Veracruz Initiative for Diabetes Awareness

VIDA

Final report

Pan American Health Organization

Regional Office of the
World Health Organization

SALUD

SECRETARÍA
DE SALUD

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Authors
Alberto Barceló, Elizabeth Cafiero, Melanie de Boer, JoAnne Epping-Jordan,
Amparo Gordillo, Micheline Meiners, Enrique Pérez Flores.

Translators
Liz Howard, Haydée Valero.

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Veracruz Project for the Improvement of Diabetes Care (VIDA); Final Report

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Foreword

Chronic noncommunicable diseases are an important source of morbidity and are responsible for two-thirds of the total deaths in our Region. The increase in the prevalence of chronic diseases, and in particular diabetes, is an important characteristic of the changing health profile of our communities. In Mexico, the national prevalence of diabetes increased from 7.2 percent in 1993 (1) to 10.7 percent in 2000 (2). Diabetes care has become one of the most important public health challenges in this country.

"Primary health care constitutes the fundamental strategy for transforming health care systems."

Poorly controlled diabetes is a major cause of disability and premature death. The morbidity and mortality related to diabetes are due to a high frequency of chronic complications, such as heart disease, amputations, and end-stage renal failure, among others. It has been shown that achieving better metabolic control can prevent or delay some complications of diabetes. The VIDA intervention (Veracruz Initiative for Diabetes Awareness), conducted as part of the Pan American Health Organization's (PAHO) program of technical cooperation with Mexico, aimed to improve diabetes control in the country.

VIDA was planned and implemented by primary care teams that received technical assistance from national and international experts. The success of this intervention demonstrates that it is possible to achieve better results when the primary care personnel work as a team and provide integrated care. Strengthening health services with the elements they need to deliver chronic care is crucial if they are to respond to new public health needs. VIDA's results confirm that primary care continues to be the essential vehicle through which better health can be brought to communities. Primary health care constitutes the fundamental strategy for transforming health care systems.

The intervention took place in the health services for the economically challenged of Veracruz, Mexico. The VIDA intervention was an effort to reduce inequity in health by improving care of the neediest. It included participation of the community and people affected by diabetes in identifying the problems related to care and searching for solutions and ways to improve care. This innovative component will contribute to the long-term sustainability of system changes made during this intervention.

Through this initiative with the Secretariat of Health of Mexico and the state of Veracruz, PAHO reaffirms its mandate and commitment to cooperation in the highest technical content, as well as solidarity with the health of the neediest.

Dr. Mirta Roses Periago
Director, Pan American Health Organization

Prevalence % of Diabetes Mellitus in Mexixo, 1993-2000
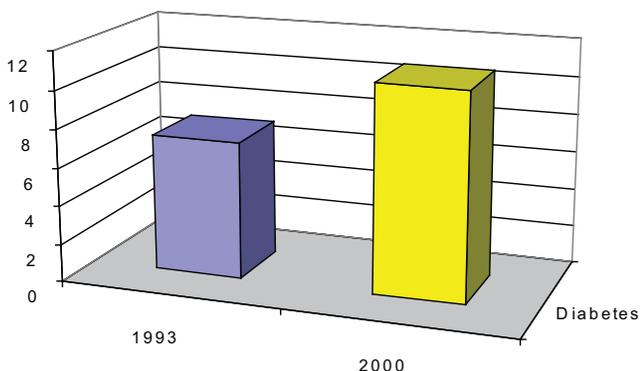
Testimony

Moisés C. Hernández Aburto, 62 years old, tells us that he suffered a fall on New Year's Day four years ago. He was taken to the hospital where he was diagnosed with diabetes and hypertension. At that point, he felt he was at a crossroads between "unwelcoming and unknown" paths. Moisés knows that diabetes affects the eyes, the feet, the kidneys and the heart. He says that the VIDA project gave him the opportunity to learn about his disease and understand different aspects of it. After learning about diabetes, Moisés arrived at the conclusion that he is not sick, because sugar is necessary for life, unlike tobacco, alcohol, or drugs. Moisés tells us "I think that when we (the diabetic population) change our lifestyle (exercise, healthy food, medicine, everything methodical and without abuse) we will be the healthiest population."

Experience

"... when we (the diabetic population) change our lifestyle (exercise, healthy food, medicine, everything methodical and without abuse) we will be the healthiest population."

Clinical diabetes management

During the VIDA project, two in-service consults on diabetes management were carried out in each intervention health center. The primary care team in each health center was taught how to identify the most complex cases to manage. These patients were scheduled for consultation during the session of technical assistance. The visiting advisor, a specialist in endocrinology with special experience in diabetes, provided clinical care to the referred patients along with a primary care team made up of a physician and a nurse. The cross consultation included educational aspects, such as the identification of factors that contribute to poor metabolic control, as well as instruction, calculation of dosage and application of insulin, particularly important given the widespread belief of the population that ocular injuries are the result of insulin treatment.

After the cross consultations, a plenary session with all the core health teams in every health center was held. During this knowledge exchange, a review of diabetes practices and treatment was conducted with emphasis on metabolic control. The session also included a question-and-answer session with a technical review of detected problems and their solutions. This methodology was particularly beneficial as it brought the specialists closer to primary care, putting them on the same level of care as the other health care personnel. Overall, this activity brought together the entire health staff – management and health teams – in a positive collaboration. The collaboration strengthened critical analysis of the care provided and efforts to remove the obstacles to good metabolic control in difficult-to-manage diabetes cases.

Executive summary

People with diabetes take center stage in their care: The Veracruz Initiative for Diabetes Awareness (VIDA) Project

The Secretariat of Health of Mexico has launched the "National Campaign for Quality Improvement" to provide better health care for the population. Chronic diseases are of particular importance, because they constitute the leading causes of morbidity and mortality in Mexico. Data from the monitoring system for quality of medical care in Mexico indicated that in 2000, 66 percent of people with diabetes had inadequate metabolic control. In order to evaluate a more integrated approach to chronic disease care, the Secretariat of Health, in collaboration with the Pan American Health Organization/World Health Organization (PAHO/WHO), conducted a pilot project in the state of Veracruz.

"... this demonstrative experience could be repeated in other geographical areas of Mexico to achieve broader results and benefits. "

The 18-month intervention consisted of in-service training of primary care personnel on diabetes management and foot care and implementation of a structured diabetes education program. In addition, primary health care teams, which included primary care personnel and staff from the local hospital, were trained to adopt a quality-improvement methodology that allowed them to develop solutions to problems that prevented them and their patients from achieving good diabetes control.

The first step identified gaps and problems in the delivery of care, using a diabetes care model adapted from the chronic care model developed by Wagner et al. (3). The model emphasizes an approach to self-management based on collaboration between the health team and patient with support from the community. The model also emphasizes the importance of clinical information systems to monitor patients, evidence-based guidelines, and team-based organization of care.

Once team members identified a specific problem, they jointly selected the most appropriate solutions and planned how to carry them out. These cycles, known as Plan-Do-Study-Act, or P-D-S-A, were adapted from a methodology used by the Institute for Healthcare Improvement (IHI).

Ten of the randomly selected centers in the state of Veracruz participated in the project. All of the centers implemented a clinical information system and all patients with diabetes were offered two glycosylated hemoglobin (A_{1C}) tests (baseline and end of project). The A_{1C} test is not standard in Mexico's health care system. Five of the health centers were randomly selected to receive the intervention (cases) and the other five participated in monitoring while their patients received usual care (controls).

The First Learning Session (LS1) of the VIDA Project consisted of meetings with national and international experts who addressed different components of the care model. The participants reviewed the concepts related to the improvement cycles. Special attention was given to diabetes education through the presentation of the Non-Insulin Dependent Diabetes Education Program of Latin America, known as PED-NID-LA.

The participants from the five primary care centers participated in several working groups, where they discussed the intervention's methodology and identified strengths and weaknesses of their respective centers. One of the principal exercises was aimed at identifying community resources and their use in the primary care system. The participants also contributed collectively to the creation of the change package, describing the activities and the health care centers' objectives and commitments needed to achieve the proposed changes. In order to guarantee the education of the patients, the group suggested the creation of core health education teams made up of a physician and one or more nurses in every health center.

The participating centers created posters that reflected the status of diabetes care in their units. In addition, an evaluation of health resources was made using the ACIC (Assessment of Chronic Illness Care) questionnaire in each health center.

A total of 43 primary care teams (made up of a physician, a nurse and other professionals such as dietitians, nutritionists, psychologists, etc.) participated in the project. The effect of the study was monitored through the review of the clinical records of 313 patients, 196 in the health centers that received the intervention and 111 who received usual care, before and after the intervention.

Primary health centers implemented a variety of innovations, such as the organization of diabetes clinics, collective medical visits for the support groups of people with diabetes, training of people with diabetes as health promoters (community workers) in order to carry out diabetes education in the community, and participation of people with diabetes in the three Learning Sessions that preceded every P-D-S-A cycle.

The number of people with diabetes and good control ($A_{1C}<7$) increased from 28 percent to 39 percent (p=0.01) in the intervention group (cases), while among the patients receiving usual care (controls), the proportion increased from 21 percent to 28 percent (p=0.22). At baseline, the mean A_{1C} among the intervention cases was 8.4 percent, and among controls it was 8.6 percent. It decreased to 7.9 percent among people in the intervention group (reduction of 0.5 percent, p<0.01, statistically significant) and remained the same (no reduction, p=0.678, not statistically significant) among people in the control group. Documented foot care education increased to 75 percent among patients in the intervention group, but to only 34 percent among people in the control group.

Key lessons learned from this experience:
- An integrated approach can improve the quality of diabetes care in a primary health care setting.
- The responsibility for health care delivery does not lie exclusively with the physician and the nurse; a well-operating team is fundamental, and most importantly, the participation of people with diabetes in the decision making process contributes enormously to successful outcomes.
- The achieved results are not due to a single intervention, but to a systems-based approach based on a combination of patient education, in-service training for primary care teams, a number of other initiatives generated by the participating health teams, and actions taken by people with diabetes and their families.
- The methodology used in VIDA motivated primary care teams to identify their problems and find solutions from within, most of which required few external resources. The participation of people with diabetes was a strategic element incorporated into the methodology -- one that is expected to ensure sustainability.

Testimony

Epifanio Vila is 52 years old; when he was 50 years old he went to the physician for pain in his foot. The doctor performed a blood glucose exam. Epifanio's blood glucose was 358 mg/dL. Epifanio felt sad and afflicted; he was depressed. His father had had diabetes and also suffered severe malnutrition before he died. Epifanio recalled that a man with whom he had worked had a leg amputated as a consequence of diabetes, and then refused to take drugs or eat until he died. Epifanio's aunt also had diabetes, became blind, and died early on. Epifanio thought that he was going to die very soon. During a visit to his health center, his blood glucose was found to be more than 200 mg/dL. He was concerned, but the physician enthusiastically informed him that they were at the beginning of a project and Epifanio agreed to participate. Epifanio tells us "After the VIDA project, I have felt very well, physically and emotionally, and I am very grateful to the personnel in charge of the project for the interest they have shown in the group. My diabetes is under control and I want to be able to share this enthusiasm with some other people that are in the same situation as me and to tell them that we are not alone and that there are people who are interested in our health."

"After the VIDA project, I have felt very well, physically and emotionally.... My diabetes is under control and I want to be able to share this enthusiasm with some other people.... "

Experience

Foot Care

The majority of non-traumatic leg amputations carried out in Mexico are the result of poorly controlled diabetes, and are frequently due to late detection and treatment of foot injuries. During the First Learning Session, the primary care team identified a need for training in foot care. A program directed at primary care personnel was organized to train them in detection and assessment of risk factors of the feet of patients with diabetes, based on the Protocol of Podiatric Assessment of the Diabetic Patient (Annex VIII). The protocol takes into consideration the conditions and resources in which the primary health care team works in Mexico so that the requirements of the team and materials were minimal. During the Second Learning Session, the primary care personnel were trained in management and interpretation of the protocol. The trainer examined the feet of several people who had diabetes and participated in the learning session. In order to facilitate the training, the procedure was videotaped and the video image was projected onto a giant screen through a digital projector. The results of the assessments carried out by the medical care team in their centers were reviewed during the Third Learning Session. A subsequent in-service training was carried out, with the goal of improving quality in the management and interpretation of the protocol.

"Amputations in people who have diabetes are synonymous with ignorance, and its economic, social and emotional impact is very high. Let us avoid amputations by educating" [Taken from a text by Carlos Gurrola].

Introduction

The Secretariat of Health of Mexico has launched the "National Campaign for Quality Improvement" to provide better health care for the population. Chronic diseases are of particular importance, because they constitute the leading causes of morbidity and mortality in Mexico. Data from the monitoring system for quality of medical care in Mexico indicated that in 2000, 66 percent of people with diabetes had inadequate metabolic control (4). In order to evaluate a more integrated approach to chronic disease care, the Secretariat of Health, in collaboration with the Pan American Health Organization/World Health Organization (PAHO/WHO), conducted a pilot project in the state of Veracruz.

Diabetes in Mexico

Mexico's national health survey (Encuesta Nacional de Salud, or ENSA), conducted in 2000, offers reliable data on the epidemiological transition and prevalence of diabetes and other noncommunicable diseases (NCDs). In addition, it calls attention to the urgent need for creating appropriate strategies, and new paradigms and partnerships to face this public health problem.

"Quality of medical care is one of the principal challenges the National Health System in Mexico faces, and one of the greatest concerns among patients. "

In Mexico, more than 50 percent of the population between the ages of 20 and 69 suffers from at least one chronic disease, and more than half are unaware of it. Less than 50 percent of people diagnosed with diabetes take pharmacological treatment for the disease.

According to ENSA, the prevalence of diabetes mellitus in the population of 20- to 69-year-olds in Mexico was 10.7 percent in the year 2000. The prevalence of diabetes increased with age and, starting at age 50, the prevalence exceeded 20 percent. Nearly half (49.9 percent) of the total population with diabetes at the time of the survey had a blood glucose level that was greater than or equal to 200 mg/dL (2,5). The state of Veracruz presented the highest prevalence of diabetes in Mexico, 16.1 percent.

In Mexico, diabetes mortality has steadily increased during the last decades. It ranked as the third cause of general mortality in 1997, with a rate of 38 deaths per 100,000 population. In 2000, however, 46,614 deaths related to diabetes were reported, a rate of 46.8 deaths per 100,000 population (6,7). In Mexico, five people with diabetes die every hour.

Diabetes is often diagnosed late. According to studies, 50 percent of patients with type 2 diabetes have some cardiovascular complication at the time of diagnosis. Ten to 30 percent present with retinopathy, 8 to 33 percent with neuropathy, 35 to 66 percent with impotence, and 32 to 65 percent present with hypertension. The ENSA survey in Mexico found that 34 percent of people who fulfilled the criteria for diagnosis of diabetes were unaware of it (2,5).

