

The Feasibility of Home or Patient Self-Testing

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In contemporary society, the most prevalent and the most demanding forms of illness are chronic diseases. These can involve daily regimens of care and self-management, usually for a lifetime, and often require significant modifications in the lifestyles and activity patterns of those affected. Recent year estimates suggest that as much as 75% of total health care costs can be attributed to the treatment of persons with chronic illnesses and their associated comorbidities and acute care episodes.¹ In decades past, the predominant concerns of health and medical care were largely related to the burden of illness associated with communicable and infectious diseases. However, today, our focus has shifted to the prevention and long-term management of chronic diseases.

Over many years, the emphasis in chronic illness care has been on the protocols for disease management and attempts to increase patient adherence to specific regimens of care. Health care technology applications have sought better methods for the detection and monitoring of disease indicators and the collection and analysis of trends in these indicators as part of overall strategies for patient care management. Despite the efforts of many, there continue to be widespread feelings of frustration and disappointment in the health care professions over the inability to achieve high levels of control of hypertension, diabetes, asthma, and other chronic conditions where patterns of personal health-related decisions and behaviors can affect these critical indicators of chronic disease self-management.

If satisfactorily controlling these vital health indicators among chronic disease patients were easy, it would not have required the efforts of so many over such a long period of time, with so few examples of successful and sustained outcomes. The good news is that there are now promising new forms of computer-assisted technology that offer the possibility of bringing the best knowledge in fields like health behavior and health education, clinical medicine, and information technology together to achieve a much

more effective interventional mode of long-term management of chronic diseases. Effective disease management care can significantly improve quality of life for those with these diseases, lead to a more effective outcome of medical therapies, and decrease overall costs of care.

New Technologies Available for Chronic Disease Self-Management

There are a number of exciting and promising developments in the field of chronic disease self-management that take advantage of existing technologies and integrate them in new ways to achieve greater efficiency and more effective self-management. For a number of years physicians and other health care professionals have used telephones to give patients the opportunity to dial in to report or upload recent readings of key clinical indicators

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and to contact them for reinforcement of medical advice and counseling. To date, many of these telehealth solutions have been tethered to the patient's home telephone line. They provided solutions for the critically ill, but were not ideal for the large population living a mobile lifestyle while trying to manage a chronic disease. The emergence of the cellular phone and its

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growing ubiquity and enhanced capabilities have provided a mobile platform to support chronic disease management in this on-the-go community.

The emergence of technology for data signal transmission to and from cellular telephones has opened up an entirely new dimension of communicating basic clinical information to and from a central site. Now it is possible, with the development of home medical devices recording biomedical indicators, to digitally transmit this information using Bluetooth® communications protocol to a cellular telephone and then to a file server. The file server can then interpret this information, comparing it to other measures taken over time, and send encouraging or instructional messages back to the patient to motivate positive health actions related to the chronic health condition. Simultaneously, a summary of this same information can be sent to the physician or other health care professional involved in the care of the patient. All of the data are accessible through a secure internet portal to the health care professional and the patient. These measurements can be taken, transmitted, interpreted, and commented upon within a few seconds, thus making it possible for both patient and health care provider to communicate about the ongoing management of one's chronic condition in near real-time.

Figure 1 depicts the way in which this new communication linkage can work with a telehealth software application installed on an off-the-shelf cell phone. Recent feasibility (acceptance) trials for Type 1 and 2 diabetes and congestive heart failure have shown that patients and their health care providers find this system an easily usable tool.

What are the Implications of These Technologies for Chronic Disease Care?

To be successful in managing chronic diseases the individual must take ownership of his/her disease. By using new mobile technology to provide a link to the doctor and to reinforce positive behaviors, the individual becomes empowered. The linkage enhances the physician-patient relationship and, through automatic notifications, keeps patients and providers updated on key aspects of the patient's treatment plan.

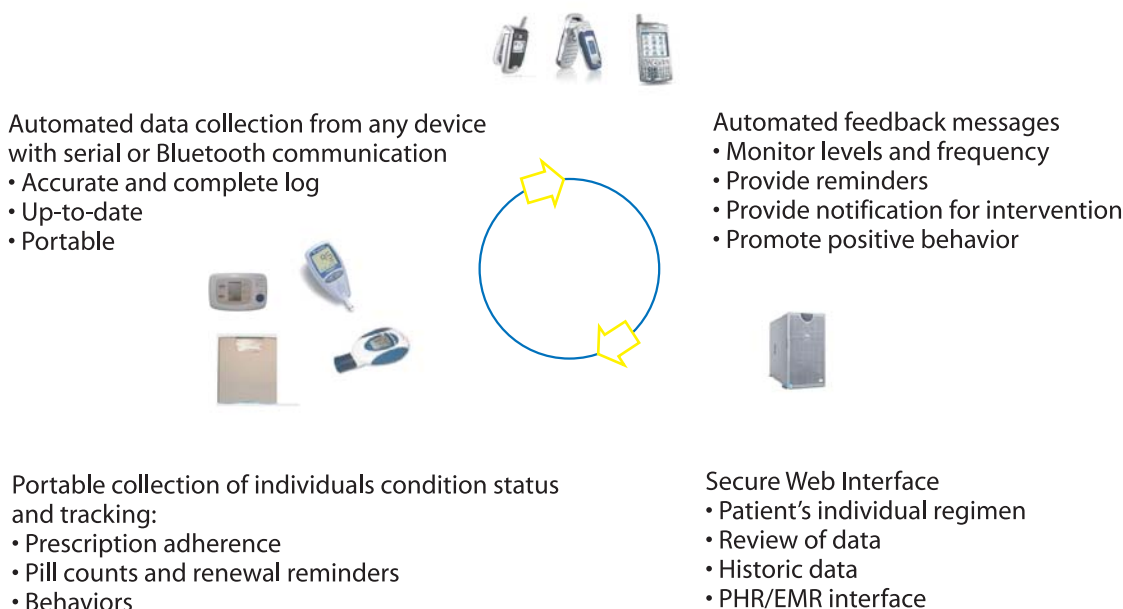
From a payer's perspective, good chronic disease management is good business. This new mobile telehealth tool has proven effective in early product trials with diabetes patients. It produced improved outcomes including more frequent testing, better glucose control, and lower HbA1cs. In addition to better short-term outcomes that translate to fewer emergency room visits, improving self-management and education is proven to reduce long-term complications and costs of care.

Other chronic diseases that require home medical device testing bear many of the same self-management issues and can benefit from this technology tool. For instance, by using an electronic weight scale, a cell phone-based weight management application can be used to promote positive behaviors in the individual's home. A protocol of self-reported symptoms and peak flow/spirometer readings can support improved asthma management. Patient reporting of prescription adherence, coupled with reminders and real-time biometric data, can be valuable to the patient as well as the provider.

In order for this or any tool to be successful in improving

Figure 1.

Cell Phone Telehealth Applications for Diabetes, Obesity, Asthma and Other Chronic Diseases Can Be Run on Many Mobile Devices



chronic disease self-management, it must be easy to use, nonintrusive, and be perceived to add value to the user. Using the cell phone, which is becoming an integral part of daily life,

greatly reduces the complexity barrier and allows for the strengthened connection to the provider to become part of the user's daily routine. **NCMJ**

REFERENCES

- 1 Centers for Disease Control and Prevention. Chronic Disease Overview. Available at: <http://www.cdc.gov/nccdphp/overview.htm#2>. Accessed March 23, 2007.



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