



The Care Management Institute's Integrated Diabetes Care Program:

A Collaborative Approach to Improving Patient Care and Outcomes

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Diabetes represents one of the most common and debilitating conditions seen among Kaiser Permanente (KP) members. Because care often involves multiple providers and because follow-up requires persistence by patients and clinicians alike, ideal outcomes are often difficult to achieve. Management of diabetes therefore offers an excellent opportunity to practice population management—a systems approach designed to ensure excellent care. Accordingly, through a broad KP collaboration, the Care Management Institute (CMI) developed a comprehensive approach to adult diabetes care: the Integrated Diabetes Care (IDC) Program. The IDC Program has three elements: an internally published report, Clinical Practice Guidelines for Adult Diabetes Care; a set of tools for applying population management and patient empowerment concepts; and an outcomes measurement component, ie, instruments for evaluating IDC Program impact and gathering feedback. In this article, we describe the IDC Program and the process by which it was developed. Included are specific examples of the tools and how they can be used at the population level and by individual clinicians in caring for patients.

Introduction

Toward the end of a busy morning session, Ms. Hopeful—a patient who is hypothetical but typical of many—appears in your office because of a week-long sore throat and a mildly productive cough. She also has diabetes (which you diagnosed seven years ago) and hypothyroidism. After taking the medical history and giving a physical examination, you diagnose a viral upper respiratory infection but also note that the patient has missed her last two appointments and has not been seen for her diabetes in more than a year.

You're running late today and scheduled a lunchtime meeting with your Chief of Service. As you thumb through Ms. Hopeful's thick medical chart for evidence of her last eye examination and relevant screening studies, you ask her about her diet and self-monitoring of blood glucose level. She tells you she thinks she is "doing okay" with her diet but could probably do better. She says she checks her finger stick results a couple of times a month and that they usually run 200 to 300 mg/dL, sometimes higher. She has not smoked in five years, she is proud to tell you.

By the end of her review, you still have not located records for her last eye examination—and the patient cannot recall when she last had one. Neither can you find the laboratory data for her last check of HbA_{1c}, microalbumin, lipid, or TSH level. You are also falling farther behind in your schedule, and you know that your Chief is a stickler for punctuality.

The Integrated Diabetes Care (IDC) Program was created for people like Ms. Hopeful. In an integrated

program, a registry component identifies patients who are "falling through the cracks" and thus facilitates proactive identification and connection with this group. The risk registry being developed for the Kaiser Permanente (KP) National Clinical Information System will allow online access to all Ms. Hopeful's pertinent clinical data during her visit. This access eliminates the need to wade through a daunting paper record for relevant information.

Ms. Hopeful's microalbumin level turned out to be elevated when last checked. This result—confirmed by repeat testing—is early evidence of end-stage organ damage. Ms. Hopeful is an excellent candidate for care management.

Care management allows a more coordinated approach to care by using a multidisciplinary team. A care coordinator ensures that all appropriate laboratory values are checked, that the patient is given lisinopril as treatment for nephropathy, that the patient's blood glucose level is controlled through both improved diet and medication management, and that the patient is taught the importance of self-care.

After completing a care management program, Ms. Hopeful says she feels more confident of her ability to participate in her own care and now understands why she must not miss any appointments. She returns to your care with all screening in order and with her medications fine-tuned. You know you will receive regular updates on her screening tests through the quarterly diabetes reports for your patient panel.

For more information about the Integrated Diabetes Care Program, please phone the CMI Product Information Line at 510-271-6426 or e-mail CMI products @ kpxchange.org

"Care management allows a more coordinated approach to care by using a multidisciplinary team."

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"A national study found that the cost of caring for the typical health plan member with diabetes was more than four times the cost of caring for nondiabetic members."²

"The IDC Program focuses on approaches that are either distinctive or emphasized in the current medical literature."

The Need for Coordinated Diabetes Care

The scenario described above shows how a diabetes care management program might improve the quality of life for an individual member, but that opportunity for improvement would apply to literally thousands of our members every day. The national prevalence of diabetes has been rising in recent decades. Among KP members, the prevalence of diabetes ranges from 3% to 6% across our 12 Regions, and data suggest that almost that many people in the general population have the disease without yet having been diagnosed.¹

The consequences of diabetes are profound. Diabetes is responsible for increased rates of myocardial infarction, stroke, kidney disease, and limb amputation, among other serious ailments. Consequently, caring for the complications of diabetes leads to dramatically higher health care costs. A national study found that the cost of caring for the typical health plan member with diabetes was more than four times the cost of caring for nondiabetic members.²

Within KP, the cost differential was best measured in a Division of Research study led by Joseph Selby, MD, MPH, that compared cost of caring for KP Northern California diabetic patients with the cost of caring for a matched cohort of nondiabetic patients. The study found that the cost of caring for diabetic patients was approximately twice the cost for nondiabetic patients, suggesting that better care may provide an opportunity for savings, ie, by reducing the \$20 million differential in cost of diabetes care in the KP Northern California Region.³

Studies have shown that careful diabetes population management is highly cost-effective.^{4,5,6}

CMI's Integrated Diabetes Care (IDC) Program

The Care Management Institute (CMI) emerged from the National Partnership Agreement forged between the Permanente Medical Groups (through The Permanente Federation) and Kaiser Foundation Health Plan. CMI's vision is to develop a nationally consistent, evidence-based, process-efficient approach to delivery of health care that is customized to the individual member.