Diabetes is the most frequent cause of polyneuropathy, and around 50 percent of people with diabetes mellitus develop neuropathic complications in the 25 years following diagnosis (8). Diabetes is responsible for

around 90 percent of nontraumatic amputations and is the leading cause of end-stage renal failure (9).

The Health Services of Veracruz

Mexico has had an integrated adult health program since 1994. The National Health Program 2001-2006 and the Veracruz Development Plan 1999-2004, in accordance with the General Law of Health, establish the importance of increasing health services coverage to the uninsured population. Diabetes care is integrated into the State Program of Health Care for the Adult and the Elderly.

The Mexican constitution grants the resident population of the Mexican Republic the right to health protection:

"Every person has right to health protection. The Law will define the bases and modalities for health service access and will establish the concurrence of the Federation and the states with regard to general health, in accordance with what Section XVI of Article 73 of this Constitution stipulates."

State of Veracruz: Eleven Health Jurisdictions

The Health Services of Veracruz (Servicios de Salud de Veracruz, SESVER) serve the population through 734 primary care units, made up of 1,347 basic centers and 46 secondary care units grouped into 11 health jurisdictions. The projected population for the state of Veracruz for 2005 was 7,295,935 inhabitants, with a nonbeneficiary population (not covered by other health insurance) of 4,778,574. This population is served by SESVER healthcare subsystems and by IMSS Oportunidades, a program of the Mexican Institute of Social Security.
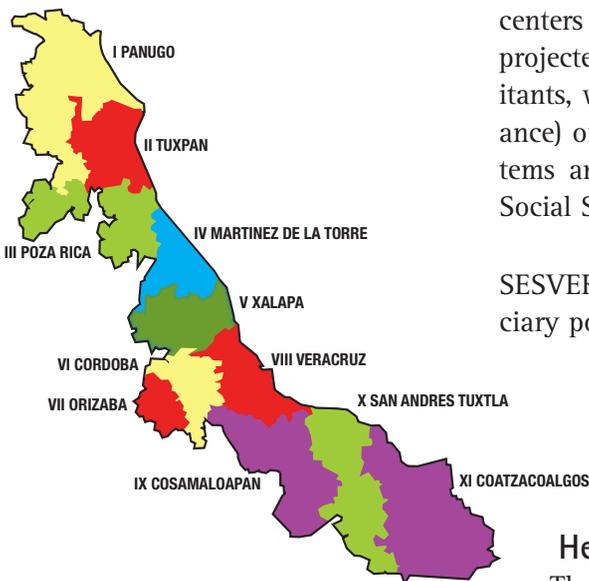
SESVER is responsible for 3,583,931 people -- 75 percent of the nonbeneficiary population--- and IMSS Oportunidades is responsible for the other 25 percent. Of the population served by SESVER, 1,711,633 people (47.75 percent) are 20 years or older; of these, 676,298 adults (18.87 percent) are 60 or older. This group has the greatest risk of suffering chronic degenerative diseases.

Health Program of the Adult and the Elderly

The adult population of the state of Veracruz is served through the comprehensive Health Program of the Adult and Elderly, which groups together several diseases and health conditions. Within this program, the Diabetes Prevention, Care and Control Program focuses on:

1. Health Promotion
2. Prevention
3. Medical Care
4. Training
5. Epidemiological Surveillance
6. Monitoring and Evaluation

Detection and Diabetes Care

Primary care medical units take the following steps to detect and control chronic diseases:

I PANUGO

II TUXPAN

IV MARTINEZ DE LA TORRE

III POZA RICA

V XALAPA

VI CORDOBA

VIII VERACRUZ

VII ORIZABA

X SAN ANDRES TUXTLA

IX COSAMALOAPAN

XI COATZACOALGOS

- Risk factors (obesity, diabetes, hypertension) are determined through a questionnaire given to any member of the population over 20 years of age who consults health services for any reason.
- A numeric indicator is calculated from the score obtained on each question.
- For people with a score of 10 or more points, a fasting plasma blood glucose test is performed; if the result is 126mg/dL or more, the person will be diagnosed with diabetes.
- If the diagnosis is positive, the patient will be invited to join a treatment program that includes an exercise regimen and nutrition plan, as well as pharmacological treatment with oral hypoglycemic agents and/or insulin, as needed.
- The patients and their family members are invited together to participate in support groups for people with diabetes (Grupos de Ayuda Mutua, GAM) in order to be trained and supervised in self-monitoring of blood glucose.

Treatment and care are free in all the primary care units.

National Campaign for Quality in the Health Services

Quality of medical care is one of the principal challenges the National Health System in Mexico faces, and one of the greatest concerns among patients. In order to face this challenge, the Secretariat of Health implemented its national campaign, The Crusade for Quality Improvement, in 2001. This campaign responds to the expectations of the population with high-quality treatment in medical care units. The Secretariat of Health's Office of Innovation and Quality helps oversee the campaign.

The Crusade for Quality Improvement program permits evaluation of the progress and the impact of the quality improvement actions over time.

The policies established in the National Health Program 2001-2006, together with The Crusade for Quality Improvement, give financial protection to Mexicans who are not otherwise covered by social security. Mexico's System of Social Protection in Health came about as a result of reforms to General Health Law, which regulates accreditation of health care establishments in the public network.

For accreditation, the Office of Innovation and Quality evaluates capacity, safety, and quality in the delivery of services that make up the Catalog of Essential Health Services of the Popular Insurance. The process is complemented by the work of the General Health Council, which handles certification of hospitals.

The progress of the Crusade for Quality Improvement is evaluated periodically using indicators developed specifically for the program. According to the government report for 2004-2005, the crusade's indicators in the medical units showed the following changes:
- The average waiting period was reduced at the first level of care by 4.5 minutes and in the second level of care by five minutes.

- User satisfaction increased by 25.4 percent with respect to diagnosis at the first level, and it increased by 10.3 percent at the second level. Satisfaction with the information on treatment at the first and second levels rose by 24.5 percent and 10.4 percent, respectively.

Testimonies

Sylvia Romero Aldaez, is 58 years old, and discovered that she had diabetes and hypertension 5 years ago. "I have diabetic grandparents, parents, and siblings. In addition, I have a diabetic son. Five years ago, I found out I had diabetes by accident. I came here to the Health Center "Gaston Melo" for a bone test, for osteoporosis. Once you are here, they measure your blood pressure and they noticed that my blood pressure was elevated. Logically, they checked my blood glucose and it was above 200. I kept it under control, and it is still under control to this day. I really think the VIDA project is excellent. I've learned how to monitor myself, use a glucometer, know myself, and try to deal with my diabetes without letting it take control over me, because I know that it is a degenerative and mortal chronic disease that has many complications if we don't control it on time. I think the VIDA project is important mostly because it gives us the information that the majority of us do not have; and this knowledge improves our quality of life. How to manage my diabetes, what diet I must follow, what physical activity I should engage in, and so on. In fact, the VIDA project has really changed my life, and the life of my family. That is how I see it. Excellent."

"...I want to thank them for inviting me to participate in the project, for helping me realize that there are people who are concerned about us diabetics, and for teaching me what my disease is. "

Cointa López Ponce, 50 years old, was diagnosed with diabetes when she was 47. When she was invited to participate in the VIDA project, she accepted immediately since the care she was receiving in the health center was already very good, so she could not refuse to cooperate. Cointa recognizes that having participated in the project was an unparalleled experience that gave her the opportunity to be treated by specialists in several fields such as internal medicine, ophthalmology, psychology, podiatry, etc. -- something that she had not been previously offered in any other institution. Cointa tells us, "For me, it was a unique experience that helped me to value myself as a human being, to build my self-esteem... Also, in the project I learned a great deal about my disease, in the course that they gave to us and also in the book on diabetes they offered us. In short, I want to thank them for inviting me to participate in the project, for helping me realize that there are people who are concerned about us diabetics, and for teaching me what my disease is." Cointa's A_{1c} decreased from 7.10 percent at the beginning to 6.10 percent at the end of the VIDA project.

Experience

Physical Activity

Physical activity and health have a major impact on cardiovascular and metabolic risk factors. In type 2 diabetes mellitus, there have been major benefits connected to good nutrition.

As another strategy in the treatment of type 2 diabetes, the Exercise Program for the Care of Health (known in Mexico as PROESA, el Programa de Ejercicios para el Cuidado de la Salud) was utilized with members of the support groups through the following:

- Evaluation of the physical capability of exercise, through the application of the cardiovascular response to physical activity and low-impact exercise
- Evaluation of flexibility and joint elasticity
- Evaluation of the muscular strength of arms, legs, and abdomen
- Skin fold measurement

In the support groups that participated in the VIDA project, it was possible to implement the physical activity program as a part of the non-pharmacological treatment. The impact of physical activity in the patients who frequently participated in it was reflected in better metabolic control of fasting blood glucose and, in the long-term, according to the measurement of glycosylated hemoglobin (A_{1c}).

Second Learning Session
Veracruz, 26–28 November, 2003

During the Second Learning Session (LS2), several meetings with national and international experts were held. These experts addressed the different components of the Chronic Care Model. The participants formed working groups to discuss methodological aspects of the intervention. They reported on the objectives used for the improvement cycles and their results during Action Period I. The working groups decided on the objectives and the activities to develop during Action Period II. Clinical training conferences on endocrinology and the diabetic foot were held by national experts. The health centers created posters that reflected the advances achieved in diabetes care in their units during Action Period I. Evaluations of the Chronic Care Model carried out during the previous learning session were presented and the characteristics of the components of the Chronic Care Model and the improvement cycles were discussed.

The VIDA Intervention

The responsibility for health care delivery does not lie exclusively with the physician and the nurse; ... , the participation of people with diabetes in the decision making process contributes enormously to successful outcomes.

Ten of the 23 existing health centers in the jurisdictions of Xalapa and Veracruz participated in the project. All patients participating in the project gave their informed written consent. All of the centers implemented a clinical information system, and all patients with diabetes were offered two glycosylated hemoglobin (A_{1C}) tests (baseline and the end of project). The A_{1C} test was not standard in Mexico's health care system. Five of the health centers were randomly selected to receive the intervention (cases) and the other five participated in the monitoring while their patients received usual care (controls). The clinical information system was based on the implementation of the QUALIDIAB (10) program of the Declaration of the Americas on Diabetes (DOTA) (Annex I).

A total of 43 primary care teams (made up of a physician, a nurse and other professionals such as dietitians, nutritionists, psychologists, etc.) participated in the project. The effects of the intervention were monitored through the review of the clinical records of 313 patients --196 in the health centers that received the intervention and 111 patients who received usual care -- before and after the intervention.

The members of the teams participating in the intervention completed the Assessment of Chronic Illness Care (ACIC) questionnaire, adapted for diabetes, before and after the intervention. The results of the outcomes assessment appear in Annex II. The questionnaire used appears in Annex III (11).

The intervention was carried out in the Health Services of Veracruz over a 18-month period. The project consisted of in-service training of primary care personnel in diabetes management and foot care, as well as implementation of a structured diabetes education program. The primary health care teams, which include primary health care personnel as well as personnel from the local hospital, were trained in a quality improvement methodology that allowed them to develop solutions to various problems, making it possible for them and their patients to achieve good diabetes control.

During the first meeting, the team of local, national, and international experts constructed a change package (Figure 1), a general intervention plan (Table 1), and a program of activities (Table 2).

Table 1: Intervention Plan

General Objective
- Increase the quality of life of people with diabetes through the improvement of quality of care.

Specific Objectives
- Train all people with diabetes in self-management and glycemic control.
- Insofar as possible, achieve blood glucose control (A_{1C} <7%) in order to prevent or delay the development of chronic complications.
- Offer emotional support to all the people with diabetes and their families.

The principal objective of the project (Figure 1) was the improvement of diabetes care. This objective should be achieved through the interaction of three factors: the health team, an educational program on diabetes, and strengthening of support groups for people with diabetes. This interaction would result in better glycemic control and prevention of chronic complications. These elements would be used in improvement cycles. This change package was used as general plan for the intervention (Table 1), and a supporting activity plan was designed (Table 2).

Table 2: Activities of the Change Package

Prevention of Complications
- In every consultation, negotiate therapeutic goals with the patient.
- Ensure monthly checkups for the patient.
- Take blood pressure twice per month and suggest the use, insofar as possible, of self-monitoring at least once per week in support groups for people with diabetes.
- Prescribe/order urine examinations (creatinine/proteunuria) as well as lipid profile once a year.
- Perform foot screening in each consultation.
- Refer the patient to the second level for visual examination, including a dilated eye examination, once a year.
- Observe and note in each consultation behavior changes (diet and physical activity) and invite and motivate the person to fulfill and continue the treatment.

Integration of the Care Team
- Hold monthly meetings of the core health team (made up of a doctor and at least one nurse) in the health centers to discuss strategies of patient care.
- Ensure the presence of one or two people with diabetes at meetings of the core health team.
- Appoint a secretary to record agreements and commitments at the meetings.

Figure 1. Change Package
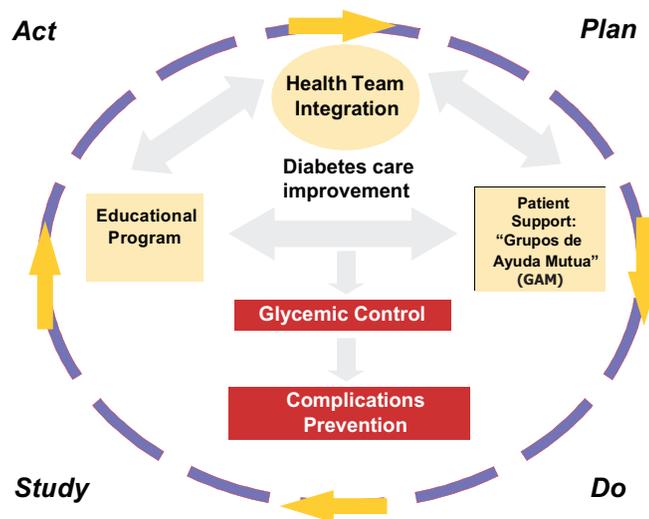
Source: VIDA Project 3rd Learning Session, XALAPA, Veracruz, 13-15 april 2004.

Three Learning Sessions were held within a period of 18 months (Figure 2). In each of the sessions, the teams selected the specific objectives for the improvement cycles, based on the problems found in the practice of each health center. These cycles are known as Plan, Do, Study, Act, or P-D-S-A, and were adapted from the Breakthrough Series (BTS) methodology used by

the Institute for Healthcare Improvement (IHI). During the discussions in the first Learning Session, the primary care team determined that they needed training in diabetes care, foot care and diabetes education. Hence, a structured program for diabetes education for patients and in-service training on diabetes management and foot care for professionals was implemented. The educational program was based on the Non-Insulin Dependent Diabetes Education Program of Latin America (PEDNID-LA) model (12) developed by the Center of Experimental and Applied Endocrinology (CENEXA) of La Plata, Argentina, a PAHO/WHO Collaborating Center in the area of diabetes. The program consists of a flipchart that is used to give lessons, as well as a manual for the patient entitled "How to Care for My Diabetes" (13).

