

The Promotora Telemedicine Project: Combining Technology and Cultural Sensitivity to Improve Diabetes Care in a Medically Underserved Community

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Abstract

The Promotora Telemedicine Project utilizes a telemedicine network to link diabetic patients in underserved areas with teams of physicians and Certified Diabetes Educators who deliver state-of-the-art health care services. Care is assisted by a support network of Spanish-speaking facilitators who serve as a cultural interface between Latino patients and diabetes care providers. This project is designed to test the hypothesis that new technology can be combined with culturally sensitive programs to improve access to high-quality care and to reduce the cost of diabetes care in Santa Clara County, California.

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Introduction

In Santa Clara County, California, 24% of the population is of Latino descent (U.S. Census Bureau, 2003). Of these,

- 12% of households live below the poverty level (\$12,675 for a family of four).
- 24.7% do not have health insurance, either job-based or government-based – the highest prevalence of all ethnic groups in the county (SCCPHD, 1997, p. 39).
- 10.6% have diabetes, rising to 25% of those over the age of 45 (CHPSCC, 2003).

Mexican-Americans in the U.S. who have diabetes:

- Have a 32-40% probability of developing diabetic retinopathy (ADA, April 2003);
- Are 4.5-6.6 times more likely than the general population to develop diabetic kidney failure (ADA, April 2003).

In addition to its high prevalence and higher likelihood of complications in Mexican-Americans, diabetes presents a special challenge because it's such a rapidly changing field in terms of both technology and treatment methods. This makes it very difficult for primary care

physicians to remain current in knowledge and skills.

For the patient with diabetes, treatment regimens are much more complicated than those for most other chronic diseases, and require more patient effort. Compliance is further complicated by poverty, as well as by language, educational and cultural barriers.

Lack of health insurance is a major barrier to accessing health care services. A survey of residents of Santa Clara County (all ethnicities) showed that 42.7% of those who were uninsured and needed to see a doctor during the previous year had not done so because of the cost, compared to 4% of those who had employer-based insurance (SCCPHD, 1997, p. 41). Unfortunately, many of those who defer medical attention for minor problems or for chronic conditions will develop complications that require hospitalization or surgery.

In Santa Clara County, diabetes is the third leading cause of hospitalization and the sixth leading cause of death among all older adults. Among Hispanics, the mortality rate for diabetes

increased by 34% between 1993 and 1999 (SCCPHD, 2001, p. 47-49, 77-78).

Health care costs for diabetics in Santa Clara County are estimated to total \$1.5 billion, or 29% of all health care dollars spent in the county (CHPSCC, 2003).

National statistics are similarly alarming. A recent study by the American Diabetes Association estimated total costs for diabetes in the US in 2002 to be nearly \$132 billion, including \$91.8 billion for direct medical expenditures and \$39.8 billion for indirect costs. Considering only direct medical expenditures, people with diabetes accounted for costs of \$13,243 per year, compared to \$2,560 for people without diabetes (ADA, 2003).

This 5:1 cost ratio would be even higher if the figure included indirect costs such as lost productivity due to disability and early mortality as well as expenses for over-the-counter medications and supplies. Also, since approximately one-third of all people with diabetes are undiagnosed, they are categorized with the non-diabetic population, resulting in further underestimation of the true costs of diabetes and of the differential between costs for those with and without diabetes.

Applying current diabetes prevalence rates to Census Bureau population projections, the national cost of diabetes could grow to \$192 billion by 2020. However, if the prevalence of diabetes continues to increase as a result of the growing problem of obesity in the U.S., the actual future cost of diabetes will be substantially higher yet.

The authors conclude that:

Diabetes imposes a substantial cost burden to society and, in particular, to those individuals with diabetes and their families. Eliminating or reducing the health problems caused by diabetes through factors such as better access to preventive care, more widespread diagnosis, more intensive disease management, and the advent of new medical technologies could significantly improve the quality of life for

people with diabetes and their families while at the same time potentially reducing national expenditures for health care services and increasing productivity in the U.S. economy (ADA, April 2003).

Background

Santa Clara County has a shortage of endocrinologists to provide care for its diabetic residents, so even patients who are fully insured may experience delays in obtaining specialty care.

