# MEDICAL BOARD OF CALIFORNIA
## Executive Office

July 1, 2011

The Honorable Curren Price, Chair
Senate Committee on Business,
Professions, and Economic Development
State Capitol, Room 2053
Sacramento, CA 95814

The Honorable Mary Hayashi, Chair
Assembly Committee on Business,
Professions, and Consumer Protection
State Capitol, Room 3013
Sacramento, CA 95814

Dear Senator Price:
Dear Assembly Member Hayashi:

This report is submitted pursuant to Business and Professions Code Section 2028.5, which was enacted by Assembly Bill 329/Nakanishi (Chap. 386, Stats. of 2007).

AB 329 authorized the Medical Board of California (Board) to establish a pilot program to expand the practice of telemedicine in California. The purpose of the pilot is to develop methods, using telemedicine, to deliver health care to persons with a chronic disease. The pilot also shall develop information on the best practices for chronic disease management services and techniques and other health care information, as deemed appropriate.

The bill requires the Board to make a report to the Legislature, with findings and recommendations, within one calendar year after the commencement date of the pilot. That report, dated July 10, 2011, is available at: http://www.mbc.ca.gov/licensee/telemedicine_pilot_program.html.

The report was required by law to include an evaluation of the improvement and affordability of health care services and the reduction in the number of complications achieved by the pilot. However, as is explained in the report, the Board entered into a contract for a three-year pilot; thus, the 2010 report and the attached report only present a summary of the milestones and achievements recognized during the first two years of the pilot. A full summary and evaluation will be submitted in the final report to be prepared next year.

If the Board can be of further assistance, please contact me at (916) 263-2389.

Sincerely,

Linda K. Whitney,
Executive Director

cc: Bill Gage, Principle Consultant, Senate Comm. on Business, Professions and Economic Development
Ross Warren, Principle Consultant, Assembly Comm. on Business, Professions, and Consumer Protection
Anna M. Caballero, Secretary, State and Consumer Services Agency
Brian J. Stiger, Acting Director, Dept. of Consumer Affairs
Members, Medical Board of California

# Second Annual Report to the Legislature

AB 329 (Nakanishi, 2007)

"Development of

Diabetes Self-Management Education Program

via Telemedicine for Patients in

Rural, Underserved Communities in California"

UCDAVIS

HEALTH SYSTEM


Administered by

University of California, Davis

Funded by

Medical Board of California

Submitted July 2011

## Executive Summary

Assembly Bill 329/Nakanishi (Chap 386, Stats. of 2007) authorized the Medical Board of California (Board) to establish a Telemedicine Pilot Program ("pilot") to expand the practice of telemedicine. AB 329 envisioned a one-year pilot and required the Board to make recommendations regarding its findings to the Legislature within one calendar year of the commencement date of the pilot program. However, upon entering into initial discussions with interested parties, the Board quickly realized that a one-year pilot was not feasible, valuable results would not be recognized, nor could feasible recommendations be made in such a short time frame.

As implementation of the bill came to fruition, the Board determined that a contractor would develop a pilot that will deliver health care and education to diabetes patients in rural, underserved communities in California. The contractor would play a significant role in developing the three annual reports evaluating the effectiveness of the pilot.

## Pilot Overview

On July 1, 2009, the Board entered into a contract with the University of California, Davis (UCD), of which the UCD Health System (UCDHS) is a major partner. The UCDHS Chronic Disease Management Program (CDM), in collaboration with the UCD Center for HealthCare Policy and Research (CHPR) and UCDHS Center for Health and Technology (CHT), was to develop a telemedicine model for the provision of modern diabetes self-management education and training classes for patients with diabetes living in a 33-county area of rural, underserved communities in northern and central California.

It was determined that the classes offered would meet the current recommendations of the American Diabetes Association (ADA) and will be taught by health educators. In addition, this pilot was defined to study the impact of offering additional follow-up health coaching to class participants via a toll-free telephone line, internet "blogging," or secure email. Data will be collected on the level of patient participation, patient clinical outcomes, patient and provider satisfaction, and project costs in order to evaluate the effectiveness and cost-efficiency of the program. The pilot will occur over a three-year time period to allow for sufficient time to measure outcomes.

## I. Focus of the Pilot Program

### A. Diabetes

Although the legislation does not specifically identify which chronic disease to target, it was decided that the pilot will focus on diabetes, a serious medical condition impacting many Californians.

The incidence of diabetes in the United States is soaring. The Centers for Disease Control (CDC) reported in 2008 that 24 million people in the U.S. are affected by diabetes, an increase of more than 3 million people in approximately two years.[1] In California, it is estimated that nearly 2 million people have diabetes with a statewide prevalence rate of 6.2%, and increasing to 15.1% for those age 65 and older.

