

Delivering Value-Based Care With E-Health Services

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EXECUTIVE SUMMARY

The emergence of value-based healthcare requires new approaches for physicians and their organizations in serving their patients. Traditional medical practices have centered on physicians detecting and responding to patients' needs, but with new payment models and technologies, practitioners will be required to prevent health issues from developing. Transitions of care and service coordination among providers and specialists need to be seamless as patients are educated about their health issues and better connected to their medical information. A key enabler of this change will be how well patients can collaborate with their care teams, and several e-health disciplines catalyze this process. In fact, there is an e-health imperative to affect outcomes and patient experiences while lowering costs.

The Triple Aim objectives of the Institute for Healthcare Improvement are more achievable with the integration of e-health tools and services with clinical care. The mobile revolution and improvements in data management practices now make improved care coordination possible throughout a patient's journey. Telehealth services facilitate connected care and inform physicians with data that flow into a patient portal, which improves risk monitoring and enables proactive treatment. The growing use of social media fosters community development, which enables patients to share experiences with others, further empowering consumerism in healthcare delivery. Finally, e-health tools enable customization of care for large populations as we stratify patient groups. Clinical data scientists and informaticists partner with physicians to establish and operationalize programs that identify new best practices and drive behavior change—especially for those patients with costly chronic conditions and comorbidities. E-health disciplines are the lifeblood of a system that engages patients in new ways to help them and their physicians adhere to practices that support value-based care.

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THE E-HEALTH OPPORTUNITY

The migration from fee-for-service to value-based healthcare in the United States is transforming the way patients receive and pay for care. These changes are driven in part by the long-term rise in total national health expenditures, which stand at \$3.2 trillion—18% of the U.S. gross domestic product (Centers for Disease Control and Prevention, 2015), and proportionately 50% more than any other industrialized country. Annual health premiums for family coverage between 2006 and 2016 rose 58% (Kaiser Family Foundation, 2016).

The Institute for Healthcare Improvement (IHI) has issued its Triple Aim objectives, which center on improving outcomes and the patient experience while simultaneously lowering the costs of care. The emerging discipline of population health management requires innovative approaches that ensure those with the financial risk can find new ways of managing their exposure to unwieldy costs while covering more people. Redundancies and inefficiencies must be streamlined, and new, better ways of engaging patients are required. Never has there been a more important time for healthcare leaders to consider new means for addressing the twin burdens of improving quality of care while lowering costs.

When Stephen Shaya, MD, medical director of J&B Medical in Wixom, Michigan, addressed colleagues at the Cavendish Global Health Impact Forum in Oxford, England (Shaya, 2014), he spoke about the impact of big data on clinical care and specifically about the use of telemedicine to improve the quality of care. He pointed out that, historically, physicians and healthcare

providers have operated by detecting and responding to patient needs, but key patient data often reside in isolated locations and response times may lag against the need for immediate care. A patient's health issue may grow or become more complex, making treatment more expensive while undermining the quality of care. Shaya argued that reducing long-term costs while improving outcomes requires a new approach centered on anticipation and prevention.

Success in the changing model of healthcare will require patient-centered solutions: streamlining clinical gaps, fostering greater patient engagement, and empowering patients with access to their data so they can make proactive decisions regarding their health, and so their physicians can offer better guidance in the spirit of a partnership based on the patient's health. Indeed, "Prepared, engaged patients are the fundamental precursor to high-quality care, lower costs and better health" (Institute of Medicine, 2013, p. 1). Thus, understanding ways to engage patients by enrolling them in their health issues is an important first step when introducing new e-health services.

PATIENT ENGAGEMENT

How well patients are engaged in their care and educated about health issues often affects the quality of outcomes and the commensurate costs of care. Yet, physicians and other providers have struggled to engage patients consistently:

- Only 1 in 5 patients is satisfied with their care provider's communications (mPulse Mobile, 2016).

- Seventy-six percent of patients are interested in using digital communications with their providers (Mottl, 2014).
- Fifty percent of patient appointment no-shows are the result of ineffective engagement (mPulse Mobile, 2016).

The costs of ineffective engagement are significant, but remediable. For instance, simple mobile text reminders sent to patients for pending appointments will reduce no-shows by 34% (Daniell, 2017), yielding a substantial increase in revenues for any practice group or hospital.

Many aspects of patient engagement that improve compliance and drive behavior change are akin to those in consumer marketing, where brands connect with their customers to foster retention and loyalty. The applications of tools that engage patients offer a paradigm seen in brand marketing that determines loyalty in consumer engagement.

