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The Hospital Landscape is Preparing for Digital Interventions – Here's How Your Organization Can Make the Most of Patient-Generated Health Data

Expert Insights on Overcoming Barriers to Remote Monitoring and Virtual Care Delivery

BECKER'S HOSPITAL REVIEW

In 2016, the number of remotely monitored patients worldwide hit 7.1 million, according to a report from the Internet of Things market research firm Berg Insight. This number is estimated to reach 50.2 million over the next three years.

Remote monitoring and virtual care programs offer patients the ability to collect and transmit relevant health and wellness data to providers remotely. Clinicians can then monitor activity and biometric data – which might include blood pressure, heart rate, electrocardiograms or sleep data from wearables and apps. Based on the raw data or trends analysis, clinicians can provide data-driven treatment assessments and behavior recommendations for patients with various chronic and post-acute conditions.

A December 2016 report commissioned by HHS' Agency for Healthcare Research and Quality found the data has consistently indicated remote monitoring programs are one of the greatest benefits of telehealth with a demonstrated return on investment for people with chronic conditions.

However, despite a substantial value proposition, providers often struggle to implement robust remote monitoring programs. To investigate why, Validic™, the leading platform for patient-generated health data integration and analysis, partnered with Becker's Hospital Review to conduct a survey on providers' attitudes toward the current and future states of remote monitoring and virtual care delivery.

About the survey

The survey of hospital and practice executives found more than half of respondents had not used remote monitoring devices such as in-home medical devices, wearables or smartphone apps in care programs, although dozens of respondents noted that programs that leverage such tools offer opportunities to improve clinical outcomes for avoidable readmissions, postoperative rehabilitation and home health, among other use cases.

Overall, half of respondents reported having rolled out at least one remote monitoring pilot. Nearly 20 percent of respondents said they had rolled out a few remote monitoring programs "broadly" at their organization, while 29 percent of respondents have completed at least one remote patient monitoring pilot. Only a small minority of respondents, 1 percent, said they had broadly implemented several remote monitoring programs across their system.

The diversity of the respondent pool is also reflected by the reimbursement landscape in which their facilities operate. The vast majority of respondents (82 percent) indicated fee-for-service, or FFS, is one of two financial models from which they see the most revenue. After FFS, the most popular financial models were bundled payment or episode-of-care payment (31 percent) followed by pay-for-performance (28 percent).

In addition to the results from the survey, this content is based on a roundtable discussion with two healthcare leaders:

- Tufia C. Haddad, MD, chair of IT for the oncology department and medical oncologist at Rochester, Minn.-based Mayo Clinic

- Dr. Martin Entwistle, president and CEO of Pasadena, Calif.-based Ares Health Systems, a company that develops tools to support care coordination

Using responses from the survey, this e-book provides an overview of three major concerns providers cited as barriers to implementing remote patient monitoring services. Additionally, this e-book offers tips on how to overcome them from leaders who have deployed successful programs in the field.

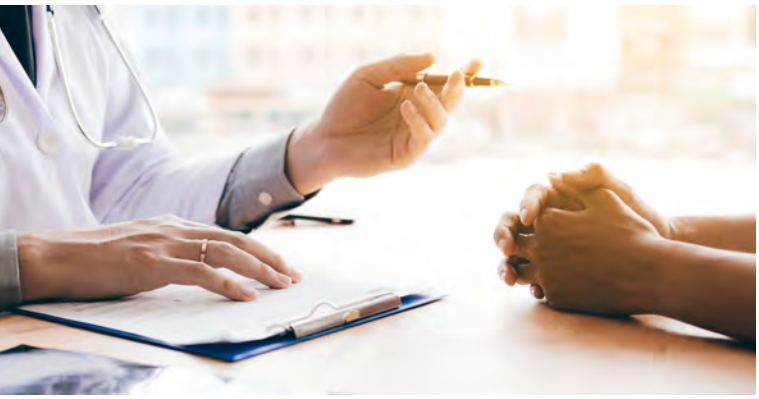
For successful implementation of remote monitoring, EHR integration is critical

Interoperability with the EHR: A top barrier

Interoperability remains a core challenge affecting the entire healthcare continuum. Today, physicians are inundated with various clinical systems that require substantial time to operate and deliver value. What's more, these systems can rarely accurately and seamlessly share data across various facilities and services to inform better care decisions – meaning clinicians face challenges in viewing all available patient data.

