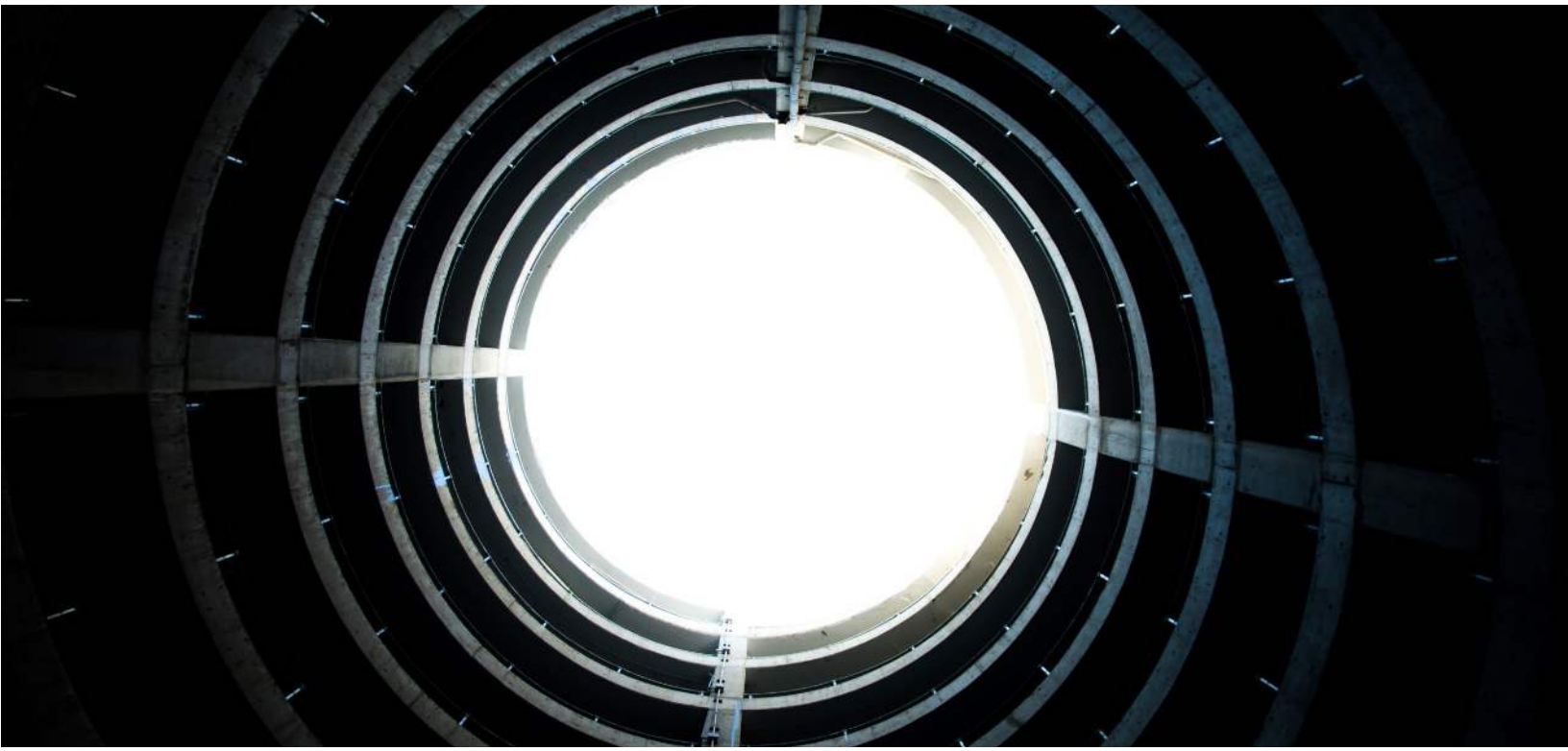
BEYOND THE PORTAL



TECHNOLOGY FOR IMPROVED CONSUMER ENGAGEMENT

A Chilmark Research Insight Report

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745 ATLANTIC AVENUE, 8TH FLOOR
BOSTON, MA 02111
617.615.9344
WWW.CHILMARKRESEARCH.COM
INFO@CHILMARKRESEARCH.COM

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EXECUTIVE SUMMARY

Market pressures as well as government regulations force consumers to take more responsibility for managing their health and paying for their healthcare.[1] But the movement to give consumers more "skin in the game" has accelerated faster than the movement to keep consumers from getting burned. Effective, easy-to-use tools for helping consumers choose the right high-deductible health plan, find the right in-network physician, and make the healthiest choices are few and far between.

No tool reflects this disparity more than the patient portal. Built by electronic health record (EHR) vendors to serve as patient engagement tools, patient portals – with very few exceptions – have been maligned as ineffective, inadequate, and outdated. As the industries and companies with which consumers interact on a regular basis have modernized, putting customer service first and embracing mobile solutions (among other innovations), portals have stood in place. Even the most advanced portals pale in comparison to the multimodal experiences offered by familiar firms such as Amazon, Apple, Facebook, Google, and Netflix.

Based on briefings with more than 20 solution providers across a number of domains[2] as well as extensive secondary research, this Insight Report from Chilmark Research will:

- Investigate why the patient portal needs to be replaced.
- Address the challenges in replacing the portal.
- Describe the architecture of the "new" portal.
- Discuss which stakeholders in the healthcare industry will drive its development.
- Provide a five-year market outlook and model for healthcare organizations (HCOs) investing in this new technology.

Above all, this report will explain the main reasons why a replacement for today's patient portal, no matter how inadequate, won't come quickly or easily.

WHY IS PORTAL ADOPTION SO LOW?

The Chilmark Research Clinical Patient Engagement 2014-2015 Market Trend Report provided the following definition for a patient portal:

> *A **patient portal** serves as a central conduit between the delivery system and a patient. The portal is a personal, secured website where patients can log in to access a menu of features – view lab results, test results, or clinical visit summaries; access an educational content library; interact with a doctor via a secure clinical messaging system; refill prescriptions; schedule appointments, and pay bills.*

The overwhelming majority of patient portals deployed today are tethered, meaning they draw predominately from one healthcare information system, typically an EHR. A smaller portion of the market – no more than 15 percent – has adopted untethered portals, which are vendor-agnostic and can be installed on top of various systems. But even an untethered portal is still limited to clinical data and is therefore less robust than a personal health record (PHR), which by definition includes clinical as well as non-clinical information ranging from diet plans to biometric device data to medication lists.[3]

[1] While the technology being examined in this report is referred to as the patient portal, Chilmark Research will refer to one who uses the portal as a consumer, reflecting the fact that interactions with the portal occur outside the care setting.

[2] Act.MD, Active Health (Aetna/Healthagen), Alegeus, American Well, athenahealth, Canary Health, Caradigm, Cerner, Emmi Solutions, Get Real Health, Health Advocate, Health Dialog, HealthLoop, Mad*Pow, Medullan, Omada Health, Orion Health, RelayHealth (McKesson), Twine Health, Validic, Wellframe, and Wellist.

By and large, portal interactions can be boiled down to single events – scheduling an appointment, requesting a prescription refill, viewing lab results, paying a bill, or sending an email to office staff. This functionality works well for healthy consumers but proves limiting for those who require more frequent interactions with HCOs. (For those who see 10 different physicians and therefore have 10 different log-ins for 10 different portals, it's downright frustrating.) What's more, these interactions are optimized for the desktop browser; portals don't work well on the tablets or smartphones that consumers increasingly – and in some cases solely – use to access the Internet.

Beyond poor portal usability, HCOs have little incentive to promote their adoption. Modifications to Stage 2 of meaningful use in October 2015 reduced the minimum number of required portal users from 5 percent of a total patient population to a single user. Once that requirement has been met, HCOs attesting for meaningful use can move to the next checklist item.[4] In addition, the still-prevalent fee-for-service (FFS) model discourages interactions with consumers that cannot be captured as billable events; portal features that replace office visits actually cost an HCO money.

It's no surprise, then, that estimates of patient portal adoption, more than one decade from their introduction to the market, only range from 25 to 36 percent.[5] We believe the true figure is actually lower, considering that only 21 percent of consumers say they have access to online appointment scheduling and 15 percent communicate with their physicians via email.[6]

WHY REPLACE THE PATIENT PORTAL?

Research has suggested that minor tweaks to portals could boost adoption, including more frequent and more personalized messages[7] or access to more information – but such minor tweaks would fail to address the fundamental shortcomings of patient portal technology.

As healthcare shifts from the prevailing fee-for-service (FFS) billing model to one of value-based reimbursement (VBR) so, too, must the nature of engagement shift from the single events on which patient portals focus to a longer, broader care management life cycle.[8] (See Figure 1.)

[3] Source: Office of the National Coordinator for Health Information Technology (ONC).

[4] Source: Health IT Analytics. While this rollback certainly benefitted some providers, especially those in small practices and/or those serving communities with low broadband Internet penetration, it also suggested to patient advocates that the Center for Medicare & Medicaid Services (CMS) had made patient engagement a low priority for the future of meaningful use.

[5] Source: American Academy of Family Physicians (AAFP) and Xerox, respectively.

[6] Source: Council of Accountable Physician Practices.

[7] Source: Journal of Medical Internet Research (JMIR).

[8] Chilmark Research defines engagement thusly: "Consumer-facing technology that promotes better self-care, education, and personal health management both inside and outside a care delivery facility. This technology also encompasses clinician-facing features to enable, administer, and otherwise manage interactions and outreach with a patient. These tools, which span enterprise, mobile, Web, wearable, and personal monitoring devices, help HCOs address federal mandates as well as the broader goals of population-level health system reform and coordinated care management."

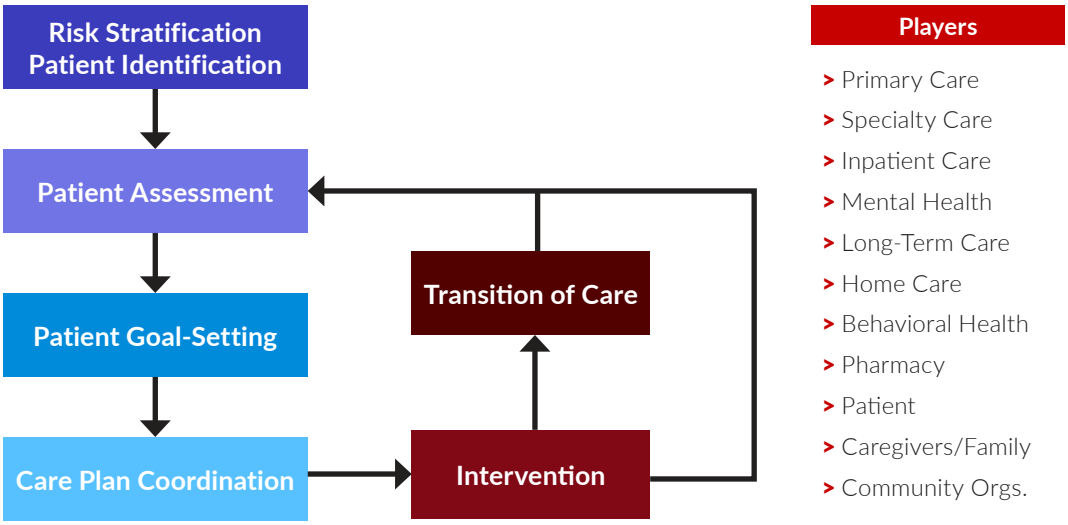


Figure 1: The Care Management Life Cycle

This is especially true of consumers with one or more chronic conditions (or at risk of developing such conditions), as well as those who get in an accident or suffer a high-acuity event, as they require more frequent interactions with HCOs and also incur additional costs (See Figure 2).

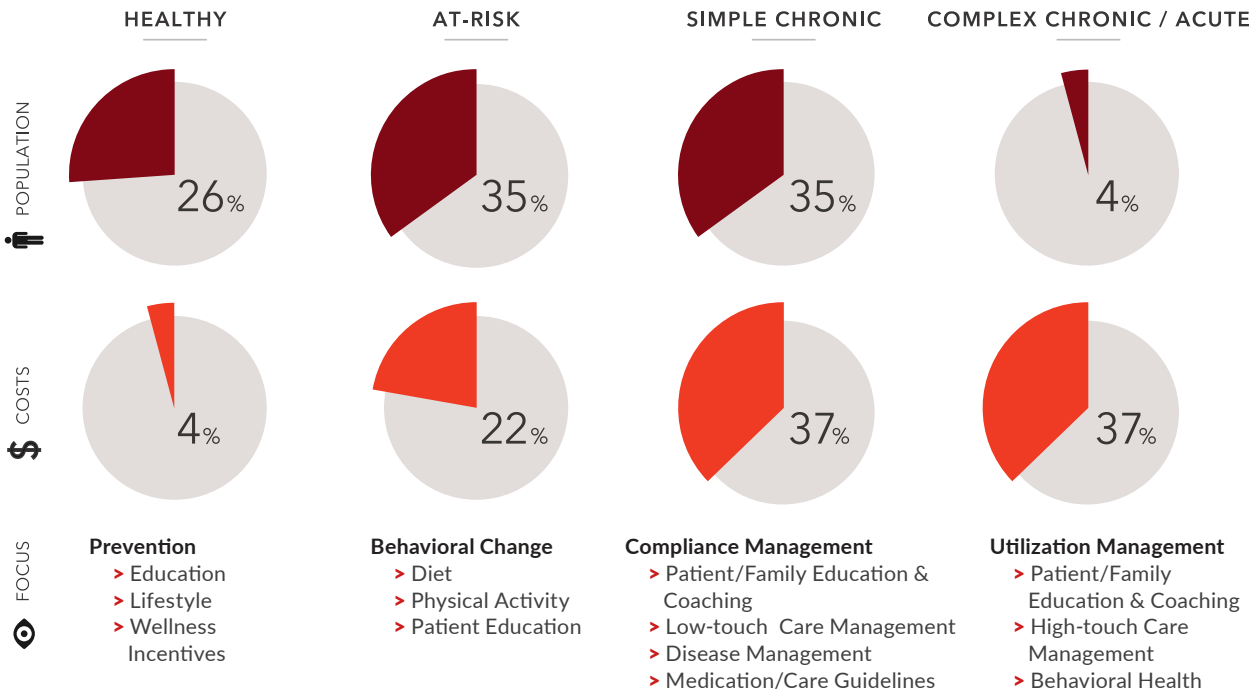


Figure 2: Stratifying Population for Cost and Care Models

The patient portal will prove insufficient for the emerging VBR model in six interrelated ways.

It's not a tool for coordinated care

Portals focus on single, billable encounters – but coordinated care is an ongoing process that lasts years, decades, or even a lifetime and aligns with the Quadruple Aim of better care, lower costs, and an improved experience for patients as well as physicians.[9] Portals don't make it easy for consumers to manage their own care or pursue care that lowers overall utilization. Information is often generalized, not personalized, and presented without explanation, context, or interpretation suitable for a non-medical professional. With no attention paid to health literacy, consumers new to their condition, care plan, or disease have little choice but to turn to more accessible (but less reputable) sources of healthcare information.

