Issue Brief

Clinical Management Apps: Creating Partnerships Between Providers and Patients

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Abstract: The market for health applications, or apps, on mobile devices is growing rapidly, with over 40,000 currently in use. One type of app technology—clinical management apps—enable patients and providers to work together to manage chronic conditions, particularly diabetes and asthma. These apps are mostly used by health plans and large health care organizations with an interest in improving outcomes and controlling costs. Challenges to broader adoption of apps include the lack of objective research to evaluate outcomes, uncertainty about how to pay for and encourage the use of cost-effective apps, and the absence of a regulatory framework that standardizes development to ensure performance. If this infrastructure is developed, apps may serve as a catalyst to stimulate the transformation of health care generally and target low-income populations to expand access to care and help reduce health disparities.

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OVERVIEW

There are estimates of some 40,000 to 60,000 health and wellness applications, or apps, for use on smartphones, tablets, and other mobile devices on the market.[1] The health app market, estimated to be worth more than $700 million in 2012, is expected to double by the end of 2013.[2] More than half (52%) of smartphone owners have used their mobile devices to gather health information and 19 percent have at least one health app on their phone.[3] Yet this market is considered to be still in its infancy.

Health apps range from calorie counters and tools that provide guidance on diet, exercise, and lifestyle to those giving patients access to their medical data or helping them work with their providers to manage chronic diseases. This issue brief focuses on clinical management apps, which use mobile devices to connect patients and clinicians—providing new ways for physicians to partner with and interact with their patients. Some such apps offer access to patients' electronic

health records (EHRs) while others send data to physicians wirelessly or involve text messaging or secure emailing between patients and providers. Established medical device companies and start-up technology firms are developing these kinds of apps, as well as new technologies such as mobile cardiovascular tools and in-car telehealth.[4]

Clinical management apps may be especially beneficial for low-income and minority patients, who are disproportionately affected by chronic disease and face barriers to accessing and managing their care. In fact, safety-net populations appear to have better-than-expected access to mobile devices, often relying on cell phones for internet access in lieu of home-based computers.[5] Both African Americans and Hispanics are more likely than whites to own a smartphone. And among cell phone owners, African Americans and Hispanics are more likely than whites to use their phones to look for health information. African Americans are also more likely than whites to receive health information through texts and to have health apps on their smartphones (Exhibit 1).[6]

This issue brief provides an overview of clinical management apps and highlights two specific types that have the potential to improve care and clinical outcomes for conditions for which there are racial and socioeconomic disparities: diabetes management apps and asthma management apps. These tools are extensions of proven interventions that have been shown to

yield clinical benefits or financial savings or both and may provide models for other clinical management apps.

To date, there is little robust utilization and outcomes data on the effects of clinical management mobile technologies, with systematic reviews finding limited evidence of their benefits or mixed results.[7] Some studies have found early indications of added value from use of clinical management apps, but final results are still a few years away.[8] Given the success of the underlying interventions and the increasing use of mobile devices, the apps discussed below hold substantial promise that warrants additional evaluation.

Patients Want Apps to Promote Communication and Engagement

According to survey data, patients want health apps to connect them with their clinicians.[9] A Harris online poll found that more than one-third of people who participate in online activities are very interested in using smartphones or tablets to ask their physicians questions, make appointments, or receive medical test results. Similar percentages would like to use mobile apps for health care services, such as diagnosing conditions or monitoring blood pressure or blood sugar. Not surprisingly, interest in using apps is linked to age; for example, about one-quarter of people age 65 and older were very interested in apps to manage blood pressure, compared with 46 percent among 25- to 29-year-olds.

Exhibit 1. Health Information Access, Cell Phones, and Smartphones*

	White, Non-Hispanic	Black, Non-Hispanic	Hispanic
Percent of cell phone owners within each group who use their phone to look up health or medical information	15% (2010) 27%	19% (2010) 35%	25% (2010) 38%
Percent of cell phone owners within each group who send or receive texts	79%	80%	85%
Percent of cell phone owners within each group who receive health or medical information via text	7%	11%	6%
Percent of U.S. adults within each group who have a smartphone	42%	47%	49%
Percent of smartphone owners within each group who have software applications on their phone to track or manage health	19%	21%	15%

* All data are from 2012 unless otherwise noted. Based on Pew Internet/California HealthCare Foundation Health Surveys: Aug. 9–Sept. 13, 2010, N=3,001 adults; Aug. 7–Sept. 6, 2012, N=3,014 adults age 18 and older.
Source: S. Fox and M. Duggan, "Mobile Health 2012: Half of Smartphone Owners Use Their Devices to Get Health Information and One-Fifth of Smartphone Owners Have Health Apps," Pew Internet and American Life Project, Pew Research Center and California HealthCare Foundation, Nov. 8, 2012.

