



Published in final edited form as:

*Health Aff (Millwood)*. 2013 August ; 32(8): . doi:10.1377/hlthaff.2012.1151.

## Electronic communication improves access, but barriers to its widespread adoption remain

Tara F. Bishop, MD, MPH<sup>1,2</sup>, Matthew J. Press, MD, MSc<sup>1,2</sup>, Jayme L. Mendelsohn, MPH<sup>1</sup>, and Lawrence P. Casalino, MD, PhD<sup>1</sup>

<sup>1</sup>Division of Outcomes and Effectiveness, Department of Public Health, Weill Cornell Medical College, New York, NY

<sup>2</sup>Department of Medicine, Weill Cornell Medical College, New York, NY

### Abstract

Principles of patient-centered care imply that physicians should use electronic communication with patients more extensively, including as a substitute for office visits when clinically appropriate. We interviewed leaders of 21 medical groups that use electronic communication with patients extensively and also interviewed staff in six of these groups. Electronic communication was widely perceived to be a safe, effective and efficient means of communication that improves patient satisfaction and saves patients time, but increases the volume of physician work unless office visits are reduced. Practice redesign and new payment methods are likely necessary for electronic communication to be used more extensively.

---

Electronic communication (e.g., email, messaging through an electronic health record [EHR]) between patients and physicians potentially has advantages over office visits and telephone communication.<sup>12</sup> Because it is asynchronous (i.e., the patient and the physician do not have to communicate with each other at the same time), it may be used at times and from locations that are convenient for both patients and physicians. It gives patients a record of their interaction with their physician. In cases where electronic communication is used through an EHR, conversations can be documented automatically in the medical record.

In 2001, the Institute of Medicine recommended changing from care provided solely through office visits to care provided through alternative mechanisms such as telephone and electronic communication to improve quality of care.<sup>1</sup> Principles of new primary care models such as the Patient Centered Medical Home (PCMH) and the Chronic Care Model (CCM) imply that practices should use electronic communication more with patients and that this form of communication could sometimes substitute for office visits when clinically appropriate.<sup>2–10,11</sup>

Despite the potential benefits of electronic communication and its potentially important role in improving quality of care, in 2008 less than 7% of physicians reported regularly communicating electronically with patients.<sup>13</sup>

Several medical groups, however, have described using electronic communication not only to communicate clinical information to patients (e.g., test results) but also to manage clinical

---

**Correspondence:** Tara F. Bishop, MD, MPH, Department of Public Health, Weill Cornell Medical College, 402 E. 67<sup>th</sup> St., Room LA-218, New York, NY 10021, tlfernan@med.cornell.edu. Tel. 646-962-8117. Fax 646-962-0281.

**Disclaimers:** None

The authors have no conflicts of interest to report.

conditions (e.g., simple acute problems) instead of having patients come into the office for face-to-face visits. Little is known about how such electronic communications programs function, what barriers medical groups face when starting electronic communication programs, and the effect of electronic communication on patients and provider. This knowledge may be useful for other medical groups that are looking to increase electronic communication and for payers and policymakers who may want to encourage more electronic communication between patients and their providers.

In this qualitative study of medical groups that use electronic communication extensively, we aimed to answer three research questions: 1) how can primary care practices use electronic communication to manage clinical issues that traditionally are managed during office visits, 2) what are the perceived advantages and disadvantages of these programs for patients, physicians, and practices, and 3) what are the barriers to and facilitators of implementation of electronic communication programs?

## Methods

### Design and sample

We identified 78 medical groups that we believed were using electronic communication through literature review, personal knowledge of organizations, and discussions with nine key informants, including informants knowledgeable about PCMH demonstration projects. Leaders responded from 35 groups. We asked each leader if they were using electronic communication systematically to deliver primary care. In the 21 groups in which the reply was “yes,” we requested an interview with that person or another leader.

We chose six of these groups (“case study medical groups”) for additional interviews because they used electronic communication extensively and varied in type, size, location, and the way they were paid by health plans. In these six groups, we conducted additional interviews with frontline providers (i.e., providers who spent the majority of their time doing direct clinical care) and non-provider staff who were identified by the leaders we had interviewed.