It's not a tool for population health management (PHM)

Portals focus on the experiences people have as patients (appointments and prescriptions), when in fact they spend the vast majority of their lives as consumers. With so much emphasis on care delivery, little attention is paid to personal wellness or the social, environmental, and genetic factors that collectively affect health far more than clinical care. Educational resources are limited to discharge summaries, lab results, and other information generated at the point of care; they are not personalized to a consumer's individual health and wellness needs.[10]

It's a system of record, not a system of engagement

As extensions of EHR or practice management systems, portals are built solely to present data captured at the point of care. There's no claims data, no patient-generated health data (PGHD), no employer health risk assessment (HRA) data, and no pharmacy data. What's more, aside from the view, download, and transmit feature required by meaningful use, there's little to no data liquidity. Consumers can see information, but they cannot interact with it.

As this Insight Report will discuss, a robust set of data is the cornerstone of improved engagement. It gives clinical staff a holistic, well-rounded view of a patient's current and future health and wellness needs. At a basic level, an office assistant answering an email about a prescription refill can remind a patient about scheduling an upcoming appointment or syncing a Fitbit. Far beyond that, comprehensive care plans for chronic disease management can be developed and disseminated using up-to-date information from all relevant physicians, the insurance company, and the patients themselves.

No portal on the market comes anywhere close to providing this functionality. And engagement – today largely defined by appointment scheduling, secure messaging, online bill payment, and the like – is only the first step on the path through the healthcare system. (See Figure 3. [11])

Portals are wholly unequipped for the education, activation, and empowerment steps that put consumers front and center in the care process and also make them more accountable and responsible for their own health and well-being. These steps require patient relationship management (PRM), a concept at the heart of the conversation about improved consumer engagement. Just as customer relationship management (CRM) software helps sales staff document and track the conversations they have with current and potential clients – whether in person, on

[9] We refer to the Quadruple Aim here to highlight the role that physicians and other clinical staff must play in improved consumer engagement. This concept is unfortunately missing from the Triple Aim.

[10] This explains in part why cancer centers typically see higher portal adoption than other types of HCOs. For these highly engaged patients, there is much data generated at the point of care, and that data is critical to understanding present and future treatment options. Source: Health Data Management.

[11] Sources: CIO.com, the author's presentation at HIMSS15, Insignia Health's Patient Activation Measure (PAM) Survey Levels, and the IMS Institute for Healthcare Informatics' report, "Improving Type 2 Diabetes Therapy Adherence and Persistence in the United States."

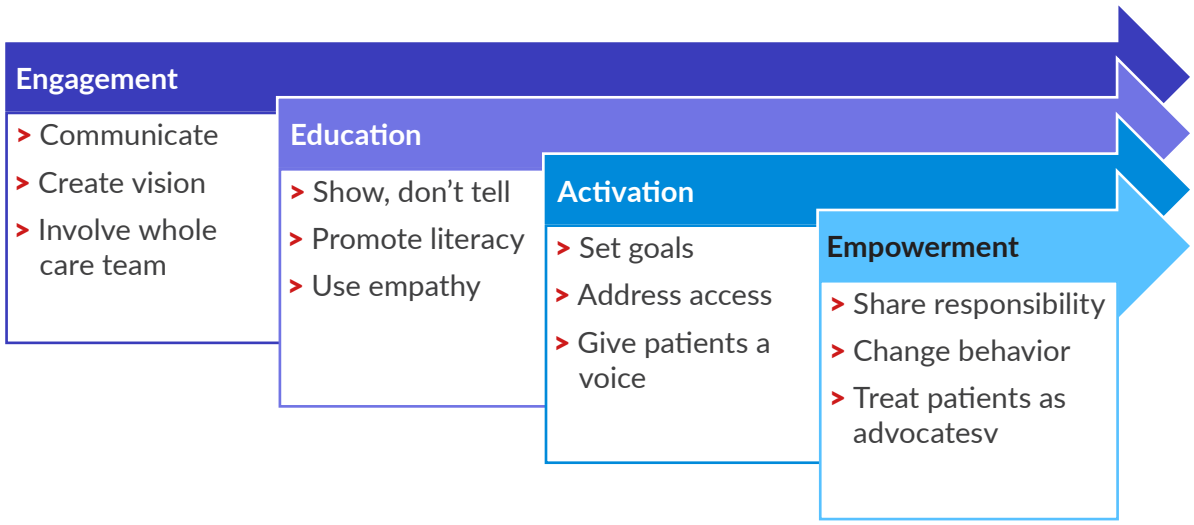


Figure 3: The Path From Engagement to Empowerment

the phone, or via email – so, too, can PRM help care teams document and track the encounters they have with patients, regardless of the mode of engagement.

It doesn't encourage behavior change

Coordinated care and PHM succeed only when consumers first understand that decisions they make in their everyday lives can impact overall health and wellness, to the point that they can reduce the risk of developing or worsening a chronic condition, and then undergo the behavior change necessary to make those decisions.

Behavior change is a long, slow process that can be derailed by a number of physical, mental, socioeconomic, and environmental factors. Consumers trying to make lifestyle changes as part of a larger care plan need all the help they can get, whether in the form of regular contact from an expanded care team (physicians, nurses, coaches, dieticians, social workers, and even representatives of community organizations) or tools that provide tips, motivation, milestones, and communities of peers to make behavior change less daunting. Beyond medication adherence and basic education, portals remain ill-suited for these interactions.

It's tied to the health system, not the individual

Because portals are inextricably linked to clinical data, they are tied to the HCOs where consumers receive care. When a consumer visits a new facility, or even a new department within an existing facility, there is often a new source of clinical data, a new EHR, and a new portal with a new log-in to remember, a new interface to learn, and new jargon to try to understand. A consumer with multiple chronic conditions, or

Healthcare as an Experience Economy

First defined in 1998, experience economy describes the evolution of the U.S. economy from commodities to goods to services to, finally, experiences. This aligns with the broad idea that U.S. healthcare is evolving from individual episodes of care (sold as commodities, goods, and services) to a continuum of coordinated care (sold as an experience). The danger is in focusing too much on the esoteric experience – widescreen TVs, valet parking, art on the walls – and not enough on the care experience – empathetic medical professionals who build personal connections and, ultimately, trust.[13] As the Cleveland Clinic's ongoing initiative to improve patient satisfaction demonstrates, consumers' top concerns during a hospital stay are being treated with respect, knowing that medical staff are communicating, and seeing staff who are happy and approachable.[14] These are issues that any HCO can address without a costly and lengthy technology implementation or capital project.

those who frequently change doctors due to employment and/or health plan churn, must therefore use several portals in an effort to cobble together a longitudinal patient record (LPR).[12] Not surprisingly, consumers often find spreadsheets or thick binders more effective than a set of portals.

It's not a tool for consumer-driven health

The portal – a static website built around one-way communication – falls flat when compared to the online consumer experience of industries such as banking, ecommerce, social media, and travel. It gives users the same viewpoint regardless of demographic profile, socioeconomic strata, or disease profile. It doesn't offer the convenience, access, and personalized experience they have come to expect; simply put, the portal is not equipped to address healthcare as an experience economy (see Sidebar). Because portals lack tools for proactive self-management of care, HCOs in turn miss opportunities to work with consumers to lower utilization rates for high-cost, high-acuity services and, in turn, optimize their own cost structures as the VBR model demands.

[12] The same is also true of HCOs aiming to build an enterprise data warehouses that uses the content of the LPR for risk stratification, analytics, and care coordination at an individual and population-wide level.

[13] Sources: The Harvard Business Review and The Health Care Blog.

[14] Source: Health Catalyst.

CHALLENGES IN REPLACING THE PATIENT PORTAL

Just because the patient portal is inadequate for the VBR environment of tomorrow doesn't mean that HCOs will be able to rip and replace the technology that they have today. Several interconnected obstacles stand in the way.

TOO MANY ENTRY POINTS TO HEALTHCARE

Consumers interact with the healthcare system writ large via emergency departments, hospitals, physician practices, employers, pharmacies, retail health clinics, telehealth providers, insurers, community organizations, and a whole host of largely unregulated mobile applications. Not surprisingly, there is significant overlap between the services that each of these entities provides; even the most well-versed consumers don't always know where to turn when they have a question or concern.

Each of these entry points is its own silo with its own protocols for collecting, storing, and sharing patient data. While some standards do exist, they cover the bare minimum of data transfers (think Continuity of Care Documents) and involve a small fraction of the data that pertains to an individual consumer's health and wellness.

That said, first catalyzing and then executing the structural change necessary to break down those silos in order to provide more coordinated care can easily have the adverse effect of slowing the pace of providing more coordinated care.[15] It's also unclear which entity is responsible for the aggregation and curation of data, as well as who will benefit most (and least) from more readily available information.

LIMITED IT RESOURCES

Healthcare spend less on information technology than other industries. Lately, those limited IT resources have been largely if not entirely devoted to two things: Meeting government mandates (meaningful use, the ICD-10 conversion, various quality reports and, soon, the Medicare Access and CHIP Reauthorization Act, or MACRA) and shoring up subpar application, data, device, and network security.

With so much money being spent on reactive initiatives such as EHR implementation, medical coding, and cybersecurity, little is left for proactive initiatives such as innovative engagement technology. As a result, efforts to improve engagement have focused on inpatient hospitality – valet parking, waiting rooms with widescreen TVs, less-revealing gowns, better cafeteria food, art on the walls, and so on – rather that the consumer experience outside an HCO's four walls.

DATA ACQUISITION

HCOs have plenty of clinical data, but that's just the first step. They also need data from a variety of other sources in order to create an effective LPR and to accomplish numerous other clinical, financial, administrative, and operations tasks. Acquiring data is a challenge in and of itself, especially for hitherto insular HCOs, but it's just the start. In order to gain insight from data (see Figure 4), they must aggregate, organize, rationalize, and normalize it in order to target the most appropriate interventions for one patient or a group of patients and then communicate that information to the right member of the care team.

In doing so, organizations must transition from big data – which is all too often unstructured, duplicative, or otherwise irrelevant – to smart data – which may be less plentiful but is more narrowly tailored to the questions an

[15] Source: Prophet in conjunction with the GE Healthcare Camden Group. That's because the process involves partnering or merging with established organizations with competing objectives, best practices, cultures, and business models.

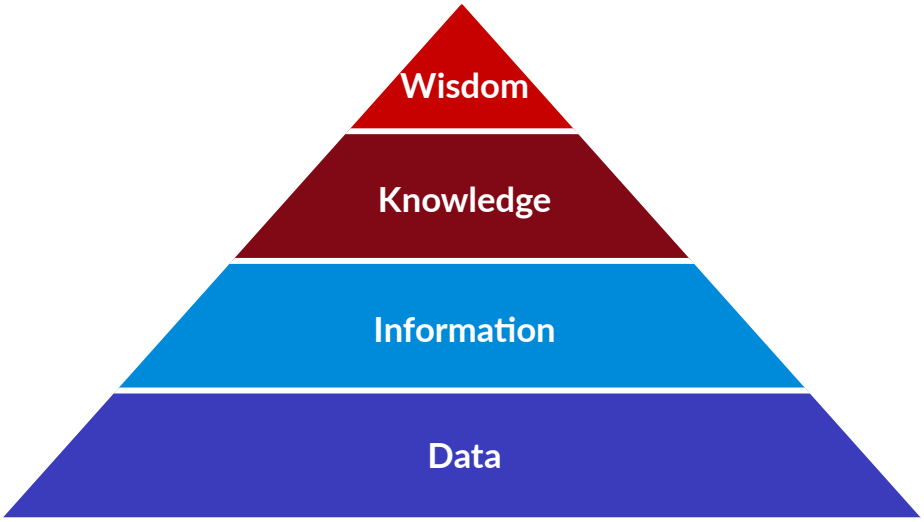


Figure 4: The Data Value Chain

HCO wants to answer.[16] Amid this transition, organizations have begun to show a reticence to gather data that they may not need. This is certainly prudent – how many HCOs have data warehouses overflowing with unstructured data they lack the technology and resources to process? – but it means that HCOs may be missing information that could augment a patient's LPR.

SERVING THE WRONG CONSTITUENCY

Using technology to improve engagement comes with inherent bias. Though there are exceptions, those more likely to own personal tech (young, affluent, and urban) are not necessarily those more likely to need healthcare services (older, less affluent, and rural). That's why so few mobile health apps target chronic condition management, while so many focus on fitness and nutrition, and why so many fitness trackers end up on the wrists of weekend warriors or other active individuals.

Any engagement solution aiming to go beyond the patient portal must be affordable to all consumers, accessible to all consumers, and personalized to the individual needs of consumers and their caregivers. It must accommodate differences in education, health literacy, culture, and accessibility, and it must be sensitive to social determinants of health (SDoH) and wellness that may limit a consumer's ability to, say, purchase fresh produce, join a gym, or go for a walk on a lunch break. It should not assume that a consumer is knowledgeable about a chronic condition just because he or she has had the condition for a long time. To date, few HCOs have been up to this challenge.[17]

RESISTANCE TO CHANGE

Using technology to improve engagement is a chicken-and-egg problem. Without an engagement strategy, technology is unlikely to change behavior, particularly for high-risk patients. Without technology, strategy remains mired in the past and fails to provide patients with modern tools to help them change their behavior.

[16] Former ONC Coordinator David Blumenthal has called for a "new cohort of health-data stewards" to help consumers obtain the data that, under HIPAA, is rightfully theirs. This is a good idea in theory, but it will add yet another middle man to an already-complex process. Source: The Wall Street Journal.

[17] In a small study conducted by researchers at the University of California San Francisco, low-income participants using apps to manage diabetes or depression struggled with tasks such as data entry, data retrieval, and basic app navigation. "In almost all cases, the participants were unable to get to a point where they were productively using any of the applications, researchers said. Source: UCSF.

For the time being, healthcare executives and physicians alike see improving engagement as a matter of strategy (more time with medical professionals, shared decision-making, and more access to services) and not technology (more information accessibility for patients, more PGHD, more wearable or RPM devices).[18] When conversations about strategy and technology occur in silos, leaders fail to realize that properly implemented engagement solutions can increase consumers' time with clinical staff, provide shared decision support, and expand access to needed medical services.

At a broader level, healthcare's resistance to change stems from the prevailing patriarchal approach to care. Many clinicians oppose the use of engagement solutions in particular, and technology in general, lest they diminish the role of the highly trained expert as they empower patients to make their own care decisions. At the same time, many consumers prefer this patriarchal approach to one that requires taking greater responsibility for their own care (whether engagement solutions are involved or not). HCOs must be prepared to address this cultural issue long before any engagement initiative begins.

Challenges in Replacing the Portal
✓ Too Many Entry Points to Healthcare
✓ Limited IT Resources
✓ Data Acquisition
✓ Serving the Wrong Constituency
✓ Resistance to Change
✓ Healthcare's "Perpetual Pilot" Phase
✓ Long Learning Curve for New Tech
✓ Privacy and Security Concerns
✓ Alphabet Soup of Mandates

Table 1: Summary of Challenges HCOs Face Related to Portal

HEALTHCARE'S "PERPETUAL PILOT" PHASE

When it comes time to deploy engagement solutions, HCOs tend to start with pilot projects. Whether the solution comes from a startup technology partner or an internal Innovation Center, it typically focuses on a small segment of the patient population – one carefully curated using risk scores, self-reported data from patients and physicians, and a narrow set of participant criteria. Or, HCOs start with their self-funded employee population – an easy group to enroll and monitor, to be sure, but not a true representation of the population at large. Such pilots are indeed valuable, and must remain narrow for the purposes of scientific and medical evaluation, but they are often followed with additional pilots.