Primary care physicians today already spend more time in the EHR than with patients, according to a 2018 study published in *Family Medicine*, so adding another onerous system for their use is unrealistic.

Although EHRs are the central hub for patient data, they often do not operate and exchange data well between disparate systems. This is a major barrier to quality care, considering that 30 percent of providers report the average clinician uses four to seven disparate systems daily, according the survey. Additionally, a 2016 analysis by the ONC determined EHR adoption was "nearly universal" among acute-care hospitals, but the majority of physicians agree making their facility's EHR system more interoperable is a top improvement they want to see, according to a recent Deloitte report. This suggests providers across the U.S. are struggling to incorporate data from external devices and systems into their EHRs, hindering their ability to view all relevant information when assessing patient care.



"The biggest challenge with any sort of digital health solution is EHR integration," Dr. Haddad said. "[It's providing] the nursing and clinical assistant teams who are monitoring [patient-generated health] data with that data integrated within the EHR, so it is seamless with the data from when [the patient was] in the hospital."

Interoperability challenges seep in at several points throughout the care process. When asked to name their primary interoperability challenge, survey respondents were split.

Of respondents who report having rolled out a few remote monitoring programs broadly, 31 percent agree that a main interoperability challenge is sharing data between different EHRs in use at their facility and sharing data between health systems. This poses a hurdle for physicians looking to coordinate care for patients who visit various facilities, and therefore may have disparate test results and data housed in records not available to each provider.

Every survey respondent cited a range of issues related to data exchange, from challenges with integration platforms (21 percent) to lack of data standards (16 percent). An integration platform, or software platform that unites data from different applications, only works if every application seamlessly connects to the service. And without comprehensive data standards, different software systems – such as an EHR and an off-site monitoring device – cannot share data using the same format.

These data exchange challenges are no different for wearables or digital health apps, which providers often struggle to connect directly into the EHR. More than one-quarter of survey respondents said EHR integration was the greatest technical consideration when implementing a new Software-as-a-Service, or SaaS, tool.

Data exchange takes an upfront investment

It's all well and good for patients to collect information on their health and well-being outside the confines of the hospital, and patients are doing so today more than ever before. In fact, a reported 42 percent of consumers are using technologies to measure fitness and health improvement goals, and more than a quarter are using these technologies to monitor health issues. These figures doubled in five years.

However, if providers can't view patient-generated health data, or PGHD, alongside their standard clinical data and medical histories, they are not able to utilize it in patient care plans. Without proper integration, this data is stuck living outside the clinical system. The information is only available and useful to the consumer, and clinicians are unable to make it actionable.

When asked about opportunities for remote monitoring at their organization, one respondent – the vice president of quality and population health at a clinically integrated network in the Southern U.S. – cited interoperability as the foundational step for a remote monitoring program.

"Within the past year, we have taken a leap into interoperability," she said, noting her organization's participation in a statewide health information exchange, launch of a population health management system and other EHR improvement efforts. "By building this strong technology infrastructure … I believe we have a great opportunity to increase remote monitoring in 2019."

One way to overcome interoperability barriers is to connect home health and wearables devices to the EHR using application programming interfaces, or APIs – sets of protocols and tools that help different applications communicate with one another. Applications can use APIs to exchange information with each other, without having to overhaul their software infrastructure, making them a convenient option to bridge the gap between different services. Promoting the use of APIs, such as those developed by Validic, is one approach federal agencies took to tackle interoperability in 2018.

