TRENDS IN DIGITAL HEALTH
How technology is impacting patient care
EXECUTIVE SUMMARY

In an effort to understand how digital health plays an increasingly vital role in the way patients manage their health, as well as the means by which care teams manage their patients, Validic conducted a survey of the Healthcare Dive readership. This survey gathers and shares insight on how digital technologies and their corresponding data are applied in patient care today, projecting into the future. This survey includes responses from 189 hospital and healthcare system executives, directors and clinicians.

Many hospital and healthcare organizations use data generated from in-home clinical devices and consumer health technologies to improve patient outcomes, reduce costs and meet required quality measures. More than half of the respondents to this survey said they have used in-home medical devices, consumer health devices, or consumer health applications in programs of care. Respondents also indicated several incentives that prompted the adoption of remote care technologies in 2018, including evidence supporting the impact of patient-generated health data (PGHD) on: reductions in the total cost of care, providers’ ability to better manage individuals while decreasing in-office visits, a decrease in the rate of readmissions and an improvement in the overall patient experience.

As healthcare systems and providers are asked to achieve better outcomes more efficiently and with fewer resources, the implementation and use of digital health technologies—in part because of the meaningful insights and patient engagement they offer—is proving to be a critical component of clinical care.
In-home medical devices
blood glucose meter, blood pressure monitor, pulse oximeter, etc.

Consumer health devices
activity tracker, smartwatch, posture devices, etc.

Consumer health applications
nutrition, running and/or stress management apps, etc.

Other

The majority of providers utilize in-home device data in patient care programs. Nearly 60% of those surveyed responded that they apply data from digital health technologies as a means to improve outcomes in care programs. 65% of respondents report using in-home medical devices, including blood glucose meters, blood pressure monitors and pulse oximeters. 62% of those surveyed said they use consumer health devices such as activity trackers, smartwatches and non-regulated devices in clinical care programs.

Several factors contribute to the rise in usage of digital health, including the numerous studies that have examined and proven the effectiveness of remote monitoring technologies. A study published in the Journal of Telemedicine and Telecare found that diabetic patients participating in a remote monitoring program realized a significant decrease in their HbA1c levels, thus lowering per-patient care costs by about $900.1

A second contributing factor is a growing understanding of how age and social determinants impact a person’s health. According to an AARP report, more than 70 million Americans ages 50 and older—four out of five older adults—suffer from at least one chronic condition.2 The application of digital health technologies has been proven in recent studies to aid patients in better managing their conditions and clinicians in better managing programs. In addition, these technologies can help care teams directly and preemptively address social and environmental factors that can contribute to ill health and even premature death.3

Q. Which in-home clinical and/or consumer health technologies have you used in your programs of care?

In-home medical devices
65%

Consumer health devices
61%

Consumer health applications
47%

Other
7%

HEALTHCARE DIVE
Providers see the value in integrating patient-generated health data to solve current inefficiencies in chronic disease management programs.

PGHD as applied to chronic disease management has become a primary focus in digital health advancement. More than 75% of respondents said that remote monitoring most positively affected diabetes management. Hypertension (59%) and congestive heart failure (48%) were also cited as therapeutic areas in which digital health technology has been applied effectively.

Remote technologies for mental and behavior care programs was also cited—with nearly 46% of respondents indicating this as a growth area for digital health to prove its efficacy. By implementing remote monitoring technologies in chronic care programs, providers can personalize therapies and treatment to optimize the patient experience and outcomes.

Q. In which therapeutic area(s) is remote care most impactful, or will be most impactful?

- Diabetes: 77%
- Hypertension: 59%
- Pre/Post-Surgical Monitoring: 56%
- Readmission Management: 56%
- Congestive Heart Failure: 48%
- Mental/Behavioral Health: 46%
- COPD: 41%
- Joint Replacement: 22%
What objections do you or others in your organization have to remote care?

- **None**: 33%
- **Data and IT concerns**: 18%
  - Privacy / HIPAA, security, accuracy, IT integration
- **Financial**: 15%
  - Costs and reimbursement
- **Resistance to and fears of change**: 13%
  - Depersonalization, MD burden, trust in technology
- **Other**: 21%
The main concerns regarding digital health technologies surround data integration and reimbursement.

In general, more respondents were concerned about data integration (50%) and related issues than were concerned about reimbursement (46%) when asked about digital health usage. Similarly, for remote care, respondents described organizational objections concerning data and IT (18%) slightly more frequently than they did financial issues, like reimbursement and costs (15%). These responses indicate an improved appreciation for the value of digital health, perhaps due to the shift away from fee for service. In fact, 33% of respondents stated their organizations had no objections to using remote care.