As well-intentioned as these projects may be, they severely limit the number of consumers who may benefit from an intervention. Testing an iPhone app, for example, excludes the majority of the population with an Android phone – not to mention those who do not own a smartphone at all. Given the sheer enormity of scale that faces our efforts to improve population health – an estimated half of American adults are prediabetic [19] – any progress in engagement, no matter how modest, should expand beyond the pilot phase.

LONG LEARNING CURVE

The learning curve for engagement solutions is not necessarily steep. For example, emerging health management and engagement platforms such as Bright.MD, CareSync, HealthLoop, and Orion Health are designed to look like Facebook Messenger, a ubiquitous application with more than 1 billion global users.

[18] Source: New England Journal of Medicine (NEJM) Catalyst Insights Council. The council surveyed 340 clinicians, clinician leaders, and executives on how they would define and improve patient engagement.

[19] Source: Journal of the American Medical Association (JAMA).

[20] Source: Council of Accountable Physician Practices (CAPP). The group, in conjunction with Nielsen Strategic Health Perspectives, surveyed more than 30,000 consumers about their use of healthcare technology and services. The survey also concluded that care coordination, though improving, is no better for those with multiple chronic conditions – that is, those who need it – than those who are otherwise healthy.

However, the learning curve is long. HCOs have numerous IT priorities, and each initiative for risk stratification, practice management, care management, PHM, quality improvement, and so on brings with it a new user interface for clinical staff to learn. A new engagement solution, in whatever form it assumes, adds another barrier to the goal of providing quality care in a busy clinical setting – as is evidenced by the fact that as many as half of consumers today don't use features such as appointment scheduling and secure messaging that are available through the portal their primary care physician already has.[20]

PRIVACY AND SECURITY CONCERNS

Healthcare's reputation for protecting personal health information (PHI) and personally identifiable information (PII) is poor at best. Nearly 90 percent of HCOs have experienced a data breach in the last two years, and two-thirds of HCOs say they are more susceptible to a breach than firms in other industries. What's more, HCOs are struggling to address "new" security concerns such as ransomware at the same time that they confront "old" issues such as inadequate employee training, vulnerable medical devices, and tenuous relationships between HIPAA covered entities and business associates.[21]

Trust is a key factor in improving engagement and encouraging behavior change. Consumers cannot be faulted for their reluctance to use digital solutions to engage with HCOs when they cannot trust those organizations to protect their medical information.

ALPHABET SOUP OF MANDATES

Starting Jan. 1, 2017, HCOs have to worry about MACRA and the two-faceted Quality Payment Program (QPP) it puts into place in the name of VBR:

- The Merit-Based Incentive Payment System (MIPS), which is for smaller eligible providers (EPs) and replaces meaningful use (MU), the Physician Quality Reporting System (PQRS), and the Value-Based Payment Modifier (VM).
- The Alternative Payment Model (APM), which will be a good fit for the accountable care organization (ACO) and bundled payment models, as well as patient-centered medical homes (PCMHs) designed in the Comprehensive Primary Care Plus (CPC+) model.

The caveat, of course, is that CPC+ as well as the new chronic care management (CCM) CPT code focus on the amount of time a physician spends with a patient, not whether the physician impacts that patient's outcomes.

[21] Sources: Ponemon Institute and Brookings Institute via MeriTalk.

BEYOND THE PATIENT PORTAL: A BROADER ENGAGEMENT MODEL

Chilmark Research's next-generation engagement model spans all modalities of care for all types of patients, regardless of age, socioeconomic status, level of health, type of insurance, or familiarity with technology. Table 2 breaks down the goals of engagement for different types of consumers across the care continuum, while Table 3 outlines how the care needs of those types of consumers change as they move across the continuum.

It is clear from this model that the patient portal of today, built to capture and display information from single care episodes, is insufficient for the level of engagement required by the coordinated care model of tomorrow. This section of our Insight Report looks at what the next generation of engagement technology will look like, who will have a stake in building that architecture, and how the market for this technology will unfold over the next few years.

	Healthy	At-Risk	Simple Chronic	Episodic / Procedural	Complex Chronic / Acute
HCO Goal	Prevention	Behavior change	Compliance management	Condition management	Utilization management
Consumer Goal	Fitness	Wellness	Staying the course	Returning to normal	Retaining quality of life
Engagement Mode	High-tech	High-tech and high-touch	High-tech and high-touch	High-touch, primarily	High-touch
Care Team Goals	Lifestyle management	Education, coaching, care guidelines	Disease management, medication adherence	Recovery	Care management, EOL planning (as needed)
Intervention Timetable	As needed	Periodic	Frequent to start, then periodic	Ongoing, for duration of episode	Ongoing, for years

Table 2: Engagement Goals for Differing Care Types

	Healthy	At-Risk	Simple Chronic	Episodic / Procedural	Complex Chronic / Acute
Engagement Tools	Mobile apps, wearables, OpenNotes, portal tools[22]	+ Targeted messages, feedback / notifications	+ Care plans	+ Targeted education	+ Medical devices / sensors
Care Team	PCP	+ Dietician, health coach	+ Mental / behavioral health	+ Physical therapists, specialists	+ Home care
Additional Care Venues[23]	Retail health, urgent care (as needed)	+ Community resources	+ Virtual visits	+ Acute care	+ LTPAC, PCMH, hospice (as needed)

Table 3: Growing Needs of Consumers Across the Care Continuum

[22] These include the aforementioned basics of scheduling appointments, paying bills, emailing clinical staff, and viewing la results.

[23] That is, beyond the traditional physician's office or hospital setting.

STANDALONE ARCHITECTURE

As this report has articulated, a portal tethered to an EHR or practice management system is inadequate for creating an LPR that must also include claims data, pharmacy data, HRA data, PGHD, and SDoH in addition to data from other EHR systems. What's more, the care teams necessary for providing value-based care include a number of healthcare professionals outside the inpatient setting who never touch inpatient systems – social workers, dieticians, home health nurses, and even community volunteers – not to mention patients and their caregivers (Figure 5 outlines the different members of the clinics, holistic, and community care teams in a coordinated care model). Finally, true care coordination requires functionality for highly personalized education and bidirectional communication. To provide this necessary functionality, the next-generation engagement solution will be built to stand on its own, untethered to any single clinical system.

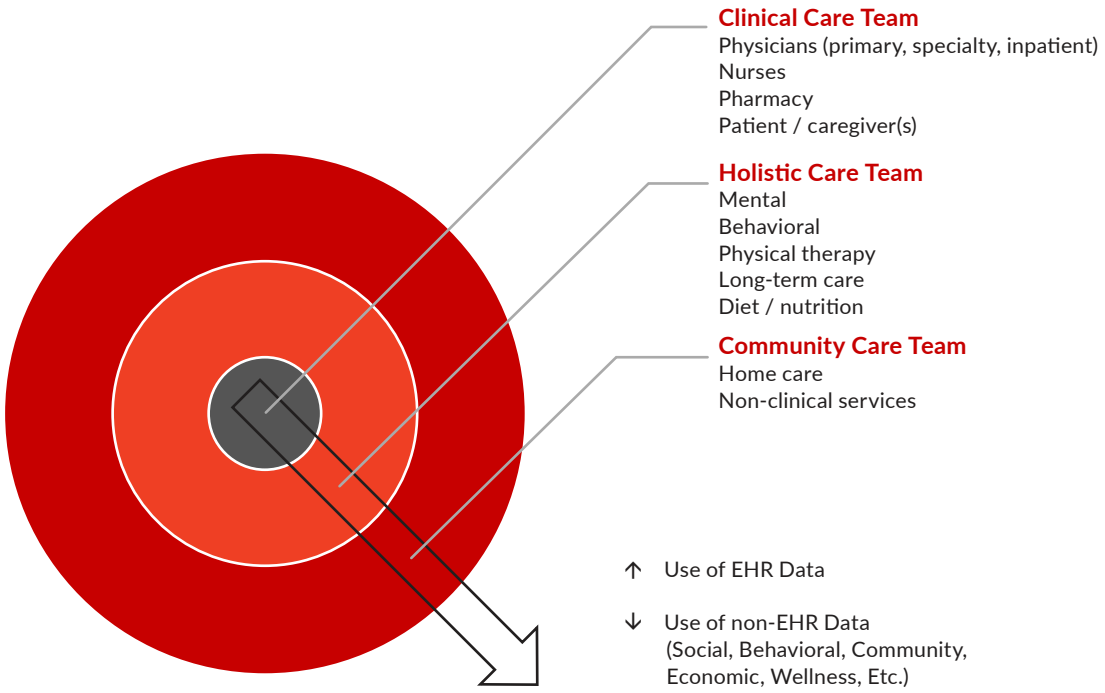


Figure 5: Clinical, Holistic, and Community Care Teams

RELIES ON OPEN APIS

One key reason that these solutions will be able to stand alone is the growing use of open application programming interfaces.[24] Open APIs allow applications to push to and pull from disparate sources using a publish-and-subscribe model; it's how Yelp provides users with directions to a restaurant using Google Maps. Some solutions today are able to integrate with portals, such as HealthLoop for communication and Emmi Manage for education, but the only medical professionals who can use them are those with access to the clinical system the portal is tied to.

[24] (Additional information about the use of APIs in healthcare will be available in a forthcoming Chilmark Research Multi-Vendor Sponsored Report.)

For next-generation engagement solutions, open APIs will allow data to be aggregated, deduplicated, and presented to consumers from a growing number of point solutions, PGHD sources, and venues of care. Open APIs also open the playing field to less traditional stakeholders who have hitherto been out of the loop in the consumer engagement paradigm – retail health clinics, employee wellness providers, fitness apps, and a host of digital health startups – as well as more purpose-built solutions for managing rare conditions. In this manner, an engagement solution will serve as a nerve center of sorts, providing seamless access to patient data no matter its source (see Figure 6.)

Figure 6: Next-Generation Engagement Solutions as a Nerve Center for Patient Data

INTEGRATES WITH SOLUTIONS CARE TEAM ALREADY USES

Care teams will get larger and more disparate as HCOs transition to the VBR model and coordinated care, as precision medicine and participatory medicine begin to take hold, and as bundled payment models expand beyond joint replacement and oncology care to other conditions where treatment options . More care will be delivered at the "edge" of the healthcare network by holistic and community care teams.

The number of clinical applications in use will also get larger and more disparate – EHR, practice management, care management, PHM, and so on.[25] Next-generation, standalone engagement solutions will have to integrate with these systems instead of forcing clinical staff to log into yet another application to, say, view a consumer's wearable device data, send educational videos pertaining to a new diagnosis, or initiative a virtual follow-up visit.

[25] The need to collect, analyze, and summarize metrics for various state and federal quality reporting mandates shows little sign of slowing down, either.

PROVIDES AUGMENTED FUNCTIONALITY

To provide the level of engagement necessary for coordinated care, next-generation solutions will include much functionality that today's portals lack. (Table 4 summarizes the new feature set in more specific terms.) While some solutions currently offer one or more features of Patient Engagement 1.0, none offer all of the features, and most won't get there in the next three years without significant effort.

New Patient Engagement 1.0 (3-5 years)	New Patient Engagement 2.0 (5+ years)
✓ Mobile-ready	✓ Mobile-first (including some solutions with biometric log-in)
✓ Caregiver[26] access to messaging	✓ Caregiver access to full CHR
✓ Bidirectional communication in consumers' preferred modality	✓ Bidirectional communication extended to caregivers
✓ Care plans with clear health, wellness goals	✓ Care plan goals tied to insurance, employer incentives
✓ Access to online, offline coaching resources	✓ Access to virtual, interactive coaching resources (e.g. two-way video)
✓ Full integration (passive upload), display of PGHD	✓ Use of PGHD to recommend interventions
✓ Partial access to physician, clinician notes (OpenNotes)	✓ Full access to physician, clinician notes
✓ Display basic health insurance info	✓ Display in-network providers, covered drugs, etc.
✓ Single interface for all points of care within HCO	✓ Single interface for points of care outside HCO
✓ Partial integration with community resources	✓ Full integration with community resources
✓ Integration of telehealth for acute care	✓ Integration of telehealth for post-acute, behavioral, therapeutic care
✓ Patients self-scheduling of appointments	✓ Integration of non-clinical resources
✓ Integration with consumer calendars (e.g. Google)	✓ Integration of basic artificial intelligence (AI)
✓ Clear but strong security, privacy policies	✓ "Warm transfer" from apps to coaches, office staff
✓ Multimedia patient education resources	
✓ Full integration of medication adherence	
✓ Contextual lab results	

Table 4: Characteristics of Next-Generation Patient Engagement

Adds Mobility

Using the principles of responsive design, solutions will be optimized for mobile operating systems – which are familiar to consumers and provide a low barrier of entry for application developers – while also able to accommodate those who do not have access to a smartphone. Using this single interface, consumers and their caregivers will be able to communicate with all members of the care team using the modality they prefer (whether phone, email, or text message) and see the information most pertinent to their health.[27] Mobile solutions can also

[26] In this case, parents or legal guardians for minors, and children, consenting family members, or legal guardians for adults.

[27] This mobility will not be limited to consumers and caregivers, as Wellframe and other vendors increasingly push a mobile-first approach to care management. In this report, though, the focus is on consumer-facing solutions.

leverage the various location, motion, and proximity sensors embedded within smartphones, as well as still and video camera capabilities, to automate or otherwise improve engagement interactions.

To gain widespread adoption of mobile engagement solutions, vendors will need strong but clear security and privacy policies. Consumers must know who has access to their data, what they are able to do with their data, and what right they have to withhold their data. Vendors must also consider pricing carefully. Many consumers are unwilling to pay for mobile applications, which will hinder adoption and care plan compliance. However, the development, implementation and maintenance of apps is obviously not without cost. The question of whether insurers, employers, or providers will foot the bill must be answered in the early stages of planning an intervention, long before it begins.

Integrates Wearable Tech (When Appropriate)

The growing market for fitness technology, plus the growing potential for medical-grade devices, suggests that next-generation engagement solutions will need to integrate with wearable tech using open APIs. Consumers who use these devices tend to be more active participants in their health and wellness, and they contribute additional PGHD to their LPR – data that tells a care team what has happened to a consumer during the long gaps between billable encounters. Here, partnerships with a mobile device data ecosystem such as Validic, which supports close to 300 device integrations as of the end of June, will give solution providers a leg up.

But solutions must do more than simply display data from the spigot that is a wearable device; either on their own or with the help of analytics tools, they must provide insight into what that data means. This will also help address the myriad challenges of wearable adoption and engagement: Lax long-term adoption, physician reticence to read data from wearables, and the tendency of wearables (due to their cost and technical immaturity) to cater to the young "worried well" and not the chronic patients more likely to benefit from them. Solutions must also accommodate consumers who, for reasons ranging from cost to comfort to complexity (e.g. Bluetooth syncing), would be better served by a smartphone's built-in step tracker than by a wearable device. Finally, solutions should make a distinction between data from FDA-approved biometric trackers and data from wearable fitness trackers (which despite ongoing improvements is largely not accurate enough for clinical use).