Additionally in 2018, CMS launched an API dubbed Blue Button 2.0 to allow third-party apps and services to connect to and make sense of Medicare data. For example, the agency suggested apps developed with the Blue Button 2.0 API could use claims data to flag if a patient is at risk for harmful drug interactions or to alert clinicians if a patient has already received a certain test. Since its launch, more than 500 groups – including Amazon, Anthem and the Massachusetts Institute of Technology in Cambridge – have registered with CMS to build apps using the API.

One of the most popular uses of APIs to date involves Apple's health records project, which integrates data from a patient's medical records into their iPhone's Health app. To facilitate this exchange, Apple uses APIs provided by participating hospitals or clinics – including leading providers like Danville, Pa.-based Geisinger and Baltimore-based Johns Hopkins Medicine – to create a direct data connection to the patient's iPhone. Roughly 100 facilities have signed on to the project since its January rollout, in an effort to allow patients to more easily review medical data from multiple providers.

Actionable insights are worth the investment

Despite interoperability challenges, providers who are taking strategic approaches to remote monitoring for

specific use cases, such as chronic disease management, experience value in such programs.

Mayo Clinic has had success with remote monitoring for patients with complex chronic conditions, such as asthma, congestive heart failure and diabetes, according to Dr. Haddad. To ease stress on the nursing and clinical assistant teams that monitor PGHD, Dr. Haddad said Mayo Clinic worked to ensure this data was automatically documented in the EHR, rather than in a standalone app.

"To do it, you have to do it right," she said. "If you don't have all those key features, you can't utilize PGHD in a systematic way. It really takes an investment. It is initially a cost to healthcare organizations to develop these systems, because you need a solid system in place to bring this data into the clinic in a thoughtful way."

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While significant, initial investments in technology can result in positive returns, both in terms of clinical outcomes and financial savings.

When PGHD is integrated into care processes and programs, physicians can proactively intervene as soon as a patient's health begins to deteriorate, as opposed to waiting until the patient arrives for his or her next appointment – or worse, when the patient is admitted for a life-threatening health event. A 2017 literature review of studies on remote patient monitoring interventions for heart failure patients, for example, found telemonitoring effectively reduced rehospitalization and mortality rates.

Over time, avoided readmissions and positive health outcomes can serve as a financial asset to hospitals. "The potential benefit of [remote monitoring] services is reducing healthcare costs and readmission penalties," Dr. Haddad said. "There's a cost-avoidance, for which some institutions say it's worth the investment."

NEW FINANCIAL MODELS MAY OFFSET THE UPFRONT COSTS OF REMOTE MONITORING PROGRAMS

Hospital leaders must show long-term gains outweigh short-term costs

Two major reasons hospitals have been slow to incorporate PGHD into patient care are tight budgets and lack of resources. Remote monitoring programs can require significant initial investments and resource expenditure to set up, and without the promise of reimbursement, hospitals may see the undertaking as a gamble.

Like Dr. Haddad said, to deploy a remote monitoring program, you have to do it right – and many hospitals may not feel the long-term benefits of the program outweigh the capital costs in the current reimbursement landscape. "There is, perhaps, more interest in doing it than there are resources to do it," she added.

Dr. Haddad isn't alone in feeling this way. Limited budget and resources topped survey respondents' list of core concerns when considering a remote monitoring program. Lack of reimbursement from payers was the most-cited barrier to adopting a remote care strategy (30 percent), closely followed by its unproven financial model (26 percent).

Hospital leaders interested in these services must demonstrate financial gains. As one survey respondent – a director of population health at a Midwestern hospital – said when asked about the potential for remote monitoring: "High, if we can address payment issues."

Almost all respondents to the survey indicated they see significant revenue from FFS financial models. According to providers, it has been more financially viable to maintain the status quo, which in most cases means in-person visits, rather than move to virtual care models. So, it's understandable why remote monitoring concerns related to payment issues dominated the list of barriers.