In recent decades, many brands that have used engagement strategies to grow their businesses have become leaders in virtually every consumer sector. Social media and mobile channels have fostered new opportunities for brands to connect with their customers, and these new channels have spurred innovations in personalizing the customer experience. As value-based care grows in prominence, those who understand how to educate and engage patients in their health issues will lead the transition in the coming years. Innovative new ways now exist for health-care teams to deepen connections with patients using these tools, and incentives in the Affordable Care Act provide the financial framework for this to happen.

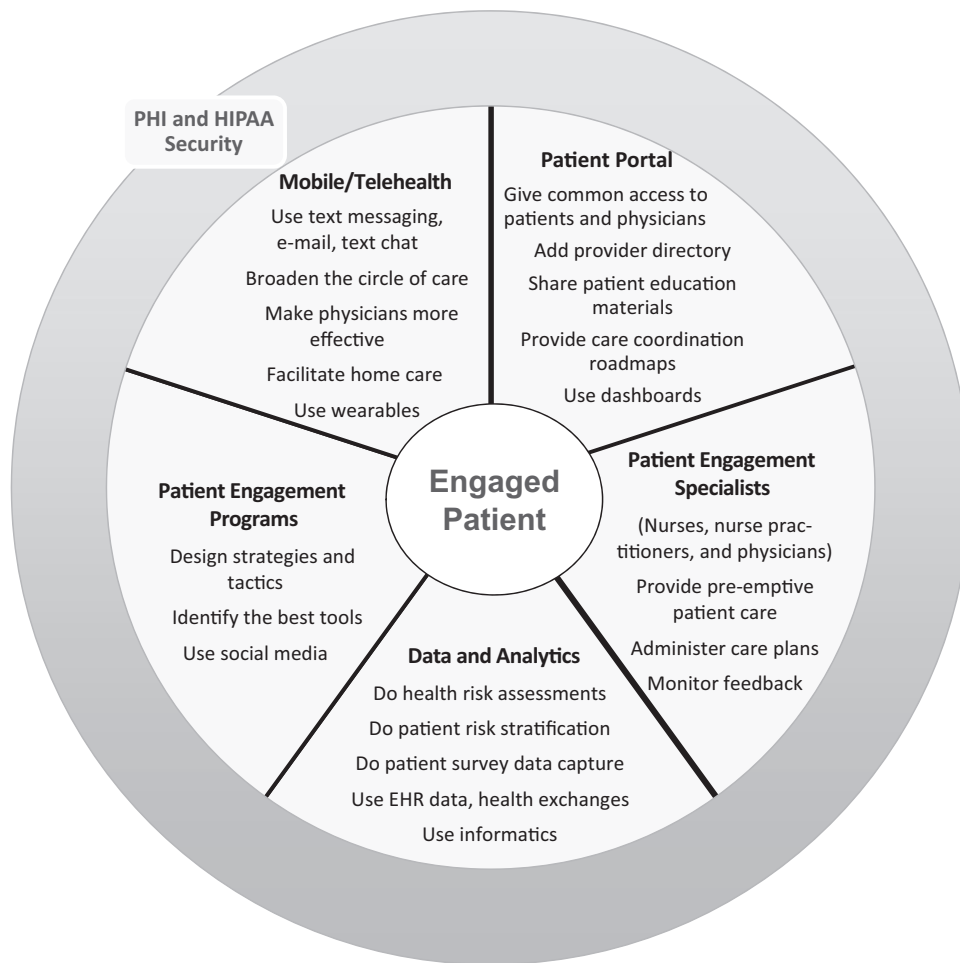
NEJM Catalyst held an event, Hardwiring Patient Engagement to Deliver Better Results, hosted by Kaiser Permanente Southern California on April 13, 2017. Stacey Chang of The University of Texas explored the topic with these comments: “Patient engagement is about understanding human motivation more deeply, and then channeling it so we can encourage and enable patients to act in beneficial ways.... An important aspect of designing care for better patient engagement: knowing the patient’s motivations is crucial for understanding how they align with a health system’s priorities. When you understand both, you can design a solution that benefits both” (Chang & Duffy, 2017). Chang identifies a good engagement strategy that is borrowed from business-to-consumer marketing practices:

1. Reinforce the motivations of the customer.
 2. Grant control over parts of the process to the customer.
 3. Embed engagement in the natural flow of the customer experience.
 4. Align the system’s financial incentives with the customer’s motivations.
 5. Make sure the strategy is self-learning: Data you generate help define the next iteration better.
- (Chang & Duffy, 2017)

E-HEALTH DISCIPLINES

A host of new services and technologies, collectively known as e-health disciplines, have emerged in response to the need for identifying ways to engage patients. Practitioners now can coordinate clinical care with mobile, online, and other telemedicine

FIGURE 1
The Tools and Disciplines of E-Health



tools that produce new data, which help them anticipate patient needs and deliver improved outcomes without interrupting existing clinical data and workflows that underpin care management. Figure 1 illustrates a few of the components that define and support e-health endeavors.