Integrates With Clinical Applications

Embedding next-generation engagement solutions within the clinical applications that care team members already use reinforces the notion that the solution is a single point of entry for managing an individual's care. This also aligns with overarching care coordination strategies, which suggest that all care team members (both within and outside an HCO) should have the same access to patient information in order to make the most informed care decisions. For HCOs, this has the added benefit of increasing the capacity of care management teams, reducing friction for consumers participating in care management programs, and enables closed-loop utilization and care episodes.

However, as the Chilmark Research 2015-2016 Care Management Market Trends Report pointed out, engagement is not a core competency of most care management solutions – and when it is, it is often the only core competency, with functionality lacking for risk stratification, care plan coordination, referral management, and care transitions. In addition, adoption is widespread but not universal; it is roughly in line with an HCO's VBR maturity and capacity for taking on risk,[28] or a payer's embrace of care management as a strategic imperative. Given the expected fluctuation in this market, as well as others (namely EHR and PHM), engagement solution providers should not align too closely with one class of clinical applications.

[28] To date, progress has been slow. Though executives are increasing their use of at-risk contracts, fewer than one in four hospitals are on track to hit the 2018 goal of providing more than 50 percent of care through value-based contracts. Source: Health Catalyst.

Becomes a True Collaborative Health Record (CHR)

Years ago, the buzzword dominating consumer healthcare engagement discussions was the personal health record. Despite the failings of services such as Google Health and Microsoft HealthVault, the term remains, and some researchers suggest PHR adoption will skyrocket to 75 percent of consumers in just four years.[29] More recently, terminology has trended toward the longitudinal patient record, or LPR, which contains the myriad data sources mentioned throughout this report – clinical, claims, pharma, device, social, and patient-generated.

The LPR is a comprehensive record, and it spans a consumer's care continuum, but it's still just a record. True engagement needs more than bits and pieces of data; it requires a living document, controlled by the consumer but available to the care team, which allows everyone involved with the care process to make more informed decisions. For consumers, inconsistent data leads to confusion, which leads to doubt, which leads to cynicism, which leads to inactivity.

The industry needs what Chilmark Research describes as the collaborative health record, or CHR, which is illustrated in Figure 7. Such a solution will allow healthcare to finally transition from the outdated system of record to the modern system of engagement.

The CHR will, in theory, steer what has been described as a patient-driven health information economy that can accomplish what the patient portal, the Blue Button, meaningful use, and health information exchange (HIE) entities could not: A freer flow of health information at the direction and consent of the consumer.[30] To do this, though, vendors must demonstrate that their solutions are more than the next generation of failed PHR tools,

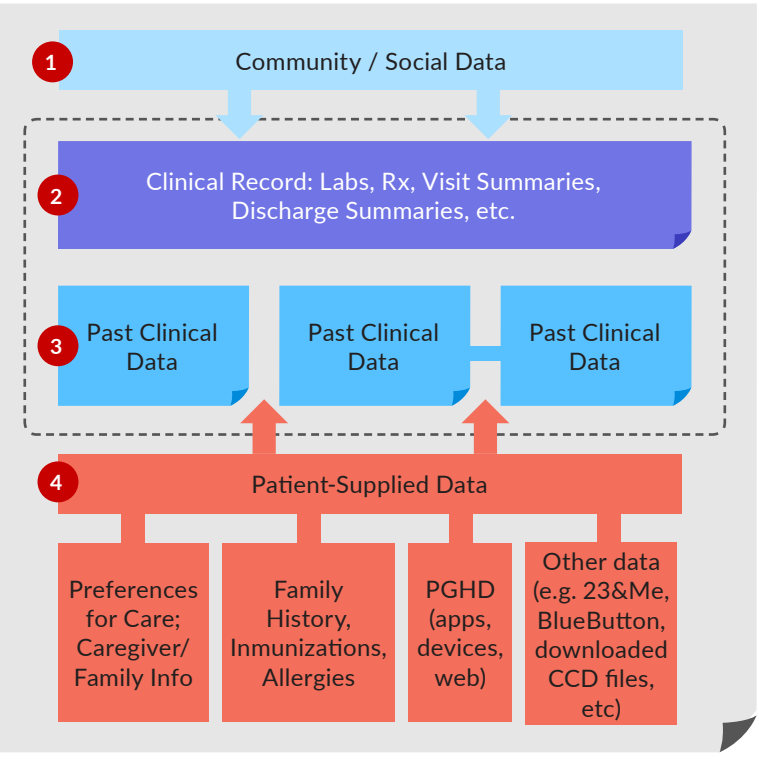


Figure 7: The Collaborative Health Record

[29] Source: JMIR. Even accepting a broad definition of patient portals as PHRs, as these researchers did, this prediction is wildly ambitious.

[30] Source: NEJM.

which they will do by embracing open APIs, establishing connections with clinical systems, and focusing on the quality of consumer health data (the context of blood test results, for example) rather than the quantity of data (the chart listing every data point generated by the blood test).

Evolves Into PRM Tool

Vendors such as Blueprint Health IT, Conversa Health, Influence Health, Patient IO, Salesforce.com, and Wellframe have rolled out PRM solutions over the last 12 to 18 months. The challenge here, as with so many problems in healthcare: Sales workflows are significantly less complicated than clinical workflows, which must be guided and informed by evidence-based care plans.

In addition, the PRM process depends on successful adoption of the coordinated care model, which places the consumer and his or her caregivers on the care team. This model will only work if stakeholders first implement a comprehensive data governance policy that ensures the privacy of consumer and caregiver information, requires their consent in order for data to be shared with care team members, and explicitly states how data will and will not be used throughout the care continuum.

PRM is much more than marketing or customer loyalty, as is the case with CRM; instead, it's about interventions that trigger repeatable activities, change behavior, and drive value to the HCO while improving health for the consumer. Absent this model, PRM exists solely for the benefit of an HCO, with the consumer left on the outside looking in.

WHO WILL DRIVE ENGAGEMENT INNOVATION?

Given the architecture and functionality necessary to deliver the next generation of consumer engagement, it's clear that a variety of stakeholders will have to come together to drive innovation.

PRIMARY STAKEHOLDERS: THOSE WHO DELIVER, PAY FOR, AND RECEIVE CARE

The main stakeholders are those who deliver, pay for, and receive care. There are several reasons why each entity is poised to drive innovation – and several reasons why not.

Healthcare Organizations (HCOs)

Hospitals, doctor's offices, and clinics are both the first and most familiar entry points into the healthcare system for consumers. That alone is enough reason for them to play a key role in leading efforts to innovate the consumer engagement experience. The ongoing shift to VBR, and the risk that HCOs must assume as they shift from care quantity to quality – whether through the ACO model, bundled payments, MACRA, or self-insurance – has also catalyzed a shift to coordinated care and shared decision-making as a means of achieving the Quadruple Aim.

At the same time, most HCOs are in a bind.

- IT budgets, hamstrung by EHR, analytics, population health, and care management projects, have very little left over for initiatives with a questionable ROI.
- Clinicians continue to push back against poorly planned technology implementations that distract from the actual practice of medicine.
- Government mandates burden medical professionals with administrative tasks well below their level of licensure.
- Most consumer engagement efforts simply deploy portals for the sake of "checking the box" on one meaningful use requirement before moving on to the next metric. Few HCOs are truly familiar with how CRM and engagement ought to work.
- The creation of "innovation centers" leads HCOs to pursue one-off projects (potentially to be spun out or sold) without first aligning their work to a shared vision across hospital departments.
- HCOs in the same geographic area compete for patients and therefore remain reluctant to share information that may jeopardize market share.
- Engagement initiatives often run headfirst into healthcare's paternalistic care model, which suggests that doctor knows best – always.

Case Study: Dartmouth-Hitchcock Medical Center's ImagineCare

Branded as a health experience platform, ImagineCare uses remote patient monitoring (RPM) devices as well as more traditional devices such as blood pressure cuffs to gather data from patients with chronic conditions. That data is combined with other data sets to create evidence-based care pathways for patients, who interact with the app on iOS devices. Registered nurses and health navigators in the "command center" monitor patient information, both to assess progress toward achieving care plan goals and to intervene (via text, video call, or phone call) if something looks amiss. The clinical interface looks less like an EHR and more like a CRM modeled after Google Plus, while the consumer interface emphasizes positive language that supports patient autonomy in order to foster behavior change.

As with many healthcare pilots, ImagineCare is starting with D-H employees, with patients to follow. This will be necessary to trigger growth and have a bigger impact on improving outcomes. So, too, will greater use of data (claims, pharma, etc.) and app support for non-Apple devices.

To achieve engagement, HCOs must innovate their technology, their consumer experience, and their business model, all at the same time. It's a substantial challenge, but some organizations are taking it on (see Sidebar).

Payers and Employers

Due to the prominence of employer-sponsored health plans, employers (and the payers who offer those plans) have much experience engaging consumers.

> Employer groups are a viable intermediary between consumers and the fragmented healthcare delivery system – for example, to help them determine which medications are covered by which health plans so they can share that information with their care team.

Case Study: Canary Health

Canary Health, formerly DPS Health, offers employers a series of digital programs for lifestyle, stress, and condition management that draw from evidence-based resources developed at Stanford University and the University of Pittsburgh. The programs range from six weeks (for chronic condition management) to one year (for a CDC-recognized diabetes prevention program) to ongoing (stress management and resilience). Canary Health also offers a six-week program for caregivers. Programs aim to address the gap between what stakeholders care about (cutting costs and improving efficiencies) and what consumers care about (managing their lives in spite of their conditions and/or SDoH).

Recently, the company announced that new partner Medtronic will be a reseller of Canary Health's self-management programs for diabetes and related comorbidities. This will help Canary advance its mission of preventing the development of an additional chronic conditions – which, left unchecked, can occur within three years, the company says.

> The combination of claims and health risk assessment (HRA) data, fed into risk stratification solutions, has allowed these stakeholders to extend engagement beyond those who willingly participate to those who, with the benefit of preventive interventions, can reduce their risk of developing a chronic condition and incurring charges for healthcare services.

> Employers are uniquely positioned to gather SDoH data about consumers – where they live, how they commute, what type of stress they experience, and so on.

> Because these stakeholders control the purse strings, they can offer a variety of incentives to first encourage healthier behavior and then reward it. They can also help employees/members understand their complex health plan benefits.

> The growing wearable technology market – and the role of companies such as Fitbit in employer wellness programs – makes it easy for participants and stakeholders alike to measure progress and track achievements.

> Participants in a consumer-driven health plan, especially those with a healthcare savings account (HSA) or flexible spending account (FSA), interact with their health plan far more often over the course of the year than employees who do not have a CDHP.

For all these advantages, employers and payers face significant hurdles in designing next-generation engagement solutions. Consumers distrust health insurance companies, plain and simple. They are reluctant to share information with employers that may be used against them – seeking treatment for mental health or substance abuse, for example. Both employers and payers can easily be tempted to offer a broad "catalog" of wellness offerings, such as smoking cessation or weight loss, which don't align with a larger strategy or set of program outcomes. Finally, employee and member churn makes it difficult to achieve stickiness, especially for those who are healthy and infrequently interact with payers.

The most successful employer-based and payer-backed engagement efforts rarely mention healthcare (see Sidebar). They take a holistic approach to wellness and well-being, understanding that medical care is only a small portion of what determines overall health.

Consumers

Consumers have often been an afterthought in the design, development, and implementation of engagement programs, but that will change with the next generation of solutions. The VBR and CDHP models depend upon the active participation of consumers in their own wellness and self-management; solutions that cannot meet this need will have a short shelf life. Meanwhile, the growth of the OpenNotes movement has demonstrated that providing consumers with greater access to clinical information can improve satisfaction and trust without compromising the integrity of physicians' notes.[31]

[31] Source: BMJ Quality & Safety (abstract). Among patients surveyed, those populations often perceived to be most vulnerable – non-white, those with poorer self-reported health, and those with fewer years of formal education – were more likely to report an improved doctor-patient relationship after accessing doctors' notes.

Taken together, those trends suggest that consumers should and, in fact, can be trusted to use health data, including information not previously available to them, to manage their own care. But institutional stakeholders have reason for skepticism. Every consumer is different; needs vary tremendously from the healthiest to the sickest. So, too, do willingness to engage and ability to engage (though the latter can be overcome by removing obstacles to access engagement solutions, as well as to care itself). Above all, designing a comprehensive engagement solution when n=1 is both expensive and unsustainable.

The vast majority of consumer-facing healthcare apps focus on basic diet and fitness as opposed to comprehensive self-management of care (and many that do focus on care lean toward low-acuity conditions); as such, they are not worth examining as case studies for prolonged, meaningful engagement. However, the example of consumer health communities (see Sidebar) offers insight into how to successfully bring consumers to the table as primary stakeholders in any engagement initiative.

Case Study: PatientsLikeMe

PatientsLikeMe started as an online community for patients with amyotrophic lateral sclerosis (ALS) but has grown over the last decade to include more than 2,500 chronic conditions. Beyond simply connecting patients with rare diseases, the free site lets its more than 400,000 members track their health in between clinical appointments, with inputs ranging from treatment history and symptoms to mood and quality of life. This robust data set allows two things to happen: Patients can compare their progress to others with their condition, and PatientsLikeMe can use this structured data to inform research. As of mid-July 2016, the company had produced more than 80 research studies.

PatientsLikeMe demonstrates the power of PGHD to inform care decisions on both an individual and population level. That said, stakeholders must delineate a clear vision and strategy for engagement if they want to expand the model. Put another way, a solution such as PatientsLikeMe will not simply be "plug and play" for HCOs looking to engage those at risk of developing chronic conditions such as diabetes, hypertension, or obesity.

IMPLICATIONS FOR PRIMARY STAKEHOLDERS

Short-Term Pain: Choices, ROI, Evolution

For HCOs, payers, employers, and consumers aiming to improve engagement, the next 24 to 36 months will be fraught with uncertainty.

Growing number of entry points into healthcare system. Healthcare is moving to more venues: Standalone EDs and surgery centers, micro-hospitals, retail health clinics, direct primary care (DPC) providers, DTC telehealth services, the patient-centered medical home, and a host of outpatient facilities. Alignment with clinical applications is on the rise – witness CVS Health's adoption of Epic, the EHR of choice for many of its HCO partners – but more entities providing care means more disparate solutions gathering consumer data and more opportunities for data silos as well as leakage.

Growing number of point solutions. Stakeholders face more questions than answers in deciding where and how to invest in engagement technology. Reputable curation services for emerging solutions are few and far between, and the volatility of the technology market in general, and digital health in particular, means that what's popular today could easily be obsolete tomorrow. Stakeholders risk going "all in" on a single solution that may not last or adopting several solutions and delaying a rollout because there are now several learning curves. The most successful "new kids on the block" will build credibility – whether it's through clinical studies, references from commercial partners, or shared thought leadership – in order to demonstrate to C-level executives that they have a vision, not just a product.

ROI is a mixed bag. So far, several types of programs have achieved success: Shared risk models, the CMS-approved Diabetes Prevention Program, coaching for chronic disease self-management,[32] and solutions built using Apple CareKit, which has garnered support from Beth Israel Deaconess Medical Center, the Cleveland Clinic and Ochsner Health System.[33] The jury is still out on employer wellness programs (which can take years to show true

[32] Source: Annals of Family Medicine. It's worth noting that human guidance (monitoring as well as feedback) may be necessary to achieve desired adherence results, according to research published in JMIR.

