Final 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"

UC DAVIS HEALTH SYSTEM

Administered by

University of California, Davis

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Acknowledgements

This report was prepared by the University of California, Davis (UCD) Chronic Disease Management (CDM) Department, the Center for Information Technology (CIT), the Center for Healthcare Policy and Research (CHPR), and the Clinical and Translational Science Center (CTSC) evaluation team.

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Members of the CIT team included George Wu and Shelley Palumbo.

Members of the CHPR team included Teresa Farley, Gisela Escalera, MSW, and Mauricio Rodriguez, BS.

Members of the CTSC evaluation team included Julie Rainwater, PhD, Stuart Henderson, PhD, and Erin Griffin, PhD.

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I. Executive Summary

Background

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 project 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 beneficial 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 would 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.

There is significant interest in measuring the impact telemedicine prevention/self-managed care educational sessions may have on chronic disease patients who currently may not have these services as a result of living in their rural or medically-underserved communities.

Findings and Recommendations

This summary serves as a quick reference to the implementation, outcomes, and recommendations from the Diabetes Telemedicine Project Team. A more detailed description of these findings can be located in the body of the final project report.

Recruitment of Practice Sites and Patients

Recruitment of clinical sites for the project was challenging. Of the 68 potential rural clinics identified, only 12 clinics expressed an initial interest; however, by the time of implementation, ten were able to continue in the intervention and two declined to move forward. (One clinic withdrew after implementation, leaving nine clinics that completed the pilot.) The participating practices cited the following reasons for their interest in the project:

1. Need for diabetes resources.
2. Inability to provide diabetes education due to lack of resources or personnel.
3. Interest in expanding telemedicine usage.

For those nonparticipating practices, the most common reasons included:

1. Competing high-priority projects.
2. Lack of personnel.
3. Lack of resources (telemedicine support, resources for staff, and time to implement the program).

The participating clinics had difficulty recruiting the desired goal of 50 patients per site; the most common barriers to patient recruitment were:

1. Staffing issues. Recruitment for classes was considered an "add-on" and trumped by usual and competing work.
2. Limited clinic resources. Clinics had competing projects that took precedence, such as implementation of emergency medical records.

Despite the stated barriers, 264 patients with diabetes were recruited. There were 15 volunteers who chose not to move forward; however, a total of 249 participated in the educational sessions and completed the extensive pre- and post-intervention assessment forms.

Delivery of Educational Content

A structured two-hour education class was delivered; it followed the American Diabetes Association Educational Guidelines. The classes were well received by the participants.

Impact of Intervention/Outcomes

Demographics:

The typical demographic profile of a participant in the study is as follows:

Caucasian:	(77.4%)
Type 2 Diabetes (>5 years):	(51.2%)
Medicare:	(49.0%)
High school diploma:	(32.0%)
Hypertension:	(55.6%)
Hyperlipidemia:	(40.2%)
Arthritis:	(36.8%)
Depression:	(29.3%)
Oral agent use:	(60.9%)
A1c:	(7.5%)
LDL-cholesterol:	(106.2 mg/dl)
Systolic blood pressure:	(130.5 mmHg)
Diastolic blood pressure:	(76.0 mmHg)

Perceived Self-Management Support

In an extensive survey of patient's perception of the support they receive in their clinic for help with their management of diabetes, most patients reported that their clinic was not able to provide sufficient support.

Impact of Class on Confidence, Knowledge about Diabetes, and Self-Management Behavior

Confidence:

There were significant changes in patients' reporting of their confidence in dealing with diabetes, and their ability to engage in self-care behaviors. These changes persisted over the 8-week follow-up period.

There was a significant decrease in the number of patients who felt overwhelmed with their diabetes; pre-intervention, 18.8% felt overwhelmed; post-intervention, 5.4% felt overwhelmed.

Knowledge About Diabetes:

There were significant changes in self-reported knowledge about diabetes that persisted over the 8-week follow-up period.

Self-Care Behavior:

Patients reported an increase in the number of days that they exercised at least 30 minutes; pre-intervention, 3.4 days; post-intervention, 3.9 days.

They also reported an increase in the number of days they checked their feet; pre-intervention, 4.2 days; post-intervention, 5.6 days.

Financial Implications

The cost burden of diabetes for the individual, their family, and the health care system is substantial.

One-third of the costs related to diabetes are related to foot complications.

Increased awareness of appropriate foot care and increased surveillance for foot problems by patients has the potential for substantial impact on the costs of diabetes care.

Further studies on the impact of educational programs on utilization of services are needed to understand the effects on costs.

Sustainability

Given all of the described challenges in recruitment for this project, the outcomes based on a two-hour educational intervention, and the epidemic burden of this disease on all healthcare facilities in California, it is recommended the next step is to assess other means of distributing the same educational content in different forums. A model to consider is adapting the Medi-Cal Incentive to Quit Smoking Program (MIQS) as a means to reach out to more patients with diabetes. As an example, it may be

reasonable to consider a trial of an educational intervention similar to smoking cessation program.

II. 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 would be taught by health educators. In addition, this pilot was designed 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 was collected on 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 project was conducted over a three-year time period to allow for sufficient time to measure project outcomes, see the timeline below:

Medical Board of California Contract: "Development of a Diabetes Self-Management Education Program via Telemedicine for Patients in Rural Undeserved Communities in California"

Project Timeline July 1, 2009 - June 30, 2012

Primary Tasks	Dates	
Contract commenced	7/1/2009	
Contract appropriated	8/6/2009	
Contract approved by IRB	11/20/2009	
Hire staff, develop curriculm, design workflow	8/6/2009-1/31/10	
Add Clinical Sites	1/1/10-8/15/11	Last possible kick off 8/15/11
Survey Physicians CME topics	1/1/10-8/31/11	
Recruit participants & Conduct classes	1/1/10-12/20/11	Last class date offered 12/20/11
Create & adjust database	7/1/10-12/31/10	
Database entry	10/1/10-4/30/12	All entries in by 5/31/12
CME Events	1/1/11-11/30/11	
Physician 1:1 consults	1/1/10-11/30/11	
Health Coaching calls	1/1/11-11/14/11	Last date offered wk of 11/14/11
Conduct chart audits	3/1/11-5/25/12	Complete by 5/25/12
Exit interviews - site champions	2/15/11-12/31/11	
Exit interviews - physician satisfaction	2/15/2011-12/31/11	
Evaluate prgress - annual report to MBC 2010 - due mid April	3/15/10-4/15/10	
Evaluate progress - annual report to MBC 2011 due mid-April	3/15/11-4/15/11	
Data analysis	1/1/12-9/30/12	
Evaluatate progress - final report to MBC September 2012 (estimate)	1/1/12-9/30/12	prelim draft by 6/29/12

Project Team

The project team consisted of various subject matter experts in multi-disciplinary areas to ensure the success of the project including:

James Nuovo, MD, and Thomas Balsbaugh, MD, both subject matter experts in chronic disease management and diabetes and faculty members in the Department of Family and Community Medicine; Bridget Levich, MS, RN, CDE, and Glee Van Loon, RD, CDE, subject matter experts in chronic disease management and educational development and delivery and project management; Teresa Farley, BA, an experienced research project administrator; Gisela Escalera, MSW, and Mauricio Rodriguez, BS, both bilingual health coaches with experience in research and intervention delivery in English and Spanish; Julie Rainwater, PhD, Stuart Henderson, PhD, and Erin Griffin, PhD, subject matter experts in program evaluation and research methods and analysis; and George Wu, Shelley Palumbo, and the technology team, subject matter experts in confidential, telemedicine video connectivity.

Interdepartmental Collaboration

This project included significant interdepartmental collaboration, project implementation, delivery and outcomes. This is a brief overview of the departments included and their focus.

Chronic Disease Management (CDM) Program

The CDM Program began in 2002 with a grant from the Robert Wood Johnson Foundation (to the Department of Family and Community Medicine) and has, since 2003, 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 several chronic illnesses targeted. The initial focus has been on developing system wide clinical information infrastructure (e.g. patient registries and 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 classes were taught, totaling nearly 200 class sessions a year. The Diabetes Self-Management Education program received an American Diabetes Association certificate of recognition for meeting the association's highest educational standards for the class, "In Charge and In Control." The UCDHS program has been recognized since 2003.

During 2008-09, 276 patients who had taken the four week "In Charge and In Control" class were tracked. Comparing patients' A1c and LDL 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 HgbA1c 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.

Center for Healthcare Policy and Research (CHPR)

The CHPR was founded in 1994 with the mission of facilitating research, promoting education, and informing policy about health and healthcare. 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 multidisciplinary approach, the CHPR helps investigators examine questions pertinent to health services access, delivery, cost and outcomes, with an emphasis on healthcare policy. It also provides the administrative resources and technical expertise crucial to implementing complex collaborative research. For this project, the CHPR provided contract management, evaluation and administrative support.

Center for Health and Technology (CHT)

The CHT began in 1992 and has grown into 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 provided technical consultation and assessment of the rural practice sites provided the videoconferencing linkage for the educational classes.

Office of Continuing Medical Education

The Office of Continuing Medical Education (OCME) offers physicians and other health care providers with educational opportunities that foster excellence in patient care. Accredited by the National Accreditation Council for Continuing Medical Education, 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 on the Internet. For this project, OCME provided consultation in the use of these new modalities and provide CME credit for the classes offered.

Project Goals/Objectives

Goal 1

To test a model for improving access to diabetes self-management training and resources via telemedicine technology for patients in rural and/or medically-underserved communities in Northern and Central California.

Objectives

1. To test the effectiveness and cost-efficiency of providing patient-self-management training via interactive videoconferencing to patients at six health care sites per year.
2. To compare the outcomes of patients participating in two different models: class attendance only and class attendance with follow-up health coaching.
3. To develop a final report summarizing project results and lessons learned.

Goal 2

To develop a method, utilizing telemedicine technology, of providing primary care physicians in rural and/or medically-underserved areas with information on best practices for diabetes management and care.

Objectives

1. To provide continuing medical education programs on best practices for diabetes management via interactive videoconferencing to primary care physicians at participating community sites.
2. To provide solo-practice primary care physicians access to clinical decision-making support regarding therapeutic changes to diabetes care.

Target Population

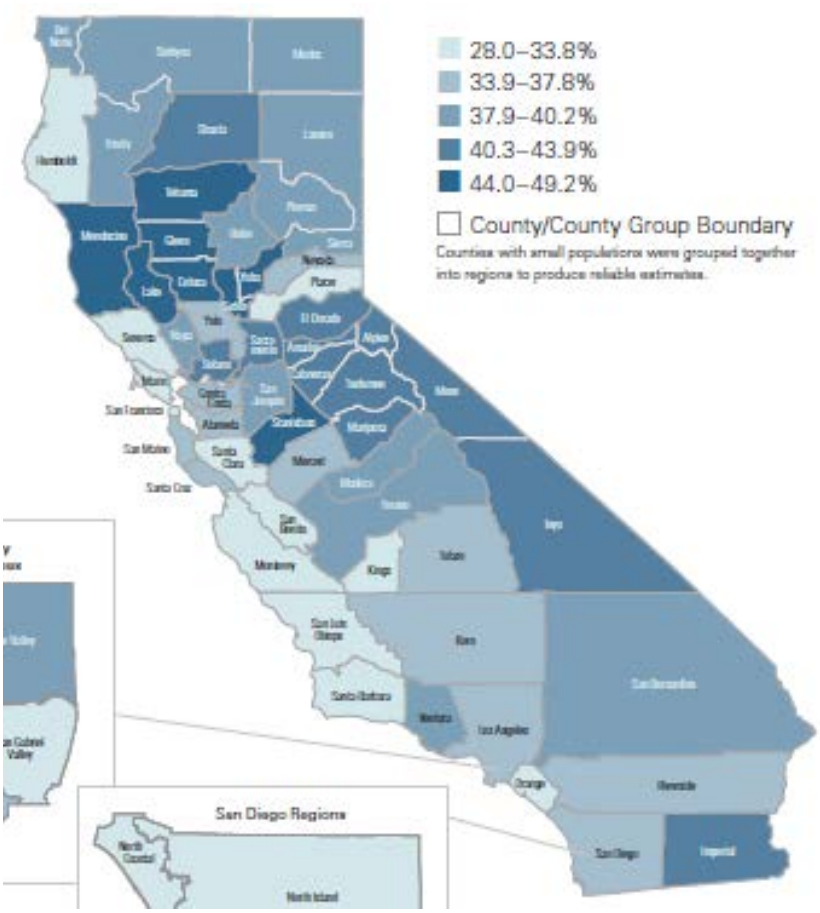
The incidence of diabetes in the United States is soaring. The Centers for Disease Control (CDC) reported 25.8 million people in the U.S. are affected by diabetes in 2011, which represents more than 8.3% of the population. In California, it is estimated that almost 2 million people have diabetes with a statewide prevalence rate of 8.9%, and 22% for those age 65 and older.

The targeted population for this project included persons over 18 years of age diagnosed with pre-diabetes or type 2 diabetes, speak English or Spanish, and were patients of a participating clinic located in a rural and/or medically-underserved area in Northern or Central California.

Target Geographic location

This pilot targeted a 33-county area in Northern and Central California where the CHT currently has telemedicine partners. The area includes nearly 80 different clinics, practices, and hospitals serving rural and medically-underserved communities. The number of healthcare sites will increase in the next few years because of the California Federal Communications Commission's Pilot Project, which will fund development of the California Tele-health Network (CTN) and the recent passage of Proposition 1D, which provides for a telemedicine equipment loan program. The 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 the south. In this service area, 25 of the 33 counties have a diabetes incidence rate that exceeds the state average of 6.2%.

Map 1. Percentage of Adults with One or More Chronic Conditions,* by County, 2007



Patient Education - Diabetes Self-Management Education Program

In the past decade, there has been a shift in the approach to caring for patients with chronic illnesses from the more traditional, reactive approach to the chronic care model, which is a planned and proactive plan. 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. The goal of the model is for "productive interactions" between an informed, empowered patient and a prepared, proactive practice team. These interactions are facilitated by coordinating health system improvements around clinical information systems, evidence-based care, delivery system improvements, and by providing patient self-management support.

For this pilot project, UCD developed and tested educational interventions that focus on improving access to patient self-management support resources. The objective of this educational effort was to engage, educate and train patients to better manage their diabetes. The project recognized 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 the illness. Thus, the goal was to teach patients not only information about their illness, but also how to take this information and use it to solve problems in their daily lives. The educational intervention also included individualized approaches based on the diverse cultures of the patient population. The desired outcome was for patients to gain a greater sense of confidence, empowerment and self-efficacy with respect to diabetes self-management. In the process, however, it must be recognized that a patient's readiness to manage self-care can vary over time, so the project was designed to recognize patient readiness to change and to meet the patients "where they are at."

Patient Education – Health Coaching

A secondary piece of this Diabetes Self-Management Education Program was 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, by forming an alliance with a patient, help the person work towards positive change. This aspect of the pilot program allowed the project team to evaluate the differences and impact, if any, for participants attending educational sessions and engaging in health coaching services compared to participants only attending educational sessions, as referenced in Goal 1, Objective 2. In this project, health coaching uses a coaching style that utilizes motivational interviewing to "empower those wishing to change behavior by *asking* where they want to go and getting to know him or her a bit, *inform* the person about

options and see what makes sense to them and *listen* to and respect what the person wants to do and offer help accordingly." (Stephen Rollnick, Willam Miller, Christine Butler; Motivational Interviewing in Health Care).

The use of silence and reflective listening are key aspects of coaching, and the coaches were advised to resist "fixing the challenges for patients," but rather use open-ended techniques to support patients in finding their own best answers.

Physician Education – CME

An additional educational effort of this program was to provide primary care physicians, via telemedicine, with the most current knowledge and care management strategies to support the provision of evidence-based care via telemedicine. Physicians were recruited to participate in telemedicine sessions that earned continuing medical education (CME) credit. The sessions were offered through on-site videoconferencing at various strategic times (early morning, during lunch, early evening) at their sites. This directly linked to Goal 2, objectives 1 and 2.

III. Background & Significance

Diabetes Epidemic, Prevalence and Costs

Diabetes epidemic/prevalence –

Although the legislation does not specifically identify which chronic disease to target, the pilot project focused on diabetes, a serious medical condition impacting the nation, and Californians.

National - The incidence of diabetes in the United States is soaring. The Centers for Disease Control (CDC) reported that over 25.8 million people in the U.S. were affected by diabetes in 2011. This is 8.3% of the population, with over 7 million people undiagnosed, with a 9% increase of the population affected since 2007. In 2007, when diabetes was reportedly affecting over 23.6 million people, the CDC estimated direct (medical only $116 billion) and indirect costs (disability, lost work etc. $58 billion) to be over $174 billion. Increasing the costs by 9%, one can estimate costs conservatively at $189 billion.

State - In California, it is estimated that over 2 million people have diabetes with a statewide prevalence rate of 8.9%. For individuals 65 and older, the prevalence rate is 22%. The economic cost of diabetes is enormous. According to a 2009 UCSF California Diabetes Program report, the cost of diabetes treatment is estimated to be approximately $24.5 billion a year. These costs include an estimated $5.8 billion in indirect payments, including disability payments, lost time from work, and premature deaths.

The California Diabetes Program report provides other notable facts regarding Californians and Diabetes, including:

- There are especially-high rates of diabetes in California's Central Valley;
- There is a high correlation with being uninsured and having diabetes (especially among the Hispanic/Latino population). There is also tremendous county-by-county variation in coverage of uninsured people with diabetes; and
- There is a growing prevalence of diabetes in young adults (ages 18-44) who have the behavioral and health access risk profiles that make them particularly vulnerable to developing complications in the prime of their lives. These include especially high rates of concurrent tobacco use (20%) and heart disease (8%), high rates of being uninsured (30%), and low rates of receipt of recommended services, such as eye exams and influenza vaccinations.