With the goal of systematically evaluating and improving care of our adult members with diabetes, CMI released an Integrated Diabetes Care (IDC) Program in January 1998. Work is now underway in almost all KP Regions to implement a care management program for all members with diabetes. (Some KP Regions already have such a program in place and provided much of the expertise for the CMI IDC Program's development.) CMI's IDC Program grew out of KP's Interregional Diabetes Effort, a national

collaboration to develop, implement, and enhance disease management programs in diabetes care.

Combining the knowledge and experience of many KP physicians and health care professionals across the nation, the IDC Program provides tools for national, Programwide implementation of KP's *Clinical Practice Guideline for Adult Diabetes Care* as well as evaluation of this implementation against a set of outcomes measures. The IDC Program also includes a curriculum for patient education and care redesign.

The core components of the IDC Program include *Clinical Practice Guidelines for Adult Diabetes Care*; use of tools that emphasize patient education and empowerment; and attention to monitoring and tracking outcomes for the population of diabetic patients.

As part of the IDC Program, CMI has produced two implementation manuals: The *Integrated Diabetes Care IDC, Version 1.0* manual is intended to assist local KP areas in design, implementation, or enhancement of programs for adult diabetic patients; *Living Well With Diabetes, Step by Step* manual is an interactive patient education curriculum that promotes self-management and skill-building for people living with diabetes.

The IDC Program focuses on approaches that are either distinctive or emphasized in the current medical literature. Tools used as part of the IDC Program are designed to be as generalizable as possible, providing flexibility so that physicians and other health care professionals can adapt them to their own patients and unique care settings. Some tools may need to be customized for special patient populations. Although the IDC components and tools can be implemented separately, care management programs are most effective when they are fully integrated to provide a comprehensive approach to caring for the target population; implementing individual pieces alone appears to have far less impact. However, no formal outcomes data are available to compare the efficacy of implementing a whole program versus the efficacy of implementing only some component parts.

Process for Developing the IDC Program

To develop an informative, valid, and feasible operating plan, more than 70 experts in diabetes, adult behavior change, operations, and outcomes evaluation from across KP met in six workgroups for more than a year. The groups developed a comprehensive program of diabetes care that includes *Clinical Practice Guidelines for Adult Diabetes Care*, a model of care delivery, a curriculum for patient education, and outcomes measures (including technical specifications for administrative data as well as a survey template for collecting patient information). Materials will be reviewed and updated regularly.

Fig. 1. IDC Program Clinical Guidelines for glycemetic control (excerpt)

Goals for glycemetic control:

If hemoglobin A1c is used to assess long-term glycemetic control, the target goal is 1-2% greater than the upper limit of normal for the lab where the test was performed. Individual needs should determine the appropriate goal for any given patient. If an analogous test of glycemetic control is used, the appropriate equivalent value should be used.

Interval to monitor long-term glycemetic control:

Once goals for glycemetic control have been attained, testing should be performed every 3-4 months for those requiring insulin, and every 6-12 months for patients not requiring insulin. The test should be performed more frequently if the glycemetic control goals have not been met, if the patient's diabetes medications are being altered, or if the therapeutic goal is to attain tight control.

Self-monitoring of blood glucose:

All diabetic patients should be offered patient education on self-monitoring of blood glucose. This should be documented in the medical record. The goal of self-monitoring should be to maintain fasting blood glucose values of between 80 and 120 mg/dL, and to aim for a 2-hour post-prandial value of < 180 mg/dL, or as individualized to each patient's situation. If preprandial values are > 150 mg/dL or post-prandial values are > 200 mg/dL, the physician and/or health care professional should reassess the need for tighter control. Patient success with self-management should be reviewed and reassessed at least annually. When appropriate, education in self-monitoring should be reoffered to patients.

"The Guidelines are written in a concise instructive style designed to enable primary care physicians and other clinicians to use the IDC materials easily."

Clinical Practice Guidelines of the IDC Program

Clinical Practice Guidelines for Adult Diabetes Care is the core of the IDC Program and consists of a series of algorithms and protocols to assist in screening, treating, and referring patients, depending on their specific circumstances. The guidelines are written in a concise instructive style designed to enable primary care physicians and other clinicians to use the IDC materials easily.