The six medical groups were: 1) Colorado Permanente Medical Group, a multispecialty group practice that cares for Kaiser Health Plan patients 2) Eisenhower Primary Care 365, a small group practice within an academic medical center that charges an annual retainer fee for all of its patients, 3) Fairview Health Services, a large group practice that uses a fee-for-service model but is reimbursed by private health plans for specified e-visits, 4) Group Health Cooperative, an integrated health care delivery and insurance system, 5) Palo Alto Medical Foundation, a large medical group that is paid via a fee-for-service model, and 6) Southcentral Foundation, a non-profit medical group that cares for an underserved population and is paid via a fee-for-service model with government supplementation.

We also interviewed a convenience sample of 6 leaders from national and regional health plans to learn whether their plan paid for electronic communication or had intentions to pay for electronic communication.

### Data collection

We developed an interview guide to use in semi-structured telephone interviews with group leaders. The instrument focused on 1) demographic characteristics of each medical group, 2) details of each group’s electronic communication program, 3) perceived advantages and disadvantages of electronic communication between physicians and patients, and 4) perceived barriers to and facilitators of implementation of electronic communication programs. For the six case study medical groups, we used a similar interview tool with

frontline providers and non-provider staff but focused more on their day-to-day experience with electronic communication and their perceptions of the advantages and disadvantages of this communication medium.

One of three investigators (T.F.B, M.J.P, or L.P.C) conducted each interview and one investigator recorded notes (J.L.M.). Interviews lasted between 30 and 60 minutes. We conducted interviews from February, 2012 to June, 2012.

## Analysis

Two investigators (T.F.B. and J.L.M) coded the interview notes in Atlas.ti (Version 6.2 Scientific Software Development) using the constant comparative method.<sup>23,24</sup> We identified *a priori* domains and themes and iteratively refined them until no new domains or themes emerged. In the results section, we report the number of respondents who mentioned each advantage, disadvantage, barrier, and facilitator.

## Limitations

Our study has some limitations. First, we used key informants to identify practices that communicate electronically with patients and possibly missed small practices, which are less visible. However, national surveys suggest that most small practices do not use electronic communication extensively.<sup>13</sup> Second, we interviewed a limited number of frontline providers and non-provider staff who were not randomly selected, but rather suggested to us by leaders of the groups. It is possible that these respondents had a more positive view of electronic communication than others in their organizations. Third, we used an iterative process for interviews, changing our interview instrument slightly as new information emerged. These factors, plus time constraints on the length of the interviews, meant that not every respondent was asked about every possible advantage, disadvantage, barrier, and facilitator. Therefore the numbers we report should be interpreted as frequencies not as percentages (ie, numerators over a denominator of twenty-six). Finally, we did not interview leaders or physicians in medical groups that had not instituted extensive electronic communication programs. Thus, the barriers we cite are ones that successful groups overcame. Medical groups that are not successful at implementing electronic communication programs or choose not to try may experience different barriers than those cited in our study.

## Results

### Case study medical groups

**Group characteristics**—Five of the groups were large (four with over 500 physicians, one with 115 physicians); the sixth was a smaller group (15 physicians) within a large academic medical center. Two groups (Group Health and Colorado Permanente) were tightly linked to their respective health plans and were paid via a negotiated budget, rather than by fee-for-service. The other four groups contracted with multiple health plans and were paid via fee-for-service. One group (Eisenhower 365) charged an annual retainer fee of approximately \$500 per patient and one (Southcentral) received government funds to help support its operations.

### Electronic communication programs

**Motivation to start initiative**—Leaders said that they started electronic communication programs to improve access to care and communication with patients. “There’s no way you can have a person-centered delivery system without having email communication with patients,” said a leader at Group Health. A leader at Fairview said, “We want to provide better access to primary care so [patients] don’t end up in the Emergency Department.”

For two groups (Group Health and Colorado Permanente) that were paid via capitation (i.e. paid a set amount for each patient), their payment model was a motivator for shifting face-to-face visits to electronic communication. Face-to-face visits generate revenue for groups being paid fee-for-service but represent a cost to groups paid via capitation.

**Content, management, and volume of electronic communications**—All six groups used electronic communication to communicate test results to patients and to allow patients to request medication refills, request appointments, and ask questions. At all the groups, providers decided whether they wanted to manage acute and chronic clinical issues electronically.

Fairview was the only group that had a formal e-visit program, which they differentiated from the informal electronic communication of test results, medication requests, and appointment scheduling. Patients initiated e-visits and providers delivered care that required a clinical decision and might normally be done in the office: the management of simple acute issues (e.g., urinary tract infections, upper respiratory infections) and the management of chronic clinical conditions (e.g., blood pressure management).