County - The county of Sacramento had over 57,944 adults (out of an adult population of 999,033) diagnosed with diabetes, according to the California Diabetes Program report. The largest percentages of diagnosed cases included men and women over 65 years old and of Latino descent.

Disparities - There are disparities in the incidence rate between various racial and ethnic populations. After adjusting for population age differences, the CDC-estimated rate of prevalence of diagnosed diabetes was 13.0% for Hispanic persons, 7.3% for non-Hispanic white persons, and 12.6% for non-Hispanic black persons.

Diabetes Self-Management Education

The benefits of education can be seen in an article (Norris S. L., Engelau, M. M. & Vencat Narayan, K. M. "Effectiveness of self management training in Type II Diabetes. A systematic review of randomized controlled trial," *Diabetes Care* 2001, Vol. 24, p.561-587), which provides a systematic review of 72 randomized controlled trials of self-managed care education. The article concludes that self-managed care training has proven to be effective in short-term management of patients with type II diabetes.

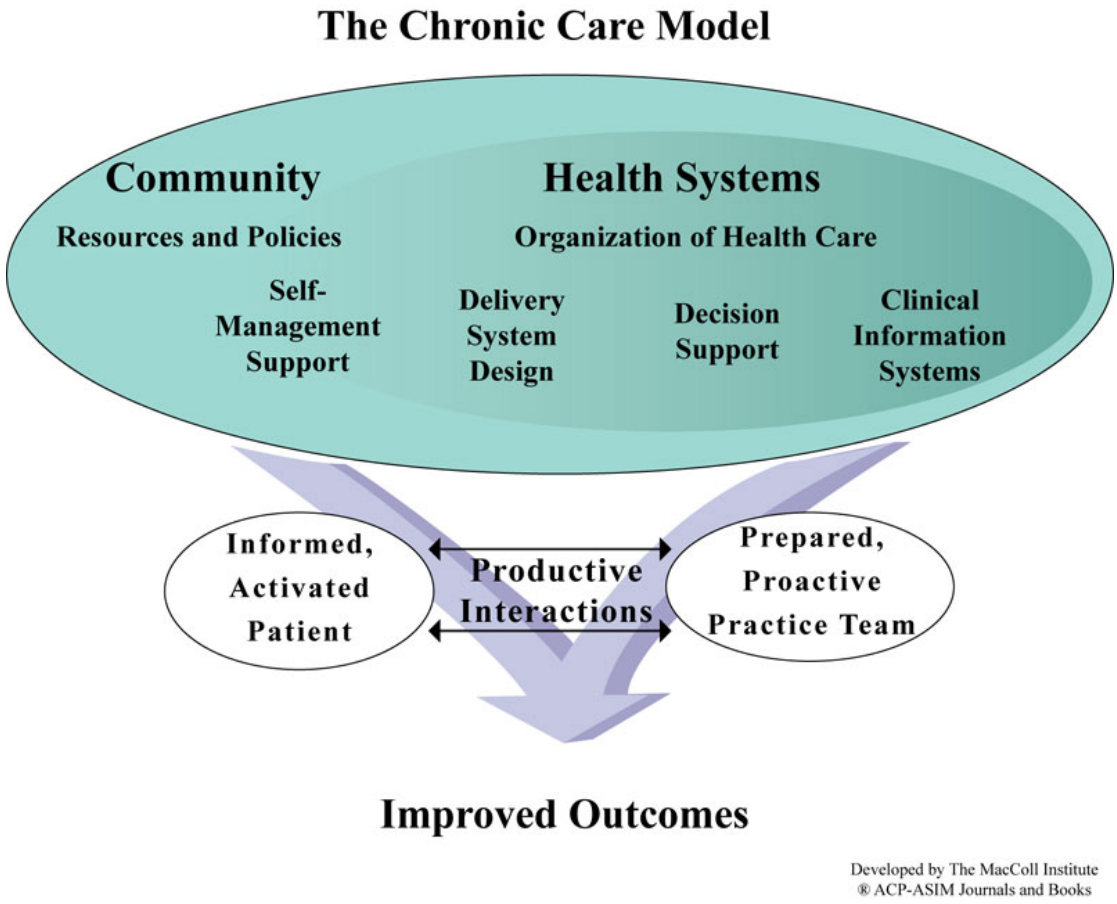
Use of Chronic Care Model Process – In this pilot program, the chronic care model was selected based on the merits, benefits and outcomes of the model. According to the Improving Chronic Care Illness website (http://improvingchroniccare.org/), the most recent data show more than 145 million people, or almost half of all Americans, live with a chronic condition. That number is projected to increase by more than one percent per year by 2030, resulting in an estimated chronically ill population of 171 million.

Almost half of all people with chronic illness have multiple conditions. As a result, many managed care and integrated delivery systems have taken a great interest in correcting

the many deficiencies in current management of diseases such as diabetes, heart disease, depression, asthma and others. Those deficiencies include:

- Rushed practitioners not following established practice guidelines
- Lack of care coordination
- Lack of active follow-up to ensure the best outcomes
- Patients inadequately trained to manage their illnesses

Overcoming these deficiencies will require nothing less than a transformation of health care, from a system that is essentially reactive - responding mainly when a person is sick - to one that is proactive and focused on keeping a person as healthy as possible. To speed the transition, Improving Chronic Illness Care created the Chronic Care Model, which summarizes the basic elements for improving care in health systems at the community, organization, practice and patient levels. Evidence on the effectiveness of the Chronic Care Model has recently been summarized and provided in a process flow, see below:



IV. Study Procedures

The pilot project was an Institutional Review Board (IRB)-approved research project managed through the Center for Healthcare Policy and Research. The pilot included the following procedures:

- Establish an IRB-approved protocol
- Create project tools (curriculum, project binders for clinics)
- Recruit and enroll clinics and physicians
- Recruit patients/collect initial data
- Deliver intervention
    - Classes
    - Health coaching
- Collect follow up data
    - Surveys
    - Chart audits
- Conduct Analysis
- Disseminate Results

Institutional Review Board

This project was administered and processed through the Organized Research Unit of the CHPR. At any point in the project implementation, when a new clinic site was added, a modification was required to add the site to the protocol list. The following is a list of IRB submissions that were completed to support the project:

1 initial IRB protocol

2 annual renewals of the protocol

19 modifications were processed

Medical Clinic Recruitment

Rural medical clinics were recruited via an email from the UCDHS telemedicine clinic manager to the documented site telemedicine coordinator. The email provided information about the project and a one-page attachment that included a descriptive overview and details of the benefits of the project.

Non-responders received a follow-up telephone call after ten days and/or a second email was sent.

For clinics that responded with interest, a “thank you for your interest” email was sent along with a one-page clinic questionnaire to be completed. The clinic questionnaire inquired about specific information (e.g. number of clinic patients with diabetes, staff levels, conference room space, telemedicine equipment, etc.) and allowed the project

manager to assess and evaluate the appropriateness of the clinic for inclusion in the project. Once the clinic questionnaire was received from a clinic, the project manager called the clinic contact person to clarify information, discuss the project in more detail and address questions.

The site search originally targeted the 33 Northern California counties, but it later was expanded geographically into the California Central Valley. This decision was made because of the low participation rates of clinics, the extensive time taken by sites to confirm or deny participation, and the need to engage a more diverse study population (specifically, Spanish-speaking participants).

Clinic Criteria

Clinics with the following attributes were identified as ideal for participation:

- Located in a rural or medically underserved area of Northern or Central California.
- Patients with a diagnosis of Type II Diabetes.
- Limited resources for diabetes education.
- Access to working telemedicine equipment appropriate for groups to view .
- The ability to provide a site champion (who became human subject research certified) .
- Access to an appropriate space where groups could learn.

Development of a Diabetes Self-Management Education Program via Telemedicine - Site Recruitment

Blue = Participating
Red = Declined
Yellow = Withdrawn during pilot

Patient Recruitment

Clinics were responsible for recruiting patients to participate in the project. A variety of direct and indirect approaches were used to recruit participants to the project. This approach gave each clinic site the opportunity to recruit patients in the manner most appealing and helpful to their respective patient population. Site champions could directly invite diabetes patients who were in the office for an appointment to participate in the project. Physicians also were encouraged to invite their patients with diabetes to participate in the project. Project flyers (in English and Spanish) posted in the clinic served as a less-direct approach to recruitment. A total of nine flyers in English and five

flyers in Spanish were available for all clinics to customize and inform their patients about the diabetes classes.

The patient recruitment goal for the project was 1,000 patients, approximately 50 patients per clinic. The majority of clinics involved in the study struggled to recruit the desired number of patients and a total of 264 patients were recruited.

Recruitment challenges arose at both the clinic and participant levels.

Clinic level - The sites varied in how they conducted study participant recruitment. Some sites relied heavily on provider participation, whereas other sites primarily used phone contacts or other outreach methods. In general, face-to-face recruitment strategies were most effective. A number of factors impacted the rural health clinics' ability to successfully recruit and retain participants.

- Staffing resources and competing duties. Many rural clinics struggle to maintain adequate levels of staff to provide usual patient care. Support staffs also are tasked with multiple duties and often have no relief staff available. Therefore, identifying one or two persons in a clinic to lead patient recruitment and class coordination efforts appeared to overburden and/or be viewed as an "add on" and resulted in recruitment efforts being overwhelmed with other duties. As one site coordinator said, "[Recruitment] was a little bit challenging for us because our staff is so thin…you know you're working people close to maximum hours - as close to it as you can get without going over 40 hours…so it was a little bit of a drain."

  Finding staff to recruit Spanish-speaking patients was especially challenging as highlighted by one coordinator's comment: "What I found frustrating is that we had a nurse that spoke Spanish but because [recruitment] was very time-consuming, and we are already spread pretty thin here. Anyway, she didn't want to take time away from her day to get it done. And that was the reason why...it was hard for her to get that done."

  Finding staff for recruitment was challenging even when patient education or outreach to their Spanish-speaking population was stated to be an important service. Additionally, if only one person was charged with the recruitment responsibility, recruitment was left unmanaged during employee absences.

- Medical information extraction. Several of the rural clinics that participated in the study relied on paper medical charts and did not have the infrastructure necessary to effectively and efficiently identify patients with a specific health diagnosis, such as Type II diabetes. In these cases, clinic recruitment efforts relied on physicians' or staffs' patient recall, patients with clinic appointments (physician referrals), and word-of-mouth generated by a flyer advertisement or

other method. This was a cumbersome and suboptimal recruitment method that produced inadequate recruitment results.

Clinics utilizing electronic medical records also require the infrastructure and technical staff to extract specific data for recruitment. Some clinics created a disease-specific report to use as a template for sending mass advertisement mailings or telephonic outreach. This was labor intensive and could present challenges. As one clinic coordinator reported:

> *We went into our EMR health line system and took…the ICD IX code for diabetes and ran that. And, it seems that every test that was ever ordered for people that were screened for diabetes was put in. We found some challenges because we called patients and talked to them and said, "Hey look, we want to let you know about this free research project - education project - that's going on that we think would really benefit you," and they were saying, "I don't have diabetes. Who said I had diabetes?"*

Thus, even with the access to electronic records, there often was a lack of a succinct and efficient method for identifying and contacting patients.

Participant level - In addition to challenges at the clinic level, there were several recruitment challenges at the patient level. The no-show rate for the intervention was also higher than anticipated (approximately 50%). Among the factors that negatively influenced recruitment and retention were:

- Perceived value of health intervention. Patients must perceive health care education as important to prevent other competing tasks or responsibilities from taking precedence. This is especially true when persons are asked to commit to a two-hour class. Site coordinators reported that many of the patients they contacted did not value health education or felt that "they know as much about their own diabetes as we could teach them." For instance, one coordinator said, "I don't think it's specific to this project but health education takes time and so that's what's hard. To convince people that this 2 ½ hours that they're going to spend on this is worth it, you know? A lot of times they don't feel that way." Another coordinator also commented on the perceived value of health education: "it's just the importance of it hasn't quite hit them yet." This is not unlike other suburban diabetes education programs where this is also an observed barrier.

- Rural environment. Living in a rural location presented unique barriers to recruitment and retention. Transportation, for instance, can be difficult in these areas. Participants often had to travel long distances to receive the health education. Some have limited access to transportation (private or public) or the financial means to pay for transportation to and from the clinic.

In addition, those who reside in rural areas are more susceptible to utility outages, poor weather conditions and suboptimal driving conditions. These issues were observed as obstacles to ones' self-management education commitment or ability to attend a class. A site coordinator highlighted this as a significant factor in her recruitment efforts: "We had winter factoring in there, and a lot of patients would confirm that they were coming and then not show up."

Economic and education levels. Rural areas of California have a high incidence of low income and education levels. According to the USDA Economic Research Service, the average per-capita income for Californians in 2009 was $42,395, although rural per-capita income lagged at $34,321. 2010 estimates indicate a poverty rate of 17.0% exists in rural California, compared to a 15.8% level in urban areas of the State. In 2010 ACS data reports that 13.2% of the rural population has not completed high school, compared to 19.5% of urban populations. The unemployment rate in rural California is at 13.2%, while in urban California it is at 11.7% (USDA-ERS, 2011).

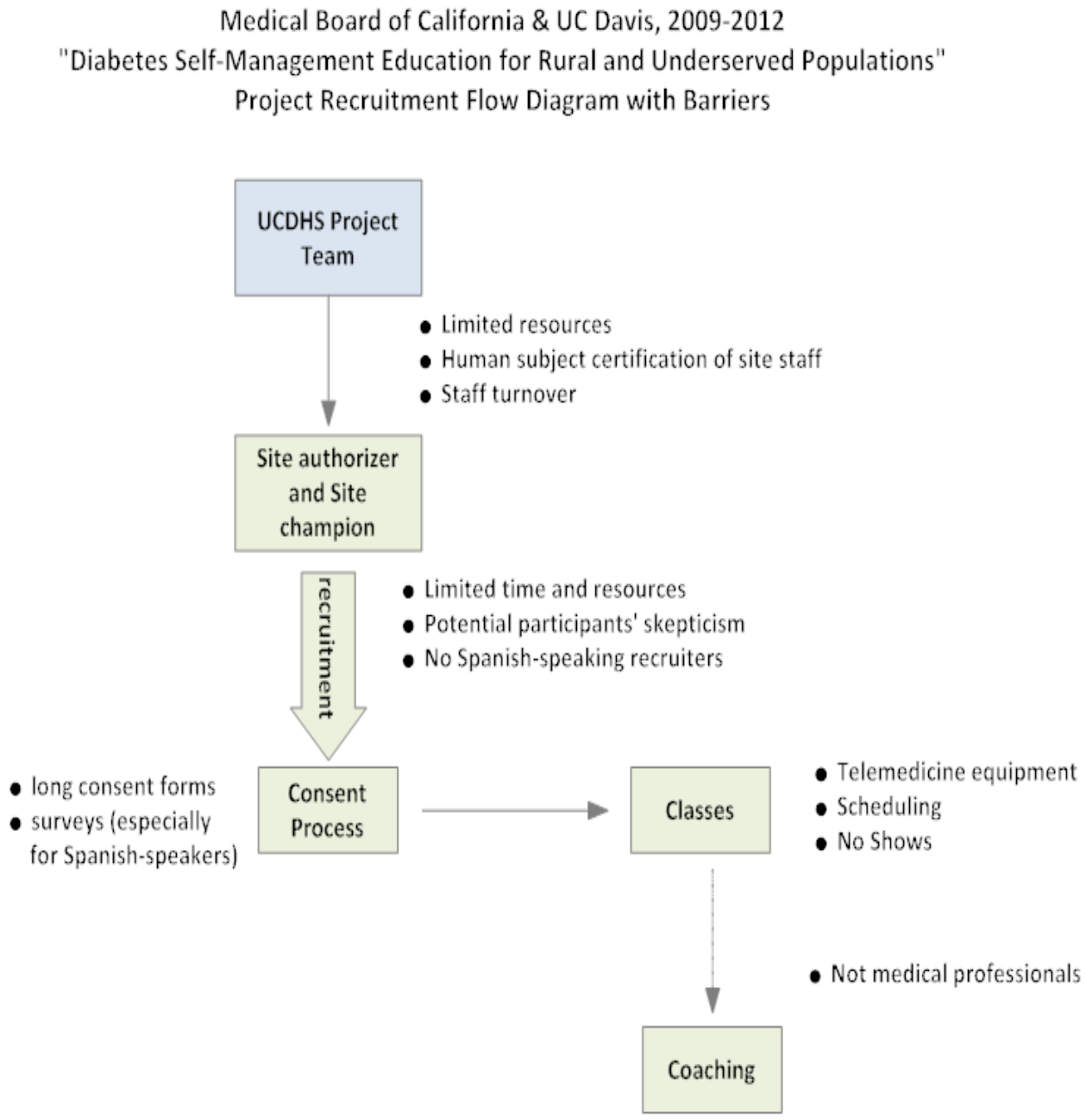
- These issues can play a significant role in patients' ability to commit to attending a self-management education class. Financial constraints may prevent a patient from taking time off work to attend a class. Or, fear of job security issues may be an issue if they request time off or reveal to their employer they have a health condition. One coordinator noted these challenges among their primarily Hispanic population:

  The Hispanic population they work long hours and for them to take 2 or 3 hours out of their day is very challenging for them, especially during the work season. Also, even if they're older people and they're not working they're usually watching kids or family for workers, so they can't just get up and leave and come to the clinic for a couple hours."

  The project team found that the limited literacy and language also impacted participants (especially Spanish-speaking participants) and the language used in the documents was too technical for some of them, despite the material being written at the sixth-grade level. A coordinator explained, "Some patients did not want to do the paperwork; it wasn't their thing at all. The second they'd see the paperwork they just wanted to leave." Another coordinator reported a similar issue: "I would wonder…why they didn't like the surveys and the consent [form].... If they were just kind of paranoid or if they had the literacy difficulties, I don't really know. Some of them did leave just prior to class. They just wouldn't fill out anything."