Presented (Figs. 1-3) are excerpts from the *IDC Clinical Practice Guidelines for Adult Diabetes Care* in three areas—glycemetic control, renal screening, and podiatric screening—which are especially important in diabetes care. *Clinical Practice Guidelines for Adult Diabetes Care* can be found on KP Exchange, a secure Internet website for use by clinical and nonclinical employees of KP (who may register online at www.kpexchange.org).

Glycemetic Control

Long-term control of blood glucose levels is the hallmark of effective diabetes care, and compelling evidence exists to show that this practice leads to lower complication rates. The IDC Clinical Practice Guidelines recommend assessment of long-term glycemetic control by using a laboratory test such as for hemoglobin A1c levels. If another test is used, its results should be correlated to HbA_{1c} test results.

Renal Screening

Diabetes patients are at risk for kidney damage that may ultimately require dialysis treatments. For patients who have tiny amounts of protein detected in their urine (ie, microalbuminuria), medication can delay or prevent deterioration of kidney function. Although the ideal interval for microalbumin testing is unclear, most groups (including the authors of KP's IDC Guidelines and the American Diabetes Association) currently recommend annual screening for microalbuminuria. It is unnecessary to test for microalbumin in patients with more advanced stages of kidney impairment.

Podiatric Screening

Regular examination of the feet is an important component of diabetes care because it facilitates early detection of peripheral vascular disease and peripheral neuropathy. The American Diabetes Association requires that at least 74% of a clinician's diabetic patients have a foot examination within a 12-month period in order to acquire points toward its provider recognition program.

Model of Care

The model of care is the infrastructure and process for managing and delivering patient care (Fig. 4). The IDC model of care is based on four key criteria: proven effectiveness; patient acceptance and satisfaction; facilitation of continual learning for diabetic



Fig. 2. IDC Program Clinical Guidelines for renal disease (excerpt)

Patients without known renal disease should be screened annually, by first morning dipstick or equivalent measure, for microalbumin in the urine. Those patients (either Type 1 or 2, normotensive or hypertensive) who test positive for microalbumin on at least two occasions should be treated with an angiotensin-converting enzyme (ACE) inhibitor medication, unless contraindicated.

Fig. 3. IDC Program Clinical Guidelines for podiatric screening (excerpt)

Visual inspection of the feet should be performed at all primary care visits. A full foot examination (including visual inspection for ulcers, cracks, calluses, and pressure points; palpation for pulses; and sensory testing—preferably with 10 g monofilament) should be performed at least annually or as clinically appropriate at each diabetes encounter. Findings should be documented in the medical record. Patients with exams that reveal one or more abnormalities should be referred if appropriate. Once a patient has demonstrated a foot abnormality they should receive a visual inspection of the feet every 3-4 months.

patients and for the professionals serving them; and feasibility of implementation.

The model of care has four important components: population identification through a registry; stratification of patients; commitment to a team approach; and evaluation of care.

Population Identification Through a Registry

The main purposes for a diabetes registry are to:

- Identify the diabetes cohort;
- Sort the cohort;
- Track services (ie, preventive screening);
- Target the patient population whose care is to be coordinated; and
- Evaluate treatment outcomes.

A registry can also be used to generate targeted mailings or clinical feedback reports and for other quality improvement projects. Reports also can be generated to show employers the care which their at-risk employees are receiving from KP.

Stratification of Patients

The stratification method is based on critical synthesis of existing stratification methods within KP and on cost-effectiveness modeling. The precise stratification for a given population is determined by several factors: size

of the diabetic population, local KP leadership's program objectives (eg, to demonstrate improved health outcomes in a brief period or improved Health Plan and Employer Data and Information Set [HEDIS] results), staffing expectations (especially for the care coordinator positions), and extent to which enabling technologies, such as care management software, can be used to serve larger numbers of patients.

At initial patient evaluation or when reviewing the local patient registry, the diabetic patient population must be segmented into groups most likely to benefit from different levels of intervention. The stratification methodology is intended to be coupled with other aspects of the IDC Program (ie, patient education, group visits, and programs for self-management of chronic disease) that provide direct service to patients. The stratification process relies on available KP data bases, allowing segmentation of the entire diabetic patient population without necessitating additional intake interviewing.

The stratification methodology in the IDC Program creates three tiers of patients with diabetes. The patients with the least severe disease are well controlled and usually have no evidence of end-stage organ damage. These patients will continue to receive most services in the usual way from their primary care physician or health care professional. Depending on available resources and maturity of the Program, some of these patients may also be targeted to receive additional educational programs to improve their diet and activity levels.