Reminders to take medication or to exercise appear to be the least favored type of app among all age groups.[10]

Patients also want app technology to fit seamlessly into their lives and routines. In addition, apps that provide users with feedback on their progress and information on health benefits appear to encourage sustained use. Finally, privacy protections remain a critical concern for both patients and providers.[11]

Wide Range of Clinical Management Apps

There are many different types of clinical management apps created and/or promoted by developers, health plans, and health systems, among others. Some hospitals use apps to help them work toward the goal of having at least 5 percent of their patients access their medical records through an electronic portal, one of the criteria used by the federal government to assess whether providers are making "meaningful use" of EHRs.[12]

Many developers promote single-function clinical management apps. For example, dermatology diagnostic apps enable the user to take a picture of a mole and transmit it to a diagnostic site to determine if it appears to be malignant or benign. A University of Pittsburgh study of such apps found, however, that 30 percent to 60 percent of melanomas were incorrectly classified as benign. Only one of these apps provided evaluation of the picture by a dermatologist, resulting in the highest (98 percent) accuracy rate. Apps with the lowest accuracy rate relied on an automated algorithm to analyze images.[13]

At the other end of the spectrum, some prominent integrated health systems such as Kaiser Permanente, Group Health Cooperative, and the Geisinger Health System offer their members access to apps to promote comprehensive medical management, from appointment scheduling to patient–provider communication to tools to manage chronic conditions.

For example, in 2011, Geisinger Health System launched a patient portal mobile app that provides patients access to their records and the ability to communicate with their care team, and more recently began pilot-testing text-message communications,

Group Health and Kaiser offer patients secure access to their medical records through an iPhone mobile app. Patients also can use it to email physicians, request prescription refills, see lab and test results, report and track their symptoms, schedule appointments, and engage in direct text-messaging with health care professionals. Kaiser's app also enables patients to find provider locations. Kaiser members had more than 12 million e-visits (direct email communications with their physicians) in 2011.

Source: *Kaiser Health News,* "Nearly 9 Million Kaiser Permanente Health Records Securely Available on Mobile Device," Jan. 24, 2012.

involving appointment reminders, medication reminders, and weight-loss tips. In 2013, Geisinger began testing a mobile Cardiac Rehab app through which patients receive medication reminders and educational information, track their physical activity, and relay concerns to their care team. The app is intended to reduce the need for patients to visit the hospital or outpatient clinic for cardiac rehabilitation.[14]

Apps and Mobile Devices to Improve Asthma Management

Because certain asthma interventions have been clearly associated with better outcomes, asthma management apps hold particular promise. For example, with support from the California HealthCare Foundation, the firm Asthmapolis designed a mobile device with Bluetooth-enabled sensors that snaps onto rescue inhalers to track how often people are using them, their location, and the time of day.[15] Capturing this information enables patients and their physicians to see whether asthma attacks are happening more often in conjunction with certain activities, in certain locations, or on certain days, allowing them to adjust medications and other treatment regimens as needed. An app then provides personalized feedback to patients to help them understand what triggers their attacks. The data are also transmitted to physicians to identify patients who are having trouble controlling their symptoms and can be used to identify potential environmental triggers

of asthma attacks. Early studies led by Asthmapolis found a 50 percent reduction in the number of people with uncontrolled asthma among users of the device and app. Partnerships with providers and payers have developed in the past year to expand the use of the device and related app.[16]

In another approach, Geisinger is using an app to survey patients with persistent asthma every 90 days via their computer or mobile phone to gather information on how effectively they are managing their condition. As of March 2013, only 13 percent of patients responded to the survey using their smartphone, but Geisinger expects this number to grow. Patients with low scores are called by a nurse to help them manage their condition. The survey app enables providers to check in more often with their patients and may help avoid asthma-related emergency department visits or hospitalizations.[17]

Diabetes Management Apps Monitor Glucose Levels and Diet

The prevalence of diabetes and the demonstrated benefits of clinical and self-management interventions have spawned the development of diabetes apps, which fall into three categories: enhanced blood glucose monitors, data transmission devices, and diabetes management apps.[18]

Enhanced blood glucose monitors collect diabetes patients' glucose levels, wirelessly transmit the data to the provider, and give patients real-time feedback. Data transmission devices are attached to a blood glucose monitor to enable transmission to a smartphone. While these devices mean users do not have to manually enter in their data, they must take the step of attaching the transmission device.

Health technology developers also are investing in mobile diabetes management platforms aimed at both prevention and treatment.[19] Diabetes management apps are intended to help patients with diabetes better control their condition, interact with caregivers and providers, and receive real-time coaching. At least one app sends data to case managers, who further advise the patients.[20]

The Diabetes mHealth Initiative, a collaboration among the U.S. Department of Health and Human Services Office of Minority Health, American Association of Diabetes Educators, AT&T, and Baylor University, piloted mobile diabetes self-management training to patients with Type 2 Diabetes in an underserved minority community. Diabetes educators delivered the training through secure video streaming via smartphones. The majority of participants were satisfied with the program, and other outcomes are now being evaluated.