Q. What are the key concerns when it comes to using digital health data?

A. Patients’ ability and willingness to use digital health devices
B. Integrating data from devices into your EHR or clinical workflow
C. Knowing what devices to use
D. How to analyze the data in a meaningful way
E. Standardization of data
F. Physicians’ ability and willingness to use digital health devices
G. Accuracy of data
H. Lack of IT services
I. No reimbursement model to support a digital health initiative
J. Unsure how to properly scale a digital health program
K. Ethical concerns
KEY FINDINGS

4 There is tremendous growth potential for digital technology application in multiple care programs.

Digital health technologies have been readily adopted and integrated in wellness and preventive programs by many providers (49%). However, the majority of organizations have yet to leverage these devices as part of a standard of care. There were four areas in which a significant gap existed between survey respondents who had used the technologies versus those who would like to use these tools. For chronic disease management, only 30% of respondents had used the technologies but 69% reported wanting to use them. Similarly, in home health, 33% reported using the technologies, but 66% reported a desire to use these tools. Telehealth and post-discharge program percentages were similar, reporting about half as many providers having used digital technologies as compared to those who responded that they’d like to use them. This suggests a sizable opportunity for providers to incorporate digital health technologies across various use cases and a potential market expansion.

Q. Have you used, or would you like to use digital technologies for the following cases?

- **Chronic disease management**: 30% have used, 69% would like to use
- **Home health / remote patient monitoring programs**: 33% have used, 66% would like to use
- **Post-discharge programs**: 23% have used, 76% would like to use
- **Research**: 63% have used, 63% would like to use
- **Wellness / preventative programs**: 49% have used, 50% would like to use
- **Telehealth**: 36% have used, 63% would like to use
More than 80% of survey respondents cited patient outcomes as the key driver for incorporating digital technologies in their care programs. Operational efficiency was the second most popular driver of digital health usage. Quality metrics—including improving patient engagement, patient experience and access—were the third most cited reason, with 66% of respondents indicating they believe the utilization of digital health technology improves these metrics. Outcomes data, operational data and quality data are key for integrating in-home and consumer medical devices with the care provided in a doctor's office or emergency room. Revenue and penalty reduction were selected by less than half of those surveyed. Here, again, there is a preference for clinical, indirect business benefits, rather than direct remuneration, though many stakeholders acknowledge digital health’s value in this respect as well.

Which of the following are key business drivers for using digital health in your organization?

- Patient outcomes: 82%
- Operational efficiency: 68%
- Quality metrics: 66%
- Revenue: 42%
- Reduce penalties: 38%
- Brand elevation: 28%
Q. What are the needed **external** incentives to support the adoption of remote care?

- Financial: 45%
- Data/IT: 7%
- Training and education: 7%
- Patient adoption: 6%
- Improved care: 6%
- Market support and awareness: 6%

Q. What are the **internal** incentives that support the adoption of remote care?

- Improved care: 32%
- Financial: 26%
- None: 19%
- Other: 13%
- Data/IT: 5%
- Service access: 3%
- Marketing: 2%
When asked what external incentives were needed for remote care adoption, almost half (45%) of responses pointed to financial factors such as reimbursement, funding and cost reduction. There was a clear plurality of 30% that specifically cited payers and reimbursement as a needed incentive. The next highest category was data and IT, at 7%, and care improvement only received 6% of responses. In contrast, when asked what internal incentives would support remote care, respondents more frequently described care improvement (32%) than financial factors (26%). This reflects a shift in the market toward value-based reimbursement, which directly rewards higher quality and better outcomes.

KEY FINDINGS

Financial factors were the leading external drivers for remote care adoption, with care improvements being the top internal drivers.
DEMOGRAPHICS

The survey received 189 responses from professionals across healthcare. 35% of respondents work in 100-150 bed hospitals, and almost a quarter (21%) work in 500+ bed hospitals. More than half of respondents (54%) currently work in a fee-for-service system.

Q. Which best matches your title?

- Other—most commonly COO, RN, CFO, or Manager: 50%
- VP/Director of Innovation, Medical Informatics, Patient Engagement, Telemedicine: 21%
- Department Head of Ambulatory Care, Endocrinology, Cardiology, Pulmonology, Nephrology, Orthopedics/Surgery: 17%
- CIO, CMIO, CMO, CTO: 12%
The Validic Healthcare Dive survey demonstrates a robust and fast-growing market for digital health technologies, with high rates of reported usage and even higher rates of desired usage, despite a lack of established reimbursement. Most interestingly, providers seem to have successfully made the business case for digital health’s value, as outcomes and quality improvement were the most popular choices as drivers toward adoption. Overall, the survey results point to a market that has passed an adoption tipping point—one third of respondents indicate their organizations have no objections to using remote care.