Patients with the most severe disease (about 15% of the diabetic patient population at any time*) have major, multiple complications from diabetes, often requiring subspecialty services. Comorbidity caused by long-standing diabetes is often the major medical problem. These patients are potential candidates for "case management."

Between these two extremes is a sizable cohort of patients who have clinically significant diabetes care needs but whose care management can be handled well through a care coordination system. Typically, this cohort represents about 50% to 60% of diabetic patients (depending on age and severity of the cohort as well as on the criteria used for inclusion and exclusion). Markers for these patients include

- Retinopathy;
- Microalbuminuria or early proteinuria;
- Angina;
- Neuropathy;
- Poorly controlled blood glucose values in relatively young patients;

*Population proportion estimates developed by diabetes outcomes researchers and program developers and validated against medical center level data in South San Francisco.

"The stratification method is based on critical synthesis of existing stratification methods within KP and on cost-effectiveness modeling."

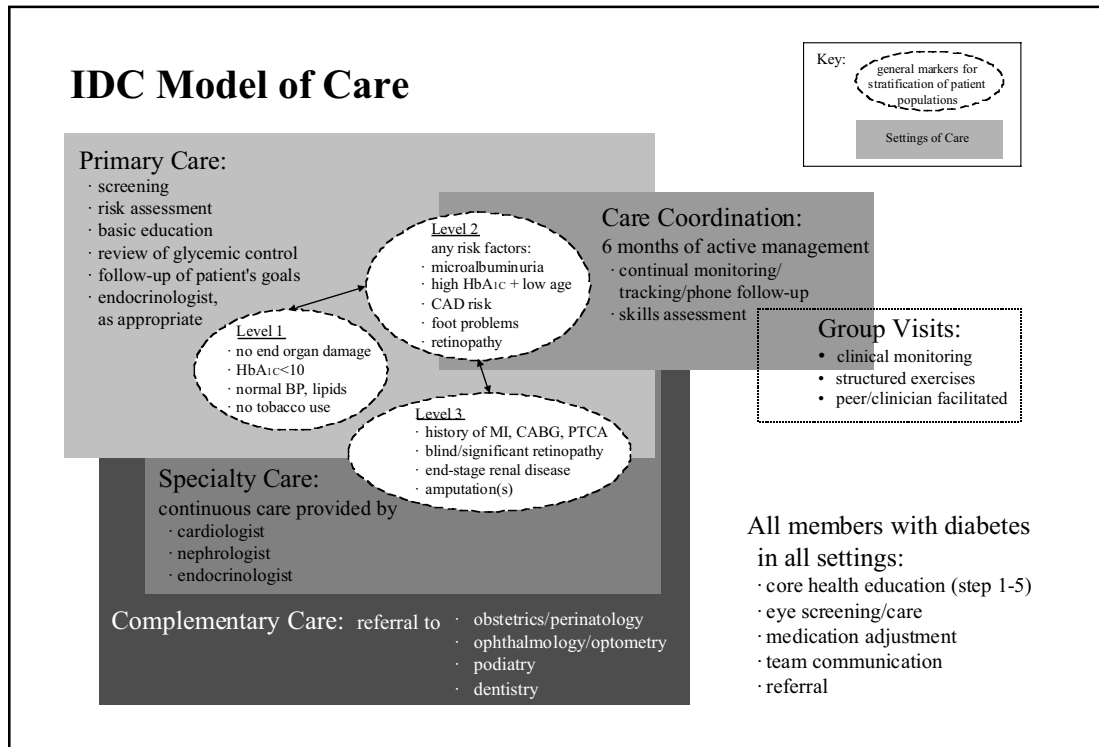


Fig. 4. The IDC model of care stratifies patients into three levels according to patient severity.

- Hypertension and hyperlipidemia with no history of cardiovascular or cerebrovascular disease.

The exact mix of inclusion and exclusion criteria as well as duration of enrollment in a care management program should be determined, using different markers, in consultation with the local KP leadership through iterative review of the size of the three strata. Another criterion for assigning patients to care management is candidates' readiness to make major lifestyle changes. To obtain such information, however, all candidates must be interviewed. Local KP leaders should decide whether to evaluate this parameter.

Commitment to a Team Approach

The model of care is a team approach in which specific responsibilities are assigned to different providers (eg, a care coordinator, diabetes educator, primary care physician, or eye-care specialist). Many team roles are likely to be new and unfamiliar to members of the team. Primary care physicians, in particular, will play more of an oversight and management role; direct patient contact is likely to be delegated to other team members. Because team members must clearly understand what is expected of them and must also understand the relationships within the team and with patients, team members' roles are clarified and rein-

forced by position descriptions, support materials, and specially tailored training sessions.

The local KP leadership should determine how care can best be complemented through use of nonphysician clinicians who have diabetes-related clinical expertise. In addition, a key contact at the local level must be identified to explain care priorities and to provide patient registry data at timely intervals.