- Health status. One of the requirements for study participation was a diabetes diagnosis. Patients' diabetes, however, impacted their health education attendance. Specifically, a patient must "feel well enough" to commit to attending a two-hour class, which is likely a three-or-more hour commitment with travel time

included. Someone with neuropathy may not want to walk to and from the bus stop or someone with hyperglycemia may feel too lethargic and unmotivated to attend a class. Although this is not unique to rural settings, it appeared to be an issue. See the recruitment flow chart below:



Project Tools

A binder was created as a tool to provide clinics with the specifics of the project. It included detailed forms such as consent forms, sign in sheets and surveys, relevant documents (such as recruitment ideas and timelines) and step-by-step instructions (such as class set up and CME instructions). The binder was provided to clinics in advance of their kick-off event and allowed clinics to have a comprehensive document at their fingertips as they progressed through the project.

A secure folder that could be shared between the project team members was developed to store all project-related documents. Additionally, a system was developed to keep track of the health coaches' day-to-day interactions with rural clinic staff regarding the progress of the project. Lastly, several spreadsheets were developed to keep track of rural site contact information and the number of classes conducted and surveys administered.

Communication

Communication was pivotal to the process of this project. Given that this project was conducted by telemedicine, the communication between project teams was conducted via telephone and email.

Regular communication between the rural clinic sites and the project staff was important, as the clinics conducted all patient recruitment and the project team provided the framework/guidelines for all project activity. Here are the key communication channels utilized to deliver this intervention:

Site Champions/Coaches

Each enrolled clinic site selected one or more site champion(s) for the pilot project. Site champions were clinic staff members who had been identified to be the primary day-to-day contact for the pilot project. Working closely with the project health coaches, the champion was required to become "human subject research certified" and was responsible for recruiting and consenting patients at the enrolled clinic site.

Kick-Off Events

Once clinics were recruited into the study, the UCD team organized a formal meeting (a "kick off" event), using the telemedicine equipment. The goal of these meetings was to provide the project team and the clinic team the opportunity to meet "face-to-face," discuss processes and procedures. as well as have an open question-and-answer session to ensure that the site had the knowledge, resources, and confidence to implement the participant recruitment portion of the project. At a minimum, persons invited to attend the kickoff event included managers, physicians and site champions.

Connection with Patients

Leveraging existing relationships between clinic staff and patients was deemed to be the most efficient way to identify and recruit patients appropriate for this project. Site champions and physicians communicated with patients to engage their interest in the self-management education opportunity. At the classes, site champions worked with patients to get them prepared for the class, yet the education delivery was conducted by the UCD project staff via telemedicine videoconferencing. The health coaches worked with and communicated with all participants in the telemedicine educational sessions to ensure that participants had an opportunity to engage and participate.

Self-Management Education

Curriculum

The curriculum was developed in Year One of the project. The curriculum mirrored the chronic disease model approach which was chosen by the project team for implementation.

Utilizing the key areas identified by the American Diabetes Association as paramount to self-management, the education program focused on balancing nutrition, activity and medication. The educational intervention lasted two hours and was delivered by health educators. The emphasis of the information delivered was on non-pharmacologic interventions, namely nutrition changes, increased activity, and prevention of complications by improving blood sugar control and implementing daily foot care to the patients regimen. Contributing factors to Type II Diabetes were shared as was the basic pathophysiology of the disease. Complications of uncontrolled diabetes were explained along with symptoms of high blood glucose. Target blood sugar values were given as was the importance and meaning of certain lab values such as the Hemoglobin A1C as an estimate of overall blood sugar control.

The educational booklet that was given to each participant (produced in English and Spanish) was an integral piece of the education delivered. As the educator began each section of the curriculum, the patient was asked via tele-video to turn to curriculum to begin. By doing so the patients and the educator were literally on “the same page.” The numbers in the booklet were listed prominently on each page in order to make it easy for patients to stay on track with the educator. The overarching foci of the educational sessions were that of action plans and behavior change. Patients were encouraged to use the “Action Plan” page towards the end of the booklet to actively plan a change to improve their health. Use of achievable goals was the emphasis; the educators stressed the benefit of small successes making way for further health behavior changes.

A key piece of the educational intervention was that of verbally engaging patients in group learning. Early in the class, patients were encouraged to share successes or challenges in managing their diabetes. Frequently, these challenges or successes were relevant to nutrition or exercise and, frequently, other patients in the group could share a similar experience. By involving patients in learning as a group, the health educators were able to tailor the information as a response to unique patient concerns or questions, thus making the education more uniquely relevant to the group receiving the education. Utilizing the empowerment model created a non-judgmental tone in the class; the educators were instructed to respond in a motivational interviewing style by rephrasing a negative statement (for example: “I was bad” to “What did you learn from that experience?”). The curriculum can be found in appendix A1.

Frequency

Classes were scheduled to meet the needs of the patients enrolled and the clinic staff, along with consideration given to space availability and the availability of the project team. A total of 43 educational sessions were delivered. Enrolled clinics were encouraged to schedule their first educational session within two weeks of their enrollment. However, this timeframe heavily depended on IRB approval of the clinic site/staff to work on the project.

Delivery

The health education delivery was conducted using telemedicine videoconferencing and the staff delivering the education were UCD project staff at the time of the delivery. The health coaches took time to work and communicate with all participants in the telemedicine educational sessions to ensure that participants had an opportunity to be heard, engage, and participate.

The delivery of the intervention, in either English or Spanish, was planned for two hours with a small break between hours. The clinic site and UCD project staff ensured the tele-video connection was established and ready before the recruited participants arrived.

The health coaches initiated and confirmed the video connection functioned well, introduced themselves, and made the time to become acquainted with all the participants in the room at the clinic site. Before the delivery of the intervention, the health coaches confirmed everyone had consented to participate in the study, with the assistance of the site champion. The delivery of the curriculum was interactive, including activities and taking time to stop and address questions, concerns or provide clarification.

Intervention

Site champions organized the participants getting into the classroom, had participants sign-in, and disseminated/collected pre-education surveys. The health coaches initiated and confirmed the video connection was functioning prior to the class. At the start, they introduced themselves and took time to become acquainted with the participants at the clinic site. Before the delivery of the intervention the health coaches confirmed everyone had consented to participate in the study, and took time to answer any questions about the forms and the project. The delivery of the curriculum was interactive and included activities. The health coaches addressed questions, concerns and provide clarification during the intervention.

Health Coaching

Health coaching randomly was made available to an entire group of class members. Every other educational session that was conducted was offered follow-up health coaching. A total of 36 patients signed up for health coaching after the educational sessions. However, only 18 of those that signed up for health coaching actually used the services. A total of 43 health coaching sessions were provided.

Physician involvement and CME education

Primary care physicians were given Informed Consent forms to participate in the project. Their participation was two-fold: first, physicians were asked to invite their patients with Type II Diabetes to participate in the pilot education project; and second, they were invited to participate in real time tele-video conference CME and best practices education consultation services.

CME Delivery

The delivery of the CME was conducted by Thomas Balsbaugh, MD, a subject matter expert in Chronic Diabetes Care, and an active member of the project team. The delivery was planned for one hour, to be held via telemedicine videoconference on a confidentially-secure, HIPAA-approved telemedicine connection.

Physicians and clinical staff could sign up for the course as late as the day it was scheduled for delivery. Since physicians' schedules can fluctuate based on patient or clinic needs, the CME courses were developed with the flexibility to accommodate for unexpected changes.

CME Event Frequency & Topics

Upon physicians' enrollment in the study, they were surveyed regarding their diabetes topic interests and preferences for the CME courses. (See appendix B.) These surveys

were used to determine the highest priority and preferred subjects requested by the physicians. Seven CME topics were available, all of which focused on diabetes best practices and delivery models. Each topic was offered once during the project and the courses were delivered at various times of the day (early morning, during lunch, and early evening) to provide flexibility to the physician participants. They were delivered once each month. A total of 7 CME courses were offered.

Physician One-on-One Consults

To provide additional support and feedback on best practices for chronic diabetes care, one-on-one consults were offered by Dr. Thomas Balsbaugh on an as-needed or as-requested basis for participating physicians. When requested, these consults were offered by Dr. Thomas Balsbaugh via telephone. There were no one-on-one consults requested.

V. Data collection

A total of nine surveys were used for data collection in this project. Patient surveys collected information on demographics, general health, health behaviors that are important to diabetes self-care (i.e. checking your feet, obtaining an annual eye exam etc.), knowledge of diabetes, self-managed care confidence, and satisfaction. Data was collected three times: before the health education course, immediately after the education course, and six-to-eight weeks following the course. Collecting data at these various points provided the opportunity to measure changes in condition, confidence levels and satisfaction over time. Physicians were also surveyed on their satisfaction with the continuing education courses.

Patient Surveys

A total of nine patient surveys were used in the project. Below is a list of the surveys and a brief explanation of their contents, purpose, method of administration, and the time at which the surveys were administered. It should be noted that the method in which the surveys were administered may have varied by clinic on the basis of participant literacy. Most participants completed the surveys independently while others were assisted by the clinic's site champion.

The following five surveys were administered on-site pre-intervention, immediately before the health education courses. Clinic site champions were on-site to answer questions regarding surveys if required. After surveys were completed, the site champion reviewed them to ensure all questions were answered. Completed surveys were returned via Federal Express to the project team and entered into a secure database.

About Me – A one-page survey to collect demographic information about the participant, including, gender, age, race/ethnicity, education level, type of insurance etc. (See appendix C.)

About My Diabetes and General Health – A two-page survey to collect information about the participant's general health, diabetes, and existing medications. (See appendix D.)

My Diabetes Care - A two-page survey to collect information about the participant's diabetes care over the last 6 months. The survey used Likert scales to measure the care they had received, their satisfaction of that care, and their experience with the health care provider. (See appendix E.)

My Self-Care Behaviors and Confidence – A two-page survey to collect information on participant's' self-care, their confidence levels in conducting self-care and the actual self-care conducted in the last 7 days. This survey used Likert scale questions as well as some selected response sections. (See appendix F.)

Pre-Education Patient Survey – A one-page survey to assess patients' knowledge of diabetes and diabetes care. Using a Likert scale questions, patients were asked questions about their knowledge of events/activities that impact diabetes as well as the level of difficulty they have in managing these events/activities. (See appendix G.)

The following two surveys were administered post-intervention and answered on-site.

Post -Education Patient Survey - A two-page survey that replicated the pre-education patient survey completed by participants before the health education program. Using Likert scale questions, patients were asked questions about their knowledge of events/activities that impact diabetes as well as the level of difficulty they believe they would have in managing these events/activities. In addition, there was a section for participants to fill out if they participated in health coaching. (See appendix H.)

UCDHS Telemedicine Diabetes Education Patient Satisfaction Survey - A one-page survey to evaluate participants' satisfaction with the health education intervention. Using Likert scale questions, patients were asked to questions about their overall satisfaction with the educational session, the use of telemedicine as a delivery tool, and the value of the course. (See appendix I.)

The following two surveys were administered six-to-eight weeks after the participants completed the health educational session. Surveys were returned to the project team in

a pre-addressed, postage-paid envelope. If the survey was not returned within a two-week period, a project team member called the participant to ask the questions via a short telephone interview. Once this information was received, the information was entered into the project data base and stored in project files.

My Self-Care Behaviors and Confidence – A one-page survey to collect information about the participant's self-care, their confidence levels in conducting self-care, and their actual self-care they have conducted in the previous seven days. This survey replicated the "My Self-Care Behaviors and Confidence" survey participants completed before the health education intervention. It was mailed to participants with a pre-addressed, postage-paid envelope. If the survey was not returned within a two week period, a project team member called the participant to ask the questions via a short telephone interview. (See appendix J.)

Post-Education Patient Survey (6-8 Weeks) – A two-page survey that replicated the pre-education patient and post-education surveys participants completed before the health education program. In addition to the knowledge questions, there was an added section for participants to fill out if they participated in health coaching. This survey was mailed to the participant with a pre-addressed, postage-paid envelope. If the survey was not returned within a two week period, a project team member called the participant to ask the questions via a short telephone interview. (See appendix K.)

Physician Surveys

Upon completion of the intervention at a clinic site, the site champion disseminated and collected a two-page satisfaction survey to all consented physicians. Using a Likert scale, physicians were asked to answer questions about their perspectives regarding telemedicine education for disease management and observations of patients who participated. Additionally, the survey offered three free-text questions to address challenges and advantages of telemedicine education. The surveys were returned via Federal Express to the project team for data base entry.

At the conclusion of the project, a debriefing interview was conducted via telephone by the project manager with each site champion. The interviews were semi-structured and followed a set of questions that explored site champions' experiences with the project, patient recruitment, the study's impact on the organization, and feedback regarding how the project could be better implemented in the future. These interviews were 30 minutes in length, kept confidential from the clinic site management, and were digitally recorded. Interview transcripts were reviewed to identify prominent themes within and between clinic sites. (See appendix L.)

CME Questionnaires

CME Topic Questionnaire At project enrollment, each physician was asked to complete a CME topic questionnaire. This one-page survey asked physicians their name and clinic location and to choose diabetes related topics from a list that they would like to see addressed by CME courses. There were two open-ended choices available if a physician was interested in a topic related to diabetes that was not listed on the survey. This survey was mailed to the site champions who requested the clinic physicians to complete the form; it was returned by mail in a pre-addressed, postage-paid envelope. (See appendix B.)

CME Evaluation - This one-page survey form asked participants' of the CME courses to evaluate the speakers/presenters of the course, the value of the information presented, and its possible influence on their practice related to diabetes. This survey used Likert scale questions. In addition, there were open-ended questions for CME course participants to provide additional comments regarding cultural competence, future interventions and other concerns. The surveys were returned via Federal Express or faxed to the project team for data base entry.

CME Pre- & Post-Knowledge Tests

Tests were mailed to the site champion prior to the event. He/she administered them to all attendees prior to and after the CME class. The tests included three, free form, true/false and/or multiple choice questions and inquired about a person's specific knowledge related to the CME topic. The surveys were returned via Federal Express or fax to the project team for data base entry.

Chart Audits

Chart audits were conducted by the project team health coaches. They traveled to the participating clinic sites to gather health information from the participants' medical charts. The information was used as a tool to measure health changes since participation in the educational sessions. A total of 216 chart audits were completed. (See appendix M.)

VI. Data Analysis

Descriptive tables with frequencies and means for the core items contained within each survey were prepared. To assess change in self-care and knowledge, change scores were calculated and Chi-Square and t-tests were calculated to assess whether changes observed over time were beyond the level expected by chance.

VII. Findings

Recruitment

The original goal of the study was to recruit 18 clinic sites for the project. Twelve clinics were recruited with two withdrawing during the study period. During the site recruitment time frame (January 2010–July 2011), a total of 69 clinics were contacted; this includes one clinic with more than ten worksites and 14 consortiums, community groups, health boards, counties and/or networks. All clinic sites recruited met the definition of rural communities within Northern or Central California; see a brief summary of the sites and their city census demographics below.

Participating Clinics that Completed the Telemedicine Study

Clinic	City	Population Pop. based on US Census Bureau, 2010
Sierra Family Medical Clinic	Nevada City	3,068
Western Sierra Medical Clinic	Downieville	282
Eastern Plumas Health care	Portola	2,104
Lassen Medical Group	Red Bluff	13,147
Tulelake Health Center	Tulelake	1,010
Miners Family Health Center	Grass Valley	10,922
John C. Fremont Healthcare District	Mariposa	1,373
Southern Trinity Health Service	Mad River	420
Jackson Rancheria Health Center	Jackson	4,651

Site recruitment was time-intensive. Many sites engaged in an ongoing conversation with the project manager over three to 12 months before making a decision regarding their participation on the project. It was not uncommon for the project manager to participate in multiple conference calls with multiple administrators and staff to explain the study.

Clinics had a variety of reasons why they did and did not participate in the project. The primary reason that clinics participated was because they recognized the health

education intervention as serving a need for their community that was not being met in other ways. Specifically, participating clinic site champions reported that they wanted to increase their local resources for diabetes education, they had an interest in expanding telemedicine usage, or they had a desire to provide diabetes education to their Spanish-speaking population. They also noted that they valued the “expertise” that partnering with UC Davis would provide.

For instance, a site champion reflected on why their clinic decided to participate in the study:

> *It was a great idea that we become involved because we serve a very disadvantaged population. Most of our patients are very low income and have financial challenges sometimes, so if we can bring in information like what you guys provided, I think it’s a great tool in addition to what our providers are giving—the kind of care they are giving. I think something like this is great for them to take ownership of their diabetes. It’s a great tool for us.*

Clinics that declined to participate cited a variety of reasons, with the main reasons being a lack of perceived need for the services, inadequate clinic resources to support the study, and insufficient or inconsistent clinic leadership support.

Lack of perceived need - Several contacted clinics indicated that they had existing access to a diabetes education program or diabetes education resources that met the needs of their diabetes population. Other clinics specialized in pediatric care and did not offer adult services and did not have the need for health education for their current patient population.

Inadequate clinic resources - Rural clinics often have limited resources, so it is challenging for them to participate in research studies. Several clinics declined participation because they had competing high priority projects in which they already were engaged. For example, some locations were involved in electronic medical record (EMR) rollouts or enhancements that were time- and resource-intensive. Other sites indicated that they did not have personnel to implement a new project or serve as champion for the project.

Lack of technology – Some clinics lacked the technology to participate in the health education intervention also was an issue for clinics. Several clinics did not have telemedicine equipment, could not find their equipment, or had inoperable or outdated equipment that was not appropriate for group use. Further, a number of sites did not have adequate or accessible meeting space for group education. To participate, clinics needed a room where tele-video equipment could be used

and where five or more people could meet for a two-hour class. Several clinics had no such space available.