Participation of people with diabetes was an important element of the Learning Sessions. A group of people in the centers participating in the intervention were selected to participate in the Learning Sessions. In some group discussions, these people were part of their health center's group, while in others a group with only people with diabetes was formed.

Figure 2
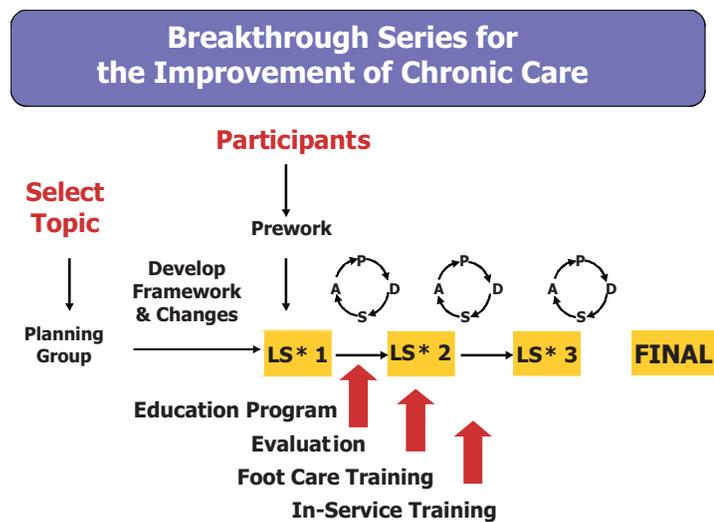
Source: VIDA Project 3rd Learning Session (LS3), XALAPA, Veracruz, 13-15 april 2004.
* Learning Session

As a part of the intervention, the current referral system was modified thanks to an innovative plan that brought specialists to the health centers. The core health team participated in the consultation together with the specialists. This cross-consultation enabled them to meet management and teaching objectives.

During the three Learning Sessions, the most important problems in medical care delivery were analyzed using the Diabetes Care Model (Figure 3), adapted from the Chronic Care Model by Wagner et al (3). The model emphasizes an approach to self-management based on the collab-

Figure 3. The Chronic Care Model

Health care system

Organization of Diabetes care

Community linkages

Self management support | Delivery system design | Decision support | Clinical Information system

Informed and active patient | **Productive interaction** | Prepared and productive team

Better results
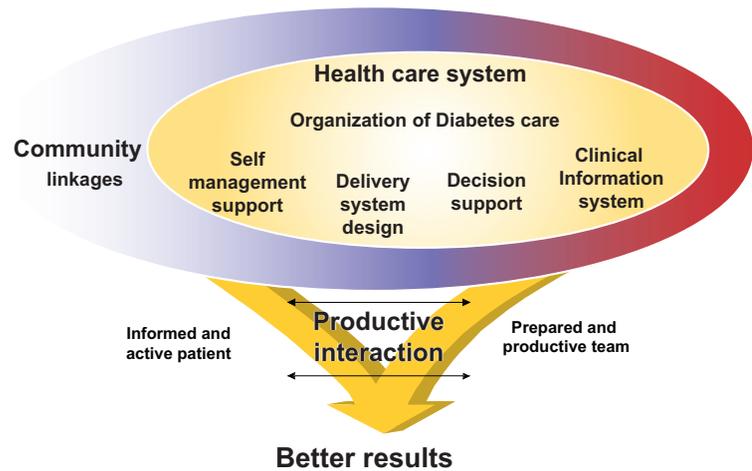
oration between the health team and the patient with the support of the community. The model also emphasizes the importance of clinical information systems to monitor patients, the support of evidence-based standards, and organization of care based on the health team. Annex IV shows the difficulties detected by the working groups and their proposed solutions. Table 3 presents an example of the contributions of people with diabetes to the project. It shows the results of a discussion group on the work of the support groups. Another group of people with diabetes had been selected to carry out educational tasks as health promoters in the support groups. The tasks undertaken by the centers and their fulfillment are summarized in Annex V.

Table 3: Views of People With Diabetes About the Support Groups

Strengths:
- The support groups are important because they help maintain leadership within the community of people who have diabetes.
- People can be mutually motivated to carry out tasks to improve diabetes control. The support groups are ideal for doing physical activity.
- The support groups are an aid for the health teams because they complement their management activities. The support groups offer the opportunity to carry out beneficial activities.

Weaknesses:
- The difficulty in carrying out behavioral changes is one of the principal problems that the support groups face.
- The groups should carry out a personalized service that helps follow up on medical care.
- The shortage of drugs and the costs of services also affect the support groups.

All the centers participating in the intervention received two sessions of in-service training given by an external advisor specialized in endocrinology. The advisor carried out the training through instructional exchanges and performed a critical review of diabetes care. The results of the critical review are found in Annex VI.

A summary of the selected objectives for the Action Periods 1, 2 and 3 appears in Annex VII. The Action Periods occurred between Learning Sessions 1–2, 2–3, 3–the end of the project. Some of the innovations implemented by the primary health centers include: the organization of diabetes clinics, collective medical visits for the support groups of people with diabetes, training of people with diabetes as health promoters (community workers) in order to carry out diabetes education more closely to the community, and participation of people with diabetes in the three Learning Sessions that preceded every series of the P-D-S-A cycle (Figure 4).

Figure 4. The P.D.S.A cycle

Act

➢ Which changes are necessary?

➢ Next cycle?

Plan

➢ Objectives

➢ Questions and Goals (why)

➢ Plan to carry out the cycle (who, what, where, when)

Study

➢ Complete analysis

➢ Compare results and goals

➢ Summarize what has been learned

Do

➢ Carry out the plan

➢ Document problems and unexpected findings

➢ Begin data analysis

Paired t test (continuous variables) and McNemar test (categorical variables) were used to compare data and to determine differences between beginning and end measures. Mixed regression logistic models were used to analyze changes in process and outcome measures from the beginning to the end of the intervention among cases and controls. The effect of the study group was adjusted for the clustering of patients within each clinic, and also for patient characteristics (age, and gender) in all models. Cluster adjustments were included as fixed effect.

Testimonies

Josefina Ortega Cisneros, 62 years old, was diagnosed with diabetes when she was 60. She had always been treated well in the health center, but she did not pay attention to everything she was told regarding nutrition and treatment. When they invited her to participate in a diabetes project, she did not understand what that meant. The physician explained it to her and she agreed to participate. When the VIDA project started, she realized that the personnel were concerned about her health by giving her more extensive information so that she knew more about her disease. They provided her with medical care from specialists in internal medicine, ophthalmology, psychology and even examined her teeth and feet. Josefina says "It is difficult to follow my diet plan, but since I participated in the VIDA project I try to carry it out as well as perform exercise because I thank the health center a great deal for all the services that they gave us."

Carmen Cristina Uscanga, director of the Coatepec Health Center states that "The collaborative project VIDA was ambitious, and offers a great experience in the comprehensive management of the diabetic patient. The project facilitated better coordination between the three levels of organization of the health services. The primary care team enjoyed the project, while they obtained better results. In Veracruz today, when we speak about care of people with diabetes, we can describe ourselves as 'Before and After the VIDA Project.'"

Experience

Mental Health

As a part of the psychological support for the patients participating in the VIDA project, each person was interviewed with the purpose of informing him or her of the project objectives and the tasks to be carried out. During the interviews and the familiarization process, some important psychological characteristics were observed among the patients. For example, some patients who lived alone demonstrated symptoms of depression including feelings of loneliness, uselessness and lack of interest.

Various patient groups were formed taking into consideration personal characteristics. In order to coordinate psychological care, psychometric tests were carried out to assess patient behavior and to standardize criteria used to evaluate each group.

The group work gave way to various learning processes and social processes that allowed patients and health care personnel to share experiences, learn how to form social networks and how to assist one another in crisis situations. In some cases, it allowed direct care of patients in crisis and identified personality characteristics that were confirmed by the applied psychometric tests.

During the Third Learning Session (LS3), the training activities that took place in the health centers were reinforced, emphasizing metabolic control, nutritional monitoring, and foot care. The participants presented results from Action Period II. The teams decided to focus on achieving greater patient participation in the activities designed to improve metabolic control. A group of patients and health workers put on a play dealing with several aspects of metabolic control and the prevention of chronic complications. The play also addressed perceptions of health care, and working groups followed up with an evaluation of experiences in this field.

During the workshops, verbal, non verbal and written communication skills were observed in the groups. The workshops also evaluated patients in terms of creativity, habits of substance consumption, eating habits, self-image, psycho-corporal balance, and expression.

Patients were given an individual diagnosis that made it possible to provide psychological support and activities aimed at their specific needs. Based on these evaluations, each person's personal progress was measured and achievements praised. The positive changes experienced by many patients participating in the VIDA project depended a great deal of their psychological state and family environment.

During the intervention, the medical care activity was complemented by specialized psychological care, with specific attention to psychosocial aspects of public health.

GRUPO DE AYUDA MUTUA
ESPERANZA SALUD Y VIDA

Results

Tables 4 through 11 present the main results of the intervention. Statistical significance was determined through the X² test. A result was considered significant with a probability less than 0.05 (p <0.05).

Table 4: Proportion of participants, cases and controls, according to age and sex.

	Cases=196 Men	Women	Total	Controls=111 Men	Women	Total
Age *						
<40	9.1	5.6	6.1	5.9	4.3	4.5
40-59	63.6	52.1	54.1	58.8	56.4	56.8
60+	27.3	42.3	39.8	35.3	39.4	38.7
Type of Diabetes *						
Type 1	6.1	1.8	2.6	0.0	1.1	0.9
Type 2	93.9	98.2	97.4	100.0	98.9	99.1
Number of Consultations**						
0-4	12.5	3.7	5.2	13.3	11.5	11.8
5-9	40.6	40.4	40.4	66.7	40.2	44.1
10+	46.9	55.9	54.4	20.0	48.3	44.1
Participated Support Groups***						
Yes	87.9	79.8	81.1	11.8	36.2	32.4
No	12.1	20.2	18.9	88.2	63.8	67.6

* at the beginning of the intervention
** during the year of the intervention
***at the end of the intervention
Sex: cases p>0.05; controls p>0.05
Age: Men p>0.05; women p>0.05
Type of diabetes: p>0.05
Number of consultations: p>0.05
Support Groups: Cases versus Controls p<0.01; Sex: p>0.05

The participation of people with diabetes was a strategic element incorporated into the methodology -- one that is expected to ensure sustainability.

In total, 196 patients were evaluated in the centers where the intervention was carried out and 111 patients were evaluated in the control centers. The distribution of patients by age and sex, as well as by type of diabetes (type 1 or type 2), was similar in cases and controls. Fifty-four percent of the cases and 44 percent of the controls attend-

ed consultation 10 or more times during the year of the intervention. The proportion of patients that participated in the support groups was greater in the cases (81 percent) than in the controls (32 percent) (p<0.01).

All of the quality indicators such as registry of foot and eye examination, nutrition education, and foot care education improved among the patients who received the intervention program. The differences between the cases and controls at the end of the intervention were statistically significant.

Table 5: Indicators (%) of the collaborative project VIDA; evaluations at the beginning and the end of the intervention.

Indicator	Beginning	End	P*
Registry of Foot Examination			
Cases	49.0	95.4	<0.001
Controls	46.8	21.6	<0.002
Adjusted p**	0.777	<0.001	
Registry of Eye Examination			
Cases	10.2	73.0	<0.001
Controls	3.6	4.5	<0.001
Adjusted p**	0.237	0.001	
Nutrition Education			
Cases	81.6	89.8	0.029
Controls	35.1	45.9	0.058
Adjusted p**	<0.007	<0.001	
Foot Care Education			
Cases	34.2	77.6	<0.001
Controls	16.2	34.2	<0.01
µAdjusted p**	0.342	<0.001	

*McNemar Test
**Adjusted for the clustering of patients within center, age, and gender.

The before-after comparison indicated that the average values of A_{1C}, blood glucose and cholesterol decreased significantly among the cases and not among the controls over the course of the program. The average values of triglycerides, weight, body mass index, and systolic and diastolic blood pressure remained the same or changed very little.

The number of people with diabetes and good control (A1C <7) increased from 28 percent to 39 percent (p=0.033) in the intervention group (cases)

while among the controls (usual care), the proportion only increased from 21 percent to 28 percent (p=0.217). The proportion of patients with blood glucose less than 130 mg/dl before and after the intervention increased among cases and also among controls. The proportion of patients who met the standards for triglycerides (<150 mg dl), BMI (<25), and blood pressure (<120/90) remained unchanged. The proportion of patients with cholesterol <200 mg dl increased significantly among cases but not among controls.

Table 6: Average values* in cases and controls, of A$_{1c}$, fasting blood sugar, cholesterol, triglycerides, weight, body mass index, and systolic and diastolic blood pressure, at the beginning and the end of the intervention.

	N	Beginning	End	Difference	P
A$_{1c}$					
Cases	196	8.4	7.9	0.5	0.001
Controls	111	8.7	8.6	0.05	0.803
Blood Glucose					
Cases	152	163.4	149.1	-14.3	<0.01
Controls	68	178.4	183.13	4.8	0.672
Cholesterol					
Cases	195	192.3	177.2	-15.1	<0.001
Controls	111	200.7	194.4	6.3	<0.05
Triglycerides					
Cases	196	194.4	193.9	-0.4	0.950
Controls	109	205.4	195.4	-9.9	0.285
Weight					
Cases	195	65.4	65.4	0.0	1.000
Controls	110	66.1	68.3	2.1	<0.05
BMI					
Cases	193	28.7	28.7	0.0	0.931
Controls	107	28.9	29.3	0.3	0.471
SBP					
Cases	181	120.5	122.1	1.6	0.234
Controls	99	122.0	122.6	0.6	0.718
DBP					
Cases	181	74.9	75.2	0.3	0.761
Controls	99	76.1	78.5	2.4	<0.05

* Two-tailed paired t-test before and after the intervention.

Table 7: Proportion (%) of patients (cases and controls) who fulfilled the standards of glycemic control, cholesterol, triglycerides, BMI, and blood pressure at the beginning and the end of the intervention.

