

## The Scientific and Clinical Evidence for the Effectiveness of Internet-based Patient Engagement

### Abstract

Effectively engaging patients has been shown through extensive studies to improve quality, patient and provider satisfaction, and, perhaps most importantly, clinical and patient-reported outcomes. The dilemma is that the current practice model typically only allows for engagement during the clinical encounter or using general health education materials, both of which are suboptimal for a plethora of reasons. Physicians need new tools to effectively engage their patients, and the Internet offers an ideal platform for such interventions. A number of studies have reported that patient engagement tools vary widely in effectiveness metrics such as satisfaction, quality of care, treatment adherence and outcomes. In this paper we review both the theoretical and clinical study evidence regarding the effectiveness of patient engagement tools. This evidence overwhelmingly points to the clinical effectiveness of interactive patient engagement portals.

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### Rationale: Today's Market Rewards Patient Engagement

Medicine in this country has reached a crossroads. Professional, policy, and health-care market leaders have begun advocating for a move toward “patient-centered care” — a model that elevates the patient’s involvement, preferences, and needs, and reorients the system around the patient. A primary component of patient-centered care is patient engagement, which fundamentally entails including patients in their care, supporting their choices, and activating them to make necessary changes. The

call for patient-centeredness and engagement has emerged from a nexus of health-care trends. Patients and their families are more motivated than ever to become active partners in their care and take part in the decision-making process as market forces drive them to become more financially responsible and engaged.

At the same time, clinical practices are being held financially accountable in new ways as Medicare and other purchasers constrict reimbursement and move toward performance-based systems. Beyond aligning provider financial incentives with this performance, these organizations are

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further leveraging their financial purchasing power to require provider quality, efficiency, and patient satisfaction measures.

A core, underlying driver of performance is the nature of patient engagement in the care process. This has been shown to affect adherence to treatment plans, medical errors, outcomes, and satisfaction with the clinical experience. And the growing shift toward pay-for-performance and transparency in healthcare implies that as more information about healthcare becomes available to the public, patients are increasingly likely to turn to the Internet and develop even more questions for clinicians. Younger patients — particularly Baby Boomers — accustomed to using the Internet to manage other personal affairs have come to expect the same web-based resources and services from their physicians. However, obtaining effective patient specific information is a challenge. Any tool able to significantly improve patient engagement in an efficient manner for the physician would likely offer a definitive advantage and financial return.

### **Patient Engagement Improves Outcomes**

A number of studies report that engaged patients are more likely to be satisfied with their care, to give their physician high performance ratings, and to refer other patients to the physician. Patient understanding and engagement also improves treatment adherence, medication safety issues, self-care performance, and outcomes. A growing body of evidence shows that patients who are well-informed about their condition, test, and treatment options are more involved in their care and more likely to comply with prescribed therapies (Forkner-Dunn; Guadagnino).

Other research reports that patients with chronic illness who collaborate with their physicians tend to have less pain and better functional outcomes than those

who do not (Tang et al); patients who are more actively involved in discussions about the management of their diabetes achieve better blood sugar control (Coulter); and informed patients with hypertension are more likely to reach their blood pressure goals (Roumie).

### **Current Practice Impedes Patient Engagement**

Short visits, patient Internet searches, and complex medical options make engaging patients using traditional approaches ineffective, and demand a new vehicle for engagement. The rushed, face-to-face nature of the episodic office visit leaves little time for verbal informing and presents communication and retention challenges. In fact, more than one-third of American patients leave their physician's office without getting important questions answered (Woolf). Other research suggests that even when patients are informed, the process is ineffective. On average, patients recall about half of what healthcare providers tell them: "patients receiving verbal education alone may forget up to 50 percent of the information provided by a health care professional within 5 minutes of leaving a consultation."

Indeed, up to 45 percent of patients cannot remember the risks of surgery, 44 percent do not know the exact nature of their operation, and many are unable to answer basic questions about the procedures or services they agreed to receive (National Quality Forum). Illness and stress can further hamper patients' ability to retain information they receive during a physician's visit.

Increasingly, physicians are being asked by patients to review information from the Internet or answer questions based on Internet search findings, and thus are finding themselves charged with the task of interpreting and putting into context patient-retrieved Internet health

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information. This role is burdensome and problematic given the current, episodic, time-limited practice delivery model.

### **Internet Innovations as Engagement Tools**

Physician-directed Internet interventions offer a viable solution to this problem. In particular, a practice tool termed a “patient engagement portal” allows patients to be efficiently “recruited” into their own care in a way that encourages treatment adherence and engagement, more productively manages the informing process, and increases patient satisfaction.

Patient engagement portals are dynamic, interactive, web-based content and tool portals that combine specific medical educational content with interactive components such as self-assessment tools, behavior change, peer, and/or decision support and are “prescribed” to patients by a physician. These portals are then used in Internet interventions as part of care delivery to educate patients about their condition, test, and treatment options, help motivate them to change unhealthy behaviors, and offer self-care support.