Insufficient leadership support - The study required clinic leaders and administrators to value the project and offer support staff members leading the work. For some clinics, there was a lack of buy-in from leadership. Other clinic leaders indicated that their clinic did not participate in any research-related projects, they were unwilling to engage in a project without a "contract," or they had concerns about using telemedicine for any patient related information and care. The sustainability of the health education class was an issue for one site coordinator who indicated that their clinic would not be able to offer the service beyond the project time period and thus, they could not support the project.

General Patient Participant Information

There were more females participants in the pilot than males: over 61% of the participants were female and almost 39% were male. The average age of participants was 63 years old. The self-identified race/ethnicities of the participants are as follows: 77% Caucasian, 9% Latino, 8% Native American, 5% identified as "other," 2% as Asian/ Pacific Islander and .8% self-identified as African American. Over 76% of pilot participants indicated they had a high school education or less, of which 3.9% indicated a grade school education; 21% reported more than a high school level education. English was spoken by 95% of participants. The internet was accessible by 68%. Whereas 93% of the participant population indicated they had either Medicare or Medical insurance, 7% had no insurance.

Patient Information about Diabetes Care and Health

Whereas only 17% had been diagnosed with diabetes less than a year ago, 31% of participants indicated they have had diabetes longer than 1 year but less than 5 years, and 51% had diabetes over 5 years. 85% of participants indicated they have Type two Diabetes, 6% self-identified with Type I Diabetes and 9% of participants reported "they were not sure of the type of diabetes they had". Most participants either took pills for diabetes or used no medication at all. 61% of participants indicated they took pills, 9% used insulin, 11% used both pills and insulin while 20% self reported "no medication used". Participants were asked about eleven co-morbidities and reported having an average of 2.4 conditions each. The highest reported conditions were high blood pressure at 56%, high cholesterol at 40% and arthritis at 37%. It should also be noted that an average of 29% of the population is impacted by depression. See the table below for important health factors impacting patient participants:

Condition	Presence in Participant Population
Presence of High Blood Pressure	55%
Have high Cholesterol	40%
Arthritis	36%
Have had Depression	29%
Circulation problems in legs	28%
Heart Attack	11%

Experiences with Care and Providers, Knowledge and Self-Efficacy

In pre-education sessions, participants were surveyed to better understand their experiences with providers, their knowledge, confidence levels and self-efficacy related to self-managed care activities. Participants were asked twenty questions about how often they received diabetes-specific care over the past 6 months. Using a scale from 1-5, 1 being “none of the time” and 5 being “all of the time,” on average participants indicated a rating of 2.5 to 3.6 regarding their experience with providers and their specific diabetes care experience. See the table below for examples; a full list can be seen in appendix N.

Experiences with Providers	Participant Rating
Asked for my ideas when we made a care plan Given Choices about treatment to think about Asked to talk about any problems with my medicines/treatments or their effects	Some of the time
Given a written list of things I could do to improve my health Given a copy of my care plan Asked how my chronic condition affects my life	A little of the time

Self-Care Items With Providers	% of Participants with this experience
Have a blood sugar meter	85%
Have seen a doctor in the last year 1-3 times for diabetes	40%
Have seen a doctor in the last year 4-7 times for diabetes	32%
Have been to the emergency room in the last year 1-3 times for diabetes	6%
Obtained an eye exam in the last year	66%
Obtained a dental exam in the last year	48%
The doctor checked my feet in the last year 0 times	34%
The doctor checked my feet in the last year 1-3 times	44%

Patient-Conducted Self-Management Care Activities (based on the last 7 days)	% of Participants with this experience	
	Pre Education	6-8 week Post Education
Patient checked their feet all 7 days in the last week	44%	62%
Have followed a healthy eating plan 6-7 days during the last week	31%	42%
Have you checked your blood sugar level every day during the last week	46%	52%
Have you exercised 30 minutes or more 6-7 days during the last week	26%	30%
Find themselves feeling down or depressed more than half the days	9%	3%
Feeling down or depressed nearly every day	5.6%	4.9%

Telemedicine Education

Less than 27% of participants have attended a formal diabetes self-management class, however, over 54% of participants reported receiving educational information from their doctors.

Over 80% of the participants indicated taking a telemedicine course was valuable with over 90% of the participants indicating that they felt comfortable communicating using the telemedicine videoconferencing as a tool. Over 92% of participant responders

indicated the screen and picture was easy to see. Over 76% of the participants indicated they were willing to take an additional course via telemedicine. This information has a standard deviation of .69-.81.

Patient Education

Classes

Over 90% of participant respondents indicated that the class instructors were knowledgeable and skillful. Over 95% of the participant responders understood the information provided by the educational health coaches.

A total of 42 classes were conducted in English & one class was delivered in Spanish. Of the 249 of patients who enrolled, 215 completed the intervention classes.

Physician Education

A total of 44 physicians participated in continuing medical education (CME). The project was able to offer 7 CME classes; 66 participants pre-registered, 39 signed into the events and 23 CME credits were processed.

Each CME event had more non-physicians participating than physicians. Participants included physician assistants, nurse practitioners, office managers, and medical assistants. The CME courses were offered at various times: three in the early morning, at noon, and in the evening. An average of 2.7 sites participated per event. The most well attended topic was *Insulin: Initiation, Evaluation and Titration: A Team Approach*. The least attended topic was *Managing Cardiovascular Risk in Patients with Diabetes*.

One-on-one consults

No physicians requested a one-on-one consultation.

Sites-Telemedicine

Site champions' experiences with the telemedicine intervention

Exit interviews with 10 site coordinators indicated that they were very satisfied with their participation in the telemedicine study and felt the intervention was useful for their clinics' patients. They highlighted three main benefits that the study provided to participants and their clinics: it introduced new resources, improved patient education, and increased patient engagement and empowerment. Importantly, these benefits extend beyond the two-hour health education course.

> *Introduced new resources* -- The diabetes information booklets that were used in the health education classes were valuable not only for the participants, but also the clinic providers and staff. For instance, one coordinator said, "You guys gave

us those wonderful 'Living Well with Diabetes' booklets after the class. That was awesome; so helpful. My doctor, the physician, everybody uses them daily. I have patients … bring it to their appointments with them." Another coordinator noted that their clinic's dietician used the booklet to follow-up with patients.

Improved patient education -- Supporting the findings from the participant surveys, the site coordinators said that the health education course had met its objective of improving patient education. Several coordinators described examples of patients who had learned information about their diet, their blood sugar level or the importance of checking their feet. One coordinator praised the balance of the educational material:

> *I liked, I really liked the fact that every patient that was there from our clinic I thought they received a very positive outlook that diabetes can be dangerous but it's also very manageable and they truly have the ability to manage it.*

Increased patient empowerment -- The site coordinators also described how the health education impacted patients' behaviors, which they felt empowered the patients. Among the examples provided, one coordinator said "one of the patients that was in the class – it was her and her mom; her mom did quite a bit of cooking. And, I had gotten a call 2-3 days later stating, 'I would like to thank you for this class. We have definitely changed our diet. My mom has stopped drinking'." Another coordinator described behavior change in a patient who had already lost part of his leg to diabetes: "And you know he was very savvy about the process and his management, a very responsible guy. But, while we were having the classes, he was real happy he took the classes because there were things he had not been doing that he started to do…" The knowledge and the ability to take control of their behavior were described as "empowerment."

Chart audits

A total of 216 medical charts were audited. The health coaches visited the participating rural clinic sites only once, not twice per year as originally intended, to conduct chart audits. All the needed data that was available was collected by the health coaches. It was found that each clinic site uses a different charting system although most seemed to use EMR. The order of charts at clinics varied based on who was responsible for the charts. There was a clinic that did not have an internal system for requesting information about patient race/ethnicity or language preference; therefore, this information was not found in their EMR system. Many clinics did not keep a record of patient height. Only

one clinic screened all of their patients for depression. Laboratory and clinical results were not consistently available.

Infrastructure

Financial

The Development of Diabetes Self-Management Education Program via Telemedicine for Patients in Rural Underserved Communities in California project had a 3 year total costs of $957,225.21 The project had significant start-up, development and clinic recruitment costs in year one, while years two and three focused primarily on patient recruitment, intervention delivery, data collection and analysis.

Total cost summary with research component

Year 1	$344,240.44
Year 2	$368,479.33
Year 3	$244,505.44
Total Costs	**$957,505.44**
Total Patients Recruited	249
Total cost per patient	**$3,845.40**

Forecasted cost summary without research component

Annual Costs	**$238,259**
Forecasted Patient Population Recruited	240-300 per year
Total Cost Per Patient	**$794-$992**

Assumptions of this forecast:

- Salaries and benefits of two intervention delivery staff, one project manager
- Supplies to support the telemedicine delivery and curriculum at UCD
- A total of 20-25 patients a month participate in the intervention. The number of sites was not forecasted.
- A total of two intervention classes would be offered per month via telemedicine.

VIII. Effectiveness, Conclusions and Recommendations: Telemedicine Model

Multiple barriers make it challenging to provide health education to rural patients. These barriers can be difficult to overcome; without intervention and focused support to address them, patients may not receive important health education. Patients who reside

in rural areas and lack opportunity to attend self-management education may be at higher risk for chronic illness complications. This increased risk may lead to a lower quality of life and ultimately a shorter lifespan.

This study examined whether recruitment for telemedicine self-management education could be a plausible solution. Recruiting patients for self-management education was observed to be complex, challenging and daunting. More substantial support may be necessary for both rural clinics and patients to implement sustainable solutions. Empowering clinical teams to promote patient education as a priority support service may be one of the keys to success. Additionally, developing systems and processes to identify, support and empower patients who are challenged by multiple barriers may be equally essential.

Strategies to enhance site and patient recruitment for future health education studies

Several strategies were identified to improve recruitment for future health education studies. These strategies can be organized into three foundational elements for recruitment: building additional communication channels, providing more resources, and consolidating project organization, as shown below.

Communication

1. Design and offer an information website – this could act as both a recruitment tool as well as a progress and communication venue.
2. Host information webinars – webinars could be advertised easily and be an efficient method for providing information and addressing questions for multiple clinical sites simultaneously.
3. Contact clinic leadership exclusively – it is optimal to introduce the project directly to a manager, director or board member rather than a telemedicine technical or line staff.
4. Develop a system so that the research team can work in tandem with the clinic to achieve recruitment goals.

Resources

1. Offer patient incentives to encourage participation.
2. Offer education sessions outside of usual business hours to increase access.

3. Engage five or more multiple clinic staff to recruit patients.
4. Increase the availability of better telemedicine equipment.

Organization

1. Reduce the time and paperwork (survey) commitment on project champions. To increase clinic participation, the process needs to be time efficient since personnel resources are limited. Because this pilot study was a research project, it increased the time and paperwork commitment of the project champions and ultimately created barriers in multiple areas in the project. Known barriers included extensive human subject certification (a 4+ hour process for most), limited staff able to recruit patients (only those human subject certified could recruit), and time consuming patient consenting process (challenging to complete for the staff member and project participants).
2. Alter the site recruitment approach - include networks, consortiums, etc. at the start of the recruitment process.
3. Extend recruitment timeframes to six months or more.

Physician CME

1. Non-physician team members are an important audience for continuing education about diabetes care and system redesign.
2. Hosting continuing education via Webinars and recording these for non-real time viewing may increase the viewing audience.
3. Physicians will apply for CME for telemedicine teaching, but many will engage without any formal credit.

Recruitment of Practice Sites

Recruitment of clinical sites for the project was challenging. Of the 68 potential rural clinics identified, only nine were able to complete the intervention.

The participating practices cited the following reasons for their interest in the project:

1. Need for diabetes resources.
2. Inability to provide diabetes education due to lack of resources or personnel.
3. Interest in expanding telemedicine usage.

For those nonparticipating practices, the most common reasons included:

1. Competing high-priority projects.
2. Lack of personnel/resources.

Recruiting Patients

The participating clinics had difficulty recruiting the desired goal of 50 patients per site.

The most common barriers to patient recruitment were:

1. Staffing issues, Recruitment for classes was considered an “add-on” and trumped by usual and competing work.
2. Limited clinic resources. Clinics had competing projects, such as EMR deployment, that took precedence.

Despite the stated barriers, we were still able to recruit 249 patients with diabetes who participated in the class and completed the extensive pre- and post-intervention assessment forms.

Curriculum Delivery

We delivered a structured 2-hour education class that followed the American Diabetes Association Educational Guidelines. A total of 43 classes, 42 in English and one in Spanish, were delivered. The classes were well received by the participants.

Telemedicine as a Delivery Method

Over 80% of the participants indicated that taking a telemedicine course was valuable with over 90% of the participants indicating that they felt comfortable communicating using the telemedicine videoconferencing as a tool. Over 76% of the participants indicated they were willing to take an additional course via telemedicine.

Challenges of program (pearls)

The site champions were excited about the research project and the health coaches/research team was excited about delivering diabetes education via telemedicine. There was a mutual benefit and common goal: educating the participants. However, site champions have their own clinic duties/responsibilities. Unintentionally, the project became stagnant and at times secondary at some clinic sites.

Some sites did not have proper telemedicine equipment to deliver the education without visual and audio challenges. Audio challenges disrupted the dynamics of class learning. Participants were asked to repeat themselves. Participants were discouraged to share their experiences in class because they would be asked to repeat themselves. However, health coaches delivered the curriculum successfully and participants received the intended tools.

Impact of Intervention/Outcomes

Demographics:

The typical demographic profile of a participant in the study is as follows:

Caucasian:	(77.4%)
Type 2 diabetes for over 5 years:	(51.2%)
Medicare:	(49.0%)
High school diploma:	(32.0%)
Hypertension:	(55.6%)
Hyperlipidemia:	(40.2%)
Arthritis:	(36.8%)
Depression:	(29.3%)
Oral agent use:	(60.9%)
A1c:	(7.5%)
LDL-cholesterol:	(106.2 mg/dl)
Systolic blood pressure:	(130.5 mmHg)
Diastolic blood pressure:	(76.0 mmHg)

Perceived Self-Management Support

In an extensive survey of patient's perception of the support they receive in their clinic for help with their management of diabetes, most patients reported that their clinic was not able to provide sufficient support.

Impact of Class on Confidence, Knowledge about Diabetes, and Self-Management Behavior

Confidence:

There were significant changes in patient's reporting of their confidence in dealing with diabetes, and their ability to engage in self-care behaviors. These changes persisted over the eight-week follow-up period.

There was a significant decrease in the number of patients who felt overwhelmed with their diabetes: pre-intervention, 18.8% felt overwhelmed; post-intervention, 5.4% felt overwhelmed.

Knowledge About Diabetes:

There were significant changes in self-reported knowledge about diabetes that persisted over the eight-week follow-up period. This is documented in appendix N, tables 19-33.

Self-Care Behavior:

Patients reported an increase in the number of days that they exercised at least 30 minutes: pre-intervention, 3.4 days; post-intervention, 3.9 days.

They also reported an increase in the number of days they checked their feet: pre-intervention, 4.2 days; post-intervention, 5.6 days.

Financial Implications

The cost burden of diabetes for the individual, their family, and the health care system is substantial.

One-third of the costs related to diabetes are related to foot complications.

Increased awareness of appropriate foot care and increased surveillance for foot problems by patients has the potential for substantial impact on the costs of diabetes care.

Further studies on the impact of educational programs on utilization of services are needed to understand the effects on costs.

Sustainability and Recommendations for the Future

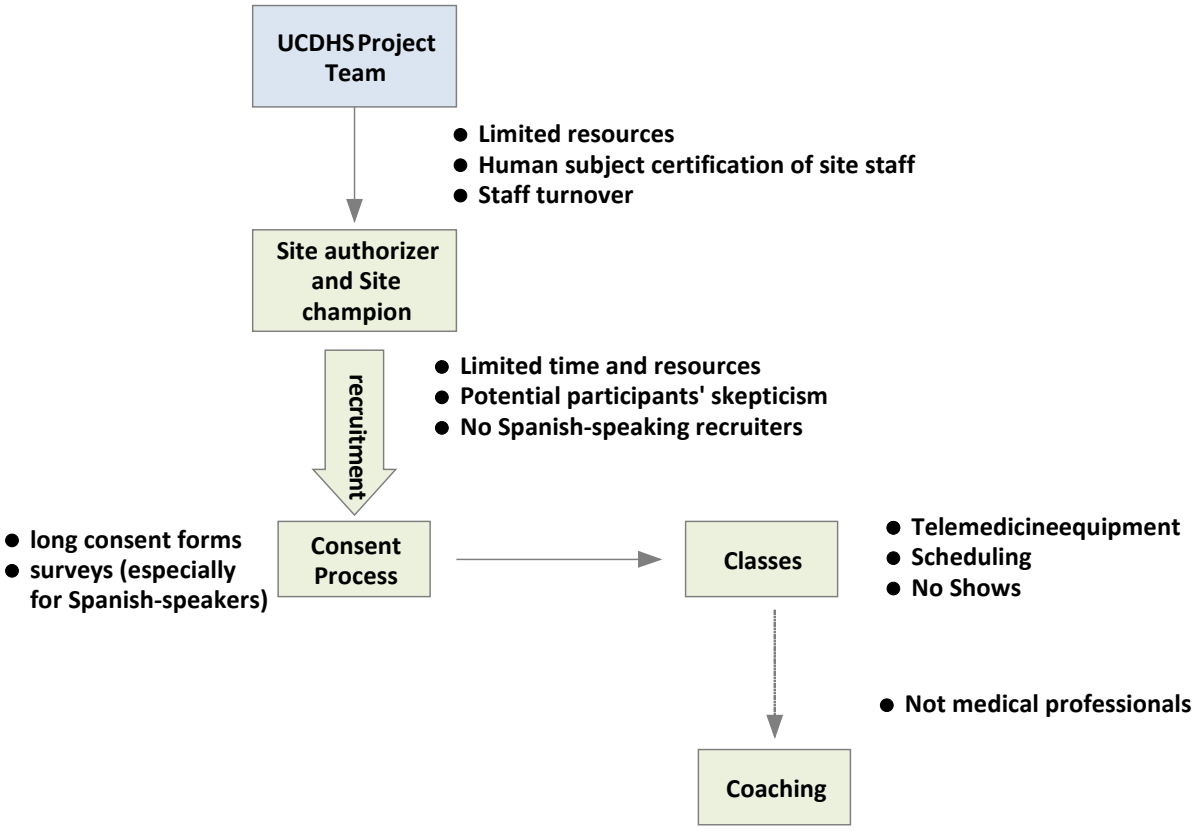
Given all of the described challenges in recruitment for this project, the outcomes based on a 2-hour educational intervention, and the epidemic burden of this disease on all healthcare facilities in California, we recommend that the next step is to assess other means of distributing the same educational content in different forums. A model to consider is adapting the Medi-Cal Incentive to Quit Smoking Program (MIQS) as a means to reach out to more patients with DM. As an example, it may be reasonable to consider a trial of an educational intervention similar to smoking cessation program.