	Beginning	End	P*
Glycosylated hemoglobin < 7% (Good Control)			
Cases	27.6	39.3	<0.01
Controls	20.7	27.9	0.185
Adjusted p**	0.217	0.033	
Fasting Glucose ≤ 130			
Cases	39.6	46.7	0.212
Controls	16.0	21.8	0.557
Adjusted p**	0.001	0.006	
Cholesterol < 200			
Cases	65.1	76.5	<0.01
Controls	54.1	58.6	0.163
Adjusted p**	0.278	0.528	
Triglycerides <150			
Cases	43.9	40.3	0.435
Controls	27.5	35.1	0.163
Adjusted p**	0.439	0.528	
BMI <25			
Cases	24.0	19.0	0.052
Controls	22.9	21.1	1.00
Adjusted p**	0.815	0.943	
BP ≤ 140/90			
Cases	73.4	75.1	1.000
Controls	72.5	69.3	0.690
Adjusted p**	0.851	0.601	

*McNemar Test
**Adjusted for the clustering of patients within center, age, and gender.

The proportion of patients with good control (A_{1C} <7 percent) at the end of the project was not related positively to age, sex, participation in the support groups, and participation in the diabetes education course. Patients with 10 or more medical visits in the intervention group were more likely to have good glycemic control (p=0.044)

When the group of patients who participated in the diabetes education course were classified according to the score on the final examination, the

Table 8: Proportion (%) of patients in the intervention and control groups with good metabolic control (A$_{1c}$ <7) at the end of the intervention, according to age, sex, participation in support groups, number of consultations, body mass index less than 25, and participation in the education course.

Factors	Cases	Controls	p
Age (in years)			
20-59	58.4	58.1	0.111
60+	41.6	41.9	0.326
p	0.765	0.671	
Sex			
Male	16.9	22.6	1.000
Female	83.1	77.4	0.029
p	1.000	0.240	
Support Groups			
Yes	81.8	35.5	0.347
No	18.2	64.5	0.276
p	1.000	0.659	
Number of Consultations			
0-9	42.1	62	0.595
10+	57.9	37.9	<0.05
p	0.462	0.510	
BMI < 25.0			
Yes	85.7	70.0	0.575
No	14.3	30.0	0.080
p	0.196	0.192	
Nutrition Education			
Yes	92.2	51.6	0.258
No	7.8	48.4	0.770
p	0.472	0.527	

ones who scored more than 80 percent on the exam achieved better metabolic control (A$_{1c}$ <7) than those with scores less than 80 percent and patients in the control group. This result was statistically significant (p=0.002)

The evaluation of the goals established by the project indicated that the Health Center (HC) 5 (52 percent) had the best results in metabolic control (A$_{1c}$ <7 percent), followed by HC 1. HC 2 and HC 3 did not succeed in significantly improving metabolic control. Blood pressure control varied very little at the beginning and end of the intervention. The rest of the indicators improved in all the participating health centers.

		Beginning	End	P*
Glycosylated hemoglobin < 7% (Good Control)				
Cases	Score ≥ 80	23.5	41.2	0.002
	Score < 80	27.9	32.6	0.727
Controls	20.7	27.9	0.185	
Fasting Blood Glucose <130				
Cases	Score ≥ 80	65.0	54.9	0.481
	Score < 80	31.3	53.5	0.125
Controls	16.0	78.2	0.557	
Cholesterol <200				
Cases	Score ≥ 80	2.0	3.9	1.000
	Score < 80	2.3	7.0	0.625
Controls	1.8	0.9	1.000	
Triglycerides <150				
Cases	Score ≥ 80	45.1	47.1	1.000
	Score < 80	34.9	37.2	1.000
Controls	27.5	35.1	0.163	
BMI < 30.0				
Cases	Score ≥ 80	22.0	15.7	0.219
	Score < 80	19.0	16.3	1.000
Controls		22.9	21.1	1.000
BP ≤140/90				
Cases	Score ≥ 80	76.5	78.4	1.000
	Score < 80	81.0	73.8	0.549
Controls	72.5	69.3	0.690	

*McNemar Test

Table 11 shows the treatment registered in the files before and at end of the intervention. The proportion of patients with combinations of insulin and oral hypoglycemic agents increased in the intervention group. The proportion of patients that were able to control their diabetes at the end of the intervention without drugs was higher among cases (6.1 percent) than among controls (4.5 percent).

Table 10: Proportion (%) of patients who met the standards established as goals of the VIDA project before and after the intervention, according to health center.

		Health Center (HC)				
		1	2	3	4	5
Glycemic control A$_{1c}$ <7	Beginning	21.6	30.6	36.2	20.0	24.1
	End	*43.1	30.6	36.2	40.0	*51.7
Blood Pressure (<140/90)	Beginning	74.0	45.0	68.9	75.0	76.0
	End	74.5	75.0	74.5	78.6	75.9
Registered Foot Examination	Beginning	52.9	4.1	51.1	100.0	79.3
	End	96.1	93.9	93.6	95.0	100.0
Registered Non–pharma–cological treatment	Beginning	19.6	16.3	4.3	0	34.5
	End	88.2	93.9	91.5	100.0	100.0
Registered Eye Examination	Beginning	15.7	4.1	19.1	0	3.4
	End	92.2	79.6	21.3	90.0	100.0
Registered Pharmacological Treatment	Beginning	90.2	93.9	83.0	95.0	89.7
	End	92.2	98.0	91.5	100.0	75.9
Patient training	Beginning	-	-	-	-	-
	End	90.2	80.9	97.9	100.0	79.3

*$P<0.05$ (McNemar Test)

Table 11: Treatment among cases, and controls.

	Cases		Controls	
	Before	After	Before	After
Insulin/Oral Hypoglycemic Agents	3.6	7.1	0.9	0.9
Oral Hypoglycemic Agents	88.8	86.7	91.9	94.6
Only Diet/ Physical Activity	7.7	6.1	7.2	4.5

Discussion

The Chronic Care Model (14) and the BTS methodology (15, 16) have been applied successfully in numerous interventions aimed at improving the care of diabetes and other chronic diseases. These interventions have primarily taken place in the United States.

Several interventions in Latin America have used metabolic control or glycosylated hemoglobin (A_{1C}) as an indicator of success. A PAHO project in Chile (17) implemented a program of education and behavioral counseling. In this Chilean study, the reduction in A_{1C} was 0.4 percent in the intervention group, compared with 0.1 percent in the control group. The PEDNID-LA Educational Program (12) was implemented in 10 Latin American countries and reported a 1.2 percent reduction in A_{1C}. (A control group was not used.) In Costa Rica, (18) a study that included nutrition and physical activity interventions managed to decrease A_{1C} by 1.8 percent, compared with only 0.4 percent in the control group.

The methodology motivated primary care teams to identify their problems and find solutions from within, most of which required few external resources.

Some of these interventions, such as PEDNID-LA and the intervention in Costa Rica, achieved better reductions in A_{1C} than those achieved by VIDA. Both PEDNID-LA and the Costa Rica study followed a selection process for patients and were intensive interventions with regard to education and exercise. On the other hand, the VIDA project monitored A_{1C} in the cases that were attended in the health centers and, as a public health intervention, acted in several aspects of health care system, not only in patient education. A study in the United States that used a similar methodology managed to improve the process indicators but did not reduce A_{1C} (19). A randomized study in Denmark that also took place in the health system demonstrated a reduction in A_{1C} of 0.5 percent in the intervention cases compared to controls (20), which is comparable to the results of the VIDA project.

Although the reduction of A_{1C} in the VIDA Project was modest (0.5 percent), it is clinically useful, and it is expected to improve the outcome of the disease, especially with respect to chronic complications. It is well documented that even a small reduction in A_{1C} can considerably reduce the risk of chronic complications of diabetes. For example, the UK Prospective Diabetes Study, UKPDS (21), demonstrated a reduction in the risk of complications of 35 percent for each percentage-point reduction of A_{1C}. In that study, the difference between the groups of intervention and of control was 0.9 percent.

The VIDA project demonstrated that an integrated approach can improve the quality of diabetes care in the area of primary health care. The key lesson from this experience is that the responsibility for health care delivery does not lie exclusively with the physician and the nurse; a well-operating team is fundamental, and most importantly, the participation of people with diabetes in the decision making process contributes enormously to successful outcomes. This intervention was based on the primary care structure in order to improve diabetes care. Some randomized

clinical trials in the same areas have reported positive results in glycemic control (22) and in the reduction of blood glucose and cholesterol (23).

The results are not due to a single intervention, but to a systems-based approach combining patient education, in-service training for primary care teams, a number of other initiatives generated by the participating health teams, and actions taken by people with diabetes and their families. The effect of the intervention was better metabolic control, as planned by the groups. No one factor appeared to have a greater effect on outcomes than any other, although it was demonstrated that the people who learned more (those with scores greater than 80 percent on the diabetes knowledge examination at the end) achieved better metabolic control and greater reduction of total cholesterol. Any additional benefit related to age, sex, number of consultations, or participation in the support groups was not evident.

In general, the project demonstrated that the in-service training was more effective than the traditional training by lectures. During the first phase of the project, it became evident that the primary care personnel were inadequately prepared to provide care to people with diabetes. The need for training of the health workers was brought up by the participants in the first Learning Session and verified by the project's advisory visits. Overall, a large group of patients with poor metabolic control and who were not on the maximum dosage of oral drugs was identified.

Another one of the problems that was frequently brought up by the primary care team was related to the referral system. The main problems were delays in obtaining appointments and failure to refer patients back to their primary care team for follow-up. Hence, a system of specialist visits to the health centers was set up; this was very effective. The primary care personnel took advantage of the system, learning from the cross consultations carried out. Specialist participation in the cross consultations contributed to the training of the primary care personnel and helped to bring about better results. The specialists' periodic visits played a double role: care of the patients who did not achieve good metabolic control, and education for the primary care team. This type of specialist involvement has proven to be effective in the United States (24, 25).

In general, the interventions that combine aspects of the health care system and diabetes education are the most effective (26). Patient education has been successfully incorporated into several research projects that managed to improve glycemic control (27,28). The patients who learned the most from the educational program (shown by a score greater than 80 percent on the final examination) achieved better results in glycemic control and cholesterol. This is evidence of the need for a structured educational program.

People with diabetes played an important role in the development of the intervention. First, a select group of people with diabetes in the health

centers participated in the Learning Sessions. This provided valuable feed-back that helped the centers improve care. Second, the primary care team decided to negotiate treatment goals with the patients. This strategy helped the patients to understand the process of the disease, and in general helped them obtain better metabolic control. This component had been used successfully by Day in 1992 (29).

The support groups, although they seem to provide great social and psychological support, did not play an important role in the patients' metabolic control. This suggests that the organization and activities of the support groups should be strengthened, with education and behavioral changes playing a greater role. Another suggestion is to restructure the support groups with activities for different subgroups of patients, defined by age or educational level. An intervention in the United States successfully used the support groups as a part of a program to improve quality of diabetes care (30).

VIDA was a randomized case-control study based on the Chronic Care Model and the BTS Series. VIDA was a public health intervention in five primary care centers in the state of Veracruz, Mexico. The methodology used in VIDA motivated primary care teams to identify their problems and find solutions from within, most of which required few external resources. The actions were directed at four components of the Chronic Care Model: Self-Management Support, Decision Support, Delivery System Design, and Clinical Information Systems. The participation of people with diabetes was a strategic element incorporated into the methodology, and one that is expected to ensure sustainability.

QUALIDIAB
AMERICAS / EUROPA

PROYECTO DE MEJORIA DE LA ATENCION A LA DIABETES EN VERACRUZ

REGISTRO

Documento del paciente   Número _____

JURIDICION [ ]   CENTRO _____

VISITA No. [ ]   **Fecha** [/ /]

CENTRO

Categoría
Paramédico ◯   MG ◯   Equipo ◯   Unidad ◯   Centro ◯

PACIENTE, DATOS BASICOS

Sólo llenar la primera vez   Hombre ◯   Mujer ◯

Apellido _____

Nombre _____

Fecha de Nacimiento [/ /]

Dirección _____

Localidad _____

Estado _____

DIABETES

Edad al diagnóstico de la diabetes [ ] Años

Tipo 1 ◯   Tipo 2 ◯   Gestacional ◯   Otros ◯

Inicio Comprimidos. Año [   ]   Inicio Insulina. Año [   ]

CONTEXTO DE LA VISITA

Ambulatorio ◯   Internado ◯

Número de consultas en los últimos 12 meses [ ]

EMBARAZOS

Embarazos en los últimos 12 meses   NO ◯   SI ◯

Partos normales [ ]   Abortos [ ]   Muertes perinatales [ ]   Malformaciones [ ]   Cesáreas [ ]   Peso al nacer [ ] Kg

FACTORES DE RIESGO CARDIOVASCULAR

Tabaquismo
NO ◯   SI ◯
cigarrillos / día [ ]

Alcohol
NO ◯   SI ◯
g/semana [ ]

Peso [   ] Kg
Talla [   ] cm
IMC [   ]

Cintura [   ] cm
Cadera [   ] cm
ICC [   ]

TA Max [   ] mmHg   TA Min [   ] mmHg

RESULTADOS LABORATORIALES   V. referencia

Glucemia ayunas [   ] mg/dl   HbA1c [   ] %   Ref. Máx. [ ] %
Glucemia casual [   ] mg/dl   HbA1 [   ] %   Ref. Máx. [ ] %

Creatinina [   ] mg/dl
Proteinuria [   ] g/día
Colesterol [   ] mg/dl
HDL [   ] mg/dl
LDL [   ] mg/dl
TG [   ] mg/dl

Microalb. Cualitativa   (+) ◯   (-) ◯

Microalb. Cuantitativa [   ]   mg/g creatinina ◯   mg/24H ◯   µg/min ◯

EDUCACION ADQUIRIDA: SE ENCUENTRA ESCRITO EN EL EXPEDIENTE SI

¿LE HAN EXPLICADO AL PACIENTE CÓMO...?