However, with new codes for remote monitoring established by CMS in 2019, the financial ROI of these programs is likely to evolve substantially in the coming years. In the 2019 Physician Fee Schedule Final Rule, CMS offered three new codes that reimburse for remote monitoring: CPT codes 99453 and 99454 reimburse for setting up technologies, patient education and transmission of data for the "remote monitoring of physiologic parameters," and CPT code 99457 covers "20 minutes or more of clinical staff/physician/other qualified healthcare professional time in a calendar month" reviewing and utilizing said data. The establishment of these codes indicates CMS' dedication to building a value-based payment model that leverages digital health technologies to make care more effective and efficient. These codes also create the needed financial incentives to help physicians and care teams utilize new care delivery models that incorporate remote monitoring.

Remote patient monitoring in the era of value-based care

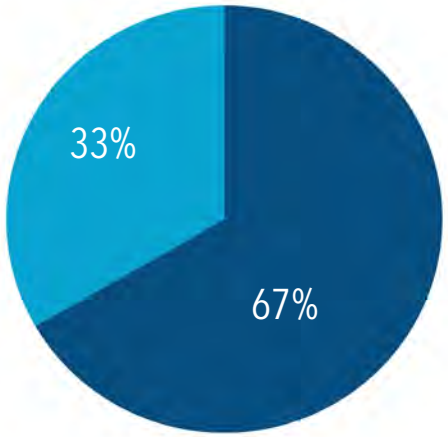
Today, organizations that heavily rely on reimbursement from FFS models are less likely to pursue remote monitoring programs. Of survey respondents who said they see most revenue from FFS payment models, only two-thirds had deployed a remote monitoring program or had plans to do so in the next 12 months. By contrast, more than 75 percent of respondents from organizations using a pay-for-performance model said they had deployed or had plans to deploy remote monitoring programs.

The shift to value-based care and performance-based reimbursement models will likely shift survey respondents' attitudes toward remote monitoring over the next several years. Thirty-eight percent of survey respondents agreed an integrated delivery system model would best support remote monitoring in their organization, followed by payer-provider shared-risk collaboration (17 percent).

"By and large, most institutions that have adopted remote patient monitoring thus far have been paying for it and not getting any reimbursement," Dr. Haddad said. "As the value of remote patient monitoring has been increasingly demonstrated, it's now being endorsed and supported, and there is a reimbursement model that's evolving through CMS."

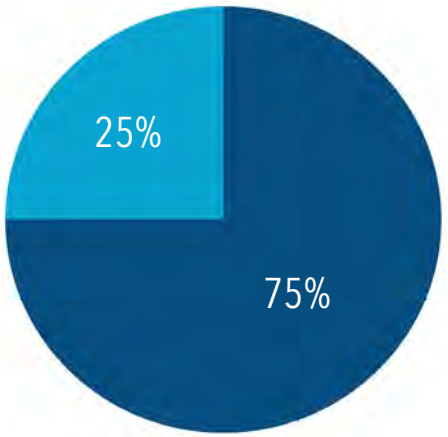
Readmission penalties and reimbursement codes: Two ways CMS drives remote monitoring

Respondents who said they see most revenue from FFS payment models



- deployed a remote monitoring program or had plans to do so in the next 12 months
- have not deployed a remote monitoring program or do not have plans to do so in the next 12 months

Respondents from organizations using a pay-for-performance model



- had deployed or had plans to deploy remote monitoring programs.
- had not deployed or do not have plans to deploy remote monitoring programs.

Hospital leaders who are concerned about readmission penalties are most likely to express interest in virtual care and remote monitoring programs, the survey suggests. Seventy-five percent of survey respondents who had rolled out remote monitoring programs agreed that readmission penalties had a moderate to significant influence on their decision-making, compared to less than half of those who had no plans to roll out virtual care programs.

In 2012, CMS established policies to reduce Medicare reimbursement for hospitals that reported high 30-day readmission rates for select conditions, with the goal to improve care quality by rewarding hospitals for patient outcomes as opposed to the volume of services rendered. Remote monitoring offers one approach for hospitals concerned with this policy. In fact, decreasing avoidable readmissions and managing recently-discharged patients were common drivers for remote monitoring programs, as cited by survey respondents.