TABLE OF CONTENTS

Appendices – Comprehensive data & documents of project

A. Recruitment Flow Chart

Medical Board of California & UC Davis, 2009-2012
"Diabetes Self-Management Education for Rural and Underserved Populations"
Project Recruitment Flow Diagram with Barriers



A.1. Curriculum

Curriculum: Two-hour telemedicine diabetes self-management class	
Introduction • Thank you for attending/Educator introduces themselves • Overall review of class structure and course content • Review class process; use of telemedicine tool • Participant introductions; using ice-breaker tool • Concept of "self-management" and self care	*Provide participants with Living Well with My Diabetes booklet*
What is Diabetes? • Basic physiology and pathophysiology • Risk factors for developing • Statistics of epidemic • Signs of high blood sugar • Overview of research showing normalized glucose and reduced complications	*Living Well with My Diabetes booklet*
Diabetes labs and guidelines • Hemoglobin A1C • Target numbers for SMBG	*Living Well with My Diabetes booklet*
Medications • Important to take medication(s) as ordered • Oral Medications work on: pancreas, liver or muscle • Diabetes is progressive; insulin is sometimes needed for glucose control	*Living Well with My Diabetes booklet*
Role of healthy nutrition • Essential role of diet in diabetes management • Improved food choices positively affect blood glucose • Improved nutrition may promote weight loss and improved diabetes control	*Living Well with My Diabetes booklet*
Foot Care • Goal of daily foot checks • Overview of personal care for feet	*Living Well with My Diabetes booklet*
Carbohydrate Counting and Control • Carbohydrate effect on blood sugar • Carbohydrate foods • Portion reduction • Reading food labels; understand sugar free products • Plate Method	*Living Well with My Diabetes booklet*
Exercise • Benefits on multiple body systems • Impact of Exercise on Blood Sugar • Types of Exercise • Goals of Exercise • Planning your Exercise Program	*Living Well with My Diabetes booklet*
Complications • Review multiple organs which can be affected by diabetes • Emphasize research that well-controlled diabetes can reduce rates of complications	*Living Well with My Diabetes booklet*

B. CME Topics Survey (Physician)

UC DAVIS HEALTH SYSTEM

CME Topic Questionnaire

"Diabetes Self-management Education for Rural and Underserved Populations"

This questionnaire is designed to determine which learning collaboratives interest you most. It is the goal of these events to provide up-to-date information about current best practices for diabetes management and care.

Physician Information	
Name	
Clinic Name	
Date	

Suggested topics: Please select four topic preferences from the list below and/or write in additional topics of interest.	
☐	Managing Cardiovascular Risk in Patients with Diabetes
☐	Diabetes Self-Management Principals and Tools
☐	Insulin: Initiation, Evaluation and Titration: A Team Approach
☐	Diabetic Neuropathy: Screening and Early Management
☐	Oral Agents and Non-Insulin Injectables
☐	New Delivery System Approaches (Planned visits, shared medical appt, etc)
☐	Nutrition for the Diabetes Self-Manager
☐	Other:
☐	Other:

E-mail completed form to glee.vanloon@ucdmc.ucdavis.edu
or fax to Glee at 916-703-5460. Thank you.

C. About Me Survey (Participant)

Participant ID: ☐☐☐☐☐☐

About Me

Demographics

Home Address: City: Zip:

Mailing Address: City: Zip:

Home Phone: Cell Phone:

Gender: ☐ Female ☐ Male Date of Birth: *mm / dd / yy*

Race or ethnicity:

☐ African American ☐ Caucasian ☐ Latino/Hispanic ☐ Asian/Pacific Islander
☐ Native American ☐ Middle Eastern ☐ Other (Specify):

What language do you speak most of the time?

☐ English ☐ Spanish ☐ Other (Specify):

What is the highest level of education you finished?

☐ Grade School ☐ Some High School ☐ High School Diploma/GED
☐ Some College ☐ Associate's Degree ☐ Bachelor's/College Degree
☐ Post-bachelor's work ☐ Other (Specify):

What kind of work do you do? _____

Internet Access

Do you have home access to the Internet? ☐ Yes ☐ No

* (If yes) how do you connect to the internet?

☐ Dial-up ☐ Satellite ☐ Smart Card
☐ Cable ☐ DSL ☐ Other:

Do you use e-mail? ☐ Yes ☐ No

Do you use social network websites? ☐ Yes ☐ No

* (If yes) which social network site(s) do you use? _____

Medical Insurance

What kind of medical insurance do you have?

☐ Medicare ☐ Medi-Cal ☐ None ☐ Other (Specify):

Do you have a co-pay for your appointments? ☐ Yes ☐ No

Do you have a co-pay for your prescriptions? ☐ Yes ☐ No

D. About My Diabetes and General Health (Participant)

Participant ID: ☐☐☐☐☐☐

About My Diabetes and General Health

Diabetes Care

1. What is the name of the doctor who cares for your diabetes?

☐ My doctor's name is: ☐ I don't know the doctor's name

2. What is the name of the clinic or hospital you go to for diabetes care?

3. On average how much money do you spend <u>each month</u> for your diabetes medicines/supplies?

Medications: $ Supplies: $

4. How long have you had diabetes?

☐ Less than 1 year ☐ Between 1 and 5 years ☐ Over 5 years

5. What type of diabetes do you have?

☐ Type 1 ☐ Type 2 ☐ Not Sure

6. What medications do you take for diabetes?

☐ None ☐ I take pills ☐ I use insulin

7. If you take medications for diabetes, which diabetes medication(s) do you currently take?

* Please list all diabetes medications here:

_____

_____

_____

_____

General Health

8. Do you have any of the following medical problems? (check all that apply)

☐ Heart attack ☐ Heart failure ☐ Stroke ☐ Arthritis

☐ Depression ☐ Kidney problems ☐ High cholesterol ☐ High blood pressure

☐ Poor vision caused by diabetes ☐ Circulation problems (legs) ☐ Other:

This diabetes summary help identify how you are doing in the care of your diabetes and the other problems which often go with this disease. If you do not know your numbers it would be a good idea to discuss this with your doctor.

The Hgb A1C or Hemoglobin A1C is an estimate of your average blood sugar over 3 months. Blood sugars that are higher than normal can cause damage to the eyes, the kidneys, and the nerves. The American Diabetes Association recommends that you maintain an A1C value less than 7.0 to reduce the risk of damage to the eyes, kidneys and nerves.

- **My most recent A1C value level was:** (please give a number)

The American Diabetes Association recommends keeping the LDL (bad cholesterol) less than 100 mg/dl. High cholesterol is associated with heart attacks, stroke, and circulation problems in the legs.

- **My most recent LDL cholesterol level was:** (please give a number)

Blood pressure is also very important for diabetes care. Controlling your blood pressure will help reduce your chances of a stroke, a heart attack, kidney damage, and eye damage. The top number is your systolic blood pressure; the lower number is your diastolic blood pressure. The American Diabetes Association recommends keeping your blood pressure less than 130/80.

- **My most recent blood pressure was:** (please give a number)

An eye examination each year is recommended to detect eye problems associated with diabetes that can cause vision problems and blindness.

- **My most recent eye examination was:** (please give a date)

E. My Diabetes Care (Participant)

Participant ID: ☐☐☐☐☐☐

My Diabetes Care

Staying healthy can be difficult when you have a chronic condition or ongoing health issue. We would like to learn about the type of help you get from the health care professionals you work with. This might include your doctor, nurse, social worker, therapist, or dietician. Your answers will be kept confidential and will not be shared with others.

Over the past six months, when I received care for my diabetes, I was:	**None of the time**	**A little of the time**	**Some of the time**	**Most of the time**	**Always**
A. Asked for my ideas when we made a care plan.	1	2	3	4	5
B. Given choices about treatment to think about.	1	2	3	4	5
C. Asked to talk about any problems with my medicines/treatments or their effects.	1	2	3	4	5
D. Given a written list of things I could do to improve my health.	1	2	3	4	5
E. Satisfied that my care was well organized.	1	2	3	4	5
F. Shown how what I did to take care of myself influenced my condition.	1	2	3	4	5
G. Asked to talk about my goals in caring for my condition.	1	2	3	4	5
H. Helped to set specific goals to improve my eating or exercise.	1	2	3	4	5
I. Given a copy of my care plan.	1	2	3	4	5
J. Encouraged to go to a specific group or class to help me cope with my chronic condition.	1	2	3	4	5
K. Asked questions, either directly or on a survey, about my health habits.	1	2	3	4	5
L. Sure that health professionals thought about my values, beliefs, and traditions when they recommended treatment to me.	1	2	3	4	5
M. Helped to make a care plan that I could carry out in my daily life.	1	2	3	4	5

Over the past six months, when I received care for my diabetes, I was:	**None of the time**	**A little of the time**	**Some of the time**	**Most of the time**	**Always**
N. Helped to plan ahead so I could take care of my condition even in hard times.	1	2	3	4	5
O. Asked how my chronic condition affects my life.	1	2	3	4	5
P. Contacted after a visit to see how things were going.	1	2	3	4	5
Q. Referred to another health care professional (my doctor, another member of the health team, etc.).	1	2	3	4	5
R. Told how my visits with other types of professionals helped my treatment.	1	2	3	4	5
S. Asked how my visits with other professionals were going.	1	2	3	4	5

F. My Self-Care Behaviors and Confidence (Participant)

Participant ID: ☐☐☐☐☐☐

My Self-Care Behaviors and Confidence

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

☐ Access to information about diabetes ☐ The costs of caring for diabetes

☐ I am overwhelmed with my diabetes ☐ Other: _____

2. Circle the number that best describes:	**Not at all Confident**		**Somewhat Confident**		**Very Confident**
A. How confident you are that you can do the things that are important to manage your diabetes?	1	2	3	4	5
B. How important is it to you to manage your diabetes?	1	2	3	4	5

3. Have you received any education on diabetes? ☐ Yes ☐ No

4. If you have received any education on diabetes, what type of education? **(Mark all that apply)**

☐ Information from my doctor ☐ Pamphlets ☐ Internet

☐ I've been to diabetes classes ☐ Other (Specify): _____

5. For each of the following questions, circle the number for the correct number of days.								
A. On how many of the last seven days have you followed a healthy eating plan?	0	1	2	3	4	5	6	7
B. On how many of the last seven days did you do at least 30 minutes of physical exercise, including walking?	0	1	2	3	4	5	6	7
C. On how many of the last seven days did you test your blood sugar? ("0" if you do not own a meter)	0	1	2	3	4	5	6	7
D. On how many of the last seven days did you check your feet?	0	1	2	3	4	5	6	7

6. Circle the number of times that apply to you.					
A. About how many times in the past year have you seen a doctor for your diabetes?	0	1-3	4-6	7-9	10 or more
B. About how many times in the past year have you been to an emergency room because of your diabetes?	0	1-3	4-6	7-9	10 or more
C. About how many times in the past year were you admitted to a hospital because of your diabetes?	0	1-3	4-6	7-9	10 or more
D. About how many times in the past year did a doctor check your feet?	0	1-3	4-6	7-9	10 or more

7. Did you get an eye exam from an eye doctor in the last 12 months?	☐ Yes	☐ No
8. Did you get two dental check ups in the past 12 months?	☐ Yes	☐ No
9. Did you get a flu shot in the last 12 months?	☐ Yes	☐ No
10. Do you own a blood sugar meter?	☐ Yes	☐ No

11. Over the past <u>two weeks</u>, how often have you been bothered by any of the following problems?				
A. Little interest or pleasure in doing things:	☐ Not at all	☐ Several days	☐ More than half the days	☐ Nearly every day
B. Feeling down, depressed or hopeless:	☐ Not at all	☐ Several days	☐ More than half the days	☐ Nearly every day

G. Pre-Education Patient Survey (Participant)

Participant ID: ☐☐☐☐☐☐

Pre-Education Patient Survey

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

	1 Very Hard	2 Fairly Hard	3 Somewhat Hard	4 A Little Hard	5 Not at all Hard
A. Manage carbohydrates	1	2	3	4	5
B. Read food labels	1	2	3	4	5
C. Exercise daily	1	2	3	4	5
D. Check your feet daily	1	2	3	4	5
E. Take medications as prescribed	1	2	3	4	5
F. Check your blood sugar	1	2	3	4	5
G. Keep doctor appointments	1	2	3	4	5

2. How much do you know about the effect of carbohydrates on your blood sugar?

Nothing 1 | A little 2 | Some 3 | A fair amount 4 | A Lot 5

3. How much do you know about reading food labels?

Nothing 1 | A little 2 | Some 3 | A fair amount 4 | A Lot 5

4. How much do you know about using portion size to improve blood sugar?

Nothing 1 | A little 2 | Some 3 | A fair amount 4 | A Lot 5

5. How much do you know about the benefits of activity and exercise on diabetes?

Nothing 1 | A little 2 | Some 3 | A fair amount 4 | A Lot 5

6. How much do you know about the importance of checking your feet daily?

Nothing 1 | A Little 2 | Some 3 | A fair amount 4 | A Lot 5

7. How much do you know about the benefits of blood sugar management on reducing long-term problems such as nerve damage, eye damage, heart damage, etc.?

Nothing 1 | A Little 2 | Some 3 | A fair amount 4 | A Lot 5

H. Post-Education Patient Survey (Participant)

Participant ID: ☐☐☐☐☐☐

Post-Education Patient Survey

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

	1 Very Hard	2 Fairly Hard	3 Somewhat Hard	4 A Little Hard	5 Not at all Hard
A. Manage carbohydrates	1	2	3	4	5
B. Read food labels	1	2	3	4	5
C. Exercise daily	1	2	3	4	5
D. Check your feet daily	1	2	3	4	5
E. Take medications as prescribed	1	2	3	4	5
F. Check your blood sugar	1	2	3	4	5
G. Keep doctor appointments	1	2	3	4	5

2. How much do you know about the effect of carbohydrates on your blood sugar?

Nothing 1 | A little 2 | Some 3 | A fair amount 4 | A Lot 5

3. How much do you know about reading food labels?

Nothing 1 | A little 2 | Some 3 | A fair amount 4 | A Lot 5

4. How much do you know about using portion size to improve blood sugar?

Nothing 1 | A little 2 | Some 3 | A fair amount 4 | A Lot 5

5. How much do you know about the benefits of activity and exercise on diabetes?

Nothing 1 | A little 2 | Some 3 | A fair amount 4 | A Lot 5

6. How much do you know about the importance of checking your feet daily?

Nothing 1 | A Little 2 | Some 3 | A fair amount 4 | A Lot 5

7. How much do you know about the benefits of blood sugar management on reducing long-term problems such as nerve damage, eye damage, heart damage, etc.?

Nothing 1 | A Little 2 | Some 3 | A fair amount 4 | A Lot 5

8. How confident are you about running your own experiments?

Not confident	A little confident	Somewhat confident	Fairly confident	Very confident
1	2	3	4	5

9. Did you design an experiment? Yes No

* If yes, the experiment involves:

☐ Depression ☐ Stress ☐ Medication ☐ Alcohol ☐ Weight loss

☐ Food ☐ Monitoring ☐ Activity ☐ Cost ☐ Smoking

☐ Other:_____

I. Telemedicine Diabetes Education Patient Satisfaction Survey (Participant)

Participant ID: ☐☐☐☐☐☐

UCDHS Telemedicine Diabetes Education - Patient Satisfaction Survey

Have you ever taken a telemedicine class before? **Yes** **No**

Does having telemedicine classes available give you more confidence in your doctor? **Yes** **No** **Somewhat**

Did the class answer your diabetes questions? **Yes** **No** **Somewhat**

Please circle one response per statement below.

	 Strongly Disagree	Disagree	 Neither Agree or Disagree	Agree	 Strongly Agree
1. Overall I was satisfied with the class	1	2	3	4	5
2. I was comfortable talking over the telemedicine video	1	2	3	4	5
3. I understood the information given	1	2	3	4	5
4. The picture on the screen was easy to see	1	2	3	4	5
5. I could hear the educators well	1	2	3	4	5
6. UC Davis teachers were polite	1	2	3	4	5
7. The UC Davis teachers were knowledgeable & skillful	1	2	3	4	5
8. Overall the telemedicine experience was satisfactory	1	2	3	4	5

9. To get future information which would you like better: A telemedicine class OR an in-person class

10. In the future, I would be willing to take another telemedicine class? **Yes** **No** **Maybe**

11. In your opinion, how valuable was it that you took a telemedicine class?

1	2	3	4	5
Not valuable		**Somewhat valuable**		**Very Valuable**

Do you have any ideas for improving the experience?

Please write any additional comments below:

Thank you!