Evaluation of Care

All implementation should be evaluated to determine what is working and what really makes a difference. The CMI is learning about the IDC model of care by working with leaders at local sites to:

- Determine priorities for patient stratification;
- Evaluate ability of physicians and other health care professionals to interpret and use stratification reports;
- Assess how well the stratification method directs at-risk patients to care coordinators for an intensive level of care management;
- Measure impact on patients' health status, self-confidence in managing their own disease, and satisfaction with care;
- Interpret whether stratification increases process efficiencies, ie, by reducing the need for physician visits and hospitalizations.

"Another criterion for assigning patients to care management is candidates' readiness to make major lifestyle changes."

"Direct patient contact is likely to be delegated to other team members."



"Patients are encouraged to use the wallet-sized card to record their medical visits and laboratory test results."

"Educational messages are tailored to each patient's readiness for change and to each provider so that they are continually reinforced."

"Speed Charting" Template, Page 2 out of 3. Other pages include history and follow-up visit forms.

INITIAL VISIT <input type="checkbox"/> Home <input type="checkbox"/> Office <input type="checkbox"/> Hospital		ORAL HEENT NECK LUNGS HEART ABDOMEN	PHYSICAL EXAM Vision: Normal for near/distance; visual evoked response Stable without orthoptics or glasses Clear to auscultation Regular rate and rhythm; no murmurs or extra heart sounds Soft without hypergastrointestinal tenderness or masses
CURRENT TREATMENT OF DIABETES MEDICATIONS MEAL PLAN RESULTS OF GLUCOSE MONITORING		SKIN FOOT-ulcers FOOT-neuro FOOT-pulses NEURO	No rashes or lesions; injection skin bridge Normal sensation to light touch; no numbness Pedals to 200% bilaterally Normal reflexes and normal muscle tone
GLYCOSYLATED HEMOGLOBIN RECORDS DATE LAB EVALUATIONS FASTING PLASMA GLUCOSE FASTING LIPID PROFILE (chol, LDL, HDL, TG) SERUM CREATININE URINE PROTEIN/MICROALBUMIN URINE KETONES URINE GLUCOSE OTHER TESTS, IF INDICATED (TSH) ECG IMMUNIZATIONS (INFLUENZA, PNEUMOVAX) OPHTHALMOSCOPIC EXAM REFERRALS (PATIENT EDUCATION, NUTRITION, SMOKING CESSATION, SOCIAL SERVICES, PODIATRY)		MANAGEMENT PLAN / SUGGESTED COUNSELING CHECKS/ISSUES WHICH NEED ADDRESSING <input type="checkbox"/> Self-monitored blood glucose <input type="checkbox"/> Glycemic control goals: Fasting _____, Postprandial _____, HbA1c _____ <input type="checkbox"/> Smoking cessation - quit date _____ <input type="checkbox"/> Meal Plan <input type="checkbox"/> Self-control <input type="checkbox"/> Exercise plan <input type="checkbox"/> Foot Care: Inspect _____, Wash _____, Moisturize _____ <input type="checkbox"/> Routine eye exam (primary care, ophthalmologist, optometrist) <input type="checkbox"/> Self-monitoring blood glucose <input type="checkbox"/> Taking medications correctly <input type="checkbox"/> Foot checks <input type="checkbox"/> Pregnancy planning MEDICATIONS REFERRAL TO CARE COORDINATION <input type="checkbox"/>	

Fig. 5. Page from template developed for providers by the Care Management Institute to assist in "speed charting" for patients with diabetes.

Recommended care and testing:

Self-monitoring of Blood Glucose	every day
Review Records	every 3 months
Blood Pressure	every visit
Weight	every visit
Height	every 6 months
Foot Exam	every visit
HbA1c	every 3 months
Review Personal Goals	every visit
Microalbuminuria	every year
Ketosteroid	every year
Cholesterol	every year
LDL target	less than 100 mg/dL
Dilated Eye Exam	at least every other year
Flu Shot	every year
Dental Exam	at least every 6 months
Podiatry	at least every 6 months
Patient Education	group or individual

Personal Diabetes Record

Keep this record for your records. Use it to help you and your doctor to keep track of your diabetes. Use this card to record your visits and lab results. Take this card with you when you visit your doctor or another member of your diabetes care team. He or she will discuss these aspects of care and your progress.

Fig. 6. Wallet-sized card for use by patients with diabetes in monitoring their care and controlling their own health.

Computer software for population management is a key tool for care coordination and is an important component of diabetes care management. Ideally, software should be able to quickly identify patients in trouble—for example, those who are not filling prescriptions or whose blood glucose levels are becoming dangerously high—and to remind care coordinators about scheduled follow-up care. The software

should also be able to broadcast messages by e-mail, phone, fax, or paper to other team members (and, in future, to patients). Current approaches can deliver some of these services. The KP National Clinical Information System currently under development is expected to provide these services in the future.

