

Pilot Study of a Comprehensive, Culturally Sensitive Diabetes Case Management Intervention For Poorly Controlled Hispanic Type 2 Patients

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ABSTRACT

We piloted a culturally sensitive diabetes case management tool (Comprehensive Diabetes Management Program, CDMP) based on the Chronic Care Model in an urban community health center. Self management support included use of the Diabetes Self Care Profile (DSCP), a web-based diabetes self management assessment program. The CDMP provides standard clinical algorithms, clinical decision support, treatment guidelines with customizable alerts, and reminders. The CDMP integrates the Joslin Vision Network eye screening telemedicine system and its nonmydriatic (non-dilated eye) camera, and standardized retinopathy reading at the Joslin Diabetes Center, Boston, Ma. PCPs receive a regular summary report of the CDMP findings from study case managers to support practice guideline adherence. Forty eligible patients (Hispanic, Type 2, poor bg control with A1c 7.5% or higher) were randomized to case management intervention (CMI) or attention control (AC). The sample was 67% female, mean age 57 yrs., 61% had diabetes >10 years. In year prior to randomization, 40% had >=1 ER visit, 35% a foot exam, 23% an eye exam. CMI patients received 6 individual 1 hour visits to the CMI team (Hispanic diabetes nurse and dietitian) over one year. We report here 6 month findings

only. Attention control received 6 individual visits with lay clinic staff trained to discuss standardized diabetes education materials. Results showed that HbA1c was significantly lowered for the CMI group as compared to AC (-1.2%±1.4 vs. -0.07%±1.0, p<0.02). Systolic and diastolic blood pressure were also significantly lowered for CMI (both p<0.02). Yield for the JVN eye screening showed 26.3% of CMI pts. required treatment follow-up for retinopathy or macular edema. DSCP results showed 87.5% of CMI pts. reported one or more psychosocial barriers at baseline. High diabetes emotional distress (Problem Areas In Diabetes, PAID score >=50) was found for 66.6%, major depression (using PHQ) for 52.3%, hypoglycemia for 57.1%, binge eating for 28.6%, low social support for 23.8%, and alcohol abuse (using CAGE) 0%. PAID change scores were significantly lowered (improved) for CMI (-11.8± 24.8) and increased for AC(+4.4 ±21.2)(p<0.03). Overall, our 6 month CDMP pilot data showed improved clinical and psychosocial outcomes, successfully identified pts. requiring treatment for retinopathy and identified a high proportion of pts. with psychosocial barriers to self management.

Note: Abstract submitted to the American Diabetes Association Annual Scientific Meeting 2007

BACKGROUND

Comprehensive Diabetes Care

- Gaps exist between clinical practice and evidence based recommendations in the US for diabetes. Clinical practices in the US face pressures to improve adherence to these national practice guidelines, improve workflow and document procedures and outcomes, develop high standards of care, reduce diabetes related co-morbidities, achieve accreditation, and control costs.
- Optimal patient management of chronic illnesses such as diabetes is complex: It requires a multidisciplinary, evidence based, population and patient-centered approach that uses behavioral theory and practical behavior change strategies, is culturally sensitive, and leverages available information technology.
- Practices that are early adopters of this comprehensive approach may potentially enjoy a competitive advantage, improve the quality of patient care, and enhance professional satisfaction of clinical staff. Ongoing research and quality improvement are critical components of this comprehensive approach.

Case Management

- Case Management is a collaborative population based clinical approach which is both specific and flexible in assessing, planning, implementing, coordinating, monitoring and evaluating the options and services for the individual patient across the continuum of care.
- Assessment, case plan development, and ongoing monitoring and service coordination using evidence based practices are key components of case management.
- Based on the needs and practical self management barriers facing the patient, and in collaboration with all service providers including the PCP, the case manager links clients with appropriate providers and resources throughout the continuum of health and human services and care settings, while ensuring that the care provided is safe, effective, client-centered, timely, efficient, and equitable.