J. My Self-Care Behaviors and Confidence 6-8 Week Survey (Patient)

Participant ID: ☐☐☐☐☐☐

My Self-Care Behaviors and Confidence (6-8 weeks)

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

☐ Access to information about diabetes ☐ The costs of caring for diabetes

☐ I am overwhelmed with my diabetes ☐ Other: _____

2. Circle the number that best describes:	**Not at all Confident**		**Somewhat Confident**		**Very Confident**
A. How confident you are that you can do the things that are important to manage your diabetes?	1	2	3	4	5
B. How important is it to you to manage your diabetes?	1	2	3	4	5

3. For each of the following questions, circle the number for the correct number of days.								
A. On how many of the last seven days have you followed a healthy eating plan?	0	1	2	3	4	5	6	7
B. On how many of the last seven days did you do at least 30 minutes of physical exercise, including walking?	0	1	2	3	4	5	6	7
C. On how many of the last seven days did you test your blood sugar? ("0" if you do not own a meter)	0	1	2	3	4	5	6	7
D. On how many of the last seven days did you check your feet?	0	1	2	3	4	5	6	7

4. Over the past <u>two weeks</u>, how often have you been bothered by any of the following problems?				
A. Little interest or pleasure in doing things:	☐ Not at all	☐ Several days	☐ More than half the days	☐ Nearly every day
B. Feeling down, depressed or hopeless:	☐ Not at all	☐ Several days	☐ More than half the days	☐ Nearly every day

J-1. Post-Education Patient 6-8 week Survey

Participant ID: ☐☐☐☐☐☐

Post-Education Patient Survey (6-8 weeks)

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

	1 Very Hard	2 Fairly Hard	3 Somewhat Hard	4 A Little Hard	5 Not at all Hard
A. Manage carbohydrates	1	2	3	4	5
B. Read food labels	1	2	3	4	5
C. Exercise daily	1	2	3	4	5
D. Check your feet daily	1	2	3	4	5
E. Take medications as prescribed	1	2	3	4	5
F. Check your blood sugar	1	2	3	4	5
G. Keep doctor appointments	1	2	3	4	5

2. How much do you know about the effect of carbohydrates on your blood sugar?

Nothing 1 | A little 2 | Some 3 | A fair amount 4 | A Lot 5

3. How much do you know about reading food labels?

Nothing 1 | A little 2 | Some 3 | A fair amount 4 | A Lot 5

4. How much do you know about using portion size to improve blood sugar?

Nothing 1 | A little 2 | Some 3 | A fair amount 4 | A Lot 5

5. How much do you know about the benefits of activity and exercise on diabetes?

Nothing 1 | A little 2 | Some 3 | A fair amount 4 | A Lot 5

6. How much do you know about the importance of checking your feet daily?

Nothing 1 | A Little 2 | Some 3 | A fair amount 4 | A Lot 5

7. How much do you know about the benefits of blood sugar management on reducing long-term problems such as nerve damage, eye damage, heart damage, etc.?

Nothing 1 | A Little 2 | Some 3 | A fair amount 4 | A Lot 5

8. How confident are you about running your own experiments?

Not confident	A little confident	Somewhat confident	Fairly confident	Very confident
1	2	3	4	5

9. Did you design an experiment? Yes No

* If yes, the experiment involves:

☐ Depression ☐ Stress ☐ Medication ☐ Alcohol ☐ Weight loss

☐ Food ☐ Monitoring ☐ Activity ☐ Cost ☐ Smoking

☐ Other:_____

*** If you participated in telephone health coaching, please answer the following questions:**

1. My overall experience with coaching was:

1	2	3	4	5
Very satisfactory	Satisfactory	Neither satisfactory or dissatisfactory	Dissatisfactory	Very dissatisfactory

2. My coach was helpful to me in developing a goal.

1	2	3	4	5
Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree

3. The coaching sessions helped me stick to my goal or change my plan if necessary.

1	2	3	4	5
Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree

4. By working with the health coach I was able to work on changing my diabetes self-care behaviors.

1	2	3	4	5
Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree

5. The program was easy for me to do from home.

1	2	3	4	5
Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree

6. The program fit into my personal schedule.

1	2	3	4	5
Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree

7. I would recommend this program to another person with diabetes.

1	2	3	4	5
Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree

K. Telephone Instructions for Obtaining 6-8 Week Follow Up Surveys

6-8 Week Follow-up Survey Calls

Instructions for Volunteer

1. Materials/tools needed (provided by health coaches):
   - Names and ID numbers of participants to be called (i.e., Participant List)
   - Access to project database
   - Paper copies of: *Post-Education Patient* Survey (6-8 weeks) and *My Self-Care Behaviors and Confidence (6-8 weeks)*.

2. Prior to the phone call:
   - Open the database, and enter the Participant ID number in the search box.
   - Locate the participant's home/cell phone number in the *About Me* tab.
   - Fill in the corresponding participant ID number on the (2) surveys.

3. During the call:
   - Use the participant list to identify participant names.
   - Ask for the participant by last name (i.e., Mr. or Ms. LAST NAME).
   - Provide your NAME, and identify self as calling from UC Davis.
   - Explain that you are following up about a diabetes telemedicine class the participant attended about 2 months ago, and are calling regarding the follow-up surveys that were mailed 2 weeks ago.
   - Identify that you are NOT one of the health coaches who taught the class.
   - Ask the participant for their permission to complete the (2) surveys over the telephone.
   - If the participant concedes, proceed to read each of the questions exactly as they are written and fill-in the answers on the paper surveys. Once completed, strikethrough the participant name and ID number from the participant list.
   - If the participant does not give permission, thank them for their time and make a note on the paper surveys (i.e., REFUSED). Strikethrough the participant name and ID number from the participant list.
   - If no answer, do NOT leave a voice message. Instead, try calling a maximum of 3 times within a 14 day period.

L. Debriefing Interview Questions

"Development of a Diabetes Self-Management Education Program via Telemedicine for patients in Rural Underserved Communities in California"

Site Champion Exit Interview

Delivery-telephonic; Goal – 30 minutes or less

Becoming a site champion

1. What were some of the things that helped you decide to become a site champion for this project?
2. Is there anything that would have made the position more appealing?

Experiences of site champion

3. What is something specific that you liked about being a site champion?
4. From this experience what is one story that stands out in your mind?
5. Describe a specific challenge you faced as site champion.
6. What could we have done to make the experience better for you?
7. How did your experience of being a site champion differ from your expectations?

Patient Recruitment

8. How did you recruit patients?
9. What strategy worked best?
10. Were there challenges recruiting patients?

Patient Experiences

11. What was the project's impact on your patients? (value/impact)
12. What could we have done to make the experience better for patients?
13. What were your observations about your patients' experiences with surveys?

Impact on the Organization

14. What was the project's impact on your organization?
15. What could we have done to make the experience better for your organization?
16. What would be necessary for your organization to participate in an ongoing televideo patient education program?

Open dialogue and Perceived Important Issues

17. Are there any lessons learned that you'd like to share?
18. Is there anything else that we didn't talk about that you think is important to know about your experience as a site champion or your organizations experience with this project?

M. Chart Audit Form

Participant ID: | | | | | | |

Chart Audit Form

DOB: _____ **Gender:** F M **Date:** _____

Ethnicity:	Caucasian	African American	Asian/Pacific Islander	Native American
	Latino/Hispanic	Middle Eastern	Other: _____	

Language: English Spanish Other: _____

DM dx date: _____ **Insurance:** Medicare Medical None Other: _____

DM Medications:	□ N/A	
□ Actos/Pioglitazone	□ Acarbose/Precose	□ Pramlintide/Symlin
□ Exenatide/Byetta	□ Rosiglitazone/Avandia	□ Avandamet
□ Glimepiride/Amaryl	□ Repaglinide/Prandin	□ Miglitol/Glyset
□ Glucovance	□ Januvia	□ Glipizide/Glocotrol/glucotrol XL
□ Nateglinide/Starlix	□ Glyburide/Diabeta/Micronase/Glynase	
□ Other: _____	□ Metformin/Glucophage/Glucophage XR	

Insulin:	□ N/A	
□ Apidra/Glulisine	□ Humalog/Lispro	□ Novolog/Aspart
□ Humulin R/regular	□ Novolin R/regular	□ Humulin N/NPH
□ Novolin N/NPH	□ Levemir/detemir	□ Lantus/glargine
□ Humulin 70/30	□ Novolin 70/30	□ Other: _____

Other Chronic Conditions:	◻ Other: _____	
◻ Heart attack/myocardial infarction	◻ Heart Failure	◻ Stroke
◻ Arthritis	◻ Depression	◻ Kidney problems/Nephropathy
◻ Poor vision caused by DM/retinopathy	◻ Circulation problems (legs)	◻ Neuropathy
◻ Hyperlipidemia	◻ Hypertension	◻ Obesity
◻ Asthma		

Depression: ◻ Diagnosis ◻ Screen ◻ N/A

Number of Hospital Admissions related to DM: _____ **Number of ER visits for DM:** _____

PCP Visits: Prior to class: _____ After class: _____

Height: _____ inches

Laboratory Values

	A1C/ date	LDL/ date	BP/ date	Weight/ date
Pre Class				
Post Class				

N. Data Tables

Results tables are organized by survey instrument and time point. Means and frequencies appear first, followed by tables of change scores over time, and associated t-tests.

A. About Me

Table 1: Patient Gender

Clinic	Patient Gender		Total Count
	Male	Female	
	Percent		
n=	**142**	**92**	
Sierra Family Medical Clinic	37.5	62.5	24
Western Sierra Medical Clinic	66.7	33.3	12
Eastern Plumas Healthcare	53.2	46.8	47
Lassen Medical Group	60.7	39.3	56
Tulelake Health Center	68.4	31.6	19
Miners Family Health Center	59.3	40.7	27
John C Fremont Healthcare District	83.3	16.7	18
Southern Trinity Health Service	72.0	28.0	25
Jackson Rancheria Health Center	66.7	33.3	6
Total	**60.7**	**39.3**	**234***

* Total is less than 239 because of missing responses.

Table 2: Average Age

Clinic	Average Age	Total Count
Sierra Family Medical Clinic	60.6	27
Western Sierra Medical Clinic	68.3	12
Eastern Plumas Healthcare	62.3	48
Lassen Medical Group	66.7	57
Tulelake Health Center	66.3	19
Miners Family Health Center	57.2	27
John C Fremont Healthcare District	61.4	18
Southern Trinity Health Service	61.0	25
Jackson Rancheria Health Center	56.0	6
Total	**62.8**	**239**

Table 3: Race/Ethnicity

Race by Clinic (Percent checked "yes")	Race/Ethnicity						Total Count
	African American	Caucasian	Latino/ Hispanic	Asian/ Pacific Islander	Native American	Other	
n=	2	185	22	5	20	12	
Clinic	Percent						27
Sierra Family Medical Clinic	0.0	81.5	3.7	3.7	11.1	3.7	27
Western Sierra Medical Clinic	0.0	83.3	0.0	0.0	0.0	16.7	12
Eastern Plumas Healthcare	0.0	87.5	6.3	2.1	4.2	0.0	48
Lassen Medical Group	0.0	71.9	10.5	1.8	10.5	3.5	57
Tulelake Health Center	0.0	47.4	42.1	0.0	5.3	10.5	19
Miners Family Health Center	3.7	85.2	11.1	0.0	0.0	0.0	27
John C Fremont Healthcare District	5.6	88.9	5.6	5.6	5.6	0.0	18
Southern Trinity Health Service	0.0	88.0	0.0	0.0	4.0	20.0	25
Jackson Rancheria Health Center	0.0	0.0	0.0	16.7	100.0	0.0	6
Total	0.8	77.4	9.2	2.1	8.4	5.0	239

Table 4: Patient Education

What is the highest level of education you finished? (Percent checked "yes")	Education								Total Count
	Grade School	Some High School	High School Diploma/GED	Some College	Associate's Degree	Bachelor's/ College Degree	Post-bachelor's work	Other (Specify)	
n=	9	25	74	67	21	22	6	7	
Clinic	Percent								
Sierra Family Medical Clinic	0.0	20.8	29.2	12.5	8.3	20.8	4.2	4.2	24
Western Sierra Medical Clinic	0.0	27.3	18.2	27.3	9.1	18.2	0.0	0.0	11
Eastern Plumas Healthcare	2.1	10.4	39.6	22.9	8.3	10.4	4.2	2.1	48
Lassen Medical Group	1.8	3.6	28.6	39.3	8.9	12.5	1.8	3.6	56
Tulelake Health Center	35.3	0.0	35.3	17.6	11.8	0.0	0.0	0.0	17
Miners Family Health Center	3.7	14.8	40.7	22.2	11.1	3.7	0.0	3.7	27
John C Fremont Healthcare District	0.0	0.0	29.4	47.1	17.6	5.9	0.0	0.0	17
Southern Trinity Health Service	0.0	16.0	28.0	32.0	4.0	4.0	8.0	8.0	25
Jackson Rancheria Health Center	0.0	33.3	16.7	50.0	0.0	0.0	0.0	0.0	6
Total	3.9	10.8	32.0	29.0	9.1	9.5	2.6	3.0	231*

* Total is less than 239 because of missing responses.

Table 5: Do you have home access to the Internet?

Do you have home access to the Internet?(Percent checked "yes")	Home Internet Access	Total Count
Clinic	Percent	
Sierra Family Medical Clinic	66.7	24
Western Sierra Medical Clinic	66.7	12
Eastern Plumas Healthcare	60.9	46
Lassen Medical Group	85.5	55
Tulelake Health Center	52.6	19
Miners Family Health Center	63.0	27
John C Fremont Healthcare District	62.5	16
Southern Trinity Health Service	70.8	24
Jackson Rancheria Health Center	50.0	6
Total	68.1	229*

* Total is less than 239 because of missing responses.

Table 6: What language do you speak most of the time?

What language do you speak most of the time? (Percent checked "Yes")	Langauge			Total Count
	English	Spanish	Other	
n=	222	7	4	
Clinic	Percent			
Sierra Family Medical Clinic	100	0	0	24
Western Sierra Medical Clinic	100	0	0	12
Eastern Plumas Healthcare	100	0	0	48
Lassen Medical Group	94.5	1.8	3.6	55
Tulelake Health Center	57.9	31.6	10.5	19
Miners Family Health Center	100	0	0	27
John C Fremont Healthcare District	100	0	0	17
Southern Trinity Health Service	100	0	0	25
Jackson Rancheria Health Center	100	0	0	6
Total	95.3	3	1.7	233*

* Total is less than 239 because of missing responses.

Table 7: What kind of medical insurance do you have?

What kind of medical insurance do you have? (Percent checked)	Insurance			Total Count
	Medicare	MediCal	None	
n=	117	61	16	
Clinic	Percent			
Sierra Family Medical Clinic	40.7	29.6	3.7	
Western Sierra Medical Clinic	66.7	8.3	8.3	12
Eastern Plumas Healthcare	66.7	22.9	2.1	48
Lassen Medical Group	50.9	12.3	3.5	57
Tulelake Health Center	42.1	63.2	10.5	19
Miners Family Health Center	33.3	48.1	14.8	27
John C Fremont Healthcare District	55.6	16.7	0.0	18
Southern Trinity Health Service	36.0	16.0	20.0	25
Jackson Rancheria Health Center	16.7	33.3	0.0	6
Total	**49.0**	**25.5**	**6.7**	239

B. About My Diabetes and Health

Table 8: How long have you had diabetes?

How long have you had diabetes? (Percent Checked)	Length of Time			Total Count
	Less than 1 year	Between 1 and 5 years	Over 5 years	
n=	37	66	108	
Clinic	Percent			
Sierra Family Medical Clinic	9.5	42.9	47.6	**21**
Western Sierra Medical Clinic	0.0	36.4	63.6	**11**
Eastern Plumas Healthcare	20.5	22.7	56.8	**44**
Lassen Medical Group	14.8	33.3	51.9	**54**
Tulelake Health Center	11.8	29.4	58.8	**17**
Miners Family Health Center	18.5	33.3	48.1	**27**
John C Fremont Healthcare District	50.0	18.8	31.3	**16**
Southern Trinity Health Service	13.3	46.7	40.0	**15**
Jackson Rancheria Health Center	16.7	16.7	66.7	**6**
Total*	**17.5**	**31.3**	**51.2**	**211***

* Total is less than 239 because of missing responses.

Table 9: What type of diabetes do you have?

What type of diabetes do you have? (Percent Checked)	Type of Diabetes			Total Count
	Type 1	Type 2	Not Sure	
n=	14	182	19	
Clinic	Percent			
Sierra Family Medical Clinic	8.7	91.3	0.0	**23**
Western Sierra Medical Clinic	0.0	91.7	8.3	**12**
Eastern Plumas Healthcare	8.7	82.6	8.7	**46**
Lassen Medical Group	3.8	90.6	5.7	**53**
Tulelake Health Center	12.5	75.0	12.5	**16**
Miners Family Health Center	7.4	77.8	14.8	**27**
John C Fremont Healthcare District	6.7	80.0	13.3	**15**
Southern Trinity Health Service	5.6	77.8	16.7	**18**
Jackson Rancheria Health Center	0.0	100.0	0.0	**5**
Total*	**6.5**	**84.7**	**8.8**	**215***

* Total is less than 239 because of missing responses.

Table 10: What medications do you take for diabetes?

What medications do you take for diabetes?				Total Count
None	I take pills	I use insulin	Pills and insulin	
n=	137	20	24	
Percent				
19.6	60.9	8.9	10.7	**225***

* Total is less than 239 because of missing responses.

Table 11: Do you have any of the following medical problems?