[33] Sources: Buzzfeed News and MobiHealthNews. Meanwhile, HIStalk notes that Apple ResearchKit is gaining support as a real-time clinical research tool.

benefits) as well as ACOs (the majority of which have yet to recover their up-front costs, let alone save money). Most engagement efforts led by providers (in the form of portals) and the fitness and wearable market (catering to the "worried well" or otherwise healthy) have thus far failed.

Programs must evolve. The most appropriate and effective engagement modality may not be the same for different patient cohort groups, disease states, or age groups. The objective of an engagement effort – education, fitness, nutrition, medication adherence, lifestyle change, symptom management, or coping – will also drive the modality used to engage. And the sheer number of stakeholders means that the pace of innovation will be evolutionary rather than revolutionary. A one-size-fits-all strategy, or one that remains rigidly tied to one modality despite evidence that it may not be working, will quickly fail. So, too, will a strategy that caters to the need of one segment of the consumer population at the expense of another.

Payers and HCOs have different needs. Payers and providers engage with consumers for different reasons (see Table 5). For payers, it's about helping consumers understand benefits, find in-network physicians, and lower costs, all in the name of driving down the medical loss ratio (MLR).[34] For HCOs, meanwhile, it's about offering consumers convenience, educational resources, and a reason to come back. Next-generation engagement solutions must find a way to meld these differing characteristics into a single platform.

	Payer-Driven Engagement	HCO-Driven Engagement
Transactions	> Provider Directory > Health Savings Account (HSA)	> Appointment Scheduling > Prescription Refilling > eVisit
Education	> Disease Information > Treatment Options > Price / Quality	> Disease Information
Results	> HSA Balance > Explanation of Benefits (EOB)	> Lab / Radiology Results
Finances	> HSA Balance > Estimated Costs	> Bills / Copays
Motivation	> Steerage to high-value HCO > In-network Services > Low MLR	> Self-care, Compliance > Brand Loyalty

Table 5: Characteristics of Payer vs. Provider Engagement

Long-Term Gain: CHR, Multimodal Experience, Self-Management

Within 24 to 36 months, the uncertainty surrounding engagement will begin to give way to progress toward engagement's broader involvement in helping HCOs reach the vision for care management's future (see Figure 8).

Access to a truly collaborative CHR. As solutions continue to embrace open APIs, the portal that's limited to clinical data will give way to a solution that contains a true CHR – a single version of the truth for all healthcare stakeholders. Buoyed by the success of the OpenNotes movement, consumers will be opted in to the solution by default and, in return, will gain greater control over which entities see their information.

[34] Under the Affordable Care Act, this rate is 80 percent for payers in the individual and small group market and 85 percent for payers in the large group market.

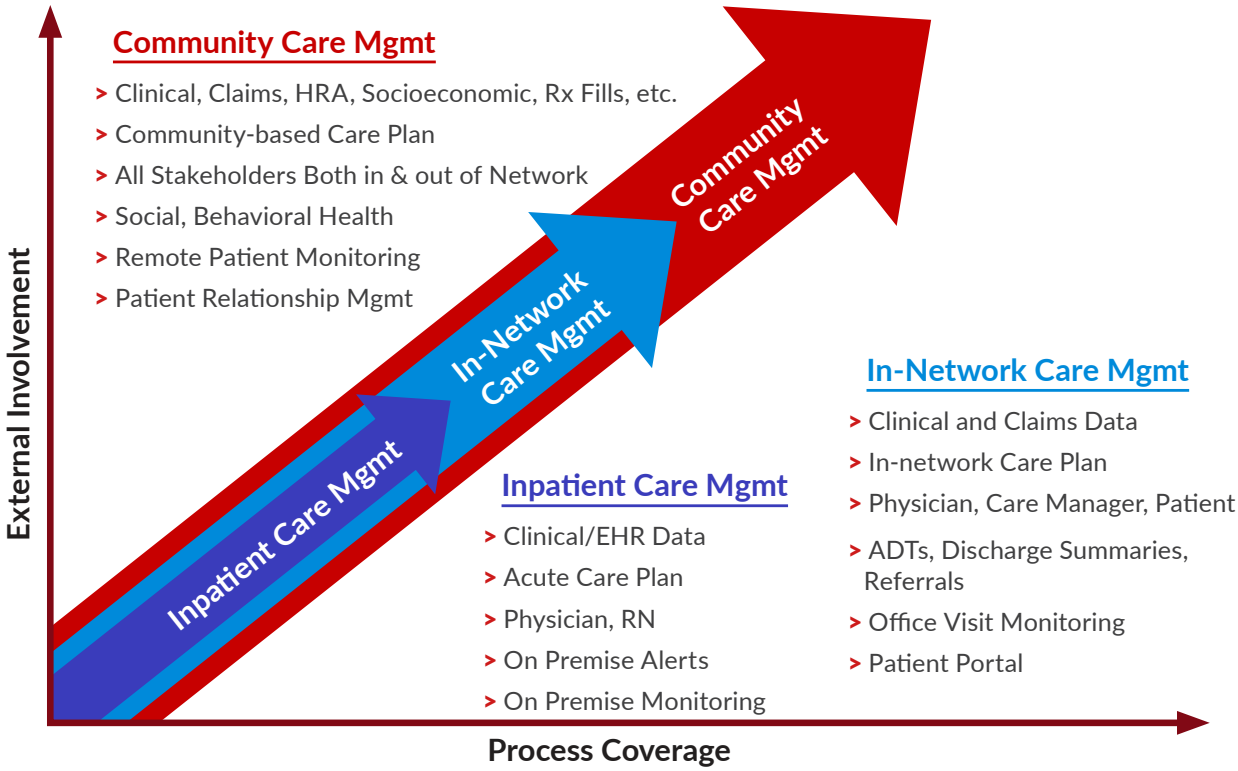


Figure 8: The Vision for Care Management's Future

Seamless, multimodal engagement experience. Healthcare stakeholders will embrace the tech world's "fail fast, fail often" mantra, treating engagement efforts less like clinical trials and more like agile software deployments. ("Efforts" here refers specifically to engagement programs, not clinical interventions or any other initiatives impacted by federal regulation or with the potential to bring harm to consumers.) With the help of both qualitative and quantitative insight into what works best, these entities will better understand which modalities provide the right engagement at the right time, along with the right peripheral device integrations.[35] This will provide the seamless, multimodal engagement experience that will improve communication among care team members and consumers in between more traditional in-system healthcare encounters.

More active participation in health and wellness. With better engagement and better communication will come more frequent and more active participation in health and wellness activities. With a more comprehensive understanding of a consumer's current condition(s) and future health risk(s), based on an analysis of the broad data now available in the LPR, care teams will be able to develop care plan goals and objectives specifically tailored to a consumer's motivations, triggers, and abilities to catalyze and achieve sustained behavior change.

[35] Source: McKinsey. In doing so, these entities will finally fulfill the dream of healthcare IT conference speakers everywhere and become more like the airline, banking, and retail industries.

Case Study: Life Balance

Developed by Brigham and Women's Hospital (BWH) in conjunction with Blue Cross Blue Shield of Massachusetts (BCBSMA), Life Balance provides resilience and coping skills that help consumers manage the mental health aspects of a significant procedure or care episode. One-on-one coaching helps patients feel more comfortable talking through their problems instead of visiting urgent care or the ED for minor concerns. BWH announced Life Balance in the summer of 2014 and initiated a small pilot. The cohort group expanded to additional BCBSMA members about a year and a half later once Life Balance was embedded in Act.MD's Care Coordination Record, the solution used by BCBSMA nurse care coordinators.

These types of partnerships take time and money. (In this case, Blue Cross' Zaffre Investments funded the expansion of the pilot.)[36] These requirements may ease as VBR starts to take hold, but the competition for resources will still be tight. This further emphasizes the notion that solution providers must bring to the table a short-term strategy for catalyzing engagement and a long-term vision for scaling adoption.

Better self-management of care. With behavior change will come consumer self-management of care. This will boost utilization of preventive care, lower utilization for inpatient services, improve care coordination, cut down on duplicative or otherwise necessary services, and boost the potential to close care gaps, which are now more visible to the care team. Achieving these goals will require collaboration among primary stakeholders as well as solution providers (see Sidebar on previous page).

SECONDARY STAKEHOLDERS: SOLUTION PROVIDERS

A variety of vendors, many offering solutions under the broad umbrella of PHM, will serve as secondary stakeholders in the effort to deliver next-generation consumer engagement (Table 6, at the end of this section, summarizes key vendors leading the way in engagement). These vendors will be developing the solutions, but they will only succeed by working closely with primary stakeholders and understanding the larger short- and long-term implications for those entities.

EHR Vendors

Patient portals are first-generation engagement solutions, and they have succeeded in certain settings, namely Kaiser Permanente.[37] Basic engagement is also better than no engagement, and it can boost a consumer's loyalty to a particular practice or facility.[38] For example, eClinicalWorks' Healow gives practices the option to push appropriate lab results to a consumer's smartphone app, giving him or her a chance to review the records and think of questions before the physician calls to discuss the results.[39] In addition, Allscripts' FollowMyHealth Achieve gives consumers connected devices and uses EHR alerts if consumers' numbers exceed established parameters or consumers otherwise demonstrate noncompliance.[40] By and large, though, pure-play EHR vendors (that is, those not pivoting into care management or PHM) remain committed to portals as engagement tools for the foreseeable future.

Care Management Vendors

Amid the healthcare industry's shift to VBR and care coordination, care management vendors of all varieties – analytics, payer-led, pure-play, and even EHR, as noted above – are positioned to improve the consumer engagement paradigm, given that they serve as a single entry point for the entire care team and given that some have extended messaging to caregivers.

However, as the Chilmark Research Care Management Market Trends Report detailed, most vendor roadmaps place priorities such as risk stratification, referral management, and task automation ahead of engagement. When it comes to engagement, they may be followers instead of leaders and as a result may seek partnerships or integrations with engagement solutions as an alternative to building their own after others have had a head start.

PRM and Other Emerging Vendors

These firms focus not on single episodes of care but the more holistic, team-based process of improving overall health and wellness, which gives them greater insight into consumer behavior. These vendors possess no preconceived notions of what engagement "should" be and seek to complement existing solutions rather than compete with them. That said, they face substantial competition from care management vendors, a high barrier to entry, a need to demonstrate clinical efficacy, and healthcare executives hesitant to add another step to an already-complicated clinical workflow.

[36] Sources: Act.MD and Behavioral Healthcare.

[37] Source: Health Affairs.

[38] Source: athenahealth Insights.

[39] Source: eClinicalWorks.

[40] Source: Allscripts.

In addition, DTC telehealth vendors such as American Well and Teladoc see themselves poised to improve care coordination and engagement by enabling more frequent (and fewer missed) appointments with members of the holistic and community care team – particularly for behavioral health, which is a leading comorbidity for chronic conditions. These virtual visits can keep at-risk or high-risk consumers "on track" between in-person visits with the clinical care team, which will improve compliance with care plans.[41] Advances in artificial intelligence (AI), though still at least five years away, may allow for more deeply personalized care plan goals and even home-based triage of low-acuity conditions. Overall, though, the ongoing challenges of reconfiguring healthcare delivery from FFS to VBR, coupled with industry resistance to telehealth adoption, suggest that consumer telehealth's role in next-generation engagement solutions will be largely limited to low-acuity care for the next 24 to 36 months.

Vendor Type	Name	Differentiating Factor
EHR	Allscripts	EHR-agnostic FollowMyHealth
	athenahealth / Patient IO	Leverages PGHD
	Cerner	Data aggregation
	eClinicalWorks	Pushes lab results to phone
	Epic	Success with Kaiser / MyChart
	Meditech	Integrates wearable data
Care Management	Act.MD	Care plans for complex patients
	Caradigm	Shows patient- and condition-specific risks
	CareEvolution	Comprehensive LPR
	IBM Watson Health	Analytics / AI
	Orion Health	Personalized experience based on SDoH
	ZeOmega	Care plan feedback loop
Condition Management	Canary Health	Uses Stanford self-management programs
	Ginger.io	Applying analytics to mental health
	Omada Health	Focuses on continuous improvement
	Twine Health	Starts with basics of behavior change
	WellDoc	Mobile Type 2 diabetes management
PRM	Blueprint Health IT	Supports videoconferencing
	Conversa Health	Emphasizes adherence
	HealthLoop	Familiar messaging interface
	Influence Health	Multimodal notification and messaging
	Philips / Wellcentive	Incorporates community resources
	Salesforce.com	CRM experience, market penetration
	Wellframe	Mobile-first strategy

Table 6: Vendors Leading the Way in Engagement

[41] Research published by the Agency for Healthcare Research Quality (AHRQ) supports this notion: Remote patient monitoring and counseling for patients with chronic conditions are the telehealth interventions with the greatest impact on outcomes.

MARKET OUTLOOK, 2016 TO 2020

In the 2014-2015 Clinical Patient Engagement Market Trends Report, released in early 2015, Chilmark Research predicted that widespread adoption of new engagement tools would begin within 18 to 24 months. This prediction proved to be optimistic.[42] Instead of engagement, HCOs are focusing their efforts on EHR optimization, quality reporting, cybersecurity, and the early stages of VBR and ACO models. Concurrent with those priorities, too, is physician engagement and the establishment of clinically integrated networks. For better or worse, these initiatives have taken precedence over moving beyond the patient portal.

What's more, the market landscape for engagement technology has changed in the last 18 months. PRM has emerged as a viable (albeit immature) alternative to traditional portal-based or telephonic engagement for coordinated care management. Traditional engagement vendors betting heavily on name recognition (namely Microsoft and WebMD) have faded from the picture, while vendors such as Dossia and RelayHealth have pivoted their focus to population health.

Given the recent shift of priorities, market trends, and engagement needs as a whole, pinpointing a future date when HCOs will adopt "engagement solutions" oversimplifies the situation. There will be no single application, pilot, or breakthrough moment signaling that an HCO has implemented a solution. Rather, the industry will take a series of steps – most forward but some backward – toward using improved engagement and coordinated care solutions. To that end, this report presents a market outlook for next-generation consumer engagement tools that extends to the end of 2020.

INTERIM STEP: CLINICAL OR EHR-BASED PHR

Achieving the long-term gains described above will take time – three years for the HCOs that are ready and even longer for those that are not. Even the most forward-looking HCOs have several installs of the same vendor's EHR and/or a dozen or more specialty EHRs within ancillary departments.

As a result, many HCOs will take an interim step from a patient portal to a clinical or EHR-based type of PHR, most likely developed by a third party. This PHR-like interface will serve as a "portal of portals," giving consumers a single front end for whatever number of EHR-based portals an HCO currently offers. For example, Get Real Health has done this at New York Presbyterian, pulling together several EHR-based portals into a single, untethered portal called My NYP (see Figure 9); Influence Health has done similar work with its large hospital and independent practice association (IPA) clients. Other HCOs will use more extensible portals to transition to the PCMH / care pathways model, as the Department of Defense is doing with its RelayHealth portal.