In addition, there are disparities in the incidence rate between various racial and ethnic populations. After adjusting for population age differences, the CDC-estimated rate of

diagnosed diabetes is 11.8% for African Americans and 10.4% for Hispanics (11.9% for Mexican Americans) compared to 7.5% for Asian Americans and 6.2% for Caucasians.[2]

Finally, the economic cost of diabetes is enormous. In California, the cost of health care for patients with diabetes is estimated to be approximately $12 billion a year which includes an estimated $3.4 billion for over 300,000 diabetes related hospitalizations.[3]

1. Centers for Disease Control and Prevention, Diabetes Public Health Resource, 2008. Fact Sheet Press Release, Available at: http://www.cdc.gov/media/pressrel/2008/r080624.htm, Accessed January 15, 2009.
2. He, G, Albright, A, Black, K, Lopez-Payan, S, "2005 Diabetes in California Counties: Prevalence, Risk Factors and Resources, http://www.caldiabetes.org. Accessed January 13, 2009.
3. Wagner EH, Sandhu N, Newton KM, McCulloch, DK, Ramsey SD, Grothaus, LC, Effect of Improved Glycemic Control on Health Care Costs and Utilization. JAMA, 2001, 285(2), 182-189.

## B. Geographic Focus Area

For this pilot, the focus is on a 33 county area in northern and central California where the UCDHS CHT currently has telemedicine partners based in nearly 80 different clinics, practices, and hospitals serving rural and medically underserved communities. The number of health care sites will increase in the next few years due to the California Federal Communications Commission's Pilot Project, which will fund development of the California Tele-health Network (CTN), and the passage of Proposition 1D (in 2006), which provides for a telemedicine equipment loan program. This service area included in this proposal stretches from the Oregon border in the north, the coast on the west, the Nevada border on the east, and down the Central Valley through Merced County. In this service area, 25 of the 33 counties have a diabetes incidence rate that exceeds the state average of 6.2%.

## C. Chronic Care Model and Self-Management

In the past decade, there has been an accelerating shift in the approach to caring for patients with chronic illnesses from the more traditional reactive approach to care that is planned and proactive. The Chronic Care Model, which is now widely accepted as "best practice," advocates a comprehensive, coordinated approach to care that is patient-centered and evidence-based. By coordinating health system improvements around clinical information systems, evidence-based care, delivery system improvements, and the provision of patient self-management support, the goal of the model is for "productive interactions" between an informed, empowered patient and a prepared, proactive practice team.

For this pilot, UCD planned to develop and test educational interventions that focus on two parts of the model: 1) improving access to patient self-management support resources and 2) improving provider knowledge on evidence-based care. The goal of the ***first*** educational effort is on activating, educating and training patients to better manage their diabetes. It recognizes the central role of the patient as the one who does the majority of the day-to-day work of health management and makes the majority of decisions in dealing with his illness. Thus, there is a goal to teach patients not only information about their illness but how to take this information and use it to solve problems that come up in their daily lives and includes individualized approaches based on the diverse cultures of the patient population. The desired outcome is for patients to gain a greater sense of confidence and self-efficacy with respect to their diabetes. In the process, however, it must be recognized that a patient's readiness to manage his care

can vary over time so it is important to meet them "where they're at." The goal of the ***second*** educational effort is to provide primary care physicians, via telemedicine, with the most current knowledge and care management strategies to support the provision of evidence-based care.

### D. Health Coaching

Health coaching is quickly emerging as a new approach of partnering with patients to enhance self-management strategies for the purpose of preventing exacerbations of chronic illness and supporting lifestyle and behavior change. A health coach is a specially trained educator who can provide information and support patients to make informed decisions and manage their health intelligently. Motivating patients to change health-related behaviors is challenging and a health coach can, through forming an alliance with a patient, help them work towards change.

## II. Organizational Experience

### A. Chronic Disease Management Program (CDM)

The CDM began in 2002 with a grant from the Robert Wood Johnson Foundation (to the Department of Family and Community Medicine) and, since 2003, has been supported by the UCDHS to continue and expand the work. The goal is to improve the quality of care provided to all patients with chronic illnesses; diabetes is one of the three chronic illnesses targeted. The initial focus has been on developing system-wide clinical information infrastructure (e.g. patient registries and electronic medical records [commonly referred to as "EMR"] tools), patient self-management resources, and active consultation with physicians and clinic staff teams around clinic redesign.

One of UCDHS' greatest successes has been in the area of patient self-management education. In 2008, four different diabetes courses were taught, totaling nearly 200 class sessions a year. The Diabetes Self-Management Education program applied for and received a certificate of recognition from the American Diabetes Association (ADA), a rigorous recognition process requiring programs to meet the highest educational standards. The ADA recognized series is titled "In Charge and In Control." The UCDHS program has been recognized since 2003.

In years 2008-2009, 276 patients were tracked; they had taken the four week "In Charge and In Control" class. Comparing patients' Hemoglobin A1C ("Hemoglobin A1C" is a laboratory test reflecting overall diabetes control for the past 3 months) and LDL ("low density lipid" level which is a marker associated with patients with diabetes risk factors for cardiac complications) lab values immediately before taking the class and 90-180 days following the class, there was a *statistically significant (p=<0.001) decrease* in mean Hemoglobin A1C from 8.3 to 7.4 and mean LDL from 112.0 to 100.4 In 2007, UCDHS also explored the feasibility of extending access to these classes within the Primary Care Network via videoconferencing. Patients attending the class at the remote site reported high satisfaction with the class and technology.

### B. Center for Health and Technology (CHT)

The CHT began in 1992 and has grown to be an internationally-recognized leader in the use of telecommunications technology to improve the delivery of health care. CHT

partners with approximately 80 hospitals and clinics throughout rural northern California, providing patients and their physicians with access to over 30 medical specialties and subspecialties through the use of telecommunications technologies. CHT has completed over 13,000 telemedicine video-based clinical consultations since the program began. For this pilot, CHT will provide technical consultation and assessment of the rural practice sites participating in this pilot and provide the videoconferencing linkage for the educational classes.