With healthcare consumerization in full swing and the need for clinical efficiency rising rapidly, market forces are exerting both a push and pull for the adoption of digital healthcare technologies, which is driving a significant increase in usage. Berg Insight reported a 44% uptick in U.S. patients remotely monitored by connected medical devices as a core part of their care plan during 2016.

These survey findings reveal important implications for the utilization of digital health technologies with three important themes that emerged—remote technologies’ impact on the patient experience, their realized and potential advancements in care delivery, and key obstacles to their adoption.
Enriching the Patient Experience

Rapid, continuous changes in the industry are catalyzing the consumerization of healthcare. These changes include a shift of healthcare costs in which patient payments accounted for 35% of provider income in 2017, as well as a proliferation of care options and decisions with financial and health consequences that are driving patients to become shoppers. The consumer-driven approach to choosing a healthcare provider has led more patients to deepen their engagement with providers, insurers and communities. Digital health technologies are playing a large role in the uptick of patient engagement, as consumer expectations raise the bar for patient experience, access and services.

Today’s consumers are empowered with information and they know the path to better health starts with their actions and decisions. Patients recognize that digital health technologies—those currently available on the market and those yet to come—can help provide them with an elevated level of support via education, motivation, feedback and control, with the continuous insights needed to effectuate decision-making in real time.

Indeed, among U.S. households with broadband, more than 40% owned a connected health product in 2017, up from 37% in 2016 and 33% in 2015, according to technology research firm Parks Associates.

Furthermore, 29% of healthcare consumers now prefer remote over in-patient visits, which is an increase from 23% in 2014, according to a recent Accenture report.

However, according to some survey respondents, not all patients are able to take advantage of these potential benefits. When physicians have not adopted the tools to support the utilization of digital health technologies as readily as their patients, a disconnect in the doctor-patient relationship emerges. According to the survey, 40% of respondents said that physician ability and willingness to use digital health technologies was a concern complicating their usage of these technologies. Additionally, respondents cited ethical concerns (32%) with integrating digital health technologies, such as intervention upon detection of an adverse event, ownership of the data and the extent of patient information transparency. These disconnects between patients and providers can be a barrier to effective implementation of digital health technologies, and require increased research from healthcare organizations into best practices for utilization at an enterprise level in order to make the best decisions for their individual populations.

With interoperability a key tenet of digital health, patients and physicians want to access their information wherever and whenever they want. This is essential for the
engaged patient, to whom connection and communication are non-negotiable. A 2017 West study notes that 66% of patients say they would stay with their healthcare team if remote monitoring were an option. Patients today want to be involved in the management of their health, and they want a healthcare team that is actively involved in managing their health via near real-time interventions that leverage consistent data.

Employing digital health technologies lends itself to creating a better overall patient experience, disposing of the miscommunication or misrepresentation that can come from pen and paper recording of information. Anywhere from 40% to 80% of medical information provided by healthcare practitioners is immediately forgotten by patients. Similarly, patient recall of information provided several days, weeks, or months before often does not contain the granularity of data needed for a physician to make meaningful interventions. About half of all the information that is recalled is incorrect.

One of the common objections to digital health technologies is that they depersonalize the patient experience. But in practice, the opposite is often true—these technologies help create a more personalized and impactful care experience for patients. One such patient, who sought out more personalized care to manage his condition, shared his story.
Steven, now in his fifties, was diagnosed with Type II diabetes when he turned 40. Even 10 years later, Steven has struggled to maintain his weight, control his blood sugar and control his overall health. He required frequent in-person visits with his endocrinologist and would track his glucose readings via a spreadsheet. He would then fax the spreadsheet of his data to his specialist. As there was no protocol in place to manage this information, Steven’s specialist promptly discarded that data. And Steven remained stagnant in his progress.

With a goal to lower his a1c by two points, Steven switched providers. He selected a health system that offered a disease management program leveraging the data Steven tracked daily. Going beyond blood sugar readings, the program also incorporated weight tracking, blood pressure monitoring and activity tracking. Steven and his care team were able to unearth a previously overlooked trend—late night snacking. Steven’s post-dinner snacks were the culprit for a severe spike he was seeing in his morning blood sugar readings.