New CMS reimbursement for remote patient monitoring services may also alleviate providers' financial concerns. With CMS' 2019 Physician Fee Schedule and Quality Payment Program Final Rule, the agency put forth numerous expansions for telehealth reimbursement, including the aforementioned new codes for remote monitoring.

"CMS is a major driver of providers using PGHD to support patient care," said Dr. Entwistle, who is also the former executive director of personal healthcare programs at Sacramento, Calif.-based Sutter Health.

"There are now programs of care that are reimbursable for PGHD and remote patient monitoring, and we're starting to see commercial plans introducing similar payment models as well," he added. "[Medicare reimbursement has] become a significant driver of using PGHD as providers are incentivized to use it to manage care."

With more stringent readmission penalties and new CPT codes, CMS has increasingly been moving toward a reimbursement landscape that encourages hospitals to try

new methods to improve clinical outcomes, rather than incentivizing them to maintain the status quo. For hospitals that can successfully integrate remote monitoring into their care processes, these regulatory changes open the doors for a range of new programs that aren't feasible under the FFS framework.

A STRONG PROGRAM AND OPERATIONAL DEPLOYMENT SUPPORT PHYSICIANS WHO ARE ALREADY INUNDATED WITH DATA

Physician burnout, a nationwide epidemic

No hospital today is immune from the risk of physician burnout, which makes hospital leaders understandably hesitant to add more data to their clinicians' plates. More than half of physicians reported experiencing frequent or constant feelings of burnout in 2017, up from 40 percent in 2013, according to a 2017 survey by Medscape.

That year, 10 prominent hospital CEOs penned a call to action in Health Affairs, calling on their colleagues to make addressing physician burnout a top priority. In the op-ed, the CEOs argued EHRs have been a driving force behind the epidemic of physician burnout.

Today, physicians spend half of their time on "desktop medicine," which includes entering notes into EHRs, reviewing test results and communicating with patients via patient portals, according to a 2017 study. One in five respondents to the survey cited fear of further clinician burnout as a major personnel barrier to implementing a virtual care program, and 17 percent said lack of physician interest in supporting this type of program is a hindrance.

With clinicians already spending so much time in front of the screen instead of with patients, the desire to prevent increased screen time is understandable. If providers are suddenly handed large amounts of raw data, more screen time is seen as an undesirable outcome.

"The concern we hear from providers pretty consistently is: 'I can't handle more data,'" Dr. Haddad said, noting physicians already balance EHRs, labs and patient messaging, among other data sources. "The thought of receiving more data, more alerts – nobody wants that – and I can certainly appreciate that as a busy provider myself."

Remote patient monitoring doesn't have to add screen time

One proven approach to lessen concern about physician burnout is providing data to physicians only once it is actionable and easily readable within existing clinical systems. By leveraging visuals to chart data, and analytics to demonstrate and predict trends, as well as notifications to automate outreach, technology can present these data to drive clinician actions – rather than overloading them with raw streams of continuous clinical data.

One way Mayo Clinic addressed physicians' concerns is by convening a separate team of virtual care nurses to oversee PGHD, rather than sending the information to individual physicians. These nurses work with patients to manage changes in vital signs and other measurements, and only escalate the data to their physician when necessary.

However, nearly 30 percent of respondents to the survey said the absence of a nurse or care manager to review PGHD is a top barrier to implementing a remote monitoring program. To incorporate PGHD without a dedicated team of virtual care nurses – like Mayo Clinic has in place – Dr. Entwistle emphasized the need for strong program infrastructure. When programs are strategically implemented, systems can augment the work of clinicians to offset the demand on hospital personnel and make remote monitoring services more effective.

"If it's possible for patients to decide, 'I can just send my PGHD' … physicians will understandably be concerned that they're going to be inundated with data," Dr.

Entwistle said. Where the data becomes meaningful is when it is integrated into a program of care that creates a feedback loop between the patient and provider.