### C. Center for Healthcare Policy and Research (CHPR)

The CHPR was founded in 1994 with the mission of facilitating research, promoting education, and informing stakeholders about health and health care policies. The CHPR brings together the talents of researchers representing a broad spectrum of disciplines from the School of Medicine, the main Davis Campus, and other organizations. With this multi-disciplinary approach, the CHPR helps investigators examine questions pertinent to health services access, delivery, cost and outcomes, with an emphasis on health care policy. It also provides the administrative resources and technical expertise crucial to implementing this kind of focused, collaborative research. For this pilot, the CHPR will provide contract management, evaluation and administrative support.

### D. Office of Continuing Medical Education (OCME)

The OCME offers physicians and other health care providers educational opportunities that foster excellence in patient care. Accredited by the national Accreditation Council for Continuing Medical Education, the OCME provides both traditional and innovative modes of learning to physicians throughout northern California. Most recently, OCME has begun utilizing new learning modalities through innovative communication technologies including interactive remote video teleconferencing and CME self-study modules and courses on the Internet. For this pilot, OCME is providing consultation in the use of these new modalities and CME credit for the classes offered.

## III. UC Davis Executive Summary

The pilot has been in existence for two years as of June 30, 2011. The work completed has enabled the project team to recruit patient participants, engaging in self-managed care courses and individual health coaching, and recruited professionals to participate in continuing medical education courses. In addition, the project team has gained new knowledge and understanding relevant to working in collaboration with rural clinics using telemedicine.

To date, the pilot has remained below budget. Less than the number of planned sites and program participants have been recruited. The project team has explored new avenues to increase participation in all aspects of the pilot. The data results show the majority of participants experience a positive shift in knowledge and confidence in the self management of diabetes after participating in the self managed care class.

In addition, over 84% of participants indicated they were satisfied with the telemedicine experience. Over 76% of participants indicated they would take a telemedicine course in the future (see tables in Appendix A). This report details the accomplishments, barriers and lessons learned related to recruitment, participation, telemedicine infrastructures, barriers and successes working with rural clinics using telemedicine to deliver courses in self- manage care and continuing medical education.

## IV. Year Two of the Pilot Project

The intention of this annual report is to provide an update and evaluation of the work in progress for the "Development of Diabetes Self-Management Education Program via Telemedicine for Patients in Rural, Underserved Communities in California" pilot, which is administered by the UCD and funded by the Board.

AB 329 envisioned a one-year pilot and required the Board to make recommendations regarding its findings to the Legislature within one calendar year of the commencement date of the pilot program. However, upon entering into initial discussions with interested parties, the Board quickly realized that a one-year pilot was not feasible, valuable results would not be recognized, nor could feasible recommendations be made in such a short time frame.

Since the actual contract took effect and was negotiated for three years, this is the second report to the Legislature. In order to comply with the spirit of the enacting legislation to have a report submitted to the Legislature by July 1 of each year, this report covers the second period from May 1, 2010 to April 30, 2011. UCD will play a significant role in developing the last subsequent annual report evaluating the effectiveness of the pilot. That final report will be submitted during the fall of 2012, after the end of the third and final year of the pilot, to include an evaluation of the entire pilot and to prepare evidence-based recommendations.

Under the direction of Dr. James Nuovo, the Principal Investigator, the project team core members have met on a monthly basis with the project manager from the Board to ensure our continued movement forward in tandem as the pilot and its momentum increases. The project team has effectively organized and laid the foundation for the success of the pilot. A collaboration of efforts has been established between the Board and UCD departments including CDM, CHT, CHPR, OCME, and various rural prime network member clinics.

The UCD project team core members have worked with internal evaluation experts, statistical experts, and research project staff to implement the data collection forms and the coaching efforts.

a. The telemedicine Diabetes Self-Management Education Curricula was developed through the collaborative efforts of the project staff subject matter experts and the health coaches. The curricula were piloted with a group of 9 patients with diabetes at UCD Medical Center. This test included the curricula and the telemedicine aspect of health educators conducting the educational process via telemedicine.
b. This period represents the second year the established and approved Diabetes Self-Management Education Curricula has been implemented.
c. In preparation for health coaching efforts as well as managing ongoing questions or concerns from clinics and class participants, a toll-free number has been established for the pilot through the CDM. This toll-free line has been available to participants during year two of the pilot.

Financially, the pilot team has spent 70% of its second year funds through April 30 2011. The team forecasts a total of 85% of the budgeted funds for year two will be expensed

by the end of fiscal year two on June 30, 2011. These lower-than-anticipated expenditures are attributed to several factors:

1. Personnel expenses were less than forecasted due to the hiring process for filling vacancies
2. Fewer sites and participants than anticipated

The following is an outline of accomplishments by April 30, 2011:

**Accomplishments as of April 30, 2011**

**Staffing**

1. During this period one of our health coaches left the team to work abroad. We hired a replacement health educator who is bilingual and has been trained.