By identifying and addressing the snacking issue, Steven was able to drop 14 pounds in one month, lower his a1c by .5 points and feel more in control of his condition. His doctor reduced the number of in-person visits Steven required to once every three months, and she and the care team continued to manage his condition and provide personal support remotely through the duration of the program. Steven’s progress was due to his ability to capture and share information about his condition with a practitioner who was able to track the anomalies in trends and intervene.

These types of pilot programs and studies are becoming increasingly common as the healthcare landscape evolves. The use of digital technologies is a distinct way to increase the personalization of care—creating programs that address dynamic goal-setting, appropriate mediums for education and real-time personal feedback, much of which is automated based on analytics and triggers.
Advancing Care Delivery

There are many ways in which digital health technologies can, and do, improve care delivery. Simply put, they increase the value of care delivered by improving quality and reducing costs—and they do this through several mechanisms. A substantial body of evidence indicates that engaging patients in their care leads to better health outcomes and lower costs. Digital health technologies can also increase clinician efficiency and lower the workload burden, thereby improving access to physicians in short supply. Finally, these technologies are critical to advanced care coordination programs, which are often the remedy for problems like early readmissions.

With value-based care models slowly displacing fee-for-service, PGHD will continue to play a larger role in patient care as physicians look for more ways to improve patient care while lowering the cost. To that end, 68% of survey respondents said that being able to manage more patients with fewer resources and to better coordinate care was a key driver for using digital health technologies in their organizations.

There seems to be wide agreement that digital health technologies better engage patients in care. Accenture’s research found that 85% of doctors and 77% of consumers felt that wearables improved patient engagement. In this survey, 96% of all respondents indicated that use of in-home health technologies would increase patients’ adherence to care. Given the research linking engagement to outcomes, it makes sense that providers look to these technologies to advance care outcomes.

An example of achieving better outcomes is the reduction in readmission rates. Many of those surveyed noted that reducing the rate of readmissions was a top consideration driving remote care forward. Hospital readmissions account for more than $17 billion in Medicare expenditures. Implementing remote health technologies to reduce readmissions, and in turn lower the cost of healthcare to patient and payer, is a major incentive for healthcare systems and organizations.

Using digital technologies not only allows for more engaged care, but also reduces the need for in-office visits, saving time and expenditure for both the patient and provider. These technologies provide more frequent connections with patients in a way that is not disruptive to their daily lives and, at the same time, allows for improved efficiency, quality and adherence.

When the appropriate workflow processes are in place, digital technologies can offer solutions to clinician workload issues. In fact, a 2016 response to new guidelines for remote monitoring of cardiac implantable...
SURVEY HIGHLIGHTS

Electronic devices stated that, “incorporation into practice results in significant reduction in device clinic workload and efficiencies for physicians and allied professional staff.”

To realize the full potential of these efficiency improvements, integration with electronic health records (EHRs) is essential. Half of the surveyed respondents cited integrating data into the EHR or clinical workflow as one of their top concerns when considering digital health data. It’s clear that while proper processes do need to be established, once in place, these data have the potential to significantly reduce the workload of the clinician.

EHRs were introduced into the healthcare landscape to better capture and improve patient records. Unfortunately, an unintended consequence of EHR usage is the major physician burnout that has occurred. At the end of 2016, the NEJM Catalyst released surprising results from a survey of their Insights Council members, that “there is overwhelming concurrence on an issue: 96% of executives, clinical leaders and clinicians agree that physician burnout is a serious or moderate problem in the health care industry.”

The NEJM Catalyst survey pointed to clerical burden as the leading cause of the burnout. “The electronic health record is a source of burnout among U.S. physicians. Data have shown that the more EHR functions that are turned on, the higher the rates of burnout and the intent of physicians to leave practice,” explains Christine Sinsky, vice president of professional satisfaction at the American Medical Association.
Physicians concur that there’s a problem—7 out of 10 U.S. physicians reported in 2016 that their EHRs reduced their productivity. Digital health technologies may alleviate this problem by reducing workload and improving efficiencies in other ways.