	NO	SI		NO	SI		NO	SI
Seleccionar alimentos	◯	◯	Identificar / tratar hipoglucemia	◯	◯	**PARTICIPA GRUPO DE AYUDA MUTUA**	◯	◯
Cuidar los pies	◯	◯	Ajustar dosis de Insulina	◯	◯	¿El paciente conoce sus metas de tratamiento?	◯	◯

¿Asistió al curso de educación del proyecto? ◯ ◯   Calificación: Pre [   ]   Post [   ]

AUTOMONITOREO: SE ENCUENTRA ESCRITO EN EL EXPEDIENTE SI EL PACIENTE

Glucemia
Dispone de tiras   NO ◯   SI ◯
Nº de veces por semana [ ]

Glucosuria
Dispone de tiras   NO ◯   SI ◯
Nº de veces por semana [ ]

Cetonuria
Dispone de tiras   NO ◯   SI ◯
Nº de veces por semana [ ]

COMPLICACIONES CRÓNICAS

MICROANGIOPATIA

	NO	SI		NO	SI
Ceguera	○	○	Nefropatía	○	○
Diálisis / Trasplante	○	○	Hipo TA ortostática	○	○
Neuropatía periférica	○	○	Disfunción eréctil	○	○

MACROANGIOPATIA

	NO	SI		NO	SI
IAM	○	○	Claudicación miembros inferiores	○	○
ACV	○	○	Revascularización	○	○
Angor	○	○	Amputación sobre tobillo	○	○
			Amputación debajo tobillo	○	○

COMPLICACIONES AGUDAS Y HOSPITALIZACIONES EN EL ÚLTIMO AÑO

(Indicar N° de episodios)   Ausentismo laboral (N°días / año) [ ][ ][ ]

		Causa de hospitalizaciones	días
Hipoglucemias severas	[ ][ ]	1- _____	[ ][ ][ ]
Cetoacidosis / coma	[ ][ ]	2- _____	[ ][ ][ ]
Coma hiperosmolar	[ ][ ]	3- _____	[ ][ ][ ]

OJOS

Examen último año   NO ○   SI ○

	NO	SI Der. Izq.
Maculopatía	○	○ ○
Retinopatía:		
No proliferativa	○	○ ○
Preproliferativa	○	○ ○
Proliferativa	○	○ ○

	NO	SI Der. Izq.
Fotocoagulación	○	○ ○
Vitrectomía	○	○ ○
Cataratas	○	○ ○
Glaucoma	○	○ ○

Agudeza visual (con corrección)   Ojo I [ ] /10   Ojo D [ ] /10

PIES

Examen último año   NO ○   SI ○

Apariencia

	NO	SI
Deformado	○	○
Piel seca	○	○
Callos	○	○
Infección	○	○
Fisuras	○	○

	NO	SI Der. Izq.
Sensib vibrat. anormal	○	○ ○
Resp. monofilamento anormal	○	○ ○
Ref. aquileano ausente	○	○ ○
Pulso pedio ausente	○	○ ○
Úlcera curada	○	○ ○
Úlcera / gangrena aguda	○	○ ○
Bypass / Angioplastía	○	○ ○

TRATAMIENTO

ESTILOS DE VIDA

	NO	SI
Solo Dieta	○	○
Actividad física	○	○

ORAL

	NO	SI
Metformin	○	○
Glibenclamida	○	○
Otro	○	○

¿Cuál? _____

INSULINA

	NO	SI
	○	○

Unidades/ dia

Cristalina	NPH	Lenta o ultralenta
[ ][ ][ ]	[ ][ ]	[ ][ ][ ]

ORIGEN

	NO	SI
Bovina	○	○
Porcina	○	○
Humana	○	○

	NO	SI
Premesclada	○	○

% [ ][ ] / [ ][ ]

FORMA DE APLICACIÓN

Jeringas ○   Pen ○   Bomba ○

N° aplicaciones / día [ ]

Análogos ○ ○   ¿Cuál? _____

MEDICACIÓN ADICIONAL

HIPERTENSIÓN ARTERIAL

	NO	SI
Prazosin	○	○
Atenolol/ Propanolol	○	○
Nifedipina	○	○
Captopril/ Enalapril	○	○
Losartan/ Valsartan	○	○
HCTZ/ Furosemida/ Clortalidona	○	○
Metildopa	○	○

DISLIPEMIA

	NO	SI
Sinvastatina	○	○
Gemfibrozilo	○	○
Otros	○	○

MED. OTRAS PATOLOGIAS

	NO	SI
Tto. Insuficiencia cardíaca	○	○
Tto. Neuropatía	○	○
Tto. Cardiopatía isquémica	○	○
Tto. Nefropatía	○	○
Otro Med _____		
Aspirina	○	○

COBERTURA DE SALUD

	NO	SI Parcial	Total
Atención médica	○	○	○
Laboratorio	○	○	○
Medicamentos	○	○	○
Tiras	○	○	○
Hospitalizaciones	○	○	○

RESPONSABLE

NOMBRE RESPONSABLE   FECHA

Annex II The Chronic Care Model

Description of the areas of the chronic care model applied to diabetes (*See figure 3*):

1. Health System Organization:

The health care system can create an environment in which the efforts to improve diabetes care are strengthened and can flourish. The critical elements include a coherent approach to the improvement of the system, committed leadership by those responsible for the improvement of the clinical results, and incentives to the suppliers and the patients to improve care and to adhere to clinical standards/guides (including non-financial incentives such as recognition and status).

2. Community Resources:

The health care system can be improved using community resources that are relevant to effective diabetes care. Community resources that support diabetes care, including both governmental programs and programs of community volunteer organizations, are needed in order to increase health care services, but the health care organizations are often poorly organized to make use of the existing community programs or promote their development.

3. Self- Care of the Patient With Diabetes Mellitus:

Support for self-care helps the patients and their families, who cope with the challenges of living with the disease and caring for chronic disorders, to minimize complications, symptoms, and disabilities. The success of self-care programs depends on the collaboration between the patients and the health providers in order to define problems, establish priorities, determine mutually agreed goals, create treatment plans, and solve long-term problems. The availability of evidence-based educational resources for training and interventions for social and psychological support are the key components of a self-care system.

4. Standards of Care of Diabetes Mellitus

Effective diabetes health care programs operate in accordance with guidelines or specific protocols, preferably evidence-based guidelines whose implementation is part of routine practice linked to reminders, effective educators, appropriate information, and the collaboration and support of the relevant medical specialty areas.

5. Technical support

Effective diabetes care requires more than simply adding interventions to an existing system centered on acute medical care. It requires basic changes in the infrastructure of the health system. Effective diabetes care sometimes requires a clear delegation of the functions and responsibilities of the physician to other professionals who are part of the health care team (for example: nurses, health educators, etc.) and who have the knowledge and the time to carry out a variety of tasks necessary for handling the complications of diabetes. Effective diabetes care also implies the use of planned visits, continuous care, and regular monitoring.

6. Diabetes Mellitus Information System

Timely information about the individual patients and the population of patients with diabetes is a critical characteristic of effective programs, especially the ones that use population-based approaches. The first step is to establish a disease registry for individual practices that includes information on elements of care. Health teams that have access to a registry can locate patients with specific needs and deliver planned care to them; the health teams can receive performance feedback and set up reminder systems.

The model has been successfully used to improve care of chronic disorders such as diabetes, asthma, congestive heart failure, depression, and for the care of the elderly in more than 300 health care organizations in the United States of America.

Results of the Assessment of Chronic Illness Care – ACIC

Introduction

The objective of the evaluation is to be familiar with the available resources in the health units and to assess these resources from the perspective of the health professionals before and after the intervention. In order to achieve these objectives, the ACIC questionnaire was applied at the beginning and the end of the intervention. This questionnaire was developed by the MacColl Institute for Healthcare Innovation in Seattle, U.S.

Summary of the Methodology of the Activity

The evaluation was carried out during Learning Sessions 1 and 3. All professionals from the health centers who were present in these sessions participated in the evaluation activities, grouped first by health unit and then into two subgroups. Each multidisciplinary group from the health center included a facilitator who served as support and as moderator of the discussions. Both in the initial and final evaluations, the results of the two subgroups of each health center were compiled separately, and the average for every component was calculated to obtain the results of each center.

Table 12: Evaluation by area of the model at the beginning and end of project

	Beginning	End	Change	SD*	p
Organization of Care	4.7	8.6	3.9	1.4	0.003
Community Services	4.3	6.1	1.7	0.7	0.007
Support for Self-management	6.2	9.9	3.7	1.1	0.002
Design of the System	5.3	9.4	4.1	1.4	0.003
Decision Support	7.2	9.6	2.3	0.8	0.002
Information System	6.2	8.4	2.2	2.2	0.083
Total	5.7	8.7	3.0	0.6	0.000

*Standard Deviation

Finally, the average was calculated for each area of the questionnaire and the final values, or the global average of each health center, were calculated.

What does the ACIC do?

The ACIC uses a standardized questionnaire to evaluate the health teams' perceptions of the availability of resources in the care services for people with diabetes, based on the Chronic Care Model, adapted for diabetes and translated and validated for Spanish. The questionnaire is divided into the six areas of the chronic care model, and each area is subdivided into specific components that receive scores from 0 to 11, in accordance with the participants' perception. The participating groups must be multidisciplinary and must reach a consensus on the stipulated values.

Results of the evaluation

In the table below, the results of the evaluation appear by area of the model at the beginning and the end of the project.

In the initial evaluation, the average score in all the areas was only 5.7, which corresponds to level C. The area that scored highest was the Decision Support (7.2, level B), and the area with the lowest score was Community Services (4.3, level C). In the final evaluation, Support for Self-management earned the highest score (9.9, level A), while Community Services again scored lowest (6.1, level B). The most important change occurred in Design of the System of Health Care (a difference of 4.1). The least change was seen in Community Services (a difference of 1.7).

At the beginning of the project, HC 4 was given the highest score (6.8, level B) in the components of the model, the only center to earn a B level; HC 2 got the lowest score (4.9, level C). In the final evaluation, HC 4 got the highest score (9.8, level A) and HC 5 (7.8, level B) got the lowest. All the centers improved their scores, with the greatest increase occurring in HC 1 and the smallest in HC 5. HC 4 was the only center that attained a score corresponding to level A; the other four centers were classified as level B at the end of the intervention.

Table 13: Initial and final evaluation in the health centers

Health Center (HC)	Beginning	End	Change
1	5.4	9.0	3.7
2	4.9	8.2	3.4
3	5.6	8.6	3.0
4	6.8	9.8	3.1
5	5.8	7.8	2.0
Total	5.7	8.7	3.0

Conclusions

According to the evaluation by members of the core health teams, community resources are not used efficiently to support people with diabetes. The highest-scoring chronic care component at the beginning was Decision Support, perhaps because of the Mexican National Standard that regulates care of people with diabetes. The area that got the highest score at the end of the project was Self-Management Support (education in diabetes), which was one of the areas where a more intense effort was carried out. The most significant change was in the Design of the Health Care System, which was also the object of a sustained effort to modify the referral system. The modification included having specialists visit the health centers, rather than the usual system of sending the patients to the secondary health care services.

As a result of the intervention, the majority of the centers passed from level C to level B. The members of the care team at HC 4 considered their center to have improved its level of care from level B to level A.

Annex III   Assessment of Chronic Illness Care

(Assessment of Chronic Illness Care ACIC, Version 3.5),

Introduction

Improving care of patients with diabetes requires establishing a Model of Care that incorporates the necessary elements for prevention and control. These changes include the active participation of informed patients and a well-prepared diabetes health care team. The interactions between the patients and the health team members increases the probability of obtaining better results, both in the functional and clinical areas (figure 1). In this model there are six areas to improve the management of patients with diabetes.

Instruction to complete the questionnaire:

This questionnaire should be filled out by a health care team, including representatives of at least three health services, i.e., laboratory, nutrition, social worker, psychologist, physician, nurse, etc. Each area has a number of components. Each component should be read and analyzed by the team in order to achieve a consensus. Each component has four levels: Level A corresponds at the ideal level of care. Level D is the level in which resources for diabetes care do not exist or are very limited. Each level has a range that goes from 0 to 11, which should be marked to reflect the consensus of the group. Only one value per component should be marked at the selected level.

Assessment of Diabetes Care (Modification of the ACIC Version 3)

Area 1. Organization of the Healthcare Delivery System. The management of diabetes can be more effective if the health system is organized to better control chronic diseases and their complications.

Components	Level D	Level C	Level B	Level A
Organization and leadership for diabetes care	...does not exist or there is a little interest.	...is reflected in vision statements and business plans, but no resources are specifically earmarked to execute the work.	...is reflected by senior leadership and specific dedicated resources (dollars and personnel).	...is part of the system's long-term planning strategy, receives necessary resources, and specific people are held accountable.
Scoring	0 1 2	3 4 5	6 7 8	9 10 11
Organizational goals for diabetes care	...do not exist or are limited to one condition.	...exist but are not actively reviewed.	...are measurable and reviewed.	...are measurable, reviewed routinely, and are incorporated into plans for improvement.
Scoring	0 1 2	3 4 5	6 7 8	9 10 11

Components	Level D	Level C	Level B	Level A
Improvement strategies for diabetes care	...are ad hoc and not organized or supported consistently.	...utilize ad hoc approaches for targeted problems as they emerge.	...utilize a proven improvement strategy for targeted problems.	...include a proven improvement strategy and use it proactively in meeting organizational goals.
Scoring	0 1 2	3 4 5	6 7 8	9 10 11
Incentives that include recognition for the healthcare worker and regulations for diabetes care.	...are not used to influence clinical performance goals.	...are used to influence utilization and costs of chronic illness care.	...are used to support patient care goals.	...are used to motivate and empower providers to support patient care goals.
Scoring	0 1 2	3 4 5	6 7 8	9 10 11
Influential leaders within the health sector and other ministries with decision-making power	...do not promote diabetes care	...do not prioritize diabetes care.	...promote efforts to improve diabetes care	...openly participate in efforts to improve diabetes care.
Scoring	0 1 2	3 4 5	6 7 8	9 10 11
Benefits related to education of the patient in diabetes self-management.	...discourage patient self-management or system changes.	...neither encourage nor discourage patient self-management or system changes.	...encourage patient self-management or system changes.	...are specifically designed to promote better diabetes care.
Scoring	0 1 2	3 4 5	6 7 8	9 10 11

Total Health Care Organization Score: ___   Average score (Health Care Organization Score/ 6) ___

Area 2: Community Linkages: Linkages between the health delivery system (or provider practice) and community resources play important roles in the management of diabetes.

Components	Level D	Level C	Level B	Level A
Availability of community resources for people with diabetes	...There are none or they are not organized systematically.	...is limited to a list of identified community resources in an accessible format.	...is accomplished through a designated staff person or resource responsible for ensuring providers and patients make maximum use of community resources.	... is accomplished through active coordination between the health system, community service agencies and people with diabetes.
Scoring	0 1 2	3 4 5	6 7 8	9 10 11

Components	Level D	Level C	Level B	Level A
Cooperation/coordination with community agencies such as diabetes associations, pharmaceutical companies, religious organizations, etc.	…does not exist.	…is being considered but they have not yet been implemented.	…is formed to develop supportive programs and policies.	…is actively sought to develop formal supportive programs and policies across the entire system.
Scoring	0 1 2	3 4 5	6 7 8	9 10 11
Regional and/or local health plans	… do not coordinate clinical guidelines, measures or care resources for diabetes at the practice level.	…would consider some degree of coordination of guidelines, measures or care resources at the practice level but have not yet implemented changes.	…currently coordinate guidelines, measures or care resources in one or two chronic illness areas.	…currently coordinate chronic illness guidelines, measures and resources at the practice level for most chronic illnesses.
Scoring	0 1 2	3 4 5	6 7 8	9 10 11

Total community linkages score _____   Average Scoring (Community Linkages Score/ 3) _____

Area III: Practice Level: Several components that manifest themselves at the level of the individual provider practice (e.g. individual clinic) have been shown to improve diabetes care.