Do you have any of the following medical problems? (Percent Checked)	Arthritis	Circulation problems (legs)	Depression	Heart Attack	Heart failure	High blood pressure	High cholesterol	Kidney problems	Poor vision caused by diabetes	Stroke	Other	Number of Comorbidities	Total Count
n=	88	68	70	27	17	133	96	20	43	13	36	Mean	
Clinic	Percent												
Sierra Family Medical Clinic	29.6	18.5	37.0	11.1	3.7	37.0	37.0	14.8	7.4	7.4	7.4	2.0	**27**
Western Sierra Medical Clinic	50.0	33.3	16.7	25.0	8.3	66.7	50.0	8.3	8.3	16.7	33.3	2.8	**12**
Eastern Plumas Healthcare	25.0	39.6	29.2	14.6	16.7	60.4	41.7	14.6	20.8	4.2	14.6	2.7	**48**
Lassen Medical Group	40.4	31.6	19.3	8.8	3.5	56.1	38.6	3.5	10.5	3.5	22.8	2.2	**57**
Tulelake Health Center	36.8	21.1	26.3	0.0	0.0	42.1	42.1	10.5	26.3	0.0	5.3	2.1	**19**
Miners Family Health Center	40.7	29.6	40.7	22.2	7.4	74.1	44.4	7.4	51.9	7.4	7.4	3.3	**27**
John C Fremont Healthcare District	33.3	16.7	27.8	5.6	5.6	66.7	38.9	5.6	16.7	11.1	5.6	2.3	**18**
Southern Trinity Health Service	52.0	20.0	36.0	8.0	4.0	44.0	24.0	4.0	0.0	4.0	20.0	2.0	**25**
Jackson Rancheria Health Center	33.3	33.3	50.0	0.0	16.7	50.0	83.3	0.0	33.3	0.0	16.7	3.0	**6**
Total	**36.8**	**28.5**	**29.3**	**11.3**	**7.1**	**55.6**	**40.2**	**8.4**	**18.0**	**5.4**	**15.1**	**2.4**	**239**

Table 12: Diabetes Summary Numbers

Diabetes Summary Numbers	My most recent A1C value level was:	My most recent LDL value level was:	My most recent Diastolic value level was:	My most recent Systolic value level was:	Total Count
n=	**131**	**81**	**146**	**146**	
Clinic	**Mean**				
Sierra Family Medical Clinic	7.5	103.0	76.6	126.6	**27**
Western Sierra Medical Clinic	7.5	103.6	74.5	127.3	**12**
Eastern Plumas Healthcare	7.8	110.0	77.1	130.1	**48**
Lassen Medical Group	7.3	101.4	74.8	135.6	**57**
Tulelake Health Center	7.1	103.1	79.5	128.8	**19**
Miners Family Health Center	8.0	113.6	77.2	133.8	**27**
John C Fremont Healthcare District	6.8	84.7	75.1	127.4	**18**
Southern Trinity Health Service	8.3	106.2	70.2	118.2	**25**
Jackson Rancheria Health Center	7.7	90.0	77.0	149.0	**6**
Total	**7.5**	**106.2**	**76.0**	**130.5**	**239**

C. My Diabetes Care

Table 13: Diabetes Care Received: Over the past six months, when I received care for my diabetes, I was:

Over the past 6 months, when I received care for my diabetes I was: (Scale: 1=None of the time; 5=Always)	Clinic									
	Sierra Family Medical Clinic	Western Sierra Medical Clinic	Eastern Plumas Healthcare	Lassen Medical Group	Tulelake Health Center	Miners Family Health Center	John C Fremont Healthcare District	Southern Trinity Health Service	Jackson Rancheria Health Center	All
n=	27	12	48	57	19	27	18	25	6	239
	Mean									
A. Asked for my ideas when we made a care plan.	2.7	2.5	2.4	2.3	2.5	3.3	2.7	3.0	4.3	2.6
B. Given choices about treatment to think about.	3.3	2.6	2.6	2.7	2.8	3.6	3.0	2.9	4.5	2.9
C. Asked to talk about any problems with my medicines/treatments or their effects.	3.3	2.6	3.0	3.2	3.1	3.8	3.5	3.3	4.3	3.3
D. Given a written list of things I could do to improve my health.	2.9	2.3	2.3	2.4	2.8	3.0	2.3	3.4	4.3	2.7
E. Satisfied that my care was well organized.	3.7	3.7	3.5	3.3	3.6	3.8	4.0	3.6	4.6	3.6
F. Shown how what I did to take care of myself influenced my condition.	3.5	3.1	2.8	2.6	3.1	3.6	3.7	3.0	4.5	3.1
G. Asked to talk about my goals in caring for my condition.	3.2	2.2	2.5	2.3	3.2	3.3	2.9	3.2	4.5	2.8
H. Helped to set specific goals to improve my eating or exercise.	3.2	2.7	2.5	2.9	2.9	3.5	3.2	3.0	4.5	3
I. Given a copy of my care plan.	2.5	2.2	2.2	2.3	2.5	3.0	1.8	2.6	4.7	2.4
J. Encouraged to go to a specific group or class to help me cope with my chronic condition.	3.5	2.3	2.4	2.8	2.7	3.1	3.2	3.2	4.0	2.9
K. Asked questions, either directly or on a survey, about my health habits.	3.3	2.9	2.4	2.6	2.6	3.6	3.2	3.3	4.3	2.9
L. Sure that health professionals thought about my values, beliefs, and traditions when they recommended treatment to me.	3.5	3.2	2.9	3.1	2.7	3.4	3.4	3.3	4.5	3.2
M. Helped to make a care plan that I could carry out in my daily life.	3.2	2.6	2.6	2.3	2.5	3.4	2.9	2.8	4.3	2.8
N. Over the past 6mos, when received care for diabetes I was: Helped to plan ahead so I could take care of my condition even in hard times.	3.1	2.1	2.2	2.3	2.4	3.0	2.5	2.5	4.5	2.5
O. Asked how my chronic condition affects my life.	2.9	2.1	2.3	2.4	2.6	2.9	2.5	2.5	4.0	2.6
P. Contacted after a visit to see how things were going.	2.6	2.4	2.0	2.1	2.1	2.8	2.2	2.5	4.3	2.3
Q. Referred to another health care professional (my doctor, another member of the health team, etc.).	2.9	2.5	2.1	2.2	2.3	3.2	2.5	2.6	4.0	2.5
R. Told how my visits with other types of professionals helped my treatment.	2.3	2.0	1.9	1.9	2.1	3.2	2.3	1.8	4.0	2.2
S. Asked how my visits with other professionals were going.	2.9	2.3	2.0	2.1	2.1	3.2	2.1	2.1	3.3	2.3
Average if Diabetes Care Items "Over the past 6mos, when received care for diabetes I was:" items	3.2	2.7	2.4	2.6	2.7	3.3	3.0	3.0	4.4	2.8

D. My Self-Care and Confidence

Table 14: Diabetes Self-Care Prior to Program Enrollment (Pre-Test Questions)

	Clinic								
	Sierra Family Medical Clinic	Western Sierra Medical Clinic	Eastern Plumas Healthcare	Lassen Medical Group	Tulelake Health Center	Miners Family Health Center	John C Fremont Healthcare District	Southern Trinity Health Service	Jackson Rancheria Health Center
Count	20	10	41	49	14	20	16	21	4
	Percent								
4. If you have received any education on diabetes, what type of education? (Percent Checked/not mutually exclusive)									
Information from my doctor	65.0	70.0	48.8	53.1	64.3	60.0	56.3	66.7	100.0
Pamphlets	55.0	50.0	46.3	49.0	35.7	25.0	37.5	52.4	100.0
Internet	35.0	40.0	24.4	36.7	14.3	15.0	12.5	28.6	0.0
I've been to diabetes classes	40.0	10.0	31.7	36.7	7.1	40.0	37.5	23.8	0.0
Other	20.0	30.0	22.0	22.4	21.4	20.0	18.8	23.8	25.0
6A. About how many times in the past year have you seen a doctor for your diabetes?									
0 times	0.0	0.0	17.1	2.0	7.1	15.0	18.8	19.0	0.0
1-3 times	30.0	0.0	48.8	42.9	57.1	25.0	43.8	66.7	0.0
4-7 times	30.0	80.0	22.0	44.9	21.4	50.0	31.3	4.8	100.0
7 to 9 times	5.0	10.0	4.9	0.0	7.1	0.0	6.3	0.0	0.0
10 or more times	35.0	10.0	7.3	10.2	7.1	10.0	0.0	9.5	0.0
6B. About how many times in the past year have you been to an emergency room because of your diabetes?									
0 times	100.0	100.0	85.4	89.8	92.9	95.0	100.0	100.0	100.0
1-3 times	0.0	0.0	7.3	10.2	7.1	5.0	0.0	0.0	0.0
4-7 times	0.0	0.0	4.9	0.0	0.0	0.0	0.0	0.0	0.0
7 to 9 times	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0
6C. About how many times in the past year were you admitted to a hospital because of your diabetes?									
0 times	100.0	100.0	90.2	95.9	100.0	95.0	100.0	100.0	100.0
1-3 times	0.0	0.0	9.8	4.1	0.0	5.0	0.0	0.0	0.0
6D. About how many times in the past year did a doctor check your feet?									
0 times	30.0	0.0	17.1	42.9	42.9	25.0	56.3	42.9	0.0
1-3 times	40.0	70.0	53.7	44.9	42.9	35.0	18.8	52.4	50.0
4-7 times	20.0	20.0	24.4	6.1	7.1	30.0	25.0	4.8	25.0
7 to 9 times	10.0	0.0	2.4	4.1	7.1	5.0	0.0	0.0	25.0
10 or more times	0.0	10.0	2.4	2.0	0.0	5.0	0.0	0.0	0.0
7. Did you get an eye exam from an eye doctor in the last 12 months?									
No	30.0	20.0	34.1	22.4	35.7	40.0	31.3	52.4	0.0
Yes	70.0	80.0	65.9	77.6	64.3	60.0	68.8	47.6	100.0
8. Did you get two dental check ups in the past 12 months?									
No	50.0	50.0	43.9	53.1	42.9	90.0	37.5	42.9	50.0
Yes	50.0	50.0	56.1	46.9	57.1	10.0	62.5	57.1	50.0
9. Did you get a flu shot in the last 12 months?									
No	30.0	20.0	41.5	36.7	71.4	50.0	31.3	33.3	0.0
Yes	70.0	80.0	58.5	63.3	28.6	50.0	68.8	66.7	100.0
10. Do you own a blood sugar meter?									
No	15.0	0.0	14.6	4.1	7.1	15.0	31.3	33.3	0.0
Yes	85.0	100.0	85.4	95.9	92.9	85.0	68.8	66.7	100.0

Table 15: Self-Care Items: Change in Self-Care: Pre to 6/8 Week Assessment: What is the hardest thing that you face in managing your diabetes?

Self-Care Items: What is the hardest thing that you face in managing your diabetes? (Percent Checked):	Clinic									Overall
	Sierra Family Medical Clinic	Western Sierra Medical Clinic	Eastern Plumas Healthcare	Lassen Medical Group	Tulelake Health Center	Miners Family Health Center	John C Fremont Healthcare District	Southern Trinity Health Service	Jackson Rancheria Health Center	
n=	27	12	48	57	19	27	18	25	6	239
Pre: Access to information about diabetes.										
Percent Checked	11.1	.	22.9	14	10.5	18.5	16.7	8	.	14.2
6-8 Week: Access to information about diabetes										
Percent Checked	3.7	.	6.3	5.3	5.3	3.7	22.2	8	.	6.3
Pre: The costs of caring for diabetes										
Percent Checked	7.4	8.3	12.5	15.8	15.8	33.3	11.1	32	.	16.7
6-8 Week: The costs of caring for diabetes										
Percent Checked	11.1	.	6.3	14	15.8	11.1	16.7	16	.	11.3
Pre: I am overwhelmed with my diabetes										
Percent Checked	22.2	.	20.8	22.8	15.8	25.9	5.6	20	.	18.8*
6-8 Week: I am overwhelmed with my diabetes										
Percent Checked	3.7	.	2.1	7	10.5	11.1	.	8	.	5.4*

Chi-Square=92.9, p<.0001

Table 16: Change in Confidence and Importance of Diabetes Self-Management: Pre to 6/8 Week Assessment

Self-Care Items		Clinic									Overall
		Sierra Family Medical Clinic	Western Sierra Medical Clinic	Eastern Plumas Healthcare	Lassen Medical Group	Tulelake Health Center	Miners Family Health Center	John C Fremont Healthcare District	Southern Trinity Health Service	Jackson Rancheria Health Center	
n=		27	12	48	57	19	27	18	25	6	239
How confident you are that you can do the things that are important to manage your diabetes? 1=Not at all Confident : 5=Very Confident											
Pre	Mean	3.8	3.4	3.6	3.6	3.7	3.7	4.2	3.5	4.5	3.7
6-8 Weeks		3.9	4.0	3.8	3.6	3.7	3.8	4.0	4.1	4.3	3.8
Pre-6/8 Weeks DELTA		-0.1	0.0	0.2	0.1	-0.3	0.5	-0.4	0.4	0.0	0.1
	t	-0.17	0.00	1.00	0.70	-1.15	1.48	-1.15	2.04	0.00	1.03
	Prob. t	0.87	1.00	0.33	0.49	0.28	0.17	0.27	0.06	1.00	0.30
How important is it to you to manage your diabetes? 1=Not at all Confident : 5=Very Confident											
Pre	Mean	4.5	3.9	4.3	4.5	4.1	4.4	4.7	4.7	4.8	4.4
6-8 Weeks		4.5	4.5	4.7	4.6	4.8	4.8	4.7	4.8	5.0	4.7
Pre-6/8 Weeks DELTA		-0.5	0.0	0.4	0.1	0.4	0.7	-0.1	0.1	0.3	0.2
	t	-1.46	.	2.20	0.49	1.08	1.77	-0.81	1.00	1.00	1.91
	Prob. t	0.18	.	**0.04**	0.63	0.31	0.10	0.43	0.33	0.42	0.06

Table 17: Change in Self-Care Days: Pre to 6/8 Week Assessment

Self-Care Items		Clinic									Overall
		Sierra Family Medical Clinic	Western Sierra Medical Clinic	Eastern Plumas Healthcare	Lassen Medical Group	Tulelake Health Center	Miners Family Health Center	John C Fremont Healthcare District	Southern Trinity Health Service	Jackson Rancheria Health Center	
n=		27	12	48	57	19	27	18	25	6	239
A. On how many of the last seven days have you followed a healthy eating plan?											
Pre	**Mean**	4.5	4.2	4.5	4.1	2.9	4.1	5.3	4.3	5.0	4.2
6-8 Week		5.2	5.8	4.9	4.7	4.2	4.9	5.0	5.4	6.0	5.0
Pre-6/8 Weeks DELTA		-0.4	0.5	-0.2	0.5	1.4	0.6	-0.6	0.7	1.3	0.3
	t	-0.92	0.77	-0.31	1.61	2.39	0.60	-1.67	1.34	4.00	1.63
	Prob. t	0.38	0.50	0.76	0.12	**0.04**	0.56	0.12	0.20	0.06	0.11
B. On how many of the last seven days did you do at least 30 minutes of physical exercise, including walking?											
Pre	**Mean**	3.6	4.3	3.2	2.8	2.6	3.9	4.6	3.5	4.8	3.4
6-8 Weeks		3.4	3.8	3.3	3.8	4.7	3.7	5.0	4.0	4.3	3.9
Pre-6/8 Weeks DELTA		-0.9	-0.3	0.1	0.7	2.8	0.4	0.4	0.6	-0.7	0.5
	t	-1.48	-0.52	0.38	1.81	3.49	0.81	0.50	1.41	-2.00	2.35
	Prob. t	0.17	0.64	0.71	0.08	**<.01**	0.44	0.62	0.17	0.18	**0.02**
C. On how many of the last seven days did you test your blood sugar? ("0" if you do not own a meter)											
Pre	**Mean**	3.3	4.1	5.0	4.6	3.6	4.6	4.3	2.7	4.8	4.2
6-8 Weeks		5.1	5.0	5.4	5.2	4.3	5.3	2.8	2.7	6.3	4.6
Pre-6/8 Weeks DELTA		0.3	0.7	0.0	0.7	1.0	0.3	-1.4	0.1	0.0	0.2
	t	0.51	0.55	0.25	1.85	1.31	0.27	-1.91	0.15	0.00	0.95
	Prob. t	0.62	0.63	0.80	0.07	0.23	0.79	0.08	0.89	1.00	0.35
D. On how many of the last seven days did you check your feet?											
Pre	**Mean**	4.5	6.1	4.0	3.9	3.6	4.1	4.5	4.3	6.5	4.2
6-8 Weeks		5.8	7.0	5.5	5.5	5.2	5.4	5.4	6.2	5.7	5.6
Pre-6/8 Weeks DELTA		0.5	0.3	1.2	1.1	2.1	0.5	0.3	2.0	-0.7	1.1
	t	0.66	1.00	2.42	2.14	1.97	1.00	0.45	2.99	-1.00	4.54
	Prob. t	0.52	0.39	**0.02**	**0.04**	0.09	0.34	0.66	**<.01**	0.42	**<.01**
Over the past two weeks, how often have you been bothered by any of the following problems?											
A. Little interest or pleasure in doing things:											
Pre	**Mean**	1.6	1.2	1.7	1.7	1.7	2.2	2.0	1.5	1.5	1.7
6-8 Weeks		1.4	1.0	1.8	1.7	1.9	1.7	1.7	1.7	1.0	1.6
Pre-6/8 Weeks DELTA		-0.3	0.0	0.0	0.0	0.4	-0.3	-0.3	0.2	0.0	0.0
	t	-1.39	.	0.21	-0.18	1.00	-0.61	-1.16	0.65	.	-0.44
	Prob. t	0.19	.	0.83	0.86	0.36	0.55	0.27	0.53	.	0.66
B. Feeling down, depressed or hopeless:											
Pre	**Mean**	1.7	1.1	1.6	1.5	1.5	2.1	1.8	1.5	1.5	1.6
6-8 Weeks		1.2	1.0	1.4	1.5	1.8	1.7	1.3	1.4	1.0	1.4
Pre-6/8 Weeks DELTA		-0.5	0.0	-0.1	0.0	0.1	-0.1	-0.4	-0.1	0.0	-0.1
	t	-1.61	.	-0.57	-0.23	1.00	-0.43	-1.70	-0.57	.	-1.88
	Prob. t	0.14	.	0.57	0.82	0.35	0.67	0.11	0.58	.	0.06