Those who have no insurance - or who have government-sponsored coverage - generally must rely on the county medical system. However, because of recent increases in unemployment in the area, the county system is overwhelmed. Diabetic patients who have neither insurance nor adequate financial resources generally must wait 6-8 months or more for an intake appointment at the county's medical center, and their follow-up appointments are spaced at longer intervals than are required for optimal care.

As a complement to the county-sponsored clinics, much of the local "safety net" is provided through nonprofit community clinics, including those operated by the Gardner Family Health Network. The Gardner clinics accept most insurance coverage, including all of the government-sponsored programs. They are also able to provide care for a limited number of patients who have no insurance and no ability to pay. However, the Gardner clinics have been similarly impacted by the recent increase in demand for services, resulting in waits of up to five months for a new patient visit.

The free clinics operated by RotaCare Bay Area serve as a "safety net for the safety net." RotaCare clinics provide services for uninsured patients who cannot afford to pay for their care. Because their original mission was to offer care only for acute conditions, these free clinics have traditionally referred patients to community clinics or to the county health system if they have chronic health problems such as diabetes, hypertension and hyperlipidemia.

However, due to the long delays involved in obtaining referrals, the RotaCare Clinics in San Jose and Mountain View have felt compelled to provide continuing care for their patients with diabetes. In addition to an increased workload for the volunteers, this results in substantially increased expenses for the clinics, which provide medications and laboratory testing at no cost to patients. It also results in care that is less than optimal in terms of continuity, since a patient is likely to see a different physician volunteer at each visit.

In response to concerns about access to care for uninsured patients with diabetes, a Diabetes Coalition has recently formed under the auspices of the Community Health Partnership of Santa Clara County. With representation from a variety of organizations and agencies, the Diabetes Coalition is committed to finding both short-term and long-term solutions to the problem of access to care.

The Diabetes Coalition is also addressing issues related to health promotion and disease prevention in the hope of creating well-coordinated, community-wide programs for both primary and secondary prevention. The Coalition recognizes that obesity is becoming much more prevalent in the U.S., especially in the Mexican-American community, and that obesity accounts for much of the increasing prevalence of Type II diabetes.

Although diet is certainly a major contributor, it appears that lack of physical activity is an even greater factor in the development of obesity. Therefore, if programs of the Diabetes Coalition and its members can contribute toward a culture of fitness – even in small pockets of the community – it may help to reduce obesity and its complications. For some it might even prevent the development of diabetes. The advantages for those individuals and their families are obvious, but there could also be significant benefits for society if it helps to keep more people in the \$2,560/year cost category instead of the \$13,243/year group.

At a time of severe downturn in the local economy, there are obvious limitations in both

human and financial resources. Therefore, it is clear that part of the solution to all of these issues must involve leveraging those scarce resources through the use of innovative, cost-effective approaches to providing high-quality medical care and preventive programs.

Earlier projects by the Pacific Medical Research Foundation (PMRF) and the Endocrine Metabolic Medical Center (EMMC) have demonstrated the usefulness of telephone and email communication in improving quality of care and lowering its cost (unpublished data). The current project is designed to determine whether those benefits can be further enhanced by the addition of telemedicine technology, defined as the use of two-way video and audio systems that allow physicians and other health professionals to treat patients at remote locations.

“Traditional” telemedicine technology allows primary care physicians in rural areas to obtain consultations for their patients through connections with specialist physicians located at university medical centers. Such systems allow patients to see specialists without having to travel to the city, but are limited by high costs and marginal efficiency.

The Video HouseCall Network is developing a new telemedicine system that allows health care providers and patients to connect at drastically reduced cost, using personal computers and inexpensive cameras. Use of the Internet drastically reduces equipment and transmission costs, making it practical and affordable for primary care physicians - as well as specialists - to provide “HouseCalls” for patients at remote locations.

Telemedicine has obvious limitations: since it is not possible to touch, taste or smell a patient at a remote location, the provider must rely on the senses of seeing and hearing. However, taste and smell are rarely useful in modern medicine and touch is frequently not required, especially in the context of care for chronic conditions. Therefore, a provider who can see and hear a patient – and be seen and heard by that patient – can usually arrive at the correct diagnosis and

determine an appropriate treatment plan without touching the patient, especially if a detailed and accurate history is available. In those cases where a more complete physical examination is required, the patient must be seen for a “hands-on” evaluation.