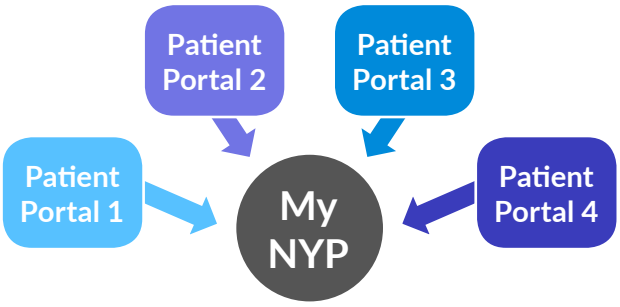


Figure 9: A "Portal of Portals"

To motivate consumers, HCOs will increasingly take the time to show consumers the basics of using the portal – how to create an account, how to view lab results, and so on – after a clinical encounter but before the consumer leaves the office. Within the next two to three years, this process will also involve showing consumers how to enroll in the CommonWell network, linking their records where they receive care and querying data available on the network.[43] While this will place a short-term burden on administrative staff, particularly when it comes to explaining the CommonWell network, it will digitize many of the phone-based encounters with the HCO and, in the long run, make life easier for that staff.

[42] This prediction also predated the easing of the meaningful use Stage 2 portal use requirement from 5 percent of a patient population to a single patient, which further downgraded engagement from a strategic priority to a meaningful use checklist item.

These interim solutions will leverage existing portal transactional features (physician messaging, prescription refill requests, bill payments, and appointment scheduling) and incorporate some of care coordination's low-hanging fruit – basic education materials, integration with consumer fitness apps, and alerts tied to upcoming appointments or repeated tasks such as taking medication or recording blood pressure. More advanced solutions will support the upload of PGHD, though consumers will still struggle to gain insight from that data within the solution itself. They will also be mobile-ready, but the lingering infrastructure of legacy technology will make a mobile-first solution hard to come by.

All told, the portal of portals won't be enough for to achieve the engagement necessary for care coordination, but it will reduce some of the fragmentation that plagues today's engagement efforts, and it will boost adoption figures for consumers who have basic administrative, behavioral, and clinical needs.

Case Study: Sharecare

Sharecare, a consumer-facing health and wellness platform, has formed joint ventures with the Hospital Corporation of American (HCA) and Guidewell, parent company to Florida Blue and several other health plans. Through these partnerships, patient / member data is integrated into Sharecare's stress management and symptom-checker apps. For Florida Blue, Sharecare will combine all of its solutions into a single app, which will launch next year; the two companies also plan to explore how to leverage additional data sources for more personalized engagement.[44]

Two Solutions or One?

As noted above, payers and providers have different reasons for improving engagement with consumers. Payers push for steerage, HSA optimization, care quality, and keeping their MLR within the Affordable Care Act's new limits. Providers aim for loyalty, convenience, and improved condition management.

Today, consumers have separate provider-facing and payer-facing portals. In a truly consumer-centric engagement experience, these would converge into a single, standalone solution that pulls in clinical and claims data (plus data from additional sources). Standalone portals are rare today – vendors include Get Real Health, HC1, Influence Health, MedFusion, and NoMoreClipboard – and we expect that it will be at least five years before such solutions see widespread adoption.

In the meantime, the bifurcation of portals will dominate the market, though payers and providers alike will continue to leverage open APIs to pull data as well as application modules from different sources in order to augment their portals without having to completely rebuild them (see Sidebar).

EHRS GIVE WAY TO PRM, CARE MANAGEMENT SOLUTIONS

Within the next three to five years, the EHR-based "portal of portals" will give way to engagement solutions more closely linked with PRM and care management applications. (But since the EHR won't go away entirely, this broad class of solutions will offer a handshake of sorts to the EHR so that it retains its place in the clinical workflow, as needed.) So, too, will a plethora of point solutions give way to larger-purpose platforms that leverage open APIs to connect individual solutions.

[43] Source: CommonWell Health Alliance. Two CommonWell members, portal providers MediPortal and Integrated Data Services, will launch the services (self-enrollment, self-linking, and self-query and view) by the end of 2016. Six other members – Aprima Medical Software, athenahealth, Cerner, Evident, Modernizing Medicine, and RelayHealth / McKesson – have committed to launching the services but have not announced a date. The initiative is admirable, but Chilmark Research imagines the learning curve to be steep for the average healthcare consumer.

[44] Source: MobiHealthNews

Not coincidentally, this will coincide with the growth of risk-based contracts between HCOs and private and public insurers. These tools will also accommodate the members of the holistic and community care team who have no role in medical coding or billing and therefore do not use an EHR system. As this report has detailed, these new solutions will improve consumer engagement in a number of ways, including but not limited to the following:

- A UX designed to be mobile-first but also suited for browser use.[45]
- A dashboard view of data.
- Through the LPR, a 360-degree view of a consumer's condition(s).
- Better alignment with the holistic care team and the larger care management lifecycle.
- Multimedia, evidence-based educational content tied to specific care plan goals.
- Embedded telehealth services.
- Through services such as Aunt Bertha and Wellist, access to community-based health resources as well as non-clinical resources ranging from child care to home modifications to meal/grocery delivery.

Expect features to roll out in piecemeal fashion, partly due to the relative immaturity of solutions at present time but mostly due to the iterative software development life cycle, especially for consumer-facing solutions. Guided by primary stakeholders, vendors will emphasize functionality for improved messaging, data collection, care plan access, and achieving measurable success such as weight loss or reduced A1C levels.

As Meaningful Use Fades, EHRs Evolve

Beginning in 2017, the Medicare meaningful use program gives way to MACRA and it four options for participation. (Medicaid meaningful use will remain in place until 2021.) MACRA signifies a shift from simply demonstrating the use of electronic systems to more broadly aligning their use with the overarching goals of PHM and care management. Prudent vendors foresaw this shift and have begun the evolution from EHR to PHM and care management – and they fare well when compared to both pure-play and payer-driven solutions. Expect more EHR vendors to do the same, but pay close attention to how (if at all) they address engagement as they pivot; as noted, simply replicating or broadening the patient portal experience won't cut it.

For Other Vendors, Years of Volatility

Vendors who intend to impact engagement but are not operating in the PRM or care management markets will face uncertainty over the next four to five years. Messaging and recordkeeping solutions will be high-demand targets for acquisition. Care management vendors that focus on analytics, such as Caradigm, Conifer Health Solutions, Enli, and Forward Health Group, will make good partners for engagement vendors. Their ability to parse the CHR and assign risk scores to patients indirectly improves engagement, as it lets care teams see at a glance which patients are high-risk at any given time and prompt interventions ranging from an email about an overdue screening to a visit from a home health nurse.

On the other hand, standalone point solutions that do not integrate with clinical workflows will begin to fade from view. This will be true for two types of tools: Today's bevy of niche direct-to-consumer apps, as well as the solutions that solve a specific problem for a single department within a single hospital within a single network within a single geographic area but cannot scale beyond that small pilot. Siloed products that only address a single chronic condi-

[45] Given the frequency of updates to mobile operating systems, and given the diverse types of devices that engagement solutions must support, we expect large-scale engagement to occur in mobile browsers as opposed to native mobile apps. But apps will still be important for certain high-risk populations with unique engagement needs.

tion will struggle to address the needs of the 25 percent of Americans with multiple chronic conditions.[46] As stated, these vendors will need a clear vision and strategy for improving the consumer experience, as well as the ability to scale and interface to existing solutions using open APIs, if they want to convince healthcare executives to invest.

Proven platforms for disease management will fare better that point solutions, as there will be no shortage of customers in need of programs to treat growing populations of patients with asthma, COPD, diabetes, hypertension, and obesity. These vendors would be wise to follow the examples of Canary Health and Omada Health; the companies' holistic approach to diabetes management helps users set well-being goals and places less emphasis on individual care episodes than traditional disease management programs.

Finally, expect leading tech vendors to continue their forays in healthcare – Apple with PHR storage and sharing (via its recent Gliimpse acquisition) as well as its app ecosystem, Salesforce.com with care management and PRM, Samsung with its evolving health app, and a number of firms with wearable devices (see next section). To succeed, these vendors cannot rely on market share and high customer approval ratings alone; they must demonstrate clinical relevance and regulatory compliance (HIPAA, FDA, and the like) in order to prove their worth to HCOs.

DEVICES ARRIVE IN DUE TIME

Both medical and consumer devices will stay on the periphery of the engagement process for the vast majority of consumers for the next 18 to 24 months. (Devices serving chronic patients with conditions such as Type 1 diabetes and hypertension will remain the exception.) Despite the growing availability of open APIs, data integration will remain a challenge, particularly with legacy devices and legacy patient portal infrastructure, and the user experience will not be unified. The neediest patients (both medically and financially) will continue to be underserved as long as HCOs have not fully committed to the VBR model, since under FFS subsidized devices will still represent a cost and not an opportunity for savings. The lack of a true all-on-one, FDA-approved medical device – one able to measure skin temperature, blood glucose, galvanic skin response (GSR), and nearby environmental factors in addition to heart rate and physical activity[47] – will dampen most HCOs' enthusiasm for device investment.

This market will turn the corner in about 24 to 36 months, though (ee Figure 10).

- Fitbit, with its extensible platform, variety of devices, and growing number of corporate wellness clients, will begin to tie its data, uploaded passively, into the consumer CHR.
- Other vendors, hoping to catch up, will be eager to lend their strengths to partnerships – Garmin with data presentation, Withings with non-wearable devices, and so on.
- Companies such as Google / Alphabet, Jawbone, Microsoft, and Philips, which appear to be going all-in on medical-grade wearables, will find willing partners for clinical trials as well as high-risk patient cohorts but will struggle to achieve widespread use – though considering the expected functionality and price tag, that very well may be the point.
- Apple and Samsung will integrate as many health and wellness features into their smartphones and smartwatches as they can without having to apply for FDA medical device clearance.
- Validic will expand its role as a wellness and medical device data "middle man" through partnerships with more patient portal and PRM solution providers. This will bring more PGHD into the CHR and provide the care team with more insight into a consumer's behavior and habits in between care episodes.

[46] Source: CDC. For Americans over 65, the figure rises dramatically, to 75 percent. ble, .

[47] It's not for a lack of effort. The technology inside wearable devices has to be sophisticated in order to differentiate among, say, steps taken while walking, steps taken while running, and a full revolution of bicycle pedals – to the point that such devices conceivably could determine if the user has fallen and cannot get up. However, that gets into the gray area of FDA approval – an area few wearable manufacturers have dared enter.

> Finally, medical device makers such as Abbott, Dexcom, Medtronic, and Welch Allyn – already well-versed in addressing consumers' needs – will increasingly make data available to third-party systems in an effort to claim a spot in the care management life cycle.

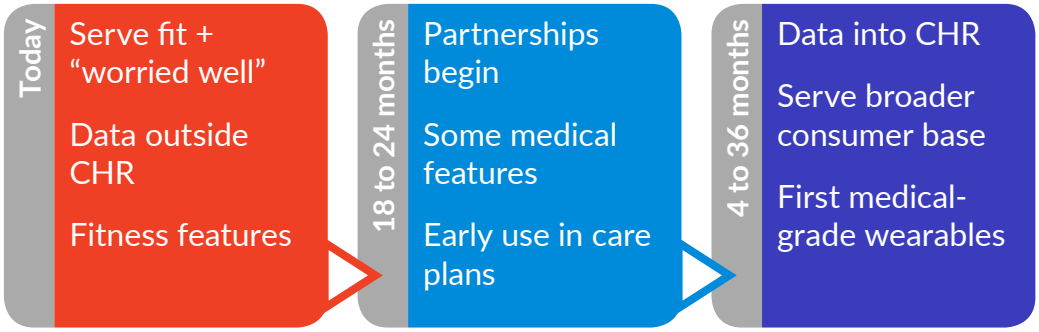
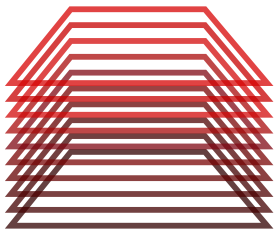


Figure 10: Wearable Device Innovation Timeline

Adoption will not happen if consumers are not assured that their applications, devices, and data are secure. This onus will fall on HCOs, as they will direct consumers' use of the devices in achieving care plan goals – and, in the absence of caregivers, in setting up the devices in the first place. As care teams expand, HCOs must take much greater steps to ensure the security of the periphery of their networks. At a minimum, all affiliates should be required to sign HIPAA business associate agreements (BAAs); in addition, consider security training for members of the extended team who are privy to device data, especially for the purpose of setting care plan objectives. Accomplishing all this will require a significant investment in time, people, and capital, but the ROI of remote monitoring – better adherence, fewer readmissions, improved engagement, and the prevention of disease onset – will more than make up for it.

PROGRESS TO SYSTEM OF ENGAGEMENT HASTENS, REMAINS INCOMPLETE

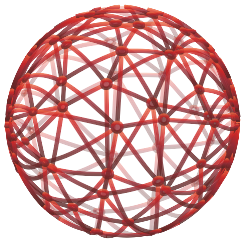
The introduction of new engagement solutions will hasten the move toward achieving an adaptive, loosely structured system of engagement (see Figure 11).



SYSTEM OF
RECORD

Hosting Processes

> Highly Structured
> Hierarchical
> Transactional
> Slow Response
> Long Deployment Cycles
> Inward Focus



SYSTEM OF
ENGAGEMENT

Touching People

> Dynamic, Loosely Structured
> Responsive, Adaptive
> Conversational
> Fundamentally Social
> Short, Rapid, Iterative Releases
> Edge of Care

Figure 11: System of Record vs. System of Engagement

However, industry-wide progress toward embracing and offering such a system to consumers will still take five years or more. Amid a fragmented delivery system, members of the holistic care team will struggle to both access and contribute to the CHR; digital messaging will improve, but analog workarounds will persist. The fax machine repair business will keep its lights on.

With these members of the care team still on the outside looking in, integration of SDoH data will remain a slow process, though examples of progress will continue to pop up. (See Sidebar.) Expect these providers to be able to contribute to the CHR within the next 24 to 36 months – albeit before they are granted full access to the CHR themselves, for reasons equally political and technical.

In the meantime, some consumers will voluntarily supply this information, but many will not. Vendors should look to public data from HHS and the Census Bureau to fill any gaps, both at an individual and population level – and be ready to explain the source of this information when it suddenly appears in a consumer's CHR.

Case Study: The YMCA Diabetes Prevention Program (DPP)

In March 2016, a CMS audit of the YMCA of the USA's Diabetes Prevention Program (DPP) found "statistically significant gross savings" of $2,650 per participant over the program's 15 months.[48] This pilot program, which operated at 17 YMCA locations in eight states, was built on previous research concluding that a lifestyle intervention (a low-fat, low-calorie diet and moderate exercise) worked better than medication (metformin, which lowers blood glucose) at reducing an individual's risk of developing diabetes. The audit was accompanied by an announcement that DPP providers can now get reimbursed for administering the program to eligible Medicare beneficiaries.

In an effort to expand the DPP – an initiative recommended by CMS – the YMCA has since partnered with athenahealth. This will allow the vendor's network of more than 78,000 clinical providers to refer patients to the YMCA DPP and help them manage their care for the duration of the program.[49]

STAKEHOLDERS MOVE FORWARD BUT REMAIN STRATIFIED

Vendor innovation in engagement solutions will be driven by the usual suspects: Large IDNs, IPAs, and academic medical centers (AMCs) that have already taken on financial risk and payers with a large percentage of high-risk members, particularly in dual-eligible populations. Having previously addressed individual disease states and small cohort populations, these entities will pursue large-scale pilots for deploying next-generation engagement solutions that help patients comply with treatment plans, track health data between visits, and proactively address issues when necessary. Expect the welcome trend of sharing best practices with non-competitors, namely those in a different geography using the same EHR or care management solution, to continue.