Physician care teams can use online and mobile tools to empower patients to protect and improve their health. Mobile services can encourage engagement by reaching patients where, when, and how

they wish to be contacted. Patients can use these tools to send and receive more timely communications with their doctors. As permission-based channels, mobile texting and other app-based services can foster richer patient–physician connections to generate data that inform care teams, so they can make smarter proactive decisions and deliver better outcomes.

Business Insider's Tech Insider (Duffy & Erbs, 2014) offered important guidance for healthcare providers that grouped mobile

trends under several headings: ubiquity, apps, personalization, data and analytics, electronic health records (EHRs), quality content, and better screen design—all focused on integrating these elements for patient care where disconnects otherwise can occur.

Mobile texting has successfully supported episodic care for several years: Logistics for appointment reminders, patient surveys, medication management programs, and procedure preparations (e.g., colonoscopies, surgeries) are examples where texting has improved patient compliance; as referenced earlier, Dialog Health, a mobile engagement firm, corroborates mPulse Mobile's findings that cancellations are reduced by more than 20% with mobile texting (mPulse Mobile, 2017). Another application includes asynchronous communications between a patient and physician's office, where the use of mobile has greatly improved efficiencies and made unanswered reminder phone calls to the home unnecessary.

Chronic care and behavior change are target areas where mobile texts and apps can support the physician by increasing the frequency of touch points with patients. The Text4Baby campaign, which provides reminders during an expectant mother's care, often reduces risks during pregnancy, potentially forestalling preterm deliveries that may result in NICU stays. Another area showing great promise is tobacco cessation, where programs (e.g., www.smokefree.gov) incorporate contextually tailored text messages over a four-month period. Mobile texting is particularly effective when it is part of an integrated program where coaches maintain ongoing connections with their patients. "Text

chats" provide real-time engagement that addresses the immediate needs of the patient. Research published in *The Lancet* has reported on the effectiveness of mobile texting in helping patients quit, and the results show that mobile campaigns have been highly effective in sustaining higher quit rates: "Smoking cessation support delivered via mobile phone text messaging doubles quit rates at six months.... On the basis of these results the txt2stop intervention should be considered as an addition to existing smoking cessation services" (Bennett & Emberson, 2011, p. 54).

Entry, logging, monitoring, and retrieval of patient data are streamlined with mobile channels and, for instance, when patients suffer from chronic pain, the resulting intelligence can expedite care. The interactions do not add a burden for the physician, who is already pressed for time. Instead, the tools enable a new level of proactive care that supports more timely, adaptive responses to changes in symptoms, and with less expense. Patients also have greater access to their data, facilitating necessary behavior adjustments. This opportunity for education can support healthful shifts in patients' behaviors.

Telemedicine offers at-home video consultations, compliant with the regulations of the Health Insurance Portability and Accountability Act, that capture and retrieve changes in a patient's clinical status, elevating the individual's quality of care by facilitating physician-patient interactions outside the confines of a medical facility. Vendors work with clinicians to define the medical necessities, apparatus, and services required to deliver these services cost effectively. For example, the Centers for Medicare & Medicaid Services

(CMS) launched a program called Chronic Care Management for older adults receiving Medicare, specifically patients with multiple comorbidities who need ongoing monitoring and who are at risk for emergency department visits. An early-stage firm, Vytalize Health, offers the services of a team of physicians and nurse practitioners who make house calls supplemented with remote visits, during which patients interface via a mobile tablet.

Vytalize is structured as an accountable care organization (ACO), and while CMS pays the firm on a fee-for-service basis, Vytalize also receives value-based payments from Medicare that depend on quality and cost metrics. At the end of each year, Medicare looks at the ACO's performance compared to key benchmarks and pays 50% of shared savings if there are any above a certain threshold. The objective is to drive patients' engagement via education and ongoing connection with their provider—where they often previously did not have one—and in doing so, save on hospital readmissions and other costs.