There are trade-offs in the use of the Internet for videoconferencing. Bandwidth is always a concern, and even when DSL is available at both ends, frame-rate and resolution are lower than with more expensive systems. However, the low-cost system is capable of providing “snapshots” -- still captures of findings such as a wound or rash that might need to be seen in more detail than is available in the real-time video. These snapshots are essentially high-resolution photographs that can be evaluated by the provider and then stored in the patient’s electronic medical record.

The low-cost system actually has an advantage over many of the more expensive “traditional” telemedicine systems because it offers several features in addition to videoconferencing. Since all transmission of video, audio and data goes through a web site, it is also possible to offer a suite of software applications on the web site using an Application Service Provider (ASP) model with a thin client.

For example, its secure email system allows providers, patients and facilitators to exchange information in an environment that is compliant with HIPAA regulations. This means that patients who have questions or problems can communicate with their providers between visits by going to any computer with Internet access and sending a secure email through the Web site.

Although telephone is still an option (and a translator is available at the provider’s office), email can prevent interruption of office schedules as well as prolonged waits for return phone calls. It is also useful for transmitting results of home blood glucose monitoring and for providing an update of the patient’s history before or between telemedicine visits.

When the telemedicine system is fully implemented, facilitators will be able to assist

patients in entering much of the past medical history and interval histories through completion of online questionnaires. This will allow for a more detailed history than a provider might have time to elicit during a visit, and will allow the patient to verify the accuracy of the recorded history before the provider even comes online. Providers will save additional time by using a “point and click” interface that records the diagnoses and treatment plan and automatically transmits prescriptions to pharmacies. Meanwhile, the improved legibility of records and prescriptions will reduce the possibility of medical errors.

Project Overview

The Promotora Telemedicine Project is utilizing this telemedicine system to connect several clinics located in underserved areas with the Endocrine Metabolic Medical Center (EMMC) in Redwood City, California. EMMC is a specialty practice that features a team of physicians and Certified Diabetes Educators who offer state-of-the-art diabetes care using evidence-based protocols.

Since March 2003, a pilot project has connected the diabetes care team at EMMC in Redwood City with patients at the RotaCare Clinic of San Jose, about 26 miles away.

The RotaCare Clinic of San Jose is a free clinic that is staffed every Wednesday evening by volunteer physicians and nurses who provide care for uninsured patients in a diverse, medically underserved area within San Jose. Most of the clinic’s patients are “working poor” who lack employer-based coverage and do not qualify for government sponsored insurance plans. Many are recent immigrants from Mexico who speak no English.

Telemedicine visits are scheduled on Wednesday afternoons, finishing in time to free up the combination telemedicine/examination room for use during the evening clinic session. If patients need to be seen for “hands-on” examinations, they simply stay for the evening session of the clinic.

Bilingual, bicultural community-based facilitators called “promotores” serve as translators during the telemedicine visits, interpreting not only between the languages but also between the cultures of the providers and the patients. Although most have no previous medical background, promotores receive intensive training in diabetes care so that they are prepared to assist patients in complying with appropriate treatment regimens and to recognize complications at an early stage.

In a typical telemedicine session, the promotora obtains the patient’s weight and vital signs and then assists the patient in logging on to the computer in the clinic. At the appointed time, the physician or Certified Diabetes Educator logs on and a two-way videoconferencing system allows the provider and patient to see and hear each other. With the promotora translating, the provider elicits a history, goes over home glucose monitoring logs, reviews any other available laboratory results and examines relevant physical findings within the previously noted limitations (see [Video Clip 1](#) of physician interviewing patient over telemedicine system with translation by promotora).

While entering the information into the electronic record, the provider explains the treatment plan to the patient, including detailed instructions regarding medications, diet and exercise. When necessary, the provider or a Medical Assistant can also demonstrate proper techniques for home glucose testing, insulin injection, foot care, etc. (see [Video Clip 2](#) of Medical Assistant using telemedicine system to instruct patient in technique for insulin injection).

The patient then receives a supply of medications and written instructions in Spanish, along with an appointment card for the next visit.