In the absence of computer software, other tools can lend assistance for care management. For example, CMI has developed a template for a paper version of "speed charting" for patients with diabetes (Fig. 5). The Speed-Charting Template allows clinicians to easily check and record pertinent clinical data at routine scheduled visits.

A Personal Diabetes Record (Fig. 6) is another paper-based way to monitor the health status and treatment history of diabetic patients in the absence of computer software. Patients are encouraged to use the wallet-sized card to record their medical visits and laboratory test results. They take the wallet card with them when they visit their physician or other member of the Diabetes Care Team, using it to discuss aspects of their care. The card unfolds to reveal panels which include space for listing areas for discussion, for noting goals, and for recording medications, medical visits, laboratory test results, and phone numbers. In this way, the wallet card helps members to monitor and control their own health.

Patient Education

Another key component of the IDC Program is integrated patient education. Based on the KP Northwest Region's *Step-by-Step Program* and the KP Northern California Region's *Living Well with Diabetes Program*, the patient education component encourages Health Plan members with diabetes to participate in groups. The groups give members an opportunity to talk with others who face similar problems and to increase the number of educational encounters they have with KP.

To change the traditional, didactic method of diabetes education, patients are asked to set and pursue specific, attainable goals and to develop individual self-management skills. Educational messages are tailored to each patient's readiness for change and to each provider so that they are continually reinforced.

The IDC Program includes several patient education tools to help members take charge of their health. Templates from the Diabetes Action Plan (Fig. 7) enable patients to note their personal behavior change goals, a copy of which can be made part of the medical record for regular review.

Tip Sheets (Fig. 8) containing helpful self-care information for members with diabetes also are included as part of a patient education section.



The IDC Patient Education Workgroup adopted this tip sheet from the American Diabetes Association (ADA) materials. An important recommendation (not included in the ADA handout) is the need to counsel patients about the use of metformin during sick days.

Diabetes Outcomes Report and Patient Survey

Condition-specific outcomes measures and targets provide the basis for all care management products. Outcomes measures are based on several factors: credibility as established in the biomedical literature in English; ability of providers to affect the outcomes; feasibility of measurement; and external demand for information.

Especially when embedded in a population management system, outcomes measures can help identify exemplary practices and can point to areas for improvement. The 1997 KP National CMI Adult Diabetes Outcomes Report used administrative data to provide information on processes of care, utilization, and clinical outcomes of interest for more than 200,000 KP members with diabetes. The report represents major work by representatives from across KP to identify patient groups consistently and to measure outcomes equivalently.

This reporting process is expected to be repeated regularly and will be valuable for tracking trends over time.

After collecting administrative data, CMI surveyed members with diabetes to collect data available only from patients (eg, self-perceived health) or which cannot be reliably measured from other data sources (eg, foot examinations by physicians). The patient data survey summarizes measures of medical care interventions, self-care attitudes and behaviors, satisfaction with medical care, and patient perceptions of health status. CMI collected data from 7123 respondents and summarized its findings in the report, *1997 KP National CMI Survey of Adults with Diabetes*, which is available on the KP Exchange website (www.kpexchange.org).

Concluding Overview

The Integrated Diabetes Care Program provides an opportunity to improve health status and outcomes for thousands of KP members while assisting KP physicians and other health care professionals. The IDC Program offers an integrated, coordinated approach to managing a chronically ill patient population. The Program provides tools and templates to help physicians manage their deskwork and gives opportunities to focus on care, instead of cure.

Although content development is important, implementation efforts are the core of CMI's work. An implementation network across KP is using the IDC program as it works with clinicians at the local level

Diabetes Action Plan
Living with Type 2 Diabetes, Step by Step

Ask your provider for a Personal Diabetes Record to help you take charge of your health!

Name: _____ Medical Record Number: _____
 Diabetes Doctor or Health Care Professional: _____ Phone Number: _____ Who Your Doctor Has (Area) Here: _____
 Primary Care Doctor: _____ Phone Number: _____ Main Location Here: _____
 Pharmacist: _____ Phone Number: _____ DR to Prescribe All Medications: _____

Blood Glucose Control

Target Blood Glucose Levels
 Fasting: 80 to 120 mg/dL (80 _____ to _____ mg/dL)
 Before meals: same as Fasting _____
 2 hours after meals: less than 180 / 180 / 180 mg/dL (before / after / at bedtime) _____

I test my blood sugar at these times:
 before breakfast _____ hour after breakfast
 before lunch _____ hour after lunch
 before dinner _____ hour after dinner
 at bedtime other _____