Like Dr. Haddad, Dr. Entwistle's experience with remote monitoring is largely associated with chronic condition patient support. However, he sees immediate value in using PGHD to support care management during patient transitions as well, such as when they are discharged from the hospital to rehabilitation.

Regardless of the use case, it's key to only allow patients to share patient-generated health data if a prior agreement is in place with their physician, Dr. Entwistle said.

"It isn't just throwing data at [physicians], but explicitly building it into the care management process," Dr. Entwistle said. "We've found when you get your ducks in a row, and you make PGHD positively impact physicians' work … they see the value through their experiences and it reinforces them to use it more."

This is where today's technological solutions come into play. When PGHD can be integrated directly into the clinical system, and analytics can be applied to show trends in data and automatically elevate exceptional data that requires immediate intervention, clinicians have a clear path forward as to how to make the insights truly actionable.

To gain physician buy-in, focus on the literature

For Dr. Haddad at Mayo Clinic, establishing physician buy-in early on proved essential

to overcoming concerns related to burnout. She found providing research that illustrated how these interventions truly support patient care — and are not simply shiny new objects for the hospital to promote — helped transform physicians' attitudes.

"By nature, based on how we were all trained, physicians want to see evidence that these types of interventions work – that they are of benefit to patients and are not adding burden to providers," Dr. Haddad said. "Thankfully, that literature is rapidly growing."

For example, a 2018 study published in JAMA found remote monitoring and virtual care programs can help patients with hypertension manage their blood pressure at home. Leading health systems like UPMC in Pittsburgh have also credited reduced readmissions for chronic conditions like heart failure and diabetes to remote patient monitoring programs.

And, indeed, education on the value of remote monitoring equips both patients and providers with greater understanding of the reasoning for such initiatives. As leaders continue to roll out new virtual care programs, the healthcare industry continues to see guidelines for best practices to create programs that effectively support all stakeholders involved.

"As much as we can share that data … share the evidence and good work that's been done by the 'early adopters,' if you will, that's how we'll continue to grow physician buy-in," Dr. Haddad said.

ALL IN ALL: IT'S ABOUT LAYING A STRONG FOUNDATION

As emerging financial models incentivize hospitals to try innovative solutions that holistically improve patient outcomes, remote monitoring will gain traction and continue to position itself as a leading method to enable early intervention. CMS has already taken a first step, establishing readmission penalties and new reimbursement codes for 2019.

In this survey, healthcare executives shared their concerns about deploying remote monitoring and virtual care programs. However, by starting early with the best practices outlined above, hospitals can lay the foundation for a successful program that integrates PGHD into standard care processes and practices. And, many respondents expressed their support of the new opportunities remote monitoring can provide and the growth they expect to see in their own health systems in the near future.

By investing in strong technology infrastructure, hospitals can promote interoperability between off-site or in-home medical devices and the hospital's EHR. And, with the addition of meaningful analytics and visuals, providers can ensure data is only delivered to physicians once it is actionable. By conducting a thorough cost-benefit analysis, hospitals can determine whether the cost-avoidance benefits of remote patient monitoring offset the financial lift required to implement the program today – and if not, they can begin to plan ahead to capitalize on changing reimbursement policies coming down the pike.

Ultimately, before a program is deployed, it is key for hospitals to achieve physician buy-in. For Mayo Clinic, this meant convening a separate team of virtual care nurses. For other hospitals, it might simply mean providing physicians with evidence that a remote monitoring service will improve care outcomes without adding significant screen time to their days.

By infusing answers to these technological, financial and personnel considerations into the building blocks of the program, hospital leaders can establish successful services that incorporate PGHD in a way that drives clinical outcomes while also maintaining patient and physician satisfaction.

About Validic

Validic guides healthcare organizations through the technical complexities associated with accessing and operationalizing patient-generated health data. Validic's scalable, secure solutions help you improve operational efficiency and patient outcomes by delivering personal health data from hundreds of home health devices seamlessly into your existing clinical workflows. To find out how healthcare is innovating to create more data-driven and integrative healthcare experiences, visit **validic.com** or follow Validic on Twitter at **@validic**.

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