A variety of less-traditional stakeholders – retail health clinics, direct primary care providers, direct-to-consumer telehealth vendors, emerging customer-centric payers such as Clover and Oscar, and even Apple and Samsung – will emerge as well. HCOs and payers should not view these entities as competitors: CVS Health, for example, has partnered with more than 60 HCOs to date and implemented Epic in order to better share data with those partners; meanwhile, Apple has several high-profile HCO partners using its CareKit and ResearchKit platforms, and the leading DTC telehealth firms (American Well, Doctor on Demand, MDLive, Teladoc) all have numerous HCO, payer, and employer partners.

HCOs and payers in the middle of the back will stand pat for at least 24 to 36 months while they sort their technology priorities as well as overall business models.

- HCOs not yet ready to become large-scale leaders in the VBR model may pivot to become regional care "destinations" or to focus on a specific disease profile. In either case, engagement initiatives will focus on the continuum of care available to consumers.
- Similarly, regional and state payers will look for engagement solutions that put the customer front and center in the care continuum, largely as a way to separate themselves from the pack of larger, national payers.

[48] Source: CMS.

[49] Source: athenahealth.

Solutions will be smaller in scale and narrower in focus than those of leading IDNs, IPAs, and payers, but they will be no less critical to these HCOs. This will require vendors to be patient – but, in due time, to adapt and scale their solutions to larger cohort groups.

Finally, stakeholders that do not pursue engagement beyond the patient portal for at least the next five years will face a stark choice: Jumping headfirst into a next-generation solution or – as part of a broader strategy in the shift to the VBR, ACO, and APM models – pursuing merger with or acquisition by an entity better positioned for long-term growth. In the latter case, solutions focused on building customer loyalty, with an emphasis on communication, operational efficiency, and streamlined workflows, will make HCOs attractive acquisition targets.[50]

As stated, successful vendors of next-generation engagement solutions must be able to articulate a clear vision for engagement in addition to pitching a product. This section of our Insight Report will help vendors understand how, when, and to what extent primary stakeholders intend to invest in engagement over the next five years. This will let vendors place their vision into the context of an individual entity's engagement strategy and help both vendors and healthcare stakeholders advance that vision to maturity.

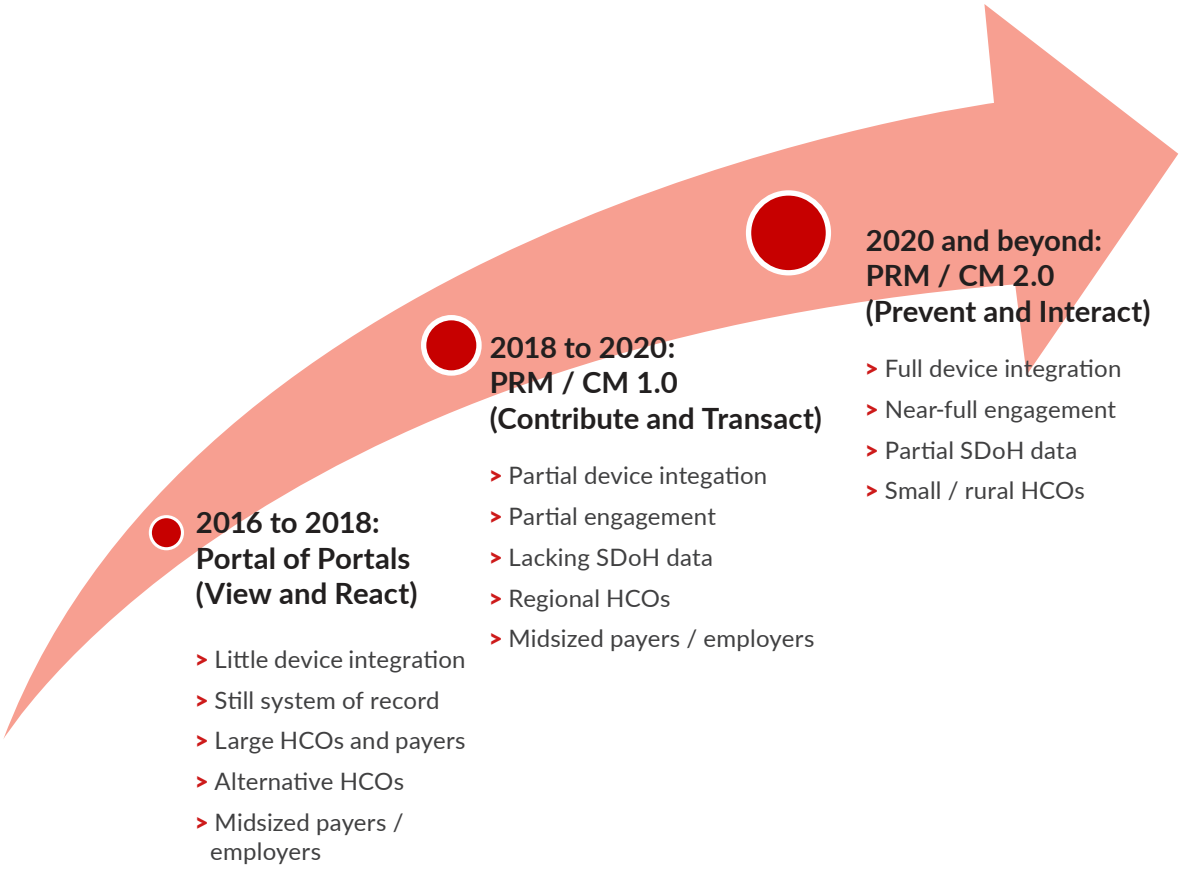


Figure 12: Engagement Solution Maturity Model

[50] Source: RelayHealth.

Stakeholders All-in on VBR Keen to Invest

Sooner or later, the industry's transitions to VBR and a consumer-centric business model will force all healthcare stakeholders to move beyond the patient portal and adopt new solutions. Those that are most interested in engagement solutions over the next three to five years will be those who have placed the biggest bets on bearing risk (see Table 7):

Type of Org	Reason for Interest
HCO	Participating in ACO, MSSP, or other alternative payment model [51]
	Integrating care as an IDN, IPA, or AMC
Payer	Working directly with large employer, union
	Taking on risk (Medicaid MCO, Medicare Advantage, dual-eligible)
Employer	Exploring self-insurance model

Table 7: Stakeholders Keen To Invest in Engagement

These models increasingly require payer-provider collaboration, so vendors must be ready to accommodate the needs of both types of stakeholders.[52] In addition, these stakeholders have moved beyond small pilots with single use cases and are ready to deploy solutions for initiatives ranging from reducing readmissions to onboarding new cohort groups to conducting HRAs on a large scale – and, as noted, they are bypassing healthcare IT vendors to work directly with consumer-first firms such as Apple and Fitbit.

Consumer engagement vendors who have not yet established a relationship with these influential stakeholders will find it difficult to get a foot in the door. Those who do – via an Innovation Center, hackathon, startup incubator, or investment arm – must demonstrate a long-term commitment beyond point solutions for a single hospital department or single chronic condition. These stakeholders are looking for investments that will scale.

Alternative Care Providers Emphasize Engagement

Many of the alternate venues of care mentioned earlier in this report – retail health clinics, DPC providers, telehealth providers, and emerging customer-centric insurers – place consumer engagement at the center of their business models. They see engagement as a way to drive customer loyalty and improve access to care, especially when compared to the traditional healthcare model. For example, a HDHP consumer with diabetes may find one of these providers less expensive and more convenient for obtaining insulin and scheduling routine care appointments.

While many HCOs will look to vendors that can influence their own engagement strategy, these alternative stakeholders already possess a clear strategy and don't need a partner with whom they can "grow together." Vendors must therefore move the conversation from vision to value – the savings, efficiencies, improved outcomes, and better consumer satisfaction that their solutions can provide. This may prove difficult, but vendors operating in this space will have the advantage of scale: With the exception of CVS Health, Walgreens, and Walmart, these stakeholders operate on small footprints relative to IDNs, IPAs, and AMCs. This will give vendors an opportunity to work more closely with HCOs to build solutions that deliver value.

[51] These include but are not limited to bundled payments for oncology, cardiac care, and joint replacement.

[52] Chilmark Research will cover payer-provider collaboration in greater detail in a forthcoming report. It's also worth noting that the spread of such collaboration has given pause to the trend of hospitals becoming insurers, which has proven to be less lucrative than many originally thought.

Many HCOs Have Hands Tied

Today's HCOs face myriad IT challenges that include security, analytics, and interoperability. That alone can cause them to put the brakes on a consumer engagement initiative. HCOs that have recently completed an EHR implementation or upgrade, or that are in the midst of such a project, will have even less capacity and willpower (in terms of finance as well as capital) to take on a big project.

Solution providers may be tempted to eschew these HCOs as potential partners or clients. Given their circumstances, improving engagement may not be central to their mission statement or a top priority of their board of directors. But there will always be front-line staff who do value consumer engagement and are willing to take incremental steps to improve engagement.

As such, vendors should be prepared to work with the systems that these HCOs already have in place, taking interim steps such as building a portal of portals, integrating new modules with existing portals, or taking a piecemeal approach to PRM / CM 1.0 functionality (emphasizing low-hanging fruit such as medication adherence or multimedia education resources). In addition, vendors should accept that lower-impact pilot projects, and not large-scale rollouts, may be all that these HCOs can handle for the time being. As these pilots unfold, vendors should remind HCOs how their solutions can accommodate their long-term engagement strategy.

In addition, smaller HCOs can provide opportunities for solution providers willing to get their hands dirty. Vendors who bring to the table a compelling vision for engagement in addition to a product can work alongside these HCOs to develop a long-term strategy. With the right partners, these HCOs may skip existing technology and embrace next-generation solutions for engagement (as well as modalities for other clinical, business, and financial use cases).[53] A comprehensive consumer engagement strategy, backed by executive leadership, will also make these HCOs more attractive M&A targets than competitors who lack such a strategy.

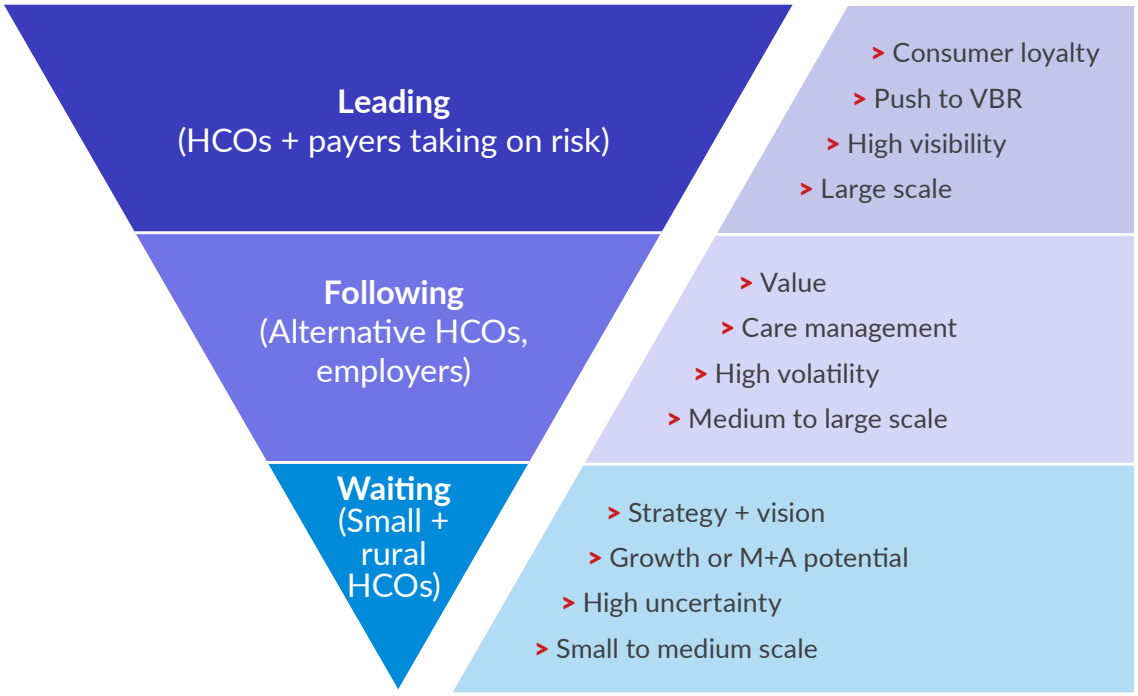


Figure 13: HCO Investment Model for Engagement Solutions

[53] Admittedly, these deployments depend on a variety of external factors, chief among them the further spread of broadband to rural areas of the country. Without the "last mile" of Internet connectivity, both HCOs and consumers will struggle to use solutions that so many in the United States take for granted.

CONCLUSIONS AND RECOMMENDATIONS

If the healthcare industry wants consumers to be more active participants in their care, to have more "skin in the game," then it must give them solutions that, at best, do an adequate job of engaging them in their care, both within but especially outside the care setting. Portals are not up to the task. They were not designed, and in fact were never intended, for the 360-degree model of engagement that provides the tools consumers need to become active participants in their own coordinated care. Even if you do not believe that FFS will give way to VBR in due time, consumers' lackluster response to portal technology should be enough to convince you that the status quo for healthcare consumer engagement isn't working.

KEY TAKEAWAYS FOR VENDORS

The following recommendations (summarized in Table 8) will guide healthcare IT vendors in their efforts to work with HCOs, payers, self-insured employers, and consumers to design, develop, and implement the next generation of engagement solutions.

Key Takeaways for Vendors
✓ Push the Envelope
✓ Emphasize Consumer-Centered Design
✓ Focus on Behavior Change
✓ Embrace Collaboration
✓ Think Small – and Think Big

Table 8: Key Takeaways for Next-Generation Engagement Solution Vendors

Case Study: Alegeus Technologies

Alegeus builds administration platforms for healthcare benefits. All told, the company serves more than 28 million covered lives. The Alegeus platform includes a contributions calculator, called Consumers Like Me, which lets members see what other people like them contribute to their HSA or FSA accounts. (It's a lot like the "people who bought X also bought Y" feature on many an ecommerce site.) According to the company, this helps members better understand the value and tax efficiencies in their CDHPs. In addition, it lets employers reduce the estimated 40 percent attrition rate from the time that members sign up for a CDHP to the time that they actually enroll.

Push the Envelope

Survey after survey suggests that consumers clamor for simple engagement features that focus on transactions: Scheduling appointments, finding doctors, emailing nurses, refilling prescriptions, seeing what procedures cost, and so on. This functionality is necessary, and worth building, but the short-term convenience that it offers does not improve outcomes in the long term. It simply provides new iterations of one-dimensional recordkeeping systems.

Next-generation engagement solutions must look ahead to what consumers will need in the next three to five years as VBR and care coordination mature (see Sidebar). Without pushing the envelope, after all, Ford Motor Company would not have built the Model T, and Apple would not have developed the iPhone.

Emphasize Consumer-Centered Design

Healthcare has been uniquely alone in failing to develop consumer-facing applications with the needs of the actual consumer in mind. Both engagement solution providers and their HCO clients must leave behind the "if you build it, they will come" attitude that led to the widespread adoption of EHR systems and patient portals that were built and implemented largely to meet government regulations and failed to meet even the most basic needs of end users.