Medication Schedule

Type of Medication	Number of Units at Each Time				
	Breakfast	Lunch	Dinner	Bedtime	Other
Remember: Diabetes management is accomplished by a combination of: <input type="checkbox"/> diet <input type="checkbox"/> physical activity <input type="checkbox"/> weight control and <input type="checkbox"/> medication for some.	short acting insulin (fast)				
	long acting insulin (slow)				
	premixed insulin (fast/slow)				
	oral diabetes agents				

Sick Days

When sick, follow these guidelines:
Type 1 and 2 diabetes:
 Check blood glucose 4 times a day.
 If over 240 mg/dL, test every 4 hours.
 Check temperature 2 times a day.
 Drink extra fluids: at least 10 to 24 cup every hour of water, juice, or soft drink.
Type 1 diabetes:
 Test for ketones 4 times a day when blood sugar is over 240 mg/dL.
 If unable to eat normal diet, eat about 15 grams of carbohydrates each hour.
 Your provider may tell you to take extra insulin.

Call provider if you have any of these symptoms:
 • Temperature over 100 for 2 days
 • Urine glucose maximally positive for 2 days
 • Vomiting or diarrhea and unable to hold down liquid for 4 hours
 • Blood sugar over 240 mg/dL for 2 days
 • Blood sugar less than 80 mg/dL twice in one day

Fig. 7. Sample page from Diabetes Action Plan, developed for the IDC Program.

What is Diabetes?

The doctor says you have diabetes. Diabetes is a serious condition. There is no cure yet, but it can be controlled. You can lead a long, healthy life with diabetes.

There are two types of diabetes. Type 1 is sometimes called insulin-dependent diabetes and type 2 is sometimes called non-insulin-dependent diabetes.

Diabetes is not like the cold or the flu. You didn't catch it from anybody. No one knows for sure why people get diabetes. Diabetes tends to run in families. Some people may become likely to get both to get diabetes. But it takes something to start the diabetes.

What is Type 1 Diabetes?
 Type 1 diabetes happens when a part of your body called the pancreas stops working. Sometimes the body mistakes certain cells in the pancreas for germs. The body harms these cells, the way it does germs.

Nearly every three specialists in the pancreas make a hormone called insulin. Insulin helps your body get energy from the food you eat. Without insulin, you don't have any energy and your body can't use food the right way. When these cells in your pancreas stop working, they don't make insulin anymore. Then you will always need insulin shots. Diabetes gets more tricky. People with type 1 diabetes usually find out that they have diabetes when they are children or young adults.

What is Type 2 Diabetes?
 Most people with diabetes have type 2 diabetes. Type 2 diabetes is a condition in which your body can't use food as it should. It is a healthy person. It has more called insulin helps to use food's energy. Some people with type 2 diabetes don't make enough insulin. Others make insulin, but their bodies no longer respond to it.

For many people with type 2 diabetes, being overweight or having insulin resistance. A bad diet as too much stress may also lead to diabetes in people who have the genes that make it possible. Most people with type 2 find out about their diabetes after age 30 or 40.

Starting Off Right
 Some people with type 2 diabetes think that if they feel better, their diabetes has gone away. It hasn't. You will have diabetes for the rest of your life. However, your diabetes care team can help you make healthy choices that will let you lead a happy, full life with diabetes.

Why Insulin Matters
 Your body needs energy. It gets that energy from the food you eat. When you eat, your body changes some of the food into sugar. Sugar gets into your blood stream and goes to the cells in your body.

When your body doesn't make enough insulin or can't use insulin in the right way, sugar can't get into cells. The sugar builds up in your blood. You had high blood sugar when your doctor first said you had diabetes.

Fig. 8. Sample self-care tip sheet designed to assist patients with diabetes.



to assist them in improving outcomes for members with diabetes.

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Peggy Latare, MD	Hawaii
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Mike Marshall, MD	Texas
Martha Mastroberti	Northeast
Lauri Matijas	Mid-Atlantic
Peggy McClure	Northwest
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Denise Myers, RN, MPH	Northern California
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KP staff can access the Integrated Diabetes Care Program directly on the KP Clinical Practice Exchange website (register at <http://www.kpexchange.org>). ❖