**Institutional Review Board (IRB):** *[An IRB is a committee that has been formally designated to approve, monitor, and review biomedical and behavioral research involving humans with the aim to protect the rights and welfare of the research subjects.]*

1. The original IRB approval was obtained November 20, 2009. The renewal was approved in November, 2010.
    a. A total of 22 modifications have been processed during this reporting period.
        i. Each time a new site is added to the process, a modification is required to include new site champions to the protocol.
    b. All consent and project forms have been translated to Spanish and approved by the IRB.

**Clinic Sites**

1. Invitations to Participate: The pilot has generated invitations to a total of 70 locations. New site contacts have remained, on average, three per month. Geographically the site invitation was expanded to include the Central Valley in an effort to engage a more diverse population and to potentially recruit more Spanish-speaking participants
    a. 59 Health Centers/Clinics/Hospitals with 1 or more locations
    b. 8 Associations/Networks
    c. 2 Consortiums/Coalitions
    d. 1 County
2. Recruitment: Timing for Acceptance or Rejection of Participation:
    a. Rejection of participation has taken 3-12 months from initial contact
    b. Acceptance of participation has taken 2-9 months from initial contact
3. Participating Sites: To date a total of 8 sites have been recruited and participated in the pilot:
    a. Sierra Family Medical, Nevada City, CA
        i. 8 completed classes, 33 participants, 1 site champion, site work finalized
    b. Western Sierra Medical Clinic, Downieville, CA
        i. 2 completed classes, 12 participants, 1 site champion, site work finalized
    c. Eastern Plumas Health Care, Portola, CA
        i. 5 completed classes, 2 classes pending, 22 participants, 3 site champions, site work active

d. Karuk Tribal Health Clinic, Happy Camp, CA
    i. 1 class completed, 3 participants, 1 site champion, site work completed but clinic withdrew from the pilot
e. Lassen Medical Group, Red Bluff, CA
    i. 5 classes completed, 2 classes pending, 31 participants, 2 site champions, site work active
f. Tulelake Health Center, Tulelake, CA
    i. 2 classes completed, 1 class pending, 12 participants, 2 site champions, site work active
g. Miners Family Health Center, Grass Valley, CA
    i. 1 class completed, 1 class pending, 4 participants, 1 site champion, site work active
h. John C. Fremont Healthcare District, Mariposa, CA
    i. 0 classes completed, 1 class pending, 0 participants, 1 site champion, site work active

**Curriculum Development and Implementation**

1. During this reporting period, the "Living Well with My Diabetes" booklet has been used at each telemedicine class and has been well received. Using the booklet as a guide during the telemedicine class, the patients are able to follow the curricula with the coaches and take the booklet home with them as a review guide and reference.
2. The "Living Well with My Diabetes" has been successfully translated to Spanish and telemedicine classes in Spanish are in the process of being scheduled for patients.

**Coaching Curriculum Development and Implementation**

1. Protocols for health coaching have been developed and documented.
2. The coaching efforts were implemented during this period.
3. Health coaching is offered to every other telemedicine class; health coaches offer this resource at the end of the class and patients are asked to accept or decline the opportunity in writing. Those interested in health coaching are asked to give optimal times and days of the week for coaching telephone calls.
4. Coaching duration is two months with four calls, each lasting 10-20 minutes.
5. Coaches have English and Spanish educational materials to mail to patients.
6. Process procedures for phone calls were developed and guidelines for calls were established.
7. A plan was designed for calls not answered and maximum numbers of calls per patients.
8. HIPAA guidelines governing patient privacy were followed regarding messages and call-backs.
9. Data is collected on each patient receiving health coaching.
    a. Data includes: dates, length of calls, behavior change goals identified and patient confidence level of each behavior change
10. If patient identifies perceived barriers to change these are documented.
11. The heath coach describes the level of engagement by the patient and notes if educational materials are mailed.

**CME**

1. The CME component has been finalized and is being implemented.
2. A total of 3 CME courses have been completed during this review period.
    a. Managing Cardiovascular Risk in Patients with Diabetes held January 18, 2011 from Noon – 1:00 pm

b. Insulin Initiation, Evaluation, Titration held March 30, 2011 from 7:30 am-8:30 am
c. Self-Management Principals and Tools held April 26, 2011 from 5:00 pm-6:00 pm

3. A total of 16 people have engaged in the CME events, 12 CME course participants have been processed for credit.

**Evaluation**

1. The provider satisfaction survey has been completed.
2. An initial evaluation of data collected has been completed.

**Preliminary Data/Evaluation Results: Overview**

We continue to collect valuable data daily. However, the preliminary summary results indicate that overall participants were satisfied with the following:

1. The telemedicine experience
2. The capacity of the equipment, i.e., sound, visual size and quality of picture
3. The delivery and quality of the curriculum

Over 76% of participants indicate they would participate in a telemedicine course in the future. On average, with 100-105 participants who completed the pre- and post-education surveys, the majority of participants demonstrated a positive change in their educational information, knowledge of factors that impact their diabetic condition and their ability to manage their diabetes. A total of 46 of the 6-8 week follow-up surveys have been received. The data from the 6-8 week follow-up information indicates, on average, a positive shift in knowledge, ability to manage diabetes and some slight increase in confidence related to caring for themselves and their diabetes. Program-to-date demographic data illustrates that the average participant is 62 years of age, Caucasian, and has had diabetes for more than five years. Data tables are available for review in the appendices of this report.