At three groups (Group Health, Colorado Permanente, Southcentral) nurses, medical assistants or case managers triaged all the messages from patients. At the other three groups (Eisenhower 365, Fairview, Palo Alto Medical Foundation), patients could send messages to different pools (e.g., nursing pool for refills, front desk pool for appointments) but could also send messages directly to their providers. Providers could decide whether to manage all these messages themselves or have one of their staff triage them. In Fairview's e-visit program, all messages went to a pool of registered nurses who could either manage a limited set of clinical issues using internally-developed protocols, forward visits to providers, or ask patients to come in for an office visit if the issue could not be addressed electronically.

Based on our conversations with frontline providers, the volume of electronic messages that reached the provider (after triage in some cases) varied from 5 to 10 per provider per day at Colorado Permanente to 20 to 50 per provider per day at Eisenhower 365 and Fairview. The volume of formal e-visits at Fairview was about 3 to 4 per provider per week.

**Payment for electronic communication**—Fairview was the only group that charged patients for e-visits. Fairview had negotiated reimbursement for e-visits with some private insurers. E-visits required some level of clinical decision-making. Reimbursement for e-visits was typically less than for face-to-face visits, and patients paid a copay. Medicare and Medicaid did not reimburse for e-visits. Fairview did not charge for other forms of electronic communication (e.g., test results).

Palo Alto Medical Foundation initially charged patients a \$60 annual fee for unlimited electronic communication, but removed that fee in 2011 because competitors were providing the service for free.

Fairview assigned e-visits and electronic messages relative value units (RVUs) at lower values than for office visits and gave credit for these when calculating physicians' pay. Group Health initially paid its physicians an incentive (\$5 per secure message) but eliminated it because physicians were dissatisfied with the incentive amount.

**Provider schedules and workday**—Two medical groups added desktop medicine time to providers' schedules. Colorado Permanente changed the primary care schedule such that each hour included two 20 minute face-to-face appointments followed by 20 minutes for

telephone or electronic management of clinical issues. Group Health incorporated an hour of desktop medicine to the daily primary care schedule.

Eisenhower 365 did not carve out specific time for electronic communication, but providers could decide how many patients to see each day, with some choosing as few as 10 face-to-face visits and spending the remainder of their time on electronic communication and, to some extent, telephone communication with patients.

At Fairview, Group Health, and Southcentral, staff assessed provider schedules either the day before or the morning of each clinical session, determined whether any scheduled visits could be managed electronically or by telephone, and contacted these patients to offer management by telephone or electronically. This eliminated unnecessary visits and opened space for same-day appointments. This not only saved patients time but eliminated unnecessary out-of-pocket expenses (e.g., copays and deductibles).

### Perceived advantages of electronic communication

**Convenient access that saved patients time**—Fourteen respondents said that electronic communication provided convenient access to care that saved patients time. “Patients feel like they have direct access and a better line of communication even than a doctor’s personal cell phone,” said one leader at Eisenhower 365. A frontline physician at that same group described a patient who unexpectedly lost her spouse and benefited from direct access to her physician: “at 3 am when she couldn’t sleep she would email me. That was something I would never have dreamt would be a good thing [but it was].”

Southcentral’s patients often travel long distances for care. “If a woman knows that she’s had UTIs before and has the same symptoms, she is really appreciative of not coming in,” said one provider.

**Patient satisfaction**—Eighteen respondents said that patients were more satisfied after the initiation of electronic communication programs. “Patients love this model,” said a leader whose group’s Press-Ganey patient satisfaction scores were consistently in the 99<sup>th</sup> percentile. A frontline physician at Colorado Permanente said, “It’s a real customer service satisfier. People are really satisfied to be able to access their provider by email.”

**Efficiency**—Leaders and frontline providers cited efficiency as an advantage. “[An email] takes 1 minute or less of my time,” said a frontline physician at Eisenhower 365. A leader at Palo Alto Medical Foundation reiterated this point, stating that electronic messages take on average 70 seconds to send.

A physician at Group Health sends his patients a secure message several days before their appointment asking for their concerns. This improves the efficiency of office visits: “half the time they’ve written the history of present illness. I just copy and paste it into the EMR.”

**Safe, high quality care**—We asked specifically whether respondents were aware of cases in which electronic communication led to poor outcomes; no respondents were able to think of such a case. Some respondents argued that care delivered electronically was safer than other modes of care. “Almost everything you say on the phone, they forget immediately. It’s good to have a paper trail,” said one physician.