All medical records are available online, stored on a secure server with password protection in full compliance with HIPAA regulations.

The project’s fitness component is being coordinated by the Fifty-Plus Fitness

Association, and provides information, instruction, encouragement and supervision for both individual and group exercise activities. The goal of the fitness program is help people to gradually increase their physical activity in ways that are non-threatening, enjoyable and culturally appropriate. While many enjoy walking, others prefer dancing or other activities.

Group leaders primarily speak Spanish, although anyone in the community is welcome to participate. A diagnosis of diabetes is not a requirement for participation, and families, including children, are encouraged to join in. In fact, the program hopes to reach many who are at risk but who are not yet overtly diabetic.

This pilot project will provide care for 15 patients in a single clinic for a period of three months. During the pilot project, the Pacific Medical Research Foundation and the HouseCall Foundation are seeking funding to allow expansion of the program in order to serve 100 patients for a period of 18 months.

Following implementation of the full project, patients will access their diabetes care through one of eight locations:

- Two free clinics - RotaCare Bay Area Clinics in San Jose and Mountain View
- Five community clinics - Gardner Family Health Network clinics in San Jose
- The Adult Day Health Care Center - Mexican American Community Services Agency (MACSA) in San Jose

The full eighteen-month project will involve 200 people with diabetes. While half will be treated intensively through this Internet-based telemedicine model, the other half will receive usual care and will serve as a control group. Indicators of quality of care will include a number of clinical end points and laboratory markers. Collaborating investigators at MACSA and at the American Society on Aging will monitor and record costs of care and quality indicators for each group for comparison at the conclusion of the study.

Expected outcomes for the study group include:

- Improved access of the diabetic population to high-quality care;
- Improved self-care capability for diabetic patients;
- Improved quality of life;
- Improved diabetes management performance indicators as measured by national guidelines;
- Reduced costs as the result of a lower incidence of emergency room visits, hospitalizations and surgeries.

Participating Organizations

The Promotora Telemedicine Project is a joint program of the Pacific Medical Research Foundation and the HouseCall Foundation in cooperation with several other organizations.

The Pacific Medical Research Foundation (PMRF) is dedicated to exploring new modalities for the treatment of diabetes and to educating physicians, health care professionals and people with diabetes to manage and successfully live with the disease.

Founded in 1986 as a 501(c)3 nonprofit organization, PMRF has conducted several previous studies involving new technologies and innovative methods of treatment for diabetes.

One of PMRF's projects, in Alameda County, California, resulted in a dramatic reduction in health care costs for diabetes. During the project, none of the diabetic patients required kidney dialysis or transplant. There were no hospitalizations and only one patient required a visit to an emergency room over a period of 18 months (Higgins, unpublished data).

The HouseCall Foundation (HCF) is a nonprofit organization dedicated to providing systems and technology to improve health care throughout the world. Its mission includes the elimination of geographic, economic and cultural barriers to access to health care in the U.S. and the rest of the world through the use of telemedicine technology. The Promotora Telemedicine Project is the first of the HouseCall Foundation's efforts to provide convenient, cost-effective

specialty care for patients in underserved areas of the U.S.

The HouseCall Foundation is also recruiting volunteer physicians who will commit four hours per month to work from their own homes or offices and use a telemedicine system to treat patients at no charge. Patients will be located in underserved areas of the U.S. and in developing countries around the world. In the HouseCall Foundation's first international project, volunteer physicians in North America and Europe will use the telemedicine system to provide general health care for residents of the Kibera slum in Nairobi, Kenya. The same technology will also connect youth in Kibera with peer health educators in an effort to reduce the rate of transmission of HIV/AIDS in Kibera, which with 1½ million residents, is one of the largest slums in Africa.

RotaCare Bay Area operates nine free medical clinics with geographic locations ranging from San Rafael to Monterey. The RotaCare Clinics in Santa Clara County are the most active, and between them, the San Jose and Mountain View clinics provide more than 5,000 patient visits per year.

At RotaCare clinics, all of the physicians and pharmacists and nearly all of the nurses and other staff are volunteers. Patients are seen at no charge, and the clinics do not bill insurance or Medi-Cal. RotaCare Bay Area is a nonprofit corporation whose funding is derived from Rotary Clubs, foundations, corporations and hospitals, as well as individual donations.

