Using Telemonitoring to Improve Health Outcomes and Reduce Health Care Costs for Diabetics

Health Information Exchange Connects with Patients in New York

Overview

As health care costs in the U.S. continue to spiral upwards, many health care organizations have begun focusing on the use of information technology in the management of chronic diseases. After all, the Centers for Disease Control (CDC) estimates that treatment for chronic diseases—such as diabetes and heart disease—now accounts for 75% of annual U.S. health care costs.

The CDC found that in 2010, 26.9% of U.S. residents 65 years or older and 11.3% of residents 20 years or older had diabetes. If current trends continue, one in three residents will have type 2 diabetes by 2050. The CDC estimates that the medical expenses for people with diabetes are more than double that for people without diabetes and that the direct medical cost of diabetes treatment in the U.S. in 2007 was $116 billion. Diabetes patients often suffer from complications such as heart disease, blindness, or kidney disease, and the risk for death among people with diabetes is more than double that of people of similar age but without diabetes.

Western New York has seen these problems with their diabetic population. Because diabetes is largely preventable and manageable, the principals at HEALTHeLINK, the regional health information organization serving the eight counties of Western New York, believe that they can have a positive impact on the lives of patients with diabetes by leveraging sophisticated health information technology. In May 2010, Western New York, with HEALTHeLINK as the lead, received a $16.1 million Beacon Award from the Office of the National Coordinator to use health information technology to improve outcomes and care management for diabetic patients and support for the providers who treat them. Goals for the program include reducing emergency department visits, hospitalizations, and readmissions for these patients by 5%.

Dan Porreca
Executive Director of HEALTHeLINK

The point of the Beacon Program in general, and specifically this telemonitoring pilot, is to improve outcomes. If we can reduce the number of emergency department visits and hospitalizations by 5%, this will be a success both from a patient health and a cost of care perspective.
As part of the WNY Beacon Project, HEALTHeLINK embarked on a telemonitoring pilot program for diabetic patients in the community, with a focus on preventative health care and early intervention. Patients use mobile devices within their own home to transmit vital signs electronically to the HEALTHeLINK’s health information exchange where they are reviewed by health care professionals. Within the first six months, the team enrolled almost one hundred patients in the pilot.

**Challenges**

Western New York has 4,500 health care providers serving 150,000 diabetic patients, one of the highest rates of diabetes in the country. And, the incidence of type 2 diabetes in the region is on the rise, especially within certain racial and ethnic groups.

As HEALTHeLINK embarked on the project, they were aware that clinical studies of telemonitoring efforts showed mixed results; some observed costs savings and improved patient outcomes, while others observed little or no improvement. They realized that the telemonitoring pilot would succeed, only if they could overcome the major issues faced when implementing telemonitoring projects:

- Ensuring patient compliance and acceptance
- Minimizing disruptions to the workflow of physicians

**Solutions**

One major component of the WNY Beacon Project is the implementation of advanced remote monitoring technology to help high-risk diabetic patients actively manage their health care from their homes. The telemonitoring devices used in the pilot capture twelve measurements and transmit the results through a secure virtual private network to HEALTHeLINK’s health information exchange, the Axolotl HIE powered by OptumInsight. The readings captured include glucose, fasting glucose, blood pressure, weight, pulse, heart rate, and oxygen saturation.

**Patient Compliance:** To address the first major issue associated with telemonitoring—ensuring patient compliance and acceptance—HEALTHeLINK partnered with home health care providers such as Catholic Health’s McAuley Seton Home Care and Kaleida Health’s Visiting Nurses Association. Each patient in the telemonitoring pilot project is visited by a nurse who trains the patient on the use of the telemonitoring devices and gets the patient up and running. The nurse is available to work with the patient as needed, either at the patient’s home or over the phone. This has been shown to improve patient compliance with the project. Another factor that increases patient acceptance is the use of customized alerts reminding patients of needed care—such as blood tests or eye exams. HEALTHeLINK believes that involving the patient directly in their own health care improves compliance, accountability, and acceptance of the process.

**Physician Workflow:** The nurses are also critical in overcoming the second major issue associated with telemonitoring—minimizing disruption to the workflow of the primary care physicians and specialists who work with this population of patients. Nurses and other health care professionals review and interpret the data on a daily basis and determine which health information must be seen immediately by the treating physician. The patient’s physicians receive critical information promptly, which ensures that potential problems are quickly identified and addressed before they become emergencies.
Physicians have access to the data through the Axolotl Virtual Health Record or through their own EHR system. Physicians can choose to see all data or to filter the data based on parameters (e.g., only data out of range). This approach significantly reduces the provider’s time and paperwork in overseeing the patient’s health care.

Historically, physicians have been skeptical about the use of telemonitoring, in part because of the concern about information overload. However, Tom Unger, HEALTHeLINK Program Director, states, “By partnering with Catholic Health Home Care Services and Kaleida’s Visiting Nurses Association to structure this pilot program, we designed a telemonitoring service that has a minimal impact for the treating physicians and a maximum impact for the community.”

Physicians can use the technology built into the health information exchange to graph the data received through the telemonitoring devices. Therefore, rather than looking at each set of data independently, the treating physician can, at a glance, focus in on trends in the data, such as the day of week or time of day that a spike occurs in the patient’s blood sugar.

**Results**

Currently, the cost for the pilot is on average $216 per patient per month. However, according to Nancy Maloney, senior business architect for the WNY Beacon project, “It is expected that the savings realized from the reduction in emergency department and hospital visits by these patients will more than offset these costs.” In fact, eliminating one ED visit each year for each patient will cover the costs associated with the pilot. HEALTHeLINK also expects that the price per patient will continue to drop over the next year or two due to economies of scale and the expected decrease in price of the technology.

Is this working? One sign of the success of the project is that at least one physician practice participating in the pilot has requested that more of their patients be enrolled. Another sign of success is that Western NY is already seeing a positive impact on patient care, exemplified by the story of a 71-year-old diabetic female with congestive heart failure who began using the telemonitoring devices and built-in education in June 2011. Three months after joining the pilot she had reduced her glucose/HbA1C levels from over 9% to 5.2%, well below the recommended level of ≤ 6.5%, and her physician took her off her diabetic medication.

Dan Porreca, the Executive Director of HEALTHeLINK, observes that, “The point of the Beacon Program in general, and specifically this telemonitoring pilot, is to improve outcomes. If we can reduce the number of emergency department visits and hospitalizations by 5%, this will be a success both from a patient health and a cost of care perspective.” The HEALTHeLINK staff members involved in this pilot project expect to see a slowing or even reversal of the diabetes of many of the participants due to enhanced coordinated care and the use of health information technology. They also see a future with reduced health care costs and improved health care outcomes for this vulnerable population.

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### Summary of Results

- **HEALTHeLINK exchange:**
  - Participating practices: 312
  - Participating providers: 2,022
  - Number of users: 5,696
  - Results available—56 million, with 1.7 million results added monthly
- **$16.1 million Beacon grant awarded May 2010**
- **Telemonitoring pilot started late May 2011**
- **Almost 100 participants enrolled in first six months; target enrollment is 150**
- **The average cost per patient is $216 per month, but costs are dropping due to economies of scale and decrease in price of technology**
- **Partnering with care managers has ensured widespread acceptance by patients and health care providers**
Resources