The Comprehensive Diabetes Management Program (CDMP)

- The CDMP is a web based case management tool that is designed to function on top of an electronic medical record (EMR) system. It aims to standardize clinical practices, procedures, and care for diabetes patients using national guidelines from the American Diabetes Association
- CDMP uses a system of dynamic red, yellow, and green clinical alerts generated from a risk assessment algorithm based on established diabetes management guidelines to provide decision support (See Figure 1)
- It uses a clinical risk assessment engine based on 5 subspecialty diagnoses (cardiovascular disease, renal disease, eye complications, peripheral vascular disease, and blood glucose control)
- CDMP provides a clinical snapshot that is the primary focus at the case management visit and is then sent to the Primary Care Provider (see Figure 2)
- It includes an diabetic eye telemedicine link to Joslin Diabetes Center in Boston (see Figure 3 for JVN report)

- It incorporates an embedded behavior/self-management assessment tool that is completed by the patient and generates a summary for discussion with the patient, the Diabetes Self Care Profile (see Figure 4)
- CDMP provides a high level of patient and medical records privacy
- It provides a chronic illness management strategy that can be adapted for other chronic illnesses such as renal failure, metabolic syndrome, asthma, arthritis, etc. We are currently developing a bariatric surgery tool in collaboration with BMC's Weight Loss Surgery Program clinical team.

How is CDMP development and research currently funded?

- CDMP represents a collaboration of diabetes expertise from the Department of Defense, the Veterans Health Administration, the Indian Health Services, the Centers for Disease Control, the Joslin Diabetes Center, and several clinical sites in Hawaii and at Baystate Medical Center
- CDMP is currently supported through federal funding from the Department of Defense.
- The Baystate Medical Center pilot study reported here is funded by an Academic Affairs research grant awarded to Behavioral Medicine Research.

Where is CDMP Being Used Clinically?

- Joslin Diabetes Center, Boston
- Walter Reed Army Medical Center, Washington DC
- Indian Health Services at Phoenix Indian Medical Center, AZ
- Veterans Affairs Healthcare System, Boston
- 3 diabetes clinical sites in Hawaii (Waianae, Mililani, Molokai)

CDMP and the Joslin Vision Network (JVN)

- The JVN is a diagnostic retinal evaluation telemedicine system incorporated into CDMP:
- JVN provides nonmydriatic (non-dilated) diabetic eye evaluation that has been validated against dilated eye exams by retinal specialists and the gold standard of imaging, 35 mm stereo slides.
 - While a patient is being seen in a primary care office, a staff imager certified by Joslin Diabetes Center takes digital images of the patient's retina using JVN software and imaging hardware. The procedure is fast and pain free, and does not involve pupil dilation so enhances patient adherence to screening.
 - The JVN images are sent to the JVN Reading and Evaluation Center at Joslin Diabetes Center in Boston via Virtual Private Network connection where specialists evaluate the digital photos. The JVN reports (see Figure 3) generated within 48 hours provide assessment and treatment recommendations for diabetic retinopathy and other ocular diseases. Digital eye images are included in CDMP to enhance patient education and motivation when findings are discussed with the case manager.

METHODS

The CDMP Pilot Study at High Street Health Center

- We are pilot testing the CDMP at HSHC in a one year intervention study of 40 poorly controlled (HbA1c >7.5%) Hispanic patients randomized to either CDMP case management or an attention control (AC) education condition. The AC group receives education support from several trained lay staff who use standard diabetes education brochures to structure the individual education sessions. All study patients received 6 one hour clinic visits in the first 6 months and then 3 in the final 6 months of the intervention.
- Baystate Reference Laboratory data was imported into CDMP. Other clinical data was entered using data entry templates.
- The DSCP self management assessment was completed at the first visit.
- The 2 person clinical team comprises 1 CDE nurse and 1 Registered Dietitian who are both bicultural (English/Spanish) and spend 30 minutes each with the patient
- Nurse: takes vital signs, discusses patient self management concerns, evaluates blood glucose data, reviews medications, checks blood glucose meter accuracy, and arranges for referrals to eye and foot specialists, mental health, communicates CDMP reports and recommendations to PCP.
- Dietitian: reviews diet plan, reviews behaviors and skills: carbohydrate counting, low fat diet, healthy protein and fat intake. Diet plan based on cultural food preferences. Dietitian also reviews exercise patterns, discusses weight control, checks pharmacy for medication adherence.
- Collaborative goal setting is documented.