During this second period we have learned some interesting and valuable lessons that we share as lessons learned. We believe these can prove to be invaluable as we continue to develop the program at its highest quality and effectiveness for all in the future.

**Note-worthy lessons learned**

1. Site Recruitment
    a. The average recruitment of sites is taking longer than anticipated.
    b. Identified reasons for non-participation:
        i. Adequate diabetes education resources already available on site
        ii. Inundated with other projects – particularly electronic medical record ("EMR") implementation
        iii. Equipment limitations (pole style or inoperable or missing)
        iv. Concerns regarding physician credentialing for telemedicine services
        v. Space limitations – inadequate space for groups
        vi. Inconveniently located televideo equipment
        vii. Staffing shortages
        viii. Time commitment
        ix. No outpatient clinics
        x. Generally no interest

c. Working with existing collaborative groups like Health Alliance of Northern California (HANC) has proven very effective for spawning interest, engaging and recruiting sites.

2. Site Champions
    a. Time: Site champions are busy with regular clinical duties and this project is aggregated into their existing work.
    b. Communication: Due to the busy nature of the site champion's work, the communication connection between the champions and the health coaches takes on average five attempts.
    c. Perception: In some cases site champions seem to perceive low class turn out rates as a negative related to their performance.
    d. Support: Sites may have one or more than one champion. Sites have mostly declined offers from the team to provide assistance with their patient outreach, reminder calls, and letter generation or follow up.
3. Chart Audits
    a. A total of two chart audit visits have been completed.
    b. The chart audit process was smooth; the sites were helpful and cooperative. The health coaches noted a larger than anticipated number of "other" chronic conditions to be recorded that are impacting participants.
    c. Both electronic and paper medical records existed at the sites.
    d. The initial audit of electronic records was more time consuming than the paper chart audit.
4. Classes
    a. High no-show rates, typically up to 50% or higher.
    b. Classes are two hours in length, but participants become antsy after 1 ½ hours of class.
    c. The nutrition section of the class seems to be the most interesting to the participants.
    d. Patient feedback from classes is positive.
    e. Quality of the technical connectivity can negatively affect participants and coaches.
5. Coaching
    a. Initially coaching opportunities do not seem to spark significant interest in participants.
    b. Initially coaching has been described by participants as:
        i. An additional component from which they can benefit
        ii. An additional component for which they don't have time
6. Telecom
    a. Equipment - Most of the sites are using older equipment that is no longer supported by the manufacturer. This has caused both poor audio and/or video issues as well as interoperability issues with the systems UCDHS is using.
    b. Encryption - Older equipment lacks the ability to encrypt communication, which is required for this project. Extensive network configurations were required in order to establish Virtual Private Network (VPN) tunnels between UCDHS and the remote sites using the public Internet.
    c. Connectivity - More and more sites are relying on the Internet for their telemedicine connectivity. However, not only is the Internet unreliable, this has placed a higher demand on the need for encryption.

d. Support – some sites contract out for technical service so onsite technical knowledge may be limited. Further, due to funding issues, some locations have lost their technical support.

7. Surveys
    a. Some patients require assistance from site champions to complete the surveys.
    b. Some patients have not enrolled in classes due to the number of surveys
    c. 6-8 week follow-up surveys are more challenging. Obtaining results from these surveys requires more effort including follow-up via mail and telephone.
    d. One survey question has a high number of no responses. Based on the way the question is listed on the survey, participants may not have understood they were to circle one of the options, which led to a low number of reporting on this question.
8. CME
    a. Physician survey of topics indicate interest in the subjects offered.
    b. Overall site and attendee registration has been low.
    c. Most attendees to the events are clinical support staff (RNs, MAs, etc); very few physicians attend.
    d. Poor telecom connectivity at one site has prevented attendance.
9. Debriefing Interviews
    a. 2 Site Debriefing Interviews have been completed.
    b. Site champions are willing and able to conduct a 30-minute telephone interview.
    c. Site champions are forthcoming and insightful.
    d. Information gathered will likely be valuable in identifying trends, barriers and needs for the future of televideo education.
10. General
    a. Duration of time to complete project in each site greater than anticipated.
    b. Rural sites are highly impacted and resources are in high demand.
    c. Rural sites are in need of greater support.
    d. Relationships of people at a site has an impact on the process and success of the project.
11. Project Relationships: Influences and Effects (see diagram that follows)

A main goal of this pilot was to describe and assess the feasibility of providing a diabetes self management education program via telemedicine to rural patients. As an initial first step to describe the feasibility, we have modeled the interconnected relationships in this pilot (figure 1). The model illustrates the complexity involved in the engagement of rural clinics and recruitment of patients for televideo self-management classes. It also provides a visual representation of the numerous points where the pilot is vulnerable to miscommunication or disruptions.

There are three main groups that must be linked for a successful pilot: UCDHS project staff, clinic site staff, and patients. The blue boxes represent the UCDHS support units all of whom rely on each other to manage various aspects of the pilot. This internal, united front includes the expertise of seven different departments and approximately 18 professionals, who each play a unique role in executing the behind the scenes work-flow necessary for outreach, site support, tele-connectivity, patient-centered learning events and CME learning events. Like all teams, these relationships are dependent on cooperation as well as individual accountability,

timeliness, communication and follow through. To date, we have found that the communication within UCDSH has been strong.

