willing to track their health-related progress using user-friendly apps. For the component of the population with serious comorbid, chronic conditions, RPM systems can easily provide an intervention, many of which would likely involve simple changes in treatment adherence and lifestyle management.

Building on this theme, Frost & Sullivan believes that the strategic imperative to realize the true potential of PGHD will be to adopt a standard interface that can turn actionable information into a tangible treatment plan by more efficiently incorporating PGHD into EHRs, creating meaningful dashboards that are standard across all healthcare systems, and triaging PGHD as if it were actual patients awaiting care in an emergency room.

When this vision is achieved, there will be three principal results. The healthcare industry:

- Will improve the healthcare experience and outcomes for many patients.
- Will succeed in lowering the per capita cost of healthcare.
- Will be able to improve the health of specific patient populations.

Simply stated, a path that ensures a connected and fully interoperable healthcare system that integrates PGHD will resolve industry challenges as it relates to delivering meaningful care to a growing population in a way that ultimately improves individuals' total health.

ENDNOTES

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