- Clinical sensitivity components:
 - ♦ Bicultural CDE nurse and dietitian care case management team
 - ♦ Easy patient access to care in dedicated case management office
 - ♦ Education materials and questionnaires translated into Spanish
 - ♦ Patients assisted with reading/questionnaire completion by case managers to overcome numeracy, literacy barriers, and comprehension barriers

Diabetes Self Care Profile

- The Diabetes Self Care Profile (DSCP) is a web-based self management assessment tool embedded in the CDMP. Self management support is an important component of the Chronic Care Model (see Figure 5)
- It is designed to support the clinician and patient working together to improve the patient's blood glucose control and quality of life. The DSCP identifies current self care behaviors and typical diabetes psychosocial problems that can undermine diabetes self care.
- A one-page report identifying the patient's own current self care problems and issues is generated following the DSCP assessment process. This report can help structure the conversation between patient and clinician regarding potential behavior change areas of focus, barriers, motivation, and strategies for making realistic and workable changes.

What does the DSCP do?

- Assesses patient's current diabetes self care behaviors (diet, exercise, diabetes medications, blood glucose monitoring) with a brief set of 10 questions.
- Identifies one self care topic to work on now and patient's goal for the next month.
- Identify specific barriers the patient faces in that area of self care (e.g., for exercise 'bad weather or outside conditions', for diet 'I eat when bored or stressed').
- Assesses 6 known psychosocial problem areas that can hinder diabetes self care (i.e., major depression, alcohol abuse, binge eating, low social support, hypoglycemia, high levels of diabetes specific emotional distress or burnout).
- If the patient is not on insulin treatment he or she is assessed regarding perceived barriers to going on insulin therapy to improve blood glucose control.
- Most recent A1c is presented using a 'thermometer'-style graphic with red, yellow, or green coding used to signify level of danger of blood glucose. This helps the patient reflect on this important lab result and tie it with self care goals