Area 3: Diabetes Self Management: Effective self-management support can help patients and families cope with the challenges of living with and treating diabetes and reduce complications and symptoms.

Components	Level D	Level C	Level B	Level A
Assessment and Documentation of Diabetes Self-Management Needs and Activities	…are not done.	…are expected.	…are completed in a standardized manner.	…are regularly assessed and recorded in standardized form linked to a treatment plan available to practices and people with diabetes.
Score	0 1 2	3 4 5	6 7 8	9 10 11
Self-Management Support	…is limited to the distribution of information (pamphlets, booklets).	…is available by referral to self-management classes or educators specialized in diabetes.	…is provided by trained clinical educators who are designated to do self-management support, affiliated with each practice, and see patients on referral.	…is provided by clinical educators, trained in patient empowerment and problem-solving methodologies, and see most patients with chronic illness.
Score	0 1 2	3 4 5	6 7 8	9 10 11

Area 3. *continued*

Components	Level D	Level C	Level B	Level A
Addressing Concerns of Patients and Families	...is not systematically done.	...is provided for specific patients and families through referral.	...is encouraged though peer support, groups, mentoring programs, and programs for educators.	...is an integral part of diabetes care and includes systematic assessment and routine involvement in peer support, groups, mentoring programs, and counseling programs.
Score	0 1 2	3 4 5	6 7 8	9 10 11
Behavior change and Peer Support	...do not exist or are not available.	...are limited to the distribution of pamphlets, booklets or other written information.	...are available only by referral to specialized centers staffed by trained personnel.	...are readily available and an integral part of routine care.
Score	0 1 2	3 4 5	6 7 8	9 10 11

Total Diabetes Self management Score   Average Score: (Self-management score/4) _____

Area 4: Standards of Diabetes Care. Effective diabetes management ensures that the health team has access to evidence-based medical information for care and support of people with diabetes. This includes evidence-based practice guidelines or protocols, specialty consultation, education for the health team on hand, and facilitating spread of information to the health team concerning effective treatments.

Components	Level D	Level C	Level B	Level A
Evidence-based guidelines	...do not exist or are not available	...are available but are not integrated into diabetes care.	...are available and supported by education offered by the health team.	...are available, support the health team, and are part of the care for people with diabetes through reminders and other proven provider behavior change methods.
Score	0 1 2	3 4 5	6 7 8	9 10 11
Involvement of the specialists within the health system for the improvement of primary diabetes care	...is primarily through traditional referral.	...is achieved through specialists in order to improve the capacity of the overall system to implement guidelines.	...includes influential specialists designated to provide training to the primary care health team.	... includes specialists who are designated to improve primary diabetes care.
Score	0 1 2	3 4 5	6 7 8	9 10 11

Area 4. *continued*

Components	Level D			Level C			Level B			Level A		
Health team education in diabetes care	...is provided sporadically.			...is provided systematically through traditional methods.			...is provides using optimal methods (i.e. credited courses).			... provides training of all the care teams, including in management of populations of people with diabetes and support for self-management.		
Scoring	0	1	2	3	4	5	6	7	8	9	10	11
Informing people with diabetes about medical guidelines.	...no information is provided.			...happens on request or through publications.			...is done through specific educational materials for every guideline.			...includes specific materials developed for patients that describe their role in achieving guideline adherence.		
Scoring	0	1	2	3	4	5	6	7	8	9	10	11

Total Standards of Diabetes Care Score: Average score (Diabetes Care Score/4)

Area 5: Technical support: Evidence suggests that effective diabetes care involves more than simply adding additional interventions to a current system focused on acute care. It may necessitate changes to the organization of practice that affect provision of care.

Components	Level D			Level C			Level B			Level A		
Health team functioning.	...it is not addressed.			...is addressed assuming that individuals with training in the key elements of diabetes care are available.			...is guaranteed by periodic team meetings to address guidelines, roles, and the problems in diabetes care.			...is guaranteed by a team that meets regularly and has clearly defined the functions, including self-management education, preventive monitoring and coordination with other resources.		
Score	0	1	2	3	4	5	6	7	8	9	10	11
Health team leadership.	...is not recognized locally nor by the system.			...is assumed by the organization to reside in specific organizational roles.			...is guaranteed through the appointment of a team leader, but its role is not defined with respect to diabetes.			...is guaranteed through the appointment of a team leader who ensures that the roles and responsibilities in diabetes care are defined clearly.		
Score	0	1	2	3	4	5	6	7	8	9	10	11

Components	Level D	Level C	Level B	Level A
Appointment System	...can be used to schedule acute care or preventive care visits.	...guarantees timely care for people with diabetes.	...is flexible and can include innovations such as personalized visit length or group visits.	...includes the organization of care, which facilitates patients seeing multiple health providers in a single visit.
Score	0　　1　　2	3　　4　　5	6　　7　　8	9　　10　　11
Follow-up appointments	... are scheduled by patients or providers on a case-by-case basis.	...are scheduled by the practice in keeping with the guidelines.	...are guaranteed by the health team through monitoring of patients.	...are in accordance with the needs of the patient, vary in intensity and methodology (telephone, personnel,) and are ensured to follow guidelines.
Score	0　　1　　2	3　　4　　5	6　　7　　8	9　　10　　11
Planned visits or by spontaneous demand of the patient.	...are not done.	...are occasionally used for the complicated patients.	...are options for interested patients.	...are used for all the patients and include periodic evaluation, preventive interventions, and support for self-management.
Score	0　　1　　2	3　　4　　5	6　　7　　8	9　　10　　11
Continuity of diabetes care	...is not a priority.	...depends on written communication between primary health care providers, specialists and case managers.	...is a priority among primary health care providers, specialists and other providers but is not carried out systematically.	...is a high priority and all the interventions for diabetes include an active coordination between primary care, specialists, and other pertinent groups.
Score	0　　1　　2	3　　4　　5	6　　7　　8	9　　10　　11

Total technical support score: _____   Average score (technical support score/6)

Area 6: Diabetes Information system: A very important aspect for diabetes care and diabetes programs is to have timely and useful information concerning patients and the patient populations with diabetes.

Components	Level D	Level C	Level B	Level A
Registries (lists of people with diabetes)	...do not exist.	...include the names, the diagnosis, contact information, either on paper or in the computer	......allows classification of patients by clinical priorities.	...is linked to guidelines which provide reminders and alerts concerning the necessary services.
Score	0　　1　　2	3　　4　　5	6　　7　　8	9　　10　　11

Components	Level D	Level C	Level B	Level A
Reminders for the health team (i.e. reminders of appointment with the nephrologist, laboratory, appointment to ophthalmology, etc.)	...do not exist.	...include general notification for diabetes care, but do not describe the necessary services at the time of a visit.	...include indications necessary for groups of patients with diabetes through periodic reporting.	...include specific information for the team concerning guideline adherence in regard to the medical information.
Score	0 1 2	3 4 5	6 7 8	9 10 11
Feedback	...there is none or it is not specific to the team.	...is provided at infrequent intervals and is delivered impersonally.	...is given at sufficiently frequent intervals to monitor quality and is specific to the health team that provides care to the patient with diabetes.	...is timely, specific for the health team and is transmitted in person and systematically by a leader in order to improve the performance of the team.
Score	0 1 2	3 4 5	6 7 8	9 10 11
Information on relevant subgroups of patients needing services.	...is not available.	...can only be obtained with special efforts or additional programming.	...can be obtained upon request, but it is not routinely available.	...is systematically provided to the health team in order to help them deliver planned care.
Score	0 1 2	3 4 5	6 7 8	9 10 11
Protocols and treatment plans	...are not expected to exist.	...are achieved through a standardized approach.	...are established in a coordinated manner and include self management as well as clinical goals.	... are established in a coordinated way and include self management and clinical goals. Follow up occurs and guides the care.
Score	0 1 2	3 4 5	6 7 8	9 10 11

_____ Total Information Systems score: ___ Average scoring (information systems score /5)

Score Summary (bring forward score at end of each section to this page)

Total Organization of Health System Score _____

Total Community Linkages Score _____

Total Self-Management Score _____

Total Standards of Diabetes Care Score   _____

Total Technical Support Score   _____

Total Diabetes Information System Score   _____

Overall Total Program Score (Sum of all scores)   _____

Average Program Score (Total Program /6)   _____

Annex IV   Obstacles to Good Diabetes Control

Organization of the Services

- Lack of adequate training of the medical team.
- Shortage of some drugs in the health centers.
- Lack of space in some health centers.
- Lack of monitoring of consultations.
- Cost of some drugs and procedures not covered by the system.
- Insufficient personnel.
- Insufficient consultation time.
- Patients do not attend consultations due to lack of promotion and motivation on the part of the personnel, both medical and others.
- Lack of supplies (drugs and reactive strips).
- Personnel not sensitive toward patient care.

Design of the Health Care System

- In some cases there is not a good physician-patient relationship.
- A drug shortage exists in the health units.
- There is a lack of integration of allied health professionals (e.g. nutritionist, podiatrist, psychologist, and dentist) into the treatment of the patient.
- Insufficient consultation time for guidance and comprehensive care of patients with diabetes.

Self-management

- Refusal to accept the disease.
- Low educational level.
- Lack of instruction on physical activity.
- Lack of motivation to carry out physical activity.
- The majority of the patients are sedentary or do not carry out sufficient physical activity.
- Lack of interest from the family, lack of family support, overcrowding, and family disintegration.
- Lack of family support for the patient to improve diabetes control or make dietary changes.
- Inadequate use of the family unit in self-management; resolving family problems, family support of an adequate diet, and stress control.
- Lack of interest by the patient in an adequate diet (quantity and quality) and lack of routine exercises.
- Lack of interest in changing behavior.
- Lack of decision and commitment by the patient, medical staff, and family members for behavioral change.
- Lack of will to adopt preventive behavior.
- Presence of cultural aspects and family traditions that interfere with the behavior.
- Improper diet.

- Eating without a schedule, with the consequent increase in caloric intake.
- Festive activities include food consumption and cause greater caloric intake.
- Harmful information from the media, such as the advertising of rich food with high caloric or fat content.
- Lack the time to carry out the non-pharmacological treatment such as diet and physical activity.
- Little promotion of the self-help groups.
- Lack of education and knowledge of diabetes.
- Scarce information on diabetes.
- Lack of teaching coordinators in the health centers.
- Fatalistic perspective of the patients with regard to the achieving good glycemic control.
- Lack of interest of the patient to learn about the disease.
- Ignorance about the illness.
- Consumption of foods that are low in dietary fiber.
- Disordered eating habits, with an increase in the intake of simple carbohydrates such as tortilla and bread.
- Poor eating patterns and personal hygiene habits; sedentary and inadequate lifestyles.

Decision Support
- Insufficient diagnostic support.
- Lack of clinical guidelines.
- Absence of a comprehensive approach in the technical documents.
- Lack of dissemination of technical documents in the health centers.
- Low motivation of the working team.
- Lack of personalization in setting goals and evaluating each patient.
- Lack of opportunity for management and prevention.

Others
- Apparent social rejection of people who have diabetes, therefore many people deny that they have the illness.
- Important migration and immigration in the community exists.
- Lack of self-esteem, absence of discipline for self-control, and high stress.
- Addictions (alcohol, tobacco) and overeating.
- Low socioeconomic level.
- Limited economic resources due to unemployment or low wages.

Annex V   Evaluation of Objectives

Proven changes	Goal	Description of what was done	Results obtained
Continuous medical feedback through weekly meetings with review of files and participation of patients.	Hold monthly meetings. Improve the care and monitoring of the patient with diabetes. Improve the quality of filling out the clinical file.	• Meetings of the health team, where agreements and commitments to improve the quality of care were made. • Criteria for the comprehensive management of patients with diabetes were standardized. • Training of the team in the prevention and early detection of patients with risk factors. • The entire health staff was invited through notification in the health center and personal notification. • At the meetings, the improvement of the physician-patient relationship, the greater integration of the patients, and the increase in patient's interest in self-care was discussed. • Raised patients' awareness of their illness. • A secretary was appointed for the meetings.	Periodic meetings were held where patients participated. The entire team was able to be part of the meetings. The number of patients under control was increased. The health team was strengthened and communication between the health provider and patient was improved.
Establish treatment goals with the patients.	Carry this out in 100% of the patients.	• Goal negotiation with patients with each member of the health team. • Monitoring to be sure monthly negotiations with the patients were carried out.	Strengthening of physician-patient communication; 90% of patients with established goals.
Train promoters: Select and train promoters among the patient candidates, certify them, provide logistical support, and evaluate the impact.	Train 100% of promoters.	• Patients were chosen and trained as promoters.	An instrument for evaluating impact was not available.
Enroll patients in the support groups.	100% of the patients.	• More flexible schedules in accordance with patients' needs were offered. • All the patients were invited to the support groups during their consultation. • In each subsequent consultation, patients were invited again to join the support groups. • The invitation was also made by all the members of the health team.	The number of patients in the support groups was doubled.
Patient referral to specialist.	Refer all patients who do not attain the therapeutic goal. Periodically refer all the patients for assessment of retinopathy and neuropathy.	• Patients were referred for ophthalmologic assessment. • The format of reference to specialists was prepared. • Patients were referred to 2nd level services with basic specialties. • Raise patient awareness of the importance of ophthalmology service.	Partial results. The referral back to the primary level was rarely received. Lack of resources on the part of the patients for consultation and

Proven changes	Goal	Description of what was done	Results obtained
		• Review the clinical file, in order to confirm annual cross consultation. • Refer to psychology, podiatry, nutrition, dentistry, nephrology, psychiatry, and ophthalmology. • Patients have been referred to the second level without obtaining referral back to the primary level.	treatment of ophthalmology. Patients in ophthalmology were deferred. The other specialties were served.
Standardize criteria for the personnel of 1st and 2nd levels.	Carry out cross consultation with specialist.	• Formation of the Committee on Quality and Ethics. • Course workshop on nutrition. • Integration of the 2nd level personnel into the Continuous Medical training	It was possible to carry out cross consultation and assessment of patients.
Registries of the activities in the clinical files: assessment of the clinical files at the working meetings of the core health team.	Register 100% of activities in the clinical files.	• Files were evaluated monthly with support of the quality committee.	100% of the clinical files were reviewed.
Foot inspection in the consultations and support groups.	100% of the patients.	• Feet were examined by the physician in each consultation for early detection of complications. • Patients were instructed on periodic examination and special care of the foot. • A meeting was held with all personnel, with regard to the importance of foot examination. • Monthly examination was stipulated in the consultation and support groups. • The day and time of the support groups was adjusted, serving the demands of the patients. • Meeting of the core health team, and later a general meeting to establish the support groups. • It was possible to increase the morning support groups, but not to create the afternoon one. • Family members' awareness was raised in order to encourage patients. • A meeting of the multidisciplinary team was held. • Home visits were carried out to all the patients. • A glycosylated hemoglobin test was carried out. • Two different schedules for operation of the support groups were established. • Physicians were trained in the diabetic	Improvement in the physical examination of the patient. Improvement in self-care on the part of the patient. Gradual increase in foot examinations during consultation was observed.