The next generation of engagement solutions will provide an experience that consumers use because they want to, not because they feel obligated to. Solutions providers must understand how and why consumers will use an engagement solution, as well as what they want and how they intend to use it – and they must develop solutions using an iterative process (see Figure 14).

To get there, solutions will mimic social and ecommerce apps that work on multiple platforms, address users' needs in the background, and offer incentives for continued use. At the same time, engagement solutions must be specifically tailored to healthcare, with information presented in easily digestible bites, with gentle nudges after periods of absence, with clear calls to action, with care plan goals in plain sight, and with "warm transfers" to a real, live human never more than a click away. And they must be extensible to individual HCOs, which have far more clinical workflows, technology profiles, and patient populations than any A/B test will be able to cover.

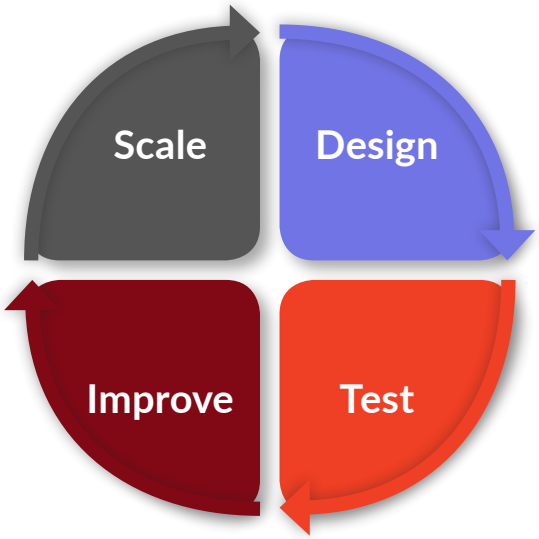


Figure 14: Iterative Process for Consumer-Centered Desig

There's no doubt that, collectively, these solutions will disrupt the delivery of healthcare services in the United States. Many will resist this change. Vendors must articulate their vision for the next generation of engagement solutions and demonstrate that consumers who are engaged, educated, activated, and ultimately empowered will self-manage their care to the point that clinical staff will devote less time to individual patients. Just as the ATM automated simple tasks that did not require an interaction with a bank teller, digital health will automate simple tasks that do not require interaction with a licensed healthcare professional, such as a prompt to schedule an appointment if data shared from a wearable or medical device is substantially different than normal.

Focus on Behavior Change

Once solutions embrace consumer-centric design, they can take the next step and encourage sustained behavior change. By matching application functionality to the three elements of behavior (motivation, ability, and triggers), solutions can better ensure that a particular healthy behavior takes place and – crucially for the care management needs of high-risk and at-risk consumers – becomes a long-term routine.[54]

There are several steps to achieving sustained behavior change:

- Understand that many consumers need support to get motivated. Solutions often focus on how consumers must engage, but the foundation of motivation is why they engage. To determine the why, ask open-ended, leading questions that will provoke consumers to think.
- Break larger care plan goals into short, frequent evidence-based triggers that mimic consumers' interactions with their mobile devices.[55] This helps consumers build both the skills and confidence necessary for achieving overarching care plan goals.
- To avoid paternalism, offer several recommendations instead of issuing a single directive. Encourage consumers to be proactive. Connect each recommendation both to the larger care plan and to the specific services that your organization provides.

[54] Source: B.J. Fogg's Behavior Model.

[55] For example, instead of telling prediabetics trying to lose weight to log all the food that they eat every day, give them a goal of eating one more piece of fruit. Or, for consumers at risk of hypertension, focus on basic tasks such as taking medications at the same time every day and logging blood pressure twice a week. Short interactions are also likely to trigger additional interactions on related material; for example, a consumer might finish an action on managing glucose and then, upon a prompt, view educational material on weight management.

- Use personalized Web forms, graphics, and videos in place of lengthy medical documents.
- Tailor rewards to consumers' motivations, bearing in mind that these differ within cohort groups.
- Put relevant data front and center and clearly articulate how HCOs are (and are not) using that data to improve your care. Provide feedback in real-time (or as close to it as possible), offering suggestions or nudges if the data shows that consumers aren't hitting their targets.
- Develop programs that evolve as consumers do, with tasks getting a little more difficult (and rewards a little better) as progress is made, always emphasizing that better decisions today lead to better health tomorrow.

When an engagement solution is able to encourage behavior change, it allows consumers to take greater responsibility for their health and wellness – and see the impact of even minor changes – and lets the industry achieve its larger goal of providing value-based care.

Embrace Collaboration

This Insight Report has stated time and again that building next-generation engagement solutions will require collaboration at many levels. Siloed solutions tethered to a particular provider, payer, or employment system will become less useful as the number of care venues continues to grow (and as those venues acquire each other and attempt to merge disparate IT systems).

Open APIs and data sets will enable vendors to grow beyond point solutions. In advocating this openness, vendors must shift the conversation from the benefits for their business to the benefits for HCOs and, ultimately, consumers: Solutions that connect these stakeholders and allow consumers to better understand how their efforts at behavior change and self-management can impact the care they receive (and pay for).

Finally, all stakeholders must embrace collaboration as part of a (much) larger purpose of creating a "culture of health." It will take an unprecedented effort to bring together every facet of a consumer's life that impacts health and wellness – work, school, community, food, and so on – but such collaboration is necessary to flip the healthcare industry on its head to emphasize health (nutrition, fitness, and mindfulness) as opposed to care (medication, surgery, and reactive interventions).

Think Small – and Think Big

The demographics don't lie: Tens if not hundreds of millions of Americans are at risk of developing one or more chronic conditions and requiring significant acute and post-acute care for years, if not decades – and there is no single, standard means of treating these individuals. Beyond that, young and healthy consumers/members/patients are poised to benefit from improved engagement with healthcare providers and payers as the industry evolves to make individuals more responsible for paying for their own care – in large part by shifting from a model that treats sick consumers at the point of care to one that enables health in between episodes of care, meeting consumers where it is most convenient and in the process building loyalty with the brand providing that seamless engagement experience.

Vendors must therefore think small and big at the same time – small to land those necessary pilot projects (especially at HCOs taking a more cautious approach to engagement) but big to scale to meet the needs of much larger populations. Point solutions may get vendors in the door, but a broad focus on self-management of care that is extensible to multiple engagement modalities, demographies, ethnographies, geographies, and disease states – beyond one hospital department in one facility in one delivery network in one city – will earn vendors the right to stay.

KEY TAKEAWAYS FOR PRIMARY STAKEHOLDERS

The following recommendations (summarized in Table 9) will guide providers and payers in their efforts to implement the next generation of engagement solutions for a broad base of healthcare consumers.

Key Takeaways for Primary Stakeholders
✓ Align Technology, Customer Experience, Business Model
✓ A Small Step Is Better Than No Step At All
✓ Focus on the Big Picture
✓ Look Beyond Your Organization's Walls
✓ Define Your Value Proposition
✓ When In Doubt, Ask Your Customers

Table 9: Key Takeaways for Primary Stakeholders

Align Technology, Customer Experience, and Business Model

For engagement initiatives to succeed, three things must align: The technology, the customer experience, and the business model. For example, a business model that emphasizes coordinated care is bound to fail if engagement technology is limited to a Web-based data repository and the customer experience is defined by a decades-old "rack and stack" philosophy of filling beds. The greatest, most comprehensive care plan and PRM tool will gather dust if the business model still depends on FFS and the customer experience doesn't account for the time it takes to explain a PRM to a patient suddenly confronted with a Type 2 diabetes diagnosis, wearable device, nutrition plan, and health coach who wants to schedule an online consultation first thing Monday morning.

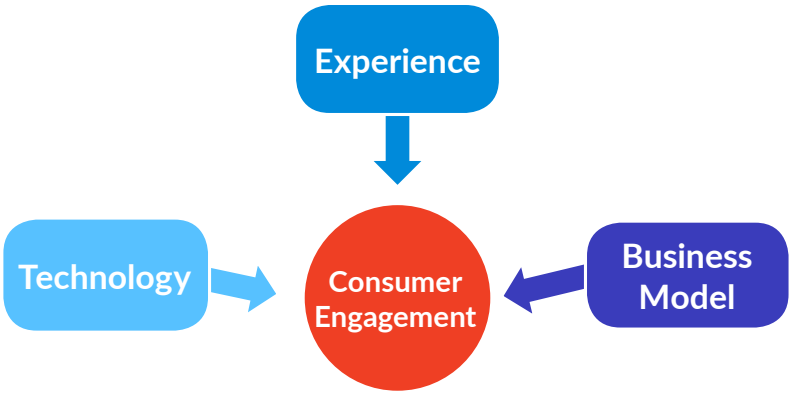


Figure 15: Aligning Factors for Successful Engagement

Simply put, each factor in Figure 15 must support the other, and in equal measure. Like any other IT system, an engagement solution is (or should be) implemented as part of a much larger organizational strategy. It will take a multidisciplinary team – one including at least one patient or member representative – to find a solution that aligns that strategy. It's not an easy conversation, but it's one that every HCO should already be having in today's business environment. Considering the needs of one's customers should be part of that conversation.

Focus on the Big Picture

Many of healthcare's recent innovations focus on single care episodes – retail health visits, virtual visits, on-demand house calls, DPC, urgent care, and a plethora of apps for finding a specialist in a given geographic area, along with the cost of a given service. These breakthroughs are certainly welcome, and they improve the healthcare experience for a majority of consumers, but by and large they remain outside the care continuum, creating additional care silos, and fail to address the factors responsible for the bulk of the nation's rising healthcare costs.

As HCOs continue to progress toward a coordinated care model, they must seek engagement solutions that focus on the bigger picture – maintaining health, managing conditions, preventing (re)admissions, closing care gaps, encouraging behavior change, addressing SDoH, etc. Solutions that improve single care episodes will bring short-term gains, but those that address the industry's most pressing needs and most underserved populations will have a much more substantial impact.

Always keep in mind the end goal of the Quadruple Aim: Solutions should improve outcomes, improve care, lower costs, and reduce the burden on medical staff. Identify which of those four aims is most important to your organization and look for engagement solutions that best address your challenges with regards to that aim.

Look Beyond Your Organization's Walls

Countless HCOs have formed Innovation Centers to cultivate new ideas for improving care processes. These groups should focus on problems unique to their particular institution, drawing from the experience of clinical staff and patient groups facing those problems every day, and at the same time realize that only some solutions can be monetized. (In other words, they should not serve as venture capital foundries. Healthcare already has plenty of those.)

HCOs must also recognize that, since so many organizations face the same problems, they are not alone in trying to find solutions. Instead of reinventing the wheel, these groups must shed the "not invented here" mentality and look beyond their four walls. Innovation centers should serve as liaisons between the healthcare executives that are defining digital health strategies and the external vendors developing engagement solutions that align with that strategy.

Rather than leave the door open to all inbound inquiries, HCOs should issue a request for proposal (RFP) when they wish to engage with the vendor community. This method, used by the Brigham Innovation Hub (iHub) at Brigham & Women's Hospital in Boston, ensures that an organization engages only with vendors that can potentially solve a problem previously identified by the innovation center.

Define Your Value Proposition

While it's important to consider an engagement solution that works for all types of consumers, it's also important to be realistic. Not all HCOs have the same cohort populations; nor do they have the same short- and long-term business models. As such, organizations must define their value proposition as they draft an engagement strategy.

An HCO targeting VBR and coordinated care will want a solution that improves interactions between a consumer and the care team, that helps consumers make the most appropriate care decisions, and that tracks their progress toward clinical as well as intrinsic care plan goals. An HCO more concerned with maintaining customer loyalty, on the other hand, will want a solution that emphasizes convenience, availability, and accessibility. While these two sets of needs are not mutually exclusive, they should drive the conversation that HCOs have with engagement solution providers and dictate the purchasing decisions that HCOs ultimately make.

A Small Step Is Better Than No Step at All

The lack of an all-in-one, one-size-fits-all engagement solution may dissuade some healthcare executives from making any kind of investment in engagement technology. The difficulty articulating the immediate ROI of that investment, especially at a time of competing IT priorities, doesn't make the case any easier.

This Insight Report encourages healthcare leaders to think big. But a small step forward is better than no step at all. HCOs should identify the biggest problem they have with engagement – communication, patient/member churn, education, adherence, behavior change, paternalism, data access, and so on – and then assemble an interdisciplinary team to brainstorm possible solutions, determine whether they can solve that problem internally or need external help, and develop an action plan to solve that problem. A small step toward addressing a big-picture problem could set the stage for further initiatives.

When In Doubt, Ask Your Customers

For a variety of reasons, healthcare typically fails to consider the wants and needs of its customers when designing basic products and services. (Clinical drug trials and other life-and-death matters are obvious exceptions.) HCOs struggling to identify a starting point for an engagement initiative need to bring patients, members, and caregivers into the conversation – and think far beyond HCAHPS scores or member survey results.

Consider some (or all) of the following open-ended questions.

- What would make your customer experience better inside the hospital?
- How do you prefer to get in touch with physicians? With nurses? With office staff?
- What's the biggest challenge you face in achieving your overall health and wellness goals?
- How many family members or friends would be interested in helping you achieve that goal?
- If a smartphone app could help you achieve your goals, would you use it? What about a device?
- How much, or how often, would you interact with that app or device every day?
- Are you open to seeing a physician or nurse over video? If so, for what type of interaction?
- How would you prefer to receive information about the medical condition(s) you have?
- When you have questions about your health, where do you turn? Who do you ask?
- Where would like your health to be in one year? Five years? Ten years?

Don't focus on technology at the outset. Listen to what customers tell you, then begin to explore the technology solutions that could solve those problems. Putting technology first risks hammering a square peg into a round hole.

ALL STAKEHOLDERS WILL SEE SAVINGS, BUT IT WILL TAKE TIME

The industry's shift from FFS to VBR will affect all who deliver, pay for, and receive care. Some stakeholders are more ready to make this transition than others, and as a result some are more ready than others to embrace a consumer engagement strategy that goes beyond the patient portal so prevalent in the FFS world.

Engagement is admittedly a difficult problem to solve. Amazon may have revolutionized ecommerce, but it built off the foundation of the payment card industry and the Sears Roebuck catalog. Facebook may have revolutionized social networking, but it built off the foundation of the "face book" that helped incoming college freshmen get to know each other. Both use cases translated well to digital platforms.

Healthcare, on the other hand, is trying to use digital platforms to revolutionize consumer engagement in the absence of an analog foundation for true engagement.

The Consume Engagement Model, Engagement Solution Maturity Model, and HCO Investment Model for Engagement Solutions presented in this Chilmark Research Insight Report will allow vendors to meet the needs of primary stakeholders at various stages of the shift from volume to value. These models will help vendors make informed decisions about what functionality to focus on, which HCOs to target, and how to cultivate partnerships that will advance consumer engagement from single care episodes to the entire care continuum. It will take at least three years for these efforts to begin to bear fruit – five or more years, in many cases – but vendors and stakeholders should lay the groundwork today that will enable better engagement tomorrow.

745 ATLANTIC AVENUE, 8TH FLOOR

BOSTON, MA 02111

WWW.CHILMARKRESEARCH.COM

INFO@CHILMARKRESEARCH.COM

PH: 617.615.9344