On July 17, 2017, Fierce Healthcare reported the following:

More than half of all respondents surveyed by the Health Industry Distributors Association (HIDA) said they learned about telehealth through their physician, making them twice as likely to use a service offered by a doctor rather than a telemedicine service. The survey results echoed prior research indicating patients value the convenience of telehealth visits, even when receiving bad news. HIDA survey respondents that used telehealth services within

the past year generally did so out of convenience and lower costs. Increasingly, independent physicians are using telemedicine apps and services to conduct virtual visits when they lack the infrastructure for an in-house program. Hospital executives have also said they plan to invest in telehealth technology despite the persistent reimbursement challenges, citing the need to maintain a competitive advantage and expand their market reach. (Sweeney, 2017)

Emerging wearables technology also offers new channels for capturing patient data, though the clinical utility of this information will remain confined to recreational use until patients can truly interoperate with online portals and their data can be formatted to work with existing EHRs and health information exchanges. Yet, as health consumerism grows, wearables remind patients of their own health needs, and some observers may see that as progress.

E-health services also support population health initiatives, which provide customized care for each patient but with technology that can be scaled to serve many individuals. A holistic approach that combines technology, digital expertise, and clinical experience now empowers physicians and their care teams to

- communicate more effectively with their patient populations,
- shape engagement strategies that drive targeted behavioral change where needed,
- reduce unnecessary healthcare expenses and inefficiencies in care management practices, and

- improve the results of chronic condition and disease management programs.

As more clinical and administrative data funnel into patient profiles, online portals are housing many tools used by physicians, other healthcare providers, coaches, and patients that inform better decision-making and help caregivers anticipate their patients' needs quickly, enabling proactive care. Patient profiles will soon also contain social factor information, which can greatly expand a care team's qualitative understanding of their patients' histories.

Once patients are engaged in targeted health initiatives, they can create their own wellness plans that let them record their progress toward their established goals. Dashboards enable coaches to enter key updates from their sessions with patients. Online physician directories are available for many care specialties, and patients can contact those who meet their geographic or specialty requirements. Social media tools also enable patients to rate their physicians, and quality scores are available for those selecting specialists or general practitioners. Finally, online curricula educate patients and help them track their progress toward specific milestones.

LEVERAGING E-HEALTH DISCIPLINES TO WIN

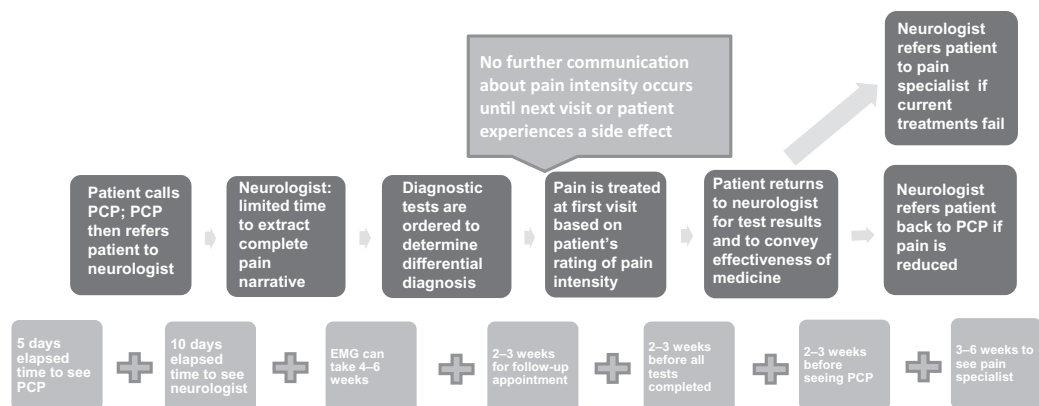
On a high level, physicians use discovery processes to help them evaluate existing methods for treating patients. These entail fact-finding questions to identify clinical weaknesses and gaps in communication that may undermine treatment; after that, linear and logistic regression can map

covariables to certain outcomes and help clinicians uncover better ways to deliver care for their patients (Compton-Phillips, 2017). Of course, physicians cannot be available for each of their patients all the time, but an e-health system using mobile, online, and data management technologies will support clinical care and enable physicians to serve more patients, hopefully at a lower cost and with greater patient engagement that makes progress more sustainable.