Proven changes	Goal	Description of what was done	Results obtained
		foot, making it possible to standardize criteria for the monthly review. • Distribution among the patients of materials on prevention and self-care of the feet. • Examinations of the feet were carried out in consultations and support groups.	
Improve physician-patient communication.	Sensitize the health personnel in order to improve the teaching technique and raise patients' awareness.	• The Intra-hospital competition was carried out in order to prepare educational material directed toward the VIDA project.	10 working teams presented. There were three winners who presented different and creative teaching techniques.
Strengthen actions of promotion and education, facilitate patient access to drugs and reactive strips, implement multidisciplinary consultation and consultations with specialists, and reinforce home visits.	Implement in all activities.	• Training of the patient through the support groups in priority subjects. • Sufficient drug supply with the reorientation of treatment. • Reactive strips obtained with new equipment. • Multidisciplinary consultations were implemented. • Home visits by multidisciplinary personnel, with support of the patients in the support groups.	Gradual increase of compliance until 100% was reached.
Guarantee monthly control of the patient: home visits and recapture of patients who have not been attending consults.	Home visits to reluctant patient and to maintain attendance in the patients who are attending consults.	• Home visits to reluctant patients were carried out.	Gradual increase of monthly attendance, reaching 98% of patients.
Teach patients to eat adequately, carrying out nutritional demonstrations.	Hold three sessions.	• Demonstrations of dishes with caloric value of 100 calories each were carried out.	Gradual increase.
Prescribe urine exam and lipid profile once a year.	Prescribe exams for patients (100%).	• The level of awareness was raised and this activity was managed through the health jurisdiction.	90% was achieved.
Train and raise patient awareness about incapacitating and lethal complications and risks.	100% of the patients.	• During the consultations, the complications of hyperglycemia -- neuropathy, nephropathy, etc. -- were stressed. • Talks about complications were carried out with patients' relatives.	It was partially achieved. Little sensitization on the part of the patient and little interest of the family members in participating.
Monitor the glycemic indices.	Decrease number of uncontrolled patients.	• Glucose taken with reactive strip in each consultation. • Control with venous blood glucose every three months.	Partial deficit in the supply of material. Limited resources for the patient to make

Proven changes	Goal	Description of what was done	Results obtained
			quarterly examinations.
Promote self-monitoring of the patient in order to achieve optimal levels of BP, glucose, lipids and BMI.	100% of the patients.	• Orientation in group sessions and individually, emphasizing the manual.	The patient learns to self-monitor and to distinguish warning signs. A 35% increase of patients under control.
Establish cross consultation with specialists in cases of difficult management or cases that do not reach therapeutic objectives.	Refer all the patients who did not achieve control in six months.	• Every patient who required referral was referred.	Referral back to the primary level is not available to date. Patients were sent to internal medicine at the general hospital. Problem cases are reviewed.
Train care team	100% of members trained.	• Weekly meetings with the core health team.	Improvement in comprehensive patient care.
Insist on the support of nutritionists and other secondary level specialists, in order to carry out the referral process.	100% support.	• Arrangements were not made.	Partial fulfillment in some centers; support was not obtained.
Periodic review of the files.	100% of files reviewed.	• Periodic review of the files in clinical sessions.	Good results. The quality of the files has been improved, correcting deficiencies.

Annex VI Problems Detected in External Advisory Services and Suggested Solutions

1- The patient cases presented by the basic working groups did not have good metabolic control of fasting blood glucose.

2- None had tests of postprandial blood glucose, an important element to guarantee good metabolic control over time.

3- The majority of the cases was obese or overweight and did not lose weight with the suggested diets.

4- There is a particular delay in achieving the recommendation of sufficiently low-calorie diets. Even though the strategy to decrease caloric intake step-by-step was used so as to avoid rejection on the part of patients, the proposed objectives were not obtained, and too much time passed without attaining the low-calorie diets that give rise to weight loss.

5- The majority of the cases were using sulfonylurea as their drug of choice, and metformin as a secondary treatment, without reaching the recommended maximum dosages.

6- There frequently is fear of systematically using regular insulin as an associated drug (not as monotherapy), when control is not obtained using the maximum dosage of oral hypoglycemics.

7- There are no drugs for the pharmacological treatment of cholesterol and high triglycerides.

8- Easy or systematic monitoring of certain situations that are detected by the physicians is not available; for example, access to podiatrists and ophthalmologists.

9- In almost all the centers, urinalysis is only conducted once a year.

The following actions were suggested:

1- Stress the importance of metabolic control.

2- Increase the knowledge and abilities of the nutritionists and physicians (using nutritionists as trainers) to attain patients' compliance with the food plan.

3- Initiate the treatment of patients with type 2 diabetes and obesity with metformin as the drug of choice (unless they have known contraindications).

4- Initiate the treatment of people with type 2 diabetes who are not overweight with sulfonylureas and treatment of thin patients with regular insulin.

5- When the people with diabetes who are treated with oral hypoglycemic agents lack metabolic control for more than three to four months without a well-

identified cause, regular insulin should be included in nocturnal, daily, or twice daily doses.

6- Intensify in the self-help groups everything that pertains to adequate nutrition, with important participation of the nutritionist and the psychologist. Establish more tools focusing on the merits of insulin and the false conception that insulin causes loss of vision.

7- In the cases of normal fasting blood glucose, a postprandial blood glucose test is needed to ensure that these results are also normal.

8- Perform urinalysis more frequently than once per year (three to four times a year).

9- Alert the health authorities of the need for: availability of tuning forks and reflex hammers for the minimal neurological examination, access to the podiatrist (or podiatrist education), access to the ophthalmologist, implementation of electrocardiograms, and including hypolipidemic drugs on the basic list.

10- Praise the motivation of health leaders, the organizers of the program, and of the core teams (physicians and nurses).

11- The support groups should be classified by age and educational status, since the strategies to follow in the cases of older age and lower educational level are different from the strategies to use in the youngest groups and higher educational level.

Annex VI Objectives Used in the P-D-S-A Cycles of Improvement in the VIDA Project, According to Area of the Chronic Care Model

Organization of the Services

- Hold a monthly meeting of all the core health teams of the health center in order to discuss strategies for patient care, conduct evaluations, provide feedback and establish commitments. The meeting should include participation of patients and a secretary should be appointed by the group.

- Reappraise the foot exam in the patient with diabetes in accordance with the established strategies. Increase the proportion of patients with foot examination in the consultation and support groups

- All the patients should be evaluated by the nutritionist; this should be coordinated with the secondary level.

- Implement an educational program and evaluate the knowledge of the patient before and after the program.

- Carry out early detection and actions to prevent diabetic foot problems, neuropathy, retinopathy and cardiovascular complications.

- Strengthen the referral system for all the patients included in the project.

- Improve the supply of metformin and insulin.

- Facilitate the management of specialized consultation at the secondary level, with involvement of jurisdictional authorities.

- Negotiate with uncontrolled patients their commitment for monthly control.

- Provide psychological and emotional support for all the people with diabetes and their family members.

- Prepare a prescription pad appropriate for people with diabetes.

- Establish cross consultation with specialists in difficult-to-manage cases.

- Identify patients with a high risk of suffering from complications.

- Insist on support from the nutritionist and other secondary-level specialists so that there is a link between referral to specialists and referral back to the primary care team.

- Monitor uncontrolled patients every 15 days for changes in treatment and improvements in use of insulin.

- In each consultation, negotiate treatment goals with the patient.

Decision Support

- Carry out referral of patients who do not attain the treatment objectives or are at greater risk.

- Follow the protocols established in the Mexican Official Standard of Diabetes.

- Train the health care team in the management of patients with diabetes.

- Prescribe urine exam and lipid profile once a year.

Self-management

- Establish and negotiate therapeutic goals with the patient in each consultation.

- Encourage participation of all patients in support groups.

- Redesign the support group sessions in a more flexible way with different turns and schedules in order to guarantee at least the monthly attendance of all patients.

- Create nucleus of coordinators in education (NCE) (one physician and up to two nurses) in each health center.

- Carry out training in self-care for the NCE.

- Reproduce educational materials for the NCE and the patients.

- Ensure that all patients will establish treatment objectives together with the physician.

- Give emotional support to the patients.

- Implement collective medical consultation for the groups of mutual assistance, promoting the sharing of experiences in daily problem-solving in diabetes management.

- Raise patients' awareness of the importance of self-care (diet, physical activity, drugs, etc).

- Hold a cooking contest of low-caloric Mexican dishes.

- Teach patients to recognize signs and symptoms of hyper- and hypoglycemia, so that they know to go immediately to the medical unit.

- Train all patients in self-care and glycemic control.

- Identify and train health promoters of the support groups.

- Encourage physical activity.

- Integrate a greater number of patients in the support groups and as part of the afternoon group.

- Involve the patients' relatives in treatment.

Information System

- Reinforce the goals of behavior changes using nurses' notes.

- Registry of complete and clear clinical files.

Community Resources

- Promote the incorporation of all the patients into the support groups as well as the search for community resources for the support of people who have diabetes.
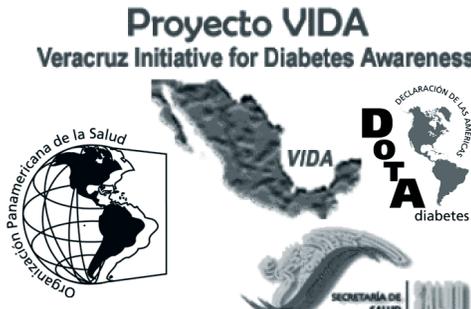
Proyecto VIDA
Veracruz Initiative for Diabetes Awareness

Instructivo

del formato de

Valoración podológica del paciente diabético

OPS/DPC/NC/DIA/66/1/-173-04

1. Objetivo

Estandarizar el llenado de la cédula para valoración podológica del paciente con diabetes mellitus.

2. Instructivo de llenado

Generalidades de llenado

Derivado de la exploración de cada pie en busca de las afecciones listadas en cada área, se asigna un número en escala de intensidad que va del 0 al 2, el **cero** será asignado para los casos en que la alteración esté ausente, **uno** para los casos en que la alteración sea moderada o incipiente y **dos** para cuando la alteración sea grave o muy marcada. El registro se debe realizar en las celdillas "**Calif.**" correspondiente a cada evento.

Para lograr una mayor objetividad de las alteraciones dermatológicas y de las estructuras óseas se presentan esquemas de ambos pies, en vistas plantar y dorsal, para indicar la ubicación exacta de las mismas, anotando la letra que le corresponde a cada afección.

Identificación

Nombre: Anotar el nombre de la persona iniciando con apellido paterno, materno y nombre(s).

Fecha: Anotar con números arábigos las dos últimas cifras del día, mes y año en que se realiza la valoración podológica. *Ejemplo:* 27/01/04

Nº de Expediente: Registrar el número del expediente del paciente.

Matriz

Se encuentra dividida en una columna izquierda para registrar los datos del pie derecho y una columna derecha para registrar los correspondientes al pie izquierdo, resultantes de la valoración independiente de cada pie, en cuatro grandes áreas de exploración: dermatológico, óseo, vascular y neurológico.

Área: Examen dermatológico
Considera para ambas columnas: pie derecho e izquierdo la valoración de:
hiperqueratosis de ubicación plantar, dorsal y talar otorgándosele a cada una letra y una celda para registrar la calificación otorgada.

Alteraciones ungueales	*Otras localizadas*
Considera para ambas columnas: pie derecho e izquierdo la identificación de: *Onicocriptósis, Onicomicosis y Onicogrifosis*	Bullosis, úlcera, necrosis, grietas y fisuras, lesiones superficiales y otras difusas (anhidrosis, tiñas, procesos infecciosos)

Valoración podológica del paciente diabético

Nombre: _____ Nº Expediente: _____

Fecha: _____

Califique: **0** = Alteración ausente; **1**= Alteración moderada; **2**= Alteración severa.

PIE DERECHO	PIE IZQUIERDO

EXAMEN DERMATOLÓGICO

Hiperqueratosis	Calif.	Hiperqueratosis	Calif.
a) Plantar		a) Plantar	
b) Dorsal		b) Dorsal	
c) Talar		c) Talar	
Subtotal		*Subtotal*	

Alteraciones ungueales		Alteraciones ungueales	
d) Onicocriptósis		d) Onicocriptósis	
e) Onicomicosis		e) Onicomicosis	
f) Onicogrifosis		f) Onicogrifosis	
Subtotal		*Subtotal*	

Otras localizadas	Calif.	Otras localizadas	Calif.
g) Bullosis		g) Bullosis	
h) Ulcera		h) Ulcera	
i) Necrosis		i) Necrosis	
j) Grietas y fisuras		j) Grietas y fisuras	
k) Lesión superficial		k) Lesión superficial	
l) Otras difusas:		l) Otras difusas:	
Anhidrosis		Anhidrosis	
Tiñas		Tiñas	
Proceso infeccioso		Proceso infeccioso	
Subtotal		*Subtotal*	

Pie derecho — Pie izquierdo

EXAMEN ESTRUCTURA ÓSEA

Deformidades oseas	Calif.	Deformidades oseas	Calif.
a) Dedos en garra		a) Dedos en garra	
b) Halux valgus		b) Halux valgus	
c) Dedos en martillo		c) Dedos en martillo	
d) Infraducto		d) Infraducto	
e) Supraducto		e) Supraducto	
f) Hipercargas bajo metatarsianos		f) Hipercargas bajo metatarsianos	
g) Pie de Charcot		g) Pie de Charcot	
Subtotal		*Subtotal*	

Pie derecho — Pie izquierdo

EXAMEN VASCULAR

Sistema arterial	Calif.	Sistema arterial	Calif.
Pulso pedio		Pulso pedio	
Llenado capilar		Llenado capilar	
Subtotal		*Subtotal*	

Sistema venoso		Sistema venoso	
Varices		Varices	
Edema		Edema	
Subtotal		*Subtotal*	

EXAMEN NEUROLOGICO

Sistema perceptual	Calif.	Sistema perceptual	Calif.
Sensibilidad táctil		Sensibilidad táctil	
Sensibilidad vibratoria		Sensibilidad vibratoria	
Subtotal		*Subtotal*	

Sistema motor	Calif.	Sistema motor	Calif.
Reflejo rotuliano		Reflejo rotuliano	
Dorsiflexión del pie		Dorsiflexión del pie	
Apertura ortejos en abanico		Apertura ortejos en abanico	
Subtotal		*Subtotal*	

Calificacion total		*Calificacion total*	

DIAGNÓSTICO PRESUNTIVO

_____
_____
_____
_____

OPS/DPC/NC/DIA/66/1/-174-04

Acronyms

The following is a combined list of acronyms of institutional names and medical, epidemiological, and social terms found in this publication. In most cases, acronyms are also defined at their first usage.