Patient engagement tools are most effective when delivered by a trusted source, clinically related to a patient’s particular situation, made readily accessible and constructed with interactive applications. This explains the potency of a physician integrating these tools into the care delivery process as an extension of the patient-clinician relationship. One study that assessed features engendering patient trust in these portals found that being free of advertising or commercial sponsorship and being regularly reviewed and updated by medical experts were critical indicators of trustworthiness (Kerr). Other research has found that engagement and retention are best achieved by providing convenient and ready access to these tools for patients, their families or caregivers, as well as by

enabling bidirectional communication and feedback. Engagement tools should offer ready electronic access to the physician for non-urgent questions and include support tools, additional resources, and dynamic qualities that encourage patients to return to the site.

### **The Evidence**

A 2006 Cochrane review systematically analyzed a large body of clinical research on the impact of Internet interventions (also known as “interactive health communication applications” or IHCAAs). This review of 24 randomized controlled trials found that Internet interventions have statistically significant, positive effects on clinical outcomes (Standardized Mean Difference [SMD], 0.18 favoring Internet Interventions), patients’ knowledge (SMD of 0.46 in favor of Internet Interventions), social support (SMD of 0.35 in favor of Internet Interventions), and behavioral outcomes (SMD of 0.2 in favor of Internet Interventions). The review also found improvements in behavioral outcomes and self-efficacy. For example, patients’ knowledge about their condition or treatment options may increase due to the interactive nature of the Internet intervention; the use of graphics, audio, and video; and the ability to revisit the information repeatedly. Important features of social support in Internet interventions include email access to the provider and the ability to share experiences via online support groups.

Clinical outcomes also benefit from Internet interventions. Studies of children and adults with diabetes mellitus, for instance, show that use of Internet interventions improve HcA1c and lipid levels, decrease hypoglycemic attacks, and reduce depression. Similar research suggests that children with asthma who use Internet interventions with their caregivers have less severe symptoms and fewer emergency department and acute office visits. And people with

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conditions such as HIV, AIDS, encopresis, and urinary incontinence also experience improved clinical outcomes by using these engagement portals (Murray et al).

### Patient Engagement Portals' "Mechanism of Action"

As healthcare researchers started to discover in the 1960s, there is a broad range of effectiveness among health communication approaches in terms of engaging consumers or patients. One of the oldest and most resilient theories is The Health Belief Model (HBM). It is a value-expectancy theory; the premise is that a patient's decision to take an action involves their assessment of the value of an outcome and the expectation that a behavior will achieve that outcome. In other words, it is

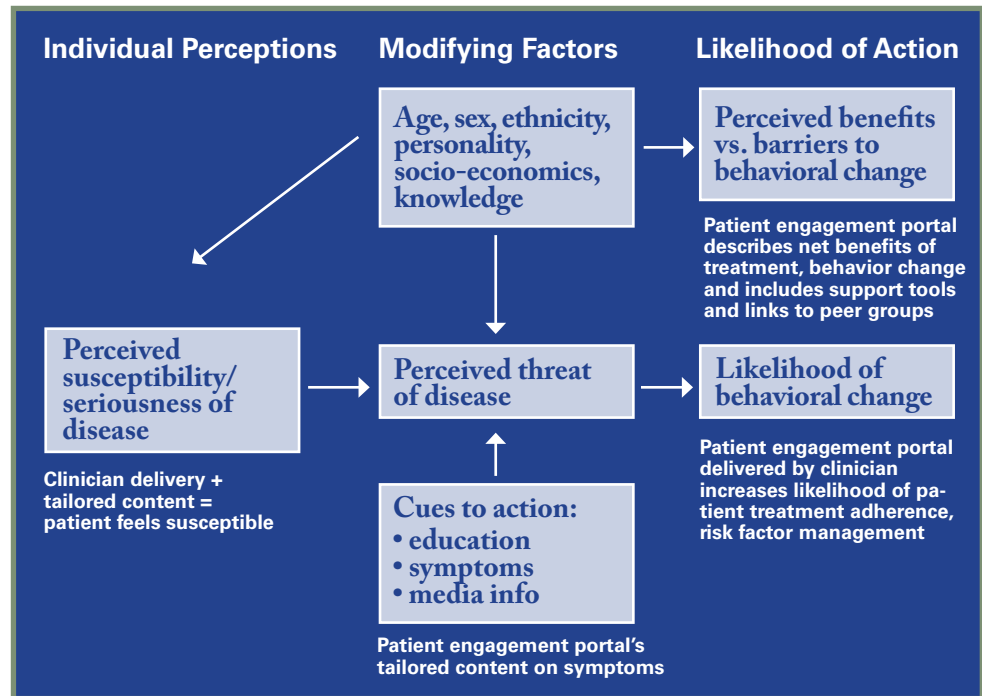
based on the understanding that a person will take a health-related action (i.e., see cardiologist) if that person:

- Feels that a negative health condition (i.e., heart attack) can be avoided;
- Has a positive expectation that by taking a recommended action, he/she will avoid a negative health condition (i.e., seeing cardiologist will help prevent heart attack); and
- Believes that he/she can successfully take a recommended health action (called self-efficacy; i.e., can adhere to a medication regimen or perform self-care after a procedure).