FIGURES

Figure 1
The CDMP Interface – Clinical Alerts

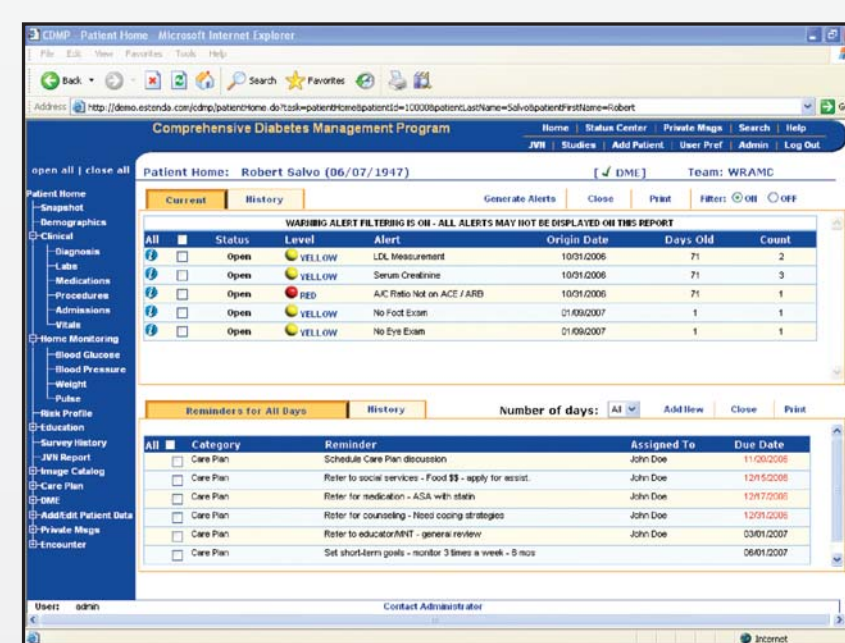


Figure 4
The CDMP Interface – DSCP Report

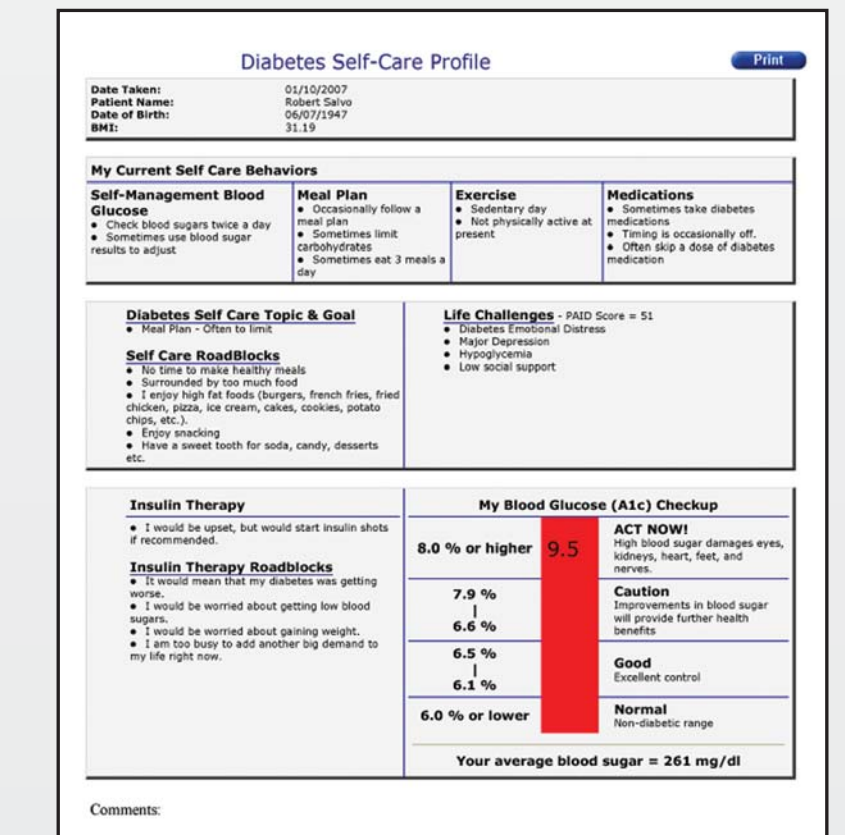


Figure 5
The Chronic Care Model



Figure 2
The CDMP Interface – SNAPSHOT summary

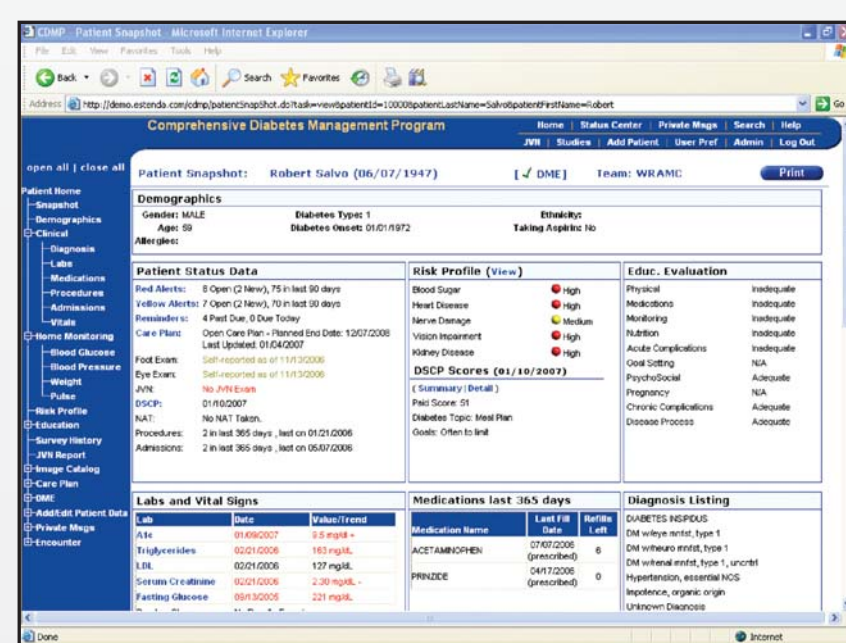


Figure 3
The CDMP Interface – JVN Report

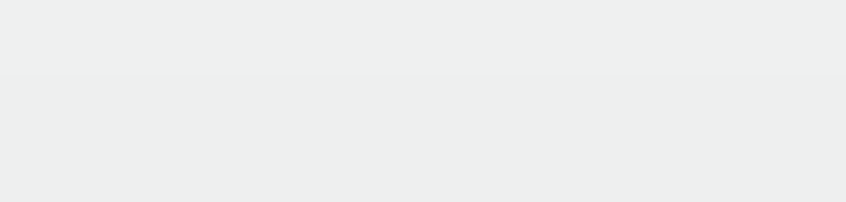


TABLE 1

CDMP Intervention vs. Attention Control Group: 6 Month Outcomes

Measure	Group	Baseline Mean (SD)	6-months Mean (SD)	Change*	Significance †
Clinical	HbA1c (%)	Control 8.5 (1.0)	Intervention 9.0 (1.3)	0.07 (1.0)	p < 0.02
	Systolic BP (mmHg)	Control 143.5 (29.2)	Intervention 131.7 (18.2)	-0.53 (24.7)	NS
Diastolic BP (mmHg)	Control	82.1 (13.9)	83.4 (12.0)	1.2 (12.7)	p < 0.09
	Intervention	80.2 (12.5)	74.6 (11.6)	-5.6 (11.1)	
JVN identified retinopathy or macular edema	Intervention	26.3%			
Psychiatric/Psychosocial	Major Depression (PHQ)	Control 41.6 (22.4)	Intervention 52.3 (24.9)	4.4 ±21.2	p<0.03
	Diabetes emotional distress (PAID, 0-100 range)	Control 41.6 (22.4)	Intervention 52.3 (24.9)	-11.8 24.8	
Hypoglycemia episodes	Intervention	57.1%			
Low social support	Intervention	23.8%			
Alcohol abuse (CAGE)	Intervention	0%			

Note: † Statistical Significance of Difference between groups in mean change

CONCLUSIONS

- The bicultural diabetes case management team approach used in this pilot study was well received by the bicultural clinicians and by our poorly controlled type 2 Hispanic intervention patients
- The CDMP intervention was very effective in reducing blood glucose control (-1.2% HbA1c) and also benefited blood pressure based on 6 month interim data for the one year intervention when compared to an attention control education group.