Sources: E. L. Carter, G. Nunlee-Bland, and C. Callender, "A Patient-Centric, Provider-Assisted Diabetes Telehealth Self-Management Intervention for Urban Minorities," *Perspectives in Health Information Management,* Jan. 1, 2011 8:1b; "HHS, American Association of Diabetes Educators and AT&T Announce mHealth Initiative to Deliver Diabetes Self-Management Training," The Office of Minority Health, http://minorityhealth.hhs.gov/templates/content.aspx?ID=9109&lvl=1&lvlID=10; and personal communication with Ruth Lipman, American Association of Diabetes Educators, Oct. 9, 2013.

Carolinas HealthCare System in Charlotte, N.C., is developing an app "formulary" through a six- to nine-month pilot program that will provide Type 2 diabetes patients with access to 15 apps and other digital tools designed to help them manage their diabetes and overall health.[21]

These apps also are used by providers to interpret clinical data entered by patients and send real-time alerts and educational materials in response.[22] Rather than directly feeding into an electronic health record, the clinical information entered into the app generally goes into other repositories, which then can be reviewed or entered into an EHR. Some apps download the information into a diary that can be shared with clinicians during office visits.

Evidence of the impact of diabetes apps is still limited. A few available studies by app manufacturers suggest that various mobile diabetes management tools have improved hemoglobin A1c levels, reduced emergency department visits and hospital stays by 58 percent over 12 months, and/or improved patient–provider interactions.[23]

Challenges to Development and Spread of Clinical Management Apps

To date, widespread use of clinical management apps appears to occur mainly in integrated health systems or through large employers. Apps that monitor patients' biometrics or enable patients to interact with a provider's office are not yet in general use among smaller provider groups or hospitals, a reflection of the reimbursement, technical, regulatory, personal, and financial challenges in bringing apps to scale.

Clearly, there needs to be a business case for use of clinical management apps to promote widespread adoption by providers or support from payers. Integrated health systems with capitated payment or another form of risk-sharing may be willing to experiment with apps that help manage patients' conditions and show promise of reducing utilization of high-cost care. But providers working in fee-for-service environments will generally expect to be paid for the time they spend on managing care through apps and for associated software or equipment costs. Yet insurers, employers, and other payers are unlikely to reimburse for these costs until there is more robust evidence of their effectiveness.

There may also be technical challenges to the spread of clinical management apps. For example, in most cases there are not seamless interfaces between app platforms and providers' existing information technology systems.[24] There are few examples of data from apps automatically downloading into EHRs, perhaps because of concerns about nonclinicians adding to patients' records. Typically, data from apps are fed into separate portals and then manually transferred, either selectively or in total, to an EHR. In many cases, it is unclear where the data go once they have been transmitted from an app. Presumably, these submissions are monitored and eventually included in the medical record, but the administrative and clinical processes for retrieving the data have not been transparent. Developing automatic pathways to ensure that information received from patients is reflected in their EHR and treatment plans may result in better outcomes and lower costs.

The absence of regulation to date likely promoted app entry to the market but also hindered widespread app use by consumers and providers uncertain of the apps' safety and performance. However the Food and Drug Administration recently released final guidance indicating that it will focus its oversight on those apps that carry greatest risk if they do not function correctly. These include diagnostic apps and those that act as medical devices.[25]

The industry itself has been seeking more standardization to facilitate development and use of health apps. In the absence of a government approval process until recently, private entities have attempted to fill the void by evaluating the technical performance of apps and providing a "seal of approval" for those that operate as advertised.[26]

Among patients, barriers to adoption of health management apps include concerns about privacy of their personal information and lack of knowledge or discomfort with technology, particularly among older patients. Insufficient training in IT applications is a barrier for both patients and providers of care.[27]

Particularly for lower-income populations, the expense of smart phones with adequate data plans can be an barrier, which has led some Medicaid managed care plans to provide smart phones to enrollees to encourage use of wellness and health management apps as well as better communication with providers and care managers.[28] In addition, the FCC will be expanding its Lifeline program that provides free basic cell phones to include smartphones and a limited internet plan for people eligible for Medicaid, food stamps, and other poverty-related programs.[29] One Lifeline assistance program for wireless phone service is partnering with a mobile company to offer free two-way messaging services between Medicaid and low-income patients and their health care providers, insurance carriers, and HMOs.[30]

CONCLUSION

For widespread adoption to occur, clinical management apps will need to be incorporated into provider reimbursement schemes and integrated into EHR systems

and other health information technologies. Such apps also will need to be rigorously evaluated and regulated to ensure their safety, performance, and effectiveness. Integrating apps into health care delivery faces several hurdles among consumers, clinicians, and payers, including lack of robust evidence of their impact on outcomes or costs; lack of knowledge or training on health applications; incompatibility with current health care practice and technology platforms; and concerns about impersonal care and privacy. If these hurdles are overcome, clinical management apps have the potential to help improve health outcomes, reduce health disparities, and control costs.

Notes

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