Gardner Family Health Network is a nonprofit organization that operates five community clinics in the San Jose area. Since they are federally licensed as community clinics, the Gardner clinics are reimbursed under a variety of federal, state and county programs.

Mexican American Community Services Agency (MACSA) is a nonprofit agency with a 39-year history of providing socially relevant and culturally sensitive services to the Latino population in Santa Clara County, with

programs in education, youth services, family services, senior services and senior housing.

MACSA's Adult Day Health Care Center will serve as an access point for patients, and MACSA staff will participate in data collection and analysis for the project.

The Fifty-Plus Fitness Association will provide the fitness component for the Promotora Telemedicine Project by designating an individual in the community as a "Fitness Ambassador." Fifty-Plus will then provide training and support for the Fitness Ambassador, who will coordinate development of a community-based exercise program specifically designed to meet the needs of Latino participants, focusing especially on those who previously have not been physically active.

Video HouseCall Network, Inc. (VHCN) is a California corporation that is developing a network infrastructure and suite of software applications to make telemedicine available as a cost-effective "doctor-to-patient" connection. Video HouseCalls allow physicians who are working in their own offices or homes to see patients who connect to the Internet from workplaces, schools, clinics or home.

Endocrine Metabolic Medical Center (EMMC) is a diabetes specialty practice located in Redwood City, California. Its team of physicians, nurses and Certified Diabetes Educators provides state-of-the-art care for diabetic patients through evidence-based protocols for patient management, data collection and evaluation techniques. For several

years, EMMC has used those protocols in an Internet-based program of diabetes care featuring provider/patient communication through telephone calls and email.

Funding

Financial support for this project will come from charitable foundations, government agencies and local companies as well as individual contributions and fund-raising events. Pharmaceutical manufacturers are donating most of the necessary medications and supplies.

Conclusions

In most parts of the United States, health care access is very limited for individuals who have neither health insurance nor adequate financial resources to pay for their care. For populations with language and cultural barriers, access becomes even more difficult.

Patients with chronic conditions such as diabetes represent a special problem, since a lack of continuing care can result in debilitating and life-threatening complications.

There is clearly a need to leverage scarce resources through the use of innovative, cost-effective approaches to providing high-quality care for patients with diabetes. High quality clinical health education can also be delivered as demonstrated in the video clip.

The current study is evaluating one such approach to determine whether it can deliver on its promise of improved access to high-quality, cost-effective care combined with a decrease in overall costs for the care of diabetic patients.

References

- American Diabetes Association. (2003). Economic costs of diabetes in the U.S. in 2002. *Diabetes Care* 26, 917-932. Retrieved April 10, 2003, from <http://care.diabetesjournals.org/cgi/content/full/26/3/917>
- American Diabetes Association. (April 2003). Diabetes facts & figures among latinos. Retrieved April 10, 2003, from http://www.diabetes.org/main/info/facts/facts_latinos.jsp
- Community Health Partnership of Santa Clara County. (2003). Community diabetes project. Retrieved April 10, 2003, from <http://www.chpscc.org>
- Santa Clara County Public Health Department. (1997). Health status report 1997. Retrieved April 10, 2003, from <http://www.sccgov.org/scc/assets/docs/30807Hsr1997b.pdf>

Santa Clara County Public Health Department. (2001). Health status of older adults: Key indicators of well-being. Retrieved April 10, 2003, from

http://www.sccgov.org/scc/assets/docs/30810Final%20Senior%20Report%202001_Final.pdf

U.S. Census Bureau. (2003). QuickFacts for Santa Clara County, California. Retrieved April 10, 2003, from <http://quickfacts.census.gov/qfd/states/06/06085.html>

Web Sites

Organization	Web Address
Fifty-Plus Fitness Association	http://www.50plus.org
Mexican American Community Services Agency (MACSA)	http://www.macsa.org
RotaCare Bay Area	http://www.rotacarebayarea.org

Video Clips for Illustrations

1. Medical Assistant uses telemedicine system to instruct patient in technique for insulin injection.
2. Physician interviews patient over telemedicine system with translation by promotora.

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