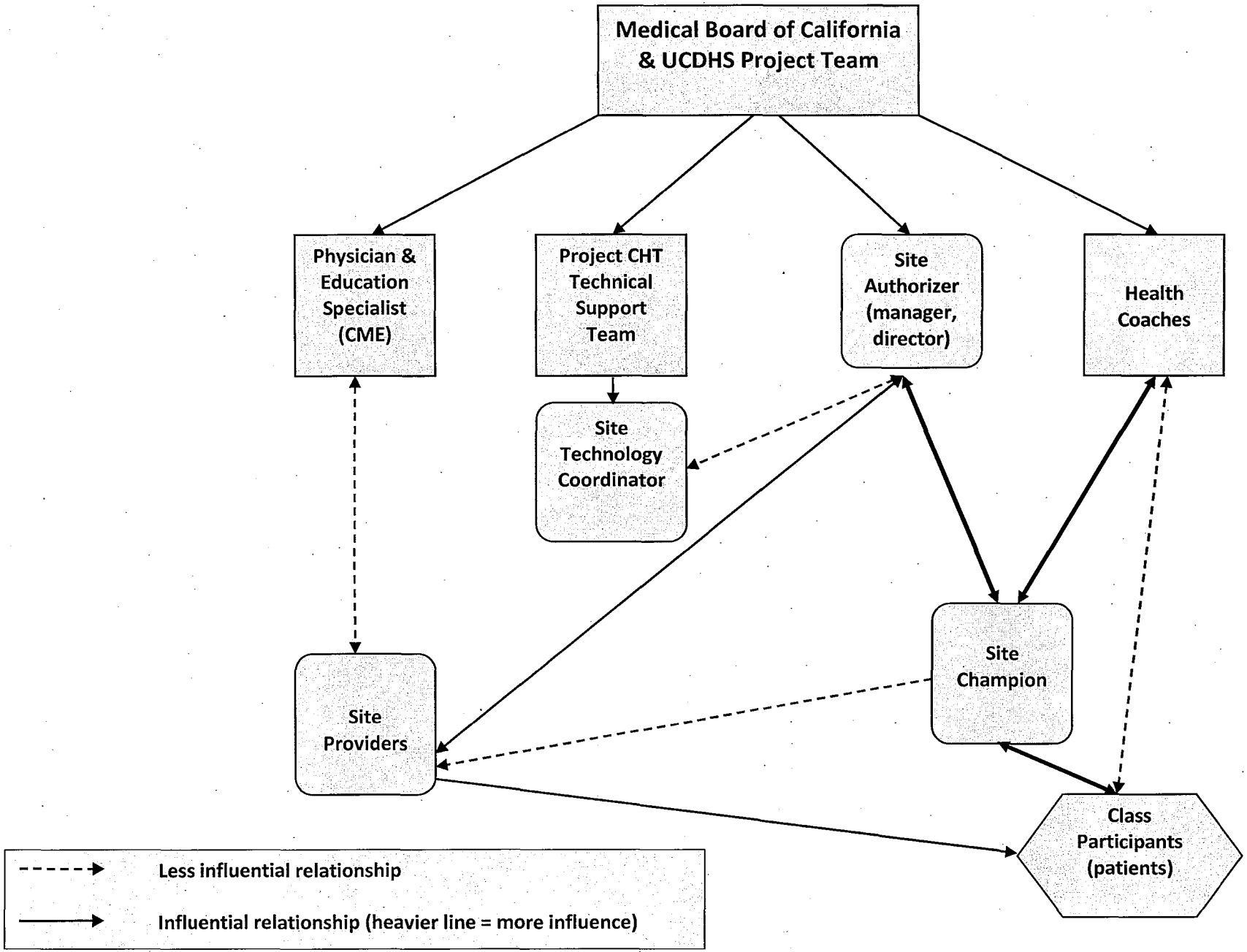
The off-white boxes represent the rural clinical staff engaged in the pilot. Each of the boxes represents several persons who are all dependent upon each others' expertise to successfully conduct the work necessary to recruit patients and coordinate on-site televideo classes for patients. As shown in the diagram, the relationships between UCDHS and the clinic staff are sometimes direct (as is the case between the technical support team and the site technology coordinator) and other times it is indirect (for instance, relationships between site providers and site champions are one step removed from the UCDHS project team). We have found that the directness of the relationship can impact oversight and communication between the project staff and clinic.

The pink box represents the patients who are contacted, engaged and taught in a televideo self-management class. There are a number of relationships that connect to patients, but the project team has a somewhat loose connection to the patients, which has negatively impacted recruitment.

The model, in addition to providing a visual of the connections among groups, also illustrates the strength of those relationships. In the model some relationships are identified as more influential than others, as noted by the heavier lines. For example, the health coaches have direct communication with the site champions (as indicated by the darkened line), but limited communication and influence over the patients who participate in the education program (as indicated by the dashed line).

The goal with constructing this model is to help us assess the project flow and determine areas where communication and oversight might be tightened in future projects. For instance, in some sites the site champion has struggled getting patients. If a project was designed so that the project team had more direct oversight in choosing the site coordinator (rather than going through the site authorizer), we might be able to achieve more buy-in from the coordinator, which may lead to more successful patient outreach (see the relationship flow chart attached).