For example, consider the plight of patients suffering from chronic pain—nearly 100 million Americans do (American Academy of Pain Medicine, n.d.), and they account for 10 to 15% of all hospital emergency department (ED) admissions (Poulin et al., 2016). On a micro level, these patients suffer over long stretches of time. They take many tests (often unneeded), and they feel unheard and misunderstood. Their physicians do not have enough time to ask all the questions about the nature of their pain. These patients use more medications, including opiates, than they should, and they repeatedly visit the ED when they feel they have nowhere else to go. The cost for this healthcare delivery is approximately \$600 billion per year. Yet, the price tag for this process does not improve patient care or satisfaction. Figure 2 illustrates the current patient journey, which leads to nearly 24 weeks of broken communications, longer-than-necessary patient suffering, and expensive and often redundant tests and medications.

Incorporating e-health tools and services with existing clinical care would enhance data capture and stratification to streamline these patients into manageable

FIGURE 2
Current Roadmap of Physician–Patient Diagnosis and Treatment



Note. EMG = electromyography; PCP = primary care physician.

subgroups with common characteristics, which then can be isolated for closer examination to help clinicians establish more causes and effects. Detailed mapping of existing chronic patient care exposes key gaps in communication and clinical care between appointments regarding medication adherence and other available nonpharmacological treatments, especially for those patients with mental health challenges that may drive or exacerbate their reported pain. Further examination points to ineffective patient communication with their physicians, which ultimately provokes a cascade of unwanted outcomes. In evaluating current treatments for patients with chronic pain, one can see how the application of digital tools can help providers anticipate changes in a patient's condition or prevent the onset of exacerbated pain levels.

For example, a team of pain specialists and researchers at the Mount Sinai Health System in New York City has developed a patient communication solution that can dramatically improve the management

and treatment of patients with chronic pain. The solution empowers patients by giving them mobile and online tools that help them monitor and communicate the dimensions of their pain in real time so their physicians can remain connected with them in the days and weeks following appointments. The solution transforms aggregate patient data into relevant medical information, so care teams have a more precise understanding of their patients' pain. With this understanding, they can provide more effective care to improve outcomes, increase patient satisfaction, and significantly lower the cost of care.

Mobile tracking virtually eliminates all communication gaps, as patients enter their own ongoing monitoring data. Eliminating these gaps provides several significant benefits in treating chronic pain. First, in managing patients' medication dosage levels, side effects, and adherence, physicians can more readily see the impact of their clinical recommendations and adjust prescriptions in a timely manner (rather than waiting for patient feedback after

four to six weeks). Second, pain specialists can access the data in advance of their meetings with patients, so they are more informed about a patient's circumstances and do not waste valuable time asking questions that yield little meaningful information. Third, since the physician's care team and the patient all access common data in the patient's health record, redundancies can be eliminated and a more efficient delivery of care is possible. Finally, the patient experience in feeling heard and understood is greatly improved. As the physician connects with the patient's pain more experientially, treatment paths may be more effective in remediating discomfort.

Again, the important piece of this solution is an engaged patient; without that engagement, care teams have neither monitoring data nor a sense of how well prescriptions are working. The methodology developed by the Mount Sinai team helps patients articulate and track their pain; these communications can be inserted into existing care coordination activities and connected with health records that the patient, coaches, and other care team members can access. The methodology is designed to cradle, or supplement, clinical care by providing a more precise and real-time expression of a patient's experience with pain. The Mount Sinai team has identified the following payoffs of using its service:

- Improved patient engagement and satisfaction, as measured by scores on the Healthcare Effectiveness Data and Information Set and Consumer Assessment of Healthcare Providers and Systems surveys
- Better outcomes and reduced ED admission rates, which lower the cost of care
- Improved medication management practices and opioid use, lowering medication costs

Finally, by isolating pain from other secondary health issues, physicians can treat the underlying conditions more effectively, which should further improve outcomes and patient satisfaction while reducing unnecessary costs.

The Mount Sinai team is embarking on a series of pilots in 2018 to explore how patients will use the software and to determine specific areas where treatments can improve the patient experience along with producing better outcomes.

CONCLUSION

Healthcare delivery systems are under more pressure than ever. With sharpened focus on cost controls and value-based care, leading providers will find new ways to adapt proactive approaches that anticipate and prevent health issues from arising or worsening. Patient engagement is central to this migration, as physicians cannot do this alone—they need timely data capture and management from the patients to be proactive in their care coordination activities. Enormous strides will reduce inefficiencies and lower costs, while empowered patients will receive better care with improved outcomes. The promise of e-health services in support of clinical care offers a compelling vision that puts “coordination” back into care programs. The results will speak for themselves, as health systems, employers, health plans, and other organizations who manage large

populations experience lower costs with healthier outcomes.

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