The key to engaging clinicians with remote monitoring devices is to ensure that they and their support staff understand how to best implement them—technically and operationally. The ability to analyze the data in a meaningful way was a concern for 41% of those surveyed, and 32% were concerned about which technologies they should be using. Thus, health system executives should consider educating clinicians on the benefits and capabilities of the technologies that would best fit their practice. Then, providers must work to establish the right procedures, processes and incentive structure to incorporate PGHD.
Adoption Hurdles

A West report noted that 66% of Americans feel that our current healthcare system does not help manage chronic conditions. Furthermore, 88% would switch providers without hesitation if they felt they were not receiving the best level of care possible. As today’s healthcare consumers are armed with more knowledge than ever before, having care plan options that work to conveniently engage and encourage patients to be an active participant in their health is essential. Digital health technologies play a large role in providing a way for healthcare consumers to connect more frequently via regular touchpoints with their physicians and set dynamic goals for their health.

Though these technologies offer numerous benefits, the primary concern that health systems and hospitals have when considering the use of PGHD is the patient’s willingness and ability to use the digital health devices and apps, a sentiment which almost 59% of survey respondents expressed.

Additional insights from survey respondents indicate that cost and reimbursement were top concerns to adopting these technologies. Of the respondents, 46% said not having a reimbursement model to support a digital health initiative was a barrier to using PGHD. McKinsey notes, however, that when technologies such as patient self-services, digital channels instead of direct physician interaction, and patient self-management solutions are incorporated into practice, the potential for net economic benefits is 7 to 11% of total healthcare spending.

Recent Medicare developments appear to be ushering in a new era for digital health technology reimbursement. In a significant advancement for remote care monitoring reimbursement, Centers for Medicare & Medicaid Services (CMS) authorized separate (i.e., unbundled) payment for Current Procedural Technology (CPT) code 99091 starting in 2018. This code describes “the collection and interpretation of physiologic data digitally stored and/or transmitted by the patient or caregiver to the physician or other qualified health professional, requiring a minimum of 30 minutes of time.” The American Medical Association’s (AMA) CPT Editorial Panel has signaled their support for remote care monitoring by agreeing to pursue expansion of the code sets.

An Accenture report, however, shows that 78% of healthcare consumers are already using, or are willing to use, a wearable device, app, or in-home monitoring device. Moreover, 90% of those are willing to share the data generated from those devices with a doctor. And, the report shows that 40% are already sharing that data with their doctor or nurse.
Medicare made other 2018 reimbursement rulings that incentivized the adoption of health technology platforms and devices that collect patient data. “CMS appears to be incentivizing the use of more ‘active devices’ that can inform the patient or their care team about critical changes to the patient’s health,” writes regulatory lawyers Jodi G. Daniel and Maya Uppaluru.

Standardization of data was cited by survey respondents as a barrier to implementation of digital health technologies. This can take many forms, including the accuracy of reported data, a specific concern for 39% of survey respondents. And that’s important—without accurate data, clinicians cannot confidently construct the best care treatment plan for their patients. Limiting the amount of self-tracking in favor of technologies that passively update or capture data can mitigate concern around accuracy, as well as provide the proper training for patients, clinicians, and support staff to interpret and use PGHD correctly.

Though privacy and security has been an oft-cited barrier for digital adoption, only 10% of respondents indicated this as a current obstacle to digital health integration. As the amount of patient data available has exploded in recent years, it is more important than ever that privacy and security of digital health technologies are addressed. However, with more HIPAA-compliant devices emerging every day, and a growing number of measures implemented to prevent breaches in security, clinicians are increasingly equipped with better tools to protect patient privacy and security.
CONCLUSION

As digital health technologies continue to grow in pervasiveness and effectiveness, many health systems and hospitals will increase their usage of PGHD as a means to improve care and outcomes. With more than three-quarters of healthcare consumers willing to use technology that will track their lifestyle and/or vital signs, the amount of data that can and will be generated is vast. Support, in the form of incentives, infrastructure and operations, is imperative for health systems focusing on improving patient health outcomes. Without it, various issues could arise, from the accuracy and medium in which the data is reported to how these data are interpreted and ultimately used to determine the best treatment protocol.

Mobile, remote monitoring technologies will continue to become more ubiquitous in healthcare. The benefits these devices offer both patients and providers are many, and though obstacles may present themselves, the healthcare systems that embrace the utility of digital health to meet patients where they are will stay competitive and relevant in the evolving value-based market.
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 over 400 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.
SOURCES

2. https://assets.aarp.org/rgcenter/health/beyond_50_hcr_conditions.pdf
“Reducing the burnout effects of EHRs,” NEJM Catalyst, from the NEJM Catalyst event Leadership: Translating Challenge to Success at Mayo Clinic, June 2, 2016.


http://www.cchpca.org/sites/default/files/resources/CY%202018%20PROPOSED%20PFS%20FINAL.pdf