- High levels of depression, diabetes related emotional distress, and hypoglycemia were identified by the DSCP assessment.
- Diabetes related emotional distress was significantly lowered by the intervention.
- 25% of patients were identified as needed follow up for diabetic eye problems by the JVN telemedicine system integrated into the CDMP

FUTURE DEVELOPMENT AND RESEARCH

The following CDMP features are currently in development working with the CDMP consortium:

- An education tracking tool with embedded multimedia, multi-level educational resources that are site and user specific
- A knowledge assessment tool that evaluates the impact of the educational intervention
- An embedded nutrition assessment and advisory module
- A "patient portal" with internet access to report various self-test information, problems, and/or issues, download test results, such as their home blood glucose monitoring efforts, adjustments to their routines, and resource information from their care team (see Figure 4)
- A Primary Care Practitioner (PCP) module that incorporates an additional level of detail associated with co-morbidity diagnoses and a more detailed patient risk assessment summary

Next research steps:

- We will have more outcomes available for the one year end point of the study (healthcare utilization, diabetes knowledge, treatment satisfaction, etc).
- We are using the pilot data reported here to prepare an NIH grant application that will allow us to conduct a large scale RCT study using the CDMP at HSHC. The RCT study will involve:
 - more intensive use of the DSCP self management assessment tool;
 - behavior change counseling training for the case managers, and;
 - a long term follow up strategy for all patients.