A1C	glycosylated hemoglobin
ACIC	Assessment of Chronic Illness Care
BMI	body mass index
BP	blood pressure
BTS	Breakthrough Series methodology
CENEXA	Center for Experimental and Applied Endocrinology
DBP	diastolic blood pressure
DOTA	Declaration of the Americas on Diabetes
ENSA	National Health Survey, Mexico
GAM	support groups for people with diabetes in Mexico
HC	health center
IHI	Institute for Healthcare Improvement
IMSS	Mexican Institute for Social Security
LS1	Learning Session 1
LS2	Learning Session 2
LS3	Learning Session 3
NCDs	noncommunicable diseases
NCE	coordinator nucleus in education
PAHO	Pan American Health Organization
PDSA	plan- do- study- act cycle
PEDNID LA	Non-Insulin Dependent Diabetes Education Program of Latin America
PROESA	Exercise Program for the Care of Health
SBP	systolic blood pressure
SESVER	Health Services of Veracruz
UKPDS	United Kingdom Prospective Diabetes Study
VIDA	Veracruz Initiative for Diabetes Awareness
WHO	World Health Organization

References

(1) Secretaria de Salud. Encuesta Nacional de Enfermedades Crónicas. 1993. ISNB 968-811-497-9. Mexico DF, 1996

(2) Velázquez O, Rosas M, Lara A, Pastelin G, Grupo ENSA 2000, Attie F, Tapia R. Prevalencia e interrelación de enfermedades crónicas no trasmisibles y factores de riesgo cardiovascular en México: resultados finales de ENSA 2000. Arch Cardiol Mex 2003, 73(1):62-77.

(3) Wagner EH, Davis C, Schaefer J, Von Korff M, Austin B. A survey of leading chronic disease management programs: Are they consistent with the literature? Manag Care Q 1999, 7(3):56-66.

(4) Secretaria de Salud de Mexico. Información básica del programa de diabetes. Estados Unidos Mexicanos 2000. (no publicado)

(5) Velázquez O, Rosas M, Lara AE, Pastelin G, Grupo ENSA 2000, Attie F, et al. Hipertensión arterial en México: resultados de ENSA 2000. Arch Cardiol Mex 2002; 72:71-84.

(6) Secretaría de Salud. Programa de Acción: Diabetes mellitus. Programa de Salud del Adulto y el Anciano, Secretaría de Salud, México: SSA; 2001.

(7) Programa de Acción: Enfermedades Cardiovasculares. Programa de Salud del Adulto y el Anciano. Secretaría de Salud. México: SSA; 2001

(8) Organización Panamericana de la Salud. Educación sobre diabetes. Disminuyamos el costo de la ignorancia. Washington D.C: OPS; 1996.

(9) Mokdad AH: A Public Health: Increasing prevalence of diabetes. Diabetes Care 2000;23:1278-1283.

(10) Gagliardino JJ, de la Hera M y Grupo de Investigación de la Red QUALIDIAB. Evaluación de la calidad de la atención al paciente diabético en América Latina. Pan American Journal of Public Health 2001;10(5):309-317.

(11) Wagner EH, Glasgow RE, Davis C, Bonomi AE, Provost L, McCulloch D, Carver P, Sixta C. Quality Improvement in Chronic Illness Care. A Collaborative Approach. J Quality Improvement 2001;27(2):63-80.

(12) Gagliardino JJ, EtchegoyenG. A Model Educational Program for People With Type 2 Diabetes: A cooperative Latin American implementation study (PED-NID-LA). Diabetes Care 2001;24(6): 1001-1007.

(13) Gagliardino JJ, Assad D, Gagliardino GG, Kronsbein P, Lahera, Mercuri N, Rizzuti L, Zufriategui Z. Como tratar mi diabetes. ISBN: 987-98423-4-0. Buenos Aires, 2003.

(14) Bodenheimer T, Wagner EH, Grumbach K. Improving primary care for patients with chronic illness: the chronic care model, Part 2. JAMA 2002 Oct 16;288(15):1909-1914.

(15) Daniel DM, Norman J, Davis C, Lee H, Hindmarsh MF, McCulloch DK, Wagner EH, Sugarman JRA. State-level application of the chronic illness breakthrough series: results from two collaboratives on diabetes in Washington State. Jt Comm J Qual Saf 2004 Feb;30(2):69-79.

(16) Daniel DM, Norman J, Davis C, Lee H, Hindmarsh MF, McCulloch DK, Wagner EH, Sugarman JR. Case studies from two collaboratives on diabetes in Washington State. Jt Comm J Qual Saf 2004 Feb;30(2):103-108, 57.

(17) Barceló A, Robles S, White F, JadueL, Vega J. Una intervención para mejorar el control de la diabetes en Chile. Rev Panam Salud Publica/Pan Am J Public Health 10(5), 2001.

(18) Goldhaber-Fiebert JD, Goldhaber-Fiebert SN, Tristan Ml, Nathan DM. Randomized Controlled Community-Based Nutrition and Exercise Intervention Improves Glycemia and Cardiovascular Risk Factors in Type 2 Diabetic Patients in Rural Costa Rica. Diabetes Care 2003;26(1)24-29.

19) Wagner EH, Grothaus LC, Sandhu N, Galvin MS, McGregor M, Artz K, Coleman EA. Chronic Care Clincs for Diabetes in Primary Care. A system-wide randomized trial. Diabetes Care 2001;25(4):695-700.

(20) Olivarius N, Beck-Nielsen H, Andreasen A, Hørder M, Pedersen P. Randomised controlled trial of structured personal care of type 2 diabetes mellitus. BMJ 2001; 323 (27):1-9.

(21) United Kingdom Prospective Diabetes Study (UKPDS) Group. Intensive blood-glucose control with sulphonylureas or insulin compared with conventional treatment and risk of complications in patients with type 2 diabetes (UKPDS 33). Lancet 1998;352 (9131):837–853.

(22) Sadur CN, Moline N, Costa M, Michalik D, Mendlowitz D, Roller S, Watson R, Swain BE, Selby JV, Javorski WC: Diabetes management in a health maintenance organization. Efficacy of care management using cluster visits. Diabetes Care 1999. Dec;22 (12):2011-2017.

(23) de Sonnaville JJ, Bouma M, Colly LP, Deville W, Wijkel D, Heine RJ. Sustained good glycaemic control in NIDDM patients by implementation of structured care in general practice: 2-year follow-up study. Diabetologia 1997 Nov;40(11):1334-1340.

(24) McCulloch D, Glasgow RE, Hampson SE, Wagner E. A systematic approach to diabetes management in the post-DCCT era. Diabet Care 1994;17(7):1-5.

(25) McCulloch DK, Price MJ, Hindmarsh M,Wagner EH. A population based approach to diabetes management in a primary setting: early results and lessons learned. Effective Clin Pract 1998;1(1): 12-22.

(26) Renders CM, Valk GD, Griffin S, Wagner EH, Eijk JT, Assendelft WJ. Interventions to improve the management of diabetes mellitus in primary care, outpatient and community settings. Diabetes Care 2001;24(10): 1821-1833.

(27) Smith DM, Norton JA, Weinberger M, McDonald CJ, Katz BP: Increasing prescribed office visits: a controlled trial in patients with diabetes mellitus. Med Care 1986;24:189-199.

(28) Jaber LA, Halapy H, Fernet M, Tummalapalli S, Diwakaran H: Evaluation of a pharmaceutical care model on diabetes management. Ann Pharmacother 1996 30:238-243.

(29) Day JL, Metcalfe J, Johnson P. Benefits provided by an integrated education and clinical diabetes centre: a follow-up study. Diabet Med. 1992 Nov;9(9):855-859.

(30) Wagner EH, Grothaus LC, Sandhu N, Galvin MS, McGregor M, Artz K, Coleman EA. Chronic care clinics for diabetes in primary care: a system-wide randomized trial. Diabetes Care 2001 Apr 24(4):695-700.

List of Participants in the VIDA Project

Intervention Team

1. **Roberto Tapia Conyer,** Deputy Secretary of Disease Prevention and Health Promotion, Secretariat of Health, Mexico.
2. **Enrique Ruelas Barajas,** Deputy Secretary of Quality Improvement, Secretariat of Health, Mexico.
3. **Mauro Loyo Varela,** Health Secretary and Director-General of Health Services of Veracruz (SESVER).
4. **Luis Fernando Antiga Tinoco,** Director of Health Services of Veracruz (SESVER).
5. **Oscar Velazquez Monroy,** Director-General, National Center of Epidemiological Surveillance and Disease Control (CENAVECE), Secretariat of Health, Mexico.
6. **Agustín Lara Esqueda,** Director, Health Program of the Adult and the Elderly, National Center of Epidemiological Surveillance and Disease Control (CENAVECE), Secretariat of Health, Mexico.
7. **José Antonio Martínez González,** Assistant Director of Process Improvement and Standardization, General Office of Health Quality and Education, Secretariat of Health, Mexico.
8. **Alberto Barceló,** Regional Advisor, PAHO, Washington DC.
9. **Melanie de Boer,** Advisor in Disease Prevention and Control, PAHO, Mexico.
10. **Micheline Meiners,** Consultant, PAHO, Washington DC.
11. **Rosa Aurora Jiménez,** Responsible for the GAM, Health Program of the Adult and the Elderly, National Center of Epidemiological Surveillance and Disease Control (CENAVECE), Secretariat of Health, Mexico.
12. **Alejandro Escobar Mesa,** Assistant Director of Disease Prevention and Control, Health Services of Veracruz (SESVER).
13. **Saturnino Navarro Ramírez,** State Coordinator of Quality Improvement, Health Services of Veracruz (SESVER).
14. **Marcelina García Lopez,** Chief, Department of Disease Control, Health Services of Veracruz (SESVER).
15. **Martha Esperanza Medina Holguín,** State Coordinator of the Health Program of the Adult and the Elderly, Health Services of Veracruz (SESVER).
16. **Gerson Moreno Bonfil,** Medical Supervisor of Quality Improvement, Health Services of Veracruz (SESVER).
17. **María Eugenia Alemán Ortega,** Chief, Health Jurisdiction VIII, Veracruz.
18. **Rafael Moreno Olvera,** Chief, Health Jurisdiction V, Xalapa.
19. **Pedro Antonio Lara Ruiz,** Coordinator, Health Program of the Adult and Elderly, Health Jurisdiction V, Xalapa.
20. **Juan Carlos Hernández Mendoza,** Coordinator, Program of the Adult and Elderly, Health Jurisdiction VIII, Veracruz.
21. **Rosa Elba Ramírez Castellanos,** Coordinator of Quality Improvement, Health Jurisdiction VIII, Veracruz.
22. **Elsa Fernández Gutiérrez,** Coordinator of Quality Improvement, Health Jurisdiction V, Xalapa.

23. Georgina Hoyos Colins, Responsible for QUALIDIAB data entry, Jurisdiction VIII, Veracruz.
24. **Alma Susterik Hernández**, Responsible for QUALIDIAB data entry, Jurisdiction V, Xalapa
25. **Rosa María Ortiz Campos**, Director, Dr. Gastón Melo Health Center.
26. **Carmen Cristina Uscanga**, Director, Coatepec Health Center.
27. **Ricardo Palacios Torres**, Director, Coatepec Hospital.
28. **Elvira Rivera Hernàndez**, Director, Dr. José Maraboto Health Center.
29. **Marisol Aragón Salazar**, Director, Lions Club Health Center.
30. **Abraham Hernàndez Aparicio**, Director, Reserva Tarimoya Health Center (1st half of the Project).
31. **Mario Humberto Silva Andraca**, Director, Reserva Tarimoya Health Center (2nd half of the Project).

Technical Advisors
International Advisors:

32. **Oscar Díaz Díaz**, Director, National Institute of Endocrinology, Havana, Cuba.
33. **Gabriel Gagliardino**, University of La Plata, Argentina.
34. **Charles M. Clark**, Associate Dean, Continuing Medical Education, Indiana University, United States.

National Advisors:

35. **Carlos Gurrola**, Specialist in Podiatry.

Local Advisors:

36. **Manuel Vicuña Beatón**, Ophthalmologist, Health Services of Veracruz (SESVER).
37. **Edgar Chillopa Cerda**, Internist, Health Jurisdiction V, Xalapa.
38. **Luis Ricardo Estrada Díaz**, Internist, Health Jurisdiction VIII, Xalapa.
39. **Rubén Torres Martínez**, Director, Mental Health Hospital, Xalapa, Veracruz.
40. **Gustavo Arenas Beneumea**, Internist, Health Jurisdiction VIII, Veracruz.
41. **Héctor de Leo Tobalina**, Chief, Department of Mental Health.
42. Irasema Guerrero Lagunes, Chief, Department of Mental Health.
43. **Jorge Rivera Cordero**, State Coordinator of the PROESA Program.
44. **Maurilio Diaz Lopez**, Responsible for the PROESA Program, Health Jurisdiction V, Xalapa.
45. **Carolina Aleman Ortega**, Responsible for the PROESA Program, Health Jurisdiction VIII, Veracruz.
46. **Pedro Coronel Brizio**, Director, Dr. Miguel Dorantes Mesa State Oncology Center.
47. **Concepción Araceli Méndez Ramírez**, Psychologist, State Addiction Program.
48. **Enrique de Jesús Gonzalez Cruz**, Laboratory Chief, Dr. Miguel Dorantes Mesa State Oncology Center.
49. **Sandy Elydet Zeferino Castillo**, Psychologist, State Addiction Program.
50. **Jesús Rosales Jiménez**, Psychologist, Mental Health Hospital, Xalapa, Veracruz.
51. **Coral Galina Retureta**, Psychologist, Mental Health Hospital, Xalapa, Veracruz.
52. **Margarita Rosaluz Ortega Osorio**, Psychologist, Mental Health Hospital, Xalapa, Veracruz.

53. **Martha Monserrat Sánchez Díaz,** Psychologist, Mental Health Hospital, Xalapa, Veracruz.
54. **Genaro Jiménez Jiménez,** Biologist, Group ICTZE S.A. de C.V.

Entities

55. Medical and paramedical staff and patients of the following health centers: **Dr. Gastón Melo, Coatepec, Dr. José Maraboto, Reserva Tarimoya and Lions Club.**
56. AVENTIS
57. Staff of the Laboratory at the **Dr. Miguel Dorantes Mesa State Oncology Center,** State of Veracruz.