Nevertheless, most medical groups had safeguards in place such as warnings that secure messaging should not be used for emergencies.

### Perceived disadvantages of electronic communication

**More work for providers**—Although respondents cited many fewer disadvantages than advantages, one commonly cited disadvantage was that electronic communication created more work for providers. One leader said that one of the problems with electronic communication is that the work never ends: “it takes a psychological toll on some people - the feeling of never being done.”

Frontline providers in all six groups reiterated this point: “each email takes little time but the emails add up. In one day, I’ve been in touch with 60 of my patients - 10 in person and 50 through email.” Another physician said, “There’s no end to it. This has allowed us to work all the time.” One physician found electronic communication a nuisance: “initially I thought it would be helpful. The way my day is set up right now, I am scheduled to see patients; I really have no time to respond to emails. If I had time allotted in my schedule [for email] every day I think it would help.”

### Barriers to implementation of electronic communication programs

**Patient and physician resistance to change**—Several respondents cited patient resistance to change and inexperience with computers/email as barriers to the use of electronic communication. For some patients, electronic communication is a “whole new way of communication – it’s a different world,” said one physician. Others stated that patients are used to the “old-fashioned model” and “the biggest obstacle to get people to buy in is educating [patients].”

Physician resistance to change was also cited as a barrier. One leader from Fairview said that physicians initially did not want to use secure messaging but their opinions changed after they realized it made it easier to reach patients. This sentiment was reiterated by a leader at Group Health.

**Lack of payment for electronic communication**—Palo Alto Medical Foundation - the only fee-for-service group that did not charge a retainer fee, did not receive payment for e-visits from health plans, and did not receive supplemental government funding - cited lack of payment for electronic communication by health plans as a barrier. “The health plans say ‘the physicians are already doing it for free, why would we pay for it?’” said one leader.

### Facilitators of implementation of electronic communication programs

**Management support**—Management support was the most frequently cited facilitator for the implementation of electronic communication programs. Management educated providers on the benefits of electronic communication, allotted time in the workday for virtual care, and, in some cases, added RVUs for virtual care.

**Patient demand**—Frontline providers and staff cited patient demand as a facilitator. “People are used to being able to access anything and now they realize they can access their physicians,” said a physician at Colorado Permanente. Another stated that patients, both young and old, feel comfortable using computers and smart phones.

### Summary of information from the non-case study medical groups

Our interviews with leaders in 15 additional medical groups yielded information that was consistent with the themes from the case studies, but a few additional details emerged.

First, four groups charged patients a fee for e-visits that ranged from \$20 to \$45. None of these groups charged annual fees or were paid via capitation. Patients could submit their bill to their health plan; some private payers reimbursed for these e-visits.

Second, all of our case study groups and most of the other groups used non-structured input in which the patient entered text like an ordinary email. However, two groups used Instant Medical History, a structured input system where patients go through a set of questions that varies based on symptoms.<sup>25</sup>

### Summary of information from health plan leaders

From our interviews with six leaders from national and regional health plans we learned that to their knowledge very few health plans reimbursed for electronic communication.

Some leaders were exploring ways to help providers become more efficient, including incentives for e-visits. “It’s important to understand that [our] policy is not to reimburse for visits that are not face-to-face. However, in the telehealth arena we do have several exceptions to our policy. We have a rigorous process through which we will allow those exceptions [and pay for email],” said one health plan executive.

Second, some health plans consider new reimbursement models such as monthly per-member PCMH reimbursements as a mechanism to pay for any services that fell outside office visits, including e-visits and do not pay anything additional for electronic communication.

Finally, one executive stated that there was little demand by patients and physicians for electronic communication: “Other than seeing an occasional article in the press, I’m not sure how much it’s getting traction. It seems like it should, and I can certainly see the ACOs [Accountable Care Organizations] in particular having a keen interest in this. I could see it becoming important in a few years. But right now, we’re not hearing or seeing demand coming from the provider side.”

### Discussion

Electronic communication with patients is not common in the U.S., and extensive use of electronic communication to replace office visits appears to be rare. Nonetheless, we were able to identify several medical groups that extensively use electronic communication in clinical care. The interviewees in these groups reported many more advantages of electronic communication than disadvantages.