The six main concepts in the model deal with the patient's perceptions of the following: susceptibility to the outcome,

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## The Health Belief Model



Source: Glanz K, Rimer BK & Lewis FM (2002). *Health Behavior and Health Education, Theory, Research and Practice*. San Francisco: Wiley & Sons, Inc.

Figure. Application of the well-studied Health Belief Model to a clinician's use of a patient engagement portal explains the mechanism motivating patients to adhere to treatments or manage risk factors.

severity of the outcome, benefits of taking action, barriers to taking action, self-efficacy, and cues to action, which are strategies that activate the behavior.

Applying this HBM model explains why a physician that refers a patient to self-navigate a public website with educational articles (self-directed education) is relatively ineffective as an engagement approach. First, the patient must identify and find the articles that are relevant to their condition and treatment via navigation of some kind, whether virtual or otherwise. Given a patient's tendency to forget what was said during an encounter, self-navigation is quite problematic. This approach also has very little or no impact on the therapeutic relationship, and lacks the component of support tools and physician interaction. The relevance, perceived severity, and source trustworthiness also tend to be low. As Haby states, "There are both theoretical and empirical reasons to believe that health information on its own is insufficient to achieve positive outcomes" (Murray et al).

Patient engagement portal instruments, on the other hand, fulfill the HBM criteria for engagement: the content is detailed and targeted and is delivered at the point of care when relevance and motivation to process is high (when the patient has been diagnosed with a particular condition or will be undergoing a particular test or treatment). It is directed from the provider, a credible, trustworthy source who provides encouragement. Perceived barriers are mitigated due to the ability of patients to communicate with their physicians (generally online, on the telephone, and in the office). Because the delivery is active as opposed to passive, the placebo effect adds a valuable therapeutic component as well.

Weiner and Biondich argue that since information flow is central to the clinical encounter process, and because the way information is collected, shared, and analyzed impacts physician-patient relations,

information technology strategies will determine the extent of patient-centeredness and engagement achieved. "Relationships and information are closely intertwined in healthcare," they write. Applications that researchers have cited as promoters of patient-centered care include:

- Web tools that provide patient access to accurate, current, pertinent clinical information before and after office encounters;
- Electronic, asynchronous, secure communications between patient and clinician. Studies indicate that these channels can enhance the physician-patient relationship by increasing dialogue frequency and encouraging communications regarding sensitive issues; and
- Physician practice web portals that enable electronic collection of the patient's medical information outside of the clinical encounter. This provides efficiencies that can improve the quality of the encounter, since precious face-to-face time is not spent documenting background and historical information.

## Practice Business Adoption Issues

### Business Benefits

A medical practice that offers Internet-based patient engagement portals can meet patient demand and improve satisfaction, reap savings of both money and time, differentiate itself in an increasingly competitive marketplace, and create opportunities for research and patient data analyses. Furthermore, satisfied patients are less likely to sue. Patients who have received complete and comprehensive information about their condition, diagnosis, and treatment options are less likely to solely blame physicians if adverse outcomes occur (Hoffman) and are less likely to file malpractice claims.

A number of reports indicate patients' willingness to pay for access to Internet-

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based patient engagement tools:

- In an urban family practice study, nearly 75 percent of patients with Internet access — and 12 percent of non-Internet users — said they would be willing to pay an annual fee for one or more of the following online services: emailing with their physician, medication refills, viewing parts of their medical record, appointment requests, and billing inquiries (Adler); and
- Market research studies have estimated that 20 to 40 percent of patients are willing to pay for online communications with their providers (Taylor; Lin et al).

Practices that offer “e-visits” in exchange for a patient fee are typically charging from about \$25 to \$50 for each consultation (Liederman; Brewer).

Online messaging and other aspects of Internet interventions can efficiently handle common administrative communications between patient and office staff, including appointment scheduling, refill requests, and registration information. This generates several sources of savings for practices, including labor costs, telephone traffic, and clinician productivity. For example, one study found that providers who use web messaging with patients experienced an 18 percent drop in telephone volume call and a 14 percent drop in total message volume (Liederman).

Second, the productivity of physicians who use web messaging is considerably

higher than that of their counterparts who do not. In one study, these physicians averaged 11.1 percent more patient visits per day (2.54 more patients per physician), translating into \$95.34 more per physician per day than physicians who did not use Internet-based patient tools (Liederman). A study of physicians in a university hospital found that patient-physician web messaging could generate an additional \$18,160 per physician annually (Liederman).

Reduced no-show rates from patient engagement through online practice communications increase revenue-generating visits as well. And pre-visit intake lowers mailing costs and streamlines patient processing so that waiting room delays are decreased. Timesavings can also result when patients enter data into their personal health records or complete medical histories online prior to the clinic encounter.

## Conclusion

A critical mass of scientific and clinical evidence now warrants the incorporation of patient engagement portals into medical care delivery. Patients are now healthcare Internet consumers who have a different set of expectations regarding their involvement in their care and relationships with their physicians. By engaging patients using these interactive Internet applications, doctors intervene in a way that yields better clinical and patient outcomes, and more satisfied patients, families, and providers.

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