Table 18: Total Number of Self-Care Days: Change Pre to 6/8 Week Assessment

Sum of Self-Care Days: Sum of 4 Self Care-Items 'On How many days did you...' (Question #5 Items A-D)		Clinic									Overall Average
		Sierra Family Medical Clinic	Western Sierra Medical Clinic	Eastern Plumas Healthcare	Lassen Medical Group	Tulelake Health Center	Miners Family Health Center	John C Fremont Healthcare District	Southern Trinity Health Service	Jackson Rancheria Health Center	
n=		27	12	48	57	19	27	18	25	6	239
Pre: Sum of 4 Self Care-Items 'On How many days did you...'	Mean	15.9	20.1	16.7	15.5	12.3	16.6	18.5	15.8	21.0	16.2
6/8 Week Follow-up: Sum of 4 Self Care-Items 'On How many days did you...'	Mean	19.5	21.5	19.5	19.2	18.4	19.3	18.8	17.9	22.3	19.2
Change in Sum of 4	Mean	-0.9	0.7	1.1	3.3	7.6	1.9	-0.3	2.9	0.0	2.1
Self Care-Items 'On	t	-0.69	0.30	1.18	4.20	3.51	0.94	-0.17	2.24	0.00	4.39
How many days did	Prob. t	0.50	0.79	0.25	**<.01**	**<.01**	0.37	0.87	0.04	1.00	**<.01**

E. Education and Knowledge

Table19: How hard do you think the following things are to do regarding management of your diabetes: A. Manage diabetes

How hard do you think the following things are to do regarding management of your diabetes: A. Manage diabetes (1=Very Hard:5=Not at all Hard)		Overall Average	
Survey	**Count**		
Pre	n=192	Mean	2.8
Post	n=191		3.6
6-8 Week Follow-up	n=145		3.3
Change Pre to Post	n=179	Mean	0.8
		t	8.59
		Probt	**<.01**
Change Pre to 6/8 Week Follow-up	n=131	Mean	0.4
		t	3.17
		Probt	**<.01**
Change Post to 6/8 Week Follow-up	n=130	Mean	-0.4
		t	-3.71
		Probt	**<.01**

Table 20: How hard do you think the following things are to do regarding management of your diabetes: B. Read food labels

How hard do you think the following things are to do regarding management of your diabetes: B. Read food labels(1=Very Hard:5=Not at all Hard)		Overall Average	
Survey	**Count**		
Pre	n=196	Mean	3.8
Post	n=188		4.2
6-8 Week Follow-up	n=145		4.2
Change Pre to Post	n=181	Mean	0.4
		t	4.64
		Probt	**<.01**
Change Pre to 6/8 Week Follow-up	n=134	Mean	0.4
		t	3.12
		Probt	**<.01**
Change Post to 6/8 Week Follow-up	n=128	Mean	-0.1
		t	-0.9
		Probt	0.37

Table 21: How hard do you think the following things are to do regarding management of your diabetes: C. Exercise daily

How hard do you think the following things are to do regarding management of your diabetes: C. Exercise daily (1=Very Hard:5=Not at all Hard)		Overall Average	
Survey	**Count**		
Pre	n=198	Mean	3.2
Post	n=187		3.6
6-8 Week Follow-up	n=145		3.1
Change Pre to Post	n=182	Mean	0.3
		t	3.97
		Probt	**<.01**
Change Pre to 6/8 Week Follow-up	n=135	Mean	-0.1
		t	-0.71
		Probt	0.48
Change Post to 6/8 Week Follow-up	n=126	Mean	-0.5
		t	-4.06
		Probt	**<.01**

Table 22: How hard do you think the following things are to do regarding management of your diabetes: D. Check your feet daily

How hard do you think the following things are to do regarding management of your diabetes: D. Check you feet daily (1=Very Hard:5=Not at all Hard)		Overall Average	
Survey	**Count**		
Pre	n=194	Mean	4.3
Post	n=187		4.4
6-8 Week Follow-up	n=143		4.5
Change Pre to Post	n=178	Mean	0.2
		t	2.04
		Probt	**0.04**
Change Pre to 6/8 Week Follow-up	n=130	Mean	0.2
		t	2.09
		Probt	**0.04**
Change Post to 6/8 Week Follow-up	n=125	Mean	0
		t	0.22
		Probt	0.83

Table 23: How hard do you think the following things are to do regarding management of your diabetes: E. Take medications as prescribed

How hard do you think the following things are to do regarding mangagement of your diabetes: E. Take medications as prescribed (1=Very Hard : 5=Not at all Hard)		Overall Average	
Survey	**Count**		
Pre	n=191	Mean	4.6
Post	n=184		4.7
6-8 Week Follow-up	n=140		4.8
Change Pre to Post	n=175	Mean	0.1
		t	2.46
		Probt	0.01
Change Pre to 6/8 Week Follow-up	n=128	Mean	0.1
		t	1.91
		Probt	0.06
Change Post to 6/8 Week Follow-up	n=122	Mean	0
		t	-0.26
		Probt	0.79

Table 24: How hard do you think the following things are to do regarding management of your diabetes: F. Check your blood sugar

How hard do you think the following things are to do regarding mangagement of your diabetes: F. Check your blood sugar (1=Very Hard : 5=Not at all Hard)		Overall Average	
Survey	**Count**		
Pre	n=191	Mean	4.1
Post	n=180		4.4
6-8 Week Follow-up	n=135		4.3
Change Pre to Post	n=175	Mean	0.3
		t	4.6
		Probt	**<.01**
Change Pre to 6/8 Week Follow-up	n=125	Mean	0.2
		t	1.66
		Probt	0.1
Change Post to 6/8 Week Follow-up	n=118	Mean	-0.2
		t	-1.4
		Probt	0.18

Table 25: How hard do you think the following things are to do regarding management of your diabetes: G. Keep doctor appointments

How hard do you think the following things are to do regarding mangagement of your diabetes: G. Keep doctor appointments (1=Very Hard : 5=Not at all Hard)		Overall Average	
Survey	**Count**		
Pre	n=197	Mean	4.7
Post	n=185		4.8
6-8 Week Follow-up	n=144		4.8
Change Pre to Post	n=179	Mean	0.1
		t	1.55
		Probt	0.12
Change Pre to 6/8 Week Follow-up	n=132	Mean	0.1
		t	1.19
		Probt	0.24
Change Post to 6/8 Week Follow-up	n=124	Mean	0.00
		t	0.00
		Probt	1.00

Table 26: Sum of "How Hard" Items: Mean Response values

Sum of "How Hard" Items: Mean Response values		Clinic									Overall Average
		Sierra Family Medical Clinic	Western Sierra Medical Clinic	Eastern Plumas Healthcare	Lassen Medical Group	Tulelake Health Center	Miners Family Health Center	John C Fremont Healthcare District	Southern Trinity Health Service	Jackson Rancheria Health Center	
Sum of "How hard do you think the following things are to do..." items: PRE	Mean	26.8	28.2	28.3	28	27.8	25.2	28.1	26.7	31.8	27.6
Sum of "How much do you know about the benefits of..." items: POST		30.7	30.1	30.2	29.8	28.7	27.2	30	29.2	30.5	29.6
Sum of "How much do you know about the benefits of..." items: 6-8 WEEKS		29.8	31.5	29	28.6	30.3	27.6	30.2	27.3	32	29
Change Pre to Post: How hard do you think the following things are... Questions A-G (1=Very Hard : 5=Not at all Hard)	t	4.4	2.2	2.1	2.1	2	1.5	2.1	2.2	-1.3	2.2
	Probt	3.67	2.23	2.3	3.94	1.79	1.58	2.57	1.9	-1.13	6.57
	Mean	<.01	0.05	0.03	<.01	0.1	0.14	0.03	0.07	0.34	**<.01**
Change Pre to 6/8 Week Follow-up: How hard do you think the following things are... Questions A-G (1=Very Hard : 5=Not at all Hard)	t	3.7	1	1.1	0.7	2.2	3.1	0.5	1.8	0	1.5
	Probt	2.88	1.1	1.09	0.92	1.35	1.28	0.52	1.1	0	3.36
	Mean	0.02	0.35	0.29	0.37	0.21	0.23	0.61	0.29	1	**<.01**
Change Post to 6/8 Week Follow-up: How hard do you think the following things are... Questions A-G (1=Very Hard : 5=Not at all Hard)	t	-2.1	0.3	-1.5	-1.4	-0.6	1.6	-1.4	-3.4	1	-1.3
	Probt	-3.03	0.15	-1.9	-1.22	-0.36	0.85	-2.37	-2.33	1.73	-2.92
	Mean	<.01	0.89	0.07	0.23	0.73	0.42	0.04	0.04	0.23	**<.01**

Table 27: How much do you know about the effect of carbohydrates on your blood sugar?

How much do you know about the effect of carbohydrates on your blood sugar? (1=Nothing : 5=A Lot)		Overall Average	
Survey	**Count**		
Pre	n=202	Mean	3.0
Post	n=192		3.9
6-8 Week Follow-up	n=147		3.8
Change Pre to Post	n=188	Mean	0.8
		t	9.8
		Probt	**<.01**
Change Pre to 6/8 Week Follow-up	n=137	Mean	0.8
		t	7.5
		Probt	**<.01**
Change Post to 6/8 Week Follow-up	n=132	Mean	-0.1
		t	-1.9
		Probt	0.06

Table 28: How much do you know about reading food labels?

How much do you know about reading food labels? (1=Nothing : 5=A Lot)		Overall Average	
Survey	**Count**		
Pre	n=201	Mean	3.4
Post	n=192		4.1
6-8 Week Follow-up	n=147		4.1
Change Pre to Post	n=187	Mean	0.6
		t	7.98
		Probt	**<.01**
Change Pre to 6/8 Week Follow-up	n=135	Mean	0.5
		t	5.46
		Probt	**<.01**
Change Post to 6/8 Week Follow-up	n=132	Mean	-0.1
		t	-0.7
		Probt	0.48

Table 29: How much do you know about the importance of checking your feet daily?

How much do you know about the importance of checking your feet daily? (1=Nothing : 5=A Lot)		Overall Average	
Survey	**Count**		
Pre	n=194	Mean	3.5
Post	n=187		4.2
6-8 Week Follow-up	n=143		4.4
Change Pre to Post	n=178	Mean	0.7
		t	8.04
		Probt	**<.01**
Change Pre to 6/8 Week Follow-up	n=130	Mean	0.8
		t	6.48
		Probt	**<.01**
Change Post to 6/8 Week Follow-up	n=125	Mean	0.1
		t	0.96
		Probt	0.34

Table 30: How much do you know about using portion size to improve blood sugar?

How much do you know about using portion size to improve blood sugar? (1=Nothing : 5=A Lot)		Overall Average	
Survey	**Count**		
Pre	n=192	Mean	3.1
Post	n=191		4
6-8 Week Follow-up	n=145		4
Change Pre to Post	n=179	Mean	0.8
		t	9.6
		Probt	**<.01**
Change Pre to 6/8 Week Follow-up	n=131	Mean	0.8
		t	6.62
		Probt	**<.01**
Change Post to 6/8 Week Follow-up	n=130	Mean	0
		t	-0.34
		Probt	0.73

Table 31: How much do you know about the benefits of activity and exercise on diabetes?

How much do you know about the benefits of activity and exercise on diabetes? (1=Nothing : 5=A Lot)		Overall Average	
Survey	**Count**		
Pre	n=202	Mean	3.6
Post	n=192		4.2
6-8 Week Follow-up	n=147		4.3
Change Pre to Post	n=188	Mean	0.5
		t	6.49
		Probt	**<.01**
Change Pre to 6/8 Week Follow-up	n=136	Mean	0.5
		t	4.77
		Probt	**<.01**
Change Post to 6/8 Week Follow-up	n=132	Mean	0.1
		t	1.43
		Probt	0.15

Table 32: How much do you know about the benefits of blood sugar management on reducing long-term problems such as nerve damage, eye damage, heart damage, etc.?

How much do you know about the benefits of blood sugar management on reducing long-term problems such as nerve damage, eye damage, heart damage, etc.? (1=Nothing : 5=A Lot)		Overall Average	
Survey	**Count**		
Pre	n=203	Mean	3.3
Post	n=191		4.1
6-8 Week Follow-up	n=188		4.0
Change Pre to Post	n=188	Mean	0.8
		t	8.84
		Probt	**<.01**
Change Pre to 6/8 Week Follow-up	n=137	Mean	0.6
		t	5.23
		Probt	**<.01**
Change Post to 6/8 Week Follow-up	n=131	Mean	-0.1
		t	-0.94
		Probt	0.35

Table 33: Sum of "How Much" Items 2-8: Mean Response values

Patient Education Survey: Sum of "How Much" Items: Mean Response values		Clinic									Overall Average
		Sierra Family Medical Clinic	Western Sierra Medical Clinic	Eastern Plumas Healthcare	Lassen Medical Group	Tulelake Health Center	Miners Family Health Center	John C Fremont Healthcare District	Southern Trinity Health Service	Jackson Rancheria Health Center	
Sum of "How much do you know about the benefits of..." items: PRE	Mean	17.5	22.4	20.3	20.6	19.1	17.1	20.6	20.4	25.3	20.0
Sum of "How much do you know about the benefits of..." items: POST		23.2	26.7	24.8	24.3	23.4	23.4	24.8	24.3	24.8	24.3
Sum of "How much do you know about the benefits of..." items: 6-8 WEEKS		26.1	25.8	24.6	24	22.3	23.3	25.1	24.5	27.7	24.5
Change Pre to Post: How much do you know about ... Items 2-8 (1=Nothing : 5=A Lot)	t	5.7	4.2	4.7	4	4.2	6.3	3.4	3.8	0.3	4.4
	Probt	4.03	3.82	5.28	4.99	2.83	4.83	2.64	2.94	0.23	10.95
	Mean	<.01	<.01	<.01	<.01	0.01	<.01	0.02	<.01	0.84	**<.01**
Change Pre to 6/8 Week Follow-up: How much do you know about ... Items 2-8 (1=Nothing : 5=A Lot)	t	7.4	4	3.7	2.6	2.4	6	3.1	5	2	4
	Probt	4.1	1.51	3.07	3.08	2.07	4.41	1.84	4.2	2	8.37
	Mean	<.01	0.23	<.01	<.01	0.08	<.01	0.09	<.01	0.3	**<.01**
Change Post to 6/8 Week Follow-up: How much do you know about ...Items 2-8 (1=Nothing : 5=A Lot)	t	0.1	-2.5	-0.2	0	-1.2	-0.4	0.4	0.4	1.7	-0.1
	Probt	0.16	-3.87	-0.19	0	-0.87	-0.25	0.35	0.31	1.39	-0.19
	Mean	0.87	0.03	0.85	1	0.41	0.81	0.73	0.76	0.3	0.85

F. Patient Satisfaction

Table 34: Patient Satisfaction Questions 1-8

Patient Satisfaction Survey Mean Scores: 1=Strongly Disagree:5=Strongly Agree	Clinic									Overall Average
	Sierra Family Medical Clinic	Western Sierra Medical Clinic	Eastern Plumas Healthcare	Lassen Medical Group	Tulelake Health Center	Miners Family Health Center	John C Fremont Healthcare District	Southern Trinity Health Service	Jackson Rancheria Health Center	
n=	27	12	48	57	19	27	18	25	6	
	mean									
1. Overall I was satisfied with the class	4.6	4.6	4.1	4.2	4.5	4.4	4.5	4.7	4	4.4
2. I was comfortable talking over the telemedicine video	4.6	4.8	4.2	4.4	4.7	4.4	4.5	4.6	4	4.4
3. I understood the information given	4.6	5	4.3	4.5	4.7	4.6	4.6	4.7	4	4.5
4. The picture on the screen was easy to see	4.7	4.9	4.2	4.5	4.6	4.4	4.4	4.8	4.2	4.5
5. I could hear the educators well	4.7	4.8	3.9	4.6	4.7	4.2	4	4.7	3.4	4.4
6. UC Davis teachers were polite	4.8	5	4.4	4.8	4.8	4.5	4.8	5	4.8	4.7
7. The UC Davis teachers were knowledgeable & skillful	4.6	4.7	4.2	4.6	4.6	4.4	4.6	4.9	4	4.5
8. Overall the telemedicine experience was satisfactory	4.7	4.8	4.2	4.4	4.7	4.4	4.6	4.9	4.4	4.5
Sum of Satisfaction Items: Question 1-8: (Range = 8-40)	37.1	38.5	34	36.3	37	35.2	36	38.1	32.8	36.2

Table 35: Patient Satisfaction – Value of telemedicine class

Patient Satisfaction Survey Mean Scores: 1=Strongly Disagree:5=Strongly Agree	Clinic									Overall Average
	Sierra Family Medical Clinic	Western Sierra Medical Clinic	Eastern Plumas Healthcare	Lassen Medical Group	Tulelake Health Center	Miners Family Health Center	John C Fremont Healthcare District	Southern Trinity Health Service	Jackson Rancheria Health Center	
n=	27	12	48	57	19	27	18	25	6	
	Mean									
In your opinion, how valuable was it that you took a telemedicine class?	4.44	4.55	3.89	4.28	4.73	4.63	4.35	4.64	3.5	4.33