These interviewees stated that electronic communication improved access to care for patients, saved patients time, and improved patient satisfaction. Physicians reported that it was an efficient form of communication for them as well - each individual e-mail or secure message took little time. Given these findings, electronic communication should help groups meet PCMH goals such as improved access to care and better communication with patients.

The biggest disadvantage that these medical groups experienced and others could experience in the future is added work from electronic communication - providers lamented that electronic communication made the workday longer. As the number of electronic communications with patients increased, several groups tried to cut down on the number of office visits but, in most cases, the number of office visits did not decrease very much. Electronic communication therefore was often added work to a full day of office visits.

One possible way to circumvent this disadvantage is to implement team-based care, in which non-provider staff can help triage and manage electronic communications. Several

groups described using nurses to electronically manage simple clinical issues using protocols and teams to triage and co-manage electronic communication. This may be a key feature to avoid overburdening providers. But even with teams in place, providers and groups probably need more of a cultural shift. Not only do they need to realize what clinical care can be delivered electronically but also need to figure out who on a team should deliver electronic care.

A key challenge to broader use of electronic communication for clinical care is the traditional fee-for-service payment model. Since few health plans pay for electronic communication, it is not surprising that most of the medical groups we identified were paid in ways other than traditional fee-for-service (e.g., capitation, annual membership fees). For example, a capitated group working within a fixed budget can reduce its expenses and increase its net revenue if electronic communication replaces office visits.

The Palo Alto Medical Foundation was an exception. This group was paid via traditional fee-for-service and payers did not reimburse it for electronic communication. Competition with other medical groups was the main motivator in their extensive use of electronic communication. It was unclear from our interviews whether this group lost revenue because of a shift to clinical care that was delivered via electronic communication.

Fairview, was another exception. It was paid via traditional fee-for-service but was able to negotiate payment from some health plans for e-visits, that were defined as electronic communications initiated by patients in which clinical decision-making occurred (by a physician, non-physician provider, or nurse).

Fairview's reimbursement mechanism is one way that payers and policymakers can promote the use of electronic communication particularly for clinical care. But paying for this type of electronic communication is not the only reimbursement mechanism. If ACOs and PCMHs are given sufficient financial incentives, they may find it financially viable to shift away from the current model of providing as many office visits as possible to a model with fewer office visits and more care delivered electronically. It also remains to be seen whether competition for patients will eventually result in large numbers of practices using electronic communication extensively, even without compensation.

In summary, we identified a number of organizations that extensively use electronic communication for clinical care. Their experiences with electronic communication were, on the whole, very positive. Electronic communication allowed them give patients better access to care and allowed them to provide more patient-centered care. Unfortunately, traditional payment models are not equipped for a shift from care provided predominantly in the office to one provided electronically. As a result, extensive electronic communication may not be widely viable, and goals of better access and more patient-centered care may not be attainable.

## Acknowledgments

**Funding:** This project was funded by a grant from the Commonwealth Fund. Dr. Bishop and Dr. Press are supported in part by funds provided to them as Nanette Laitman Clinical Scholars in Public Health at Weill Cornell Medical College. Dr. Bishop is supported by a National Institute On Aging Career Development Award (K23AG043499).

We thank Melinda Chen, M.D., M.S. for her insight and expertise that greatly assisted the early phases of this research. We also thank the many people who consented to be interviewed, especially the organizations that consented to be case studies for this research.