**Medical Board of California & UC Davis, 2009-2012**
**"Diabetes Self-Management Education for Rural and Underserved Populations"**
***Project Relationships: Influences and Effects***



**Goals for May 1, 2011 to June 30, 2012**

**IRB**

1. Continue to submit and process IRB modifications for newly recruited sites or as needed.
2. Process the renewal in November 2011.

**Clinic Site**

1. Continue to recruit clinical sites.
2. Continue to conduct chart audits at sites where site work is completed.
3. Continue to conduct telephone debriefing interviews at conclusion of sites involvement.
4. Continue to work with and support site champions to successfully implement the pilot at their site.

**Classes**

1. Continue to conduct classes in English and Spanish.
2. Continue to aim for seven classes per site.

**Curriculum Development**

1. Continue to monitor curriculum usage and feedback.

**CME**

1. Continue to deliver CME courses.

**Health Coaching**

1. Continue to offer health coaching to every other class.
2. Conduct health coaching in English and Spanish.

**Evaluation**

1. Continue to conduct additional evaluation of pre, post and follow data collected from participants and sites for the Diabetes Self-Managed Care Education and CME courses.
2. Begin preparation of final report due Fall, 2012

**Appendix A – Data Tables**

**Surveys:**

**About Me Survey**
Note: 115 people completed surveys

| Subject | Reported Data | Reported Data | Reported Data |
|---|---|---|---|
| Participants | 56% Male | 44% Female | 115 Participants |
| Age | Average 62.9 yrs | Youngest 20 yrs | Oldest 89 yrs |
| Average years with Diabetes | 5+ years 46% | 1-5 years 31% | Less than a year 15% |
| Received diabetes education | 63% = yes | 25% = no | 12%-no answer or declined to answer |

| Ethnicity | Percentage |
|---|---|
| Caucasian | 79% |
| Latino/Hispanic | 6% |
| Native American | 6% |
| Asian/Pacific Islander | 1.7% |
| African American | 1% |
| Other | 5% |

**Participant Telemedicine Satisfaction Survey**
Note: 115 people completed surveys

| Question Surveyed | Strongly Agree | Agree | Overall Agree Percentage |
|---|---|---|---|
| Satisfied with the telemedicine class | 43% | 41% | 84% |
| Comfortable talking/using telemedicine video | 57% | 32% | 89% |
| Understood information given in the class | 53% | 41% | 94% |
| Picture on the screen was easy to see | 53% | 32% | 85% |
| Can hear the educators | 56% | 31% | 87% |
| Educators were polite | 75% | 18% | 93% |
| Educators were knowledgeable and skillful | 55% | 31% | 86% |
| Overall Telemedicine Experience satisfactory | 60% | 23% | 83% |
| Willing to take a telemedicine course in the future | 76% | | 76% |

**Verbal comments and suggestions for improvement from participants**

1. Better voice quality, larger class space, larger screen, more practice, round table discussions

**Additional comments**

1. Class was excellent, learned a lot, I am impressed with telemedicine, I appreciated the class, thank you, I truly understand a lot better, food, carbs, portions effects on overall health

**Pre-post Education Surveys**
Scoring is 1 through 5 with 1 being "Very hard" and 5 being "Not at all hard"
Pre = 115 people surveyed, Post 105 people surveyed, 6-8 week follow up 46 people surveyed

How hard do you think the following things are to do regarding management of your diabetes?

**Manage your Diabetes?**

| Score | Pre | Post | 6-8 week Follow up |
|---|---|---|---|
| 1 | 18% | 13% | 4% |
| 2 | 19% | 13% | 19% |
| 3 | 22% | 21% | 37% |
| 4 | 17% | 34% | 28% |
| 5 | 9% | 17% | 10% |

**Read Food Labels?**

| Score | Pre | Post | 6-8 week Follow up |
|---|---|---|---|
| 1 | 12% | 2% | 0% |
| 2 | 3% | 2% | 2% |
| 3 | 18% | 11% | 8% |
| 4 | 14% | 14% | 28% |
| 5 | 45% | 59% | 60% |

**Exercise Daily?**

| Score | Pre | Post | 6-8 week Follow up |
|---|---|---|---|
| 1 | 17% | 11% | 15% |
| 2 | 11% | 12% | 23% |
| 3 | 27% | 18% | 30% |
| 4 | 19% | 21% | 15% |
| 5 | 18% | 24% | 13% |

**Check Your Feet Daily?**

| Score | Pre | Post | 6-8 week Follow up |
|---|---|---|---|
| 1 | 6% | 1% | 0% |
| 2 | 3% | 4% | 4% |
| 3 | 10% | 10% | 2% |
| 4 | 10% | 14% | 21% |
| 5 | 61% | 60% | 67% |

**Take medications as prescribed?**

| Score | Pre | Post | 6-8 week Follow up |
|---|---|---|---|
| 1 | 1% | 0% | 2% |
| 2 | 1% | 0% | 2% |
| 3 | 2% | 1% | 2% |
| 4 | 12% | 12% | 17% |
| 5 | 71% | 77% | 76% |

**Check your blood sugar?**

| Score | Pre | Post | 6-8 week Follow up |
|---|---|---|---|
| 1 | 4% | 2% | 4% |
| 2 | 6% | 2% | 6% |
| 3 | 6% | 7% | 8% |
| 4 | 20% | 12% | 10% |
| 5 | 51% | 62% | 67% |

**Keep Doctor's appointments?**

| Score | Pre | Post | 6-8 week Follow up |
|---|---|---|---|
| 1 | 12% | 0% | 0% |
| 2 | 1% | 1% | 0% |
| 3 | 2% | 2% | 0% |
| 4 | 7% | 2% | 8% |
| 5 | 82% | 85% | 89% |

**Education Specific questions**

Pre-post Education Surveys
Scoring was 1 through 5 with 1 being "No knowledge" and 5 being "A lot of knowledge"
Pre = 115 people surveyed, Post 105 people surveyed, 6-8 week follow up 46 people surveyed

How much do you know about the following?