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References

1. National Diabetes Data Group (U.S.) Diabetes in America 2nd ed. Bethesda, MD: National Institutes of Health, National Institute of Diabetes, Digestive, and Kidney Diseases; 1995.
2. Rubin RJ, Altman WM, Mendelson DN. Health care expenditures for people with diabetes mellitus, 1992. *J Clin Endocrinol Metab* 1994;78:809A-809F.
3. Selby JV, Ray GT, Zhang D, Colby CJ. Excess costs of medical care for patients with diabetes in a managed care population. *Diabetes Care* 1997;20:1396-02.
4. Kahn JG, Johnston CM, Marseille E, Solomon N. Costs and benefits of intensified renal care in Type II diabetes mellitus from a managed care perspective. Presented at the conference of the Society of General Internal Medicine, Chicago, April 28, 1998.
5. The Diabetes Control and Complications Trial Research Group. Lifetime benefits and costs of intensive therapy as practiced in the Diabetes Control and Complications Trial. *JAMA* 1996;276:1409-15.
6. Eastman RC, Javitt JC, Herman WH, Dasbach EJ, Copley-Merriman C, Maier W, et al. Model of complications of NIDDM.II. Analysis of the health benefits and cost-effectiveness of treating NIDDM with the goal of normoglycemia. *Diabetes Care* 1997;20:735-44.



Commentary: The Care Management Institute's Integrated Diabetes Care Program

In the ongoing wave of discontent about health care in the USA, two themes surface repeatedly in the political rhetoric and oversimplified soundbites from the media. The first is that consumers should have the freedom to go anywhere and choose anyone (specialists, alternative therapies, etc.) whenever they feel they need help. The second is that the phrase "managed care" is increasingly used as a pejorative euphemism for "bad care," with all managed care organizations (MCOs) being lumped together as heartless money-grubbing demons which exist to make money for their shareholders by denying critical services to their hapless enrollees. There is certainly some justification for the concerns being raised, and there is plenty of room for improvement in the US health care system. But for those of us who work for organizations like Kaiser Permanente (KP), who dedicate our efforts to improving the health and quality of life for our enrolled members, this misrepresentation of managed care is hard to take. I would like to see two different themes receive increasing prominence in the near future. The first of these is that the biggest concern for the US health care system ought to be how to deal effectively with the ever-growing problem of chronic disease. And the second is that NOT all MCOs are the same. The article by Rachele Mirkin, Neil Solomon, MD, and Helen Pettay in this issue of *The Permanente Journal* is a wonderful example of how organizations like ours can deal with chronic disease in ways that simultaneously will improve health outcomes, patient satisfaction, quality of life, AND reduce overall costs. I believe that this kind of work will set us apart from our competitors and should be promoted and expanded throughout our system.

Individuals with a chronic condition like diabetes dominating their lives need much more than cheap, easy access to a variety of services and specialists whenever they think they need help. They need to be empowered to take a central role in a health care team to utilize a coordinated set of services and supports that will promote better health outcomes and improved quality of life for them, long before they feel that they NEED to seek out someone because of a "problem." In other words, they need "well-managed care." The Care Management Institute's Integrated Diabetes Care Program grew out of KP's Interregional Diabetes Effort and has taken the knowledge and experience of many KP health care professionals across the nation. The goal was to develop a nationally consistent, evidence-based, process-efficient, and population-based approach to diabetes care that is customized to the individual member with diabetes. The keys to this approach are to

first identify all diabetic patients by using consistent methods so that comparisons among different groups around the country are valid. Second, the key elements of good diabetes care need to be agreed on and defined. All these elements of care can then be tracked for all diabetic members on an ongoing basis (ideally using sophisticated electronic registries). Third, evidence-based guidelines for improving diabetes care need to be developed and become embedded in the health care system to ensure that they are followed. Fourth, patients need to be stratified so that the appropriate level of care and support can be customized to meet each diabetic patient's needs. All patients should have a clear, collaboratively developed Action Plan that is communicated to all team members. Last, the success of this integrated effort needs to be continuously evaluated throughout the KP system and be modified as needed to foster continuous improvement.

As described in the article, although not all these elements are being actively employed in all KP Regions of the country, the Care Management Institute has the goal of facilitating rapid dissemination of the relevant skills and resources to where they are needed. And in Regions where most or all of the components have been implemented (such as in KP's Northwest Region, or Group Health Cooperative of Puget Sound), the improvement in patient satisfaction and health outcomes has been clearly shown.

Another criticism which is often leveled against this kind of integrated approach to managing care is that it takes away from the individual freedom of both the patient and the provider to do what they think is best. I believe that this is a myth. There is plenty of evidence in the literature that the uncoordinated traditional approach to managing chronic illness like diabetes has resulted in abysmal outcomes, unhappy patients, and inefficient and expensive care.

A coordinated and integrated program like the one described here, which gives timely reminders about what services are recommended along with a range of options for supporting good decision-making and behavior change, can actually increase the sense of well-being and freedom for the patient and the other members of the health care team.

This work should be applauded and should be expanded to all regions of our organization as well as to other chronic conditions. Not only will it result in healthier, happier enrolled members, it is likely to reduce our overall costs of care, all of which will improve our competitiveness and make it clear to anyone who cares to dip below the superficial surface of rhetoric and soundbites that some MCOs are VERY much better than others. ❖

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