## Endnotes

1. Institute of Medicine. Crossing the quality chasm: a new health system for the 21st century. Washington DC: 2001.
2. American Academy of Family Physicians, American College of Physicians, American Osteopathic Association (AOA). [Accessed July 29, 2012] Joint Principles of the Patient-Centered Medical Home. 2007 Mar. Available at [http://www.acponline.org/advocacy/where\\_we\\_stand/medical\\_home/approve\\_jp.pdf](http://www.acponline.org/advocacy/where_we_stand/medical_home/approve_jp.pdf).
3. Anderson G, Knickman JR. Changing the chronic care system to meet people's needs. *Health Aff (Millwood)*. 2001 Nov-Dec;20(6):146–160. [PubMed: 11816653]
4. Berenson RA, Hammons T, Gans DN, et al. A house is not a home: keeping patients at the center of practice redesign. *Health Aff (Millwood)*. 2008 Sep-Oct;27(5):1219–1230. [PubMed: 18780904]
5. Bodenheimer T, Grumbach K, Berenson RA. A lifeline for primary care. *N Engl J Med*. 2009 Jun 25; 360(26):2693–2696. [PubMed: 19553643]
6. O'Malley, AS.; Ginsburg, PB. Making Medical Homes Work: Moving from Concept to Practice. Washington, DC: Center for Studying Health System Change; 2008.
7. Wagner EH, Groves T. Care for chronic diseases. *BMJ*. 2002 Oct 26; 325(7370):913–914. [PubMed: 12399321]
8. Bodenheimer T, Wagner EH, Grumbach K. Improving primary care for patients with chronic illness: the chronic care model, Part 2. *JAMA*. 2002 Oct 16; 288(15):1909–1914. [PubMed: 12377092]
9. Bodenheimer T, Wagner EH, Grumbach K. Improving primary care for patients with chronic illness. *JAMA*. 2002 Oct 9; 288(14):1775–1779. [PubMed: 12365965]
10. Wagner EH, Austin BT, Davis C, Hindmarsh M, Schaefer J, Bonomi A. Improving chronic illness care: translating evidence into action. *Health Aff (Millwood)*. 2001 Nov-Dec;20(6):64–78. [PubMed: 11816692]
11. Casalino LP. Analysis & commentary. A Martian's prescription for primary care: overhaul the physician's workday. *Health Aff (Millwood)*. 2010 May; 29(5):785–790. [PubMed: 20439862]
12. Dixon RF. Enhancing primary care through online communication. *Health Aff (Millwood)*. 2010 Jul; 29(7):1364–1369. [PubMed: 20606189]
13. Boukus, ER.; O'Malley, AS. Physicians slow to e-mail routinely with patients. Washington, DC: Center for Studying Health System Change; 2010.
14. Kilo CM. Transforming care: medical practice design and information technology. *Health Aff (Millwood)*. 2005 Sep-Oct;24(5):1296–1301. [PubMed: 16162576]
15. Reid RJ, Coleman K, Johnson EA, et al. The group health medical home at year two: cost savings, higher patient satisfaction, and less burnout for providers. *Health Aff (Millwood)*. 2010 May; 29(5):835–843. [PubMed: 20439869]
16. Okie S. Innovation in primary care--staying one step ahead of burnout. *N Engl J Med*. 2008 Nov 27; 359(22):2305–2309. [PubMed: 19038876]
17. Bachman JW. The patient-computer interview: a neglected tool that can aid the clinician. *Mayo Clin Proc*. 2003 Jan; 78(1):67–78. [PubMed: 12528879]
18. Chen C, Garrido T, Chock D, Okawa G, Liang L. The Kaiser Permanente Electronic Health Record: transforming and streamlining modalities of care. *Health Aff (Millwood)*. 2009 Mar-Apr; 28(2):323–333. [PubMed: 19275987]
19. Ralston JD, Coleman K, Reid RJ, Handley MR, Larson EB. Patient experience should be part of meaningful-use criteria. *Health Aff (Millwood)*. 2010 Apr; 29(4):607–613. [PubMed: 20368589]
20. Zhou YY, Kanter MH, Wang JJ, Garrido T. Improved quality at Kaiser Permanente through e-mail between physicians and patients. *Health Aff (Millwood)*. 2010 Jul; 29(7):1370–1375. [PubMed: 20606190]
21. Zhou YY, Garrido T, Chin HL, Wiesenthal AM, Liang LL. Patient access to an electronic health record with secure messaging: impact on primary care utilization. *Am J Manag Care*. 2007 Jul; 13(7):418–424. [PubMed: 17620037]
22. Adamson SC, Bachman JW. Pilot study of providing online care in a primary care setting. *Mayo Clin Proc*. 2010 Aug; 85(8):704–710. [PubMed: 20516427]

23. Patton, M. *Qualitative Research and Evaluation Methods*. 3rd ed. Thousand Oaks, CA: Sage; 2002.
24. Glaser, B.; Strauss, A. *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Chicago: Aldine; 1967.
25. [Accessed July 31, 2012] Primetime Medical, Instant Medical History. Available at <http://www.medicalhistory.com/home/index.asp>.
26. Christensen CMBR, Kenagy J. Will Disruptive Innovations Cure Health Care? *Harvard Business Review*. 2000 Sep.
27. Whelan D. Disruptive Health Start-Ups Could Mean Fewer Doctors Offices. *Forbes*. 2010 Oct 5.
28. Schultz, JS. Getting Treated for Common Ailments Online. *The New York Times*; 2010 May 17.