**The effect of carbohydrates on your blood sugar?**

| Score | Pre | Post | 6-8 week Follow up |
|---|---|---|---|
| 1 | 17% | 3% | 6% |
| 2 | 16% | 5% | 7% |
| 3 | 22% | 13% | 15% |
| 4 | 24% | 37% | 43% |
| 5 | 14% | 33% | 25% |

**Reading food labels?**

| Score | Pre | Post | 6-8 week Follow up |
|---|---|---|---|
| 1 | 8% | 2% | 0% |
| 2 | 14% | 3% | 2% |
| 3 | 15% | 10% | 15% |
| 4 | 33% | 34% | 41% |
| 5 | 23% | 41% | 41% |

**Using portion size to improve your blood sugar?**

| Score | Pre | Post | 6-8 week Follow up |
|---|---|---|---|
| 1 | 12% | 3% | 0% |
| 2 | 16% | 6% | 2% |
| 3 | 25% | 12% | 17% |
| 4 | 26% | 37% | 52% |
| 5 | 14% | 33% | 28% |

**The benefits of activity and exercise on diabetes?**

| Score | Pre | Post | 6-8 week Follow up |
|---|---|---|---|
| 1 | 4% | 1% | 0% |
| 2 | 11% | 2% | 2% |
| 3 | 22% | 12% | 17% |
| 4 | 30% | 36% | 30% |
| 5 | 26% | 41% | 50% |

**The importance of checking your feet daily?**

| Score | Pre | Post | 6-8 week Follow up |
|---|---|---|---|
| 1 | 11% | 4% | 2% |
| 2 | 8% | 2% | 2% |
| 3 | 18% | 12% | 21% |
| 4 | 25% | 23% | 15% |
| 5 | 31% | 50% | 58% |

**The benefits of blood sugar management on reducing long term problems such as nerve damage, eye damage, heart damage, etc?**

| Score | Pre | Post | 6-8 week Follow up |
|---|---|---|---|
| 1 | 16% | 3% | 2% |
| 2 | 10% | 2% | 8% |
| 3 | 21% | 16% | 19% |
| 4 | 20% | 29% | 43% |
| 5 | 26% | 40% | 26% |

**Pre-6/8 Week follow up My Self-Care Behaviors and Confidence**
Note: 46 completed the 6-8 week follow-up surveys

**What is the hardest thing that you face in managing your diabetes?**

| Question | Pre | 6-8 week Follow up |
|---|---|---|
| Access to information about diabetes | 14% | 3% |
| The cost of caring for diabetes | 14% | 6% |
| I am overwhelmed with my diabetes | 17% | 2.5% |

**Confidence Questions**

**How confident are you that you can do the things that are important to manage your diabetes?**

| Score | Pre | 6-8 week Follow up |
|---|---|---|
| Not Confident | 4% | 0% |
| Not/Somewhat Confident | 7% | 2% |
| Somewhat Confident | 31% | 38% |
| Somewhat/very confident | 17% | 29% |
| Very Confident | 32% | 25% |

**How important is it to you to manage your diabetes?**

| Score | Pre | 6-8 week Follow up |
|---|---|---|
| Not Confident | 1% | 0% |
| Not/Somewhat Confident | 2% | 4% |
| Somewhat Confident | 11% | 13% |
| Somewhat/very confident | 16% | 15% |
| Very Confident | 59% | 63% |

**Other Self-Care information:**
A total of 109 responses

**How many times in the last 12 months have you?**

| Item | 0 | 1-3 | 4-7 | 7-9 | 10+ |
|---|---|---|---|---|---|
| Been to the emergency room due to diabetes | 84% | 4% | 1% | 1% | 0% |
| Been admitted to the hospital due to diabetes | 87% | 4% | 0% | 0% | 0% |
| Had a doctor check your feet | 29% | 44% | 12% | 3% | 2% |

**In the last 12 month have you:**

| Item | Yes | No |
|---|---|---|
| Had an eye exam by an eye doctor | 62% | 31% |
| Had two dental check-ups with a dentist | 46% | 46% |
| Received a flu shot | 54% | 38% |

**Depression Scales**
A total of 115 people surveyed

**Over the past two weeks how often have you been bothered by the following problems?**

| Question | Not at all | Several Days | More than half the days | Nearly everyday |
|---|---|---|---|---|
| Pre-Little or no interest or pleasure in doing things | 50% | 22% | 10% | 7% |
| 6/8 week-Little or no interest or pleasure in doing things | 60% | 15% | 4% | 13% |
| Pre-Feeling down, depressed or hopeless | 56% | 21% | 11% | 2% |
| 6/8 week-Feeling down, depressed or hopeless | 68% | 8% | 6% | 6% |