The Challenge of Promoting Integration: Conceptualization, Implementation, and Assessment of a Pilot Care Delivery Model for Patients With Type 2 Diabetes

Louise Nasmith, MDCM, MEd; Brigitte Coté, MD; Joseph Cox, MD, MSc; Diane Inkell, RN, MAP; Heather Rubenstein, MDCM; Vania Jimenez, MDCM; Rosario Rodriguez, MD, PhD; Danielle Larouche, MSc; Andre-Pierre Contandriopoulos, PhD; and the Côte-des-Neiges Diabetes Project Team

Background: The Côte-des-Neiges diabetes pilot project strove to conceptualize, implement, and assess an integrated health care system for Type 2 diabetes. Using a disease management and population-based approach, a multidisciplinary team sought to (1) organize health care in an integrative framework, (2) promote behavior changes in patients to foster self-care, (3) introduce tools to allow family physicians to modify their practices, and (4) encourage local community action to support patients and providers. Methods: Information from a needs assessment helped guide the development of the care model, which was implemented over a 1-year period. A preliminary assessment was undertaken using qualitative methods. Data were collected through in-depth interviews, focus groups, participant observation, and document analysis. Results: (1) Physicians and patients appreciated having access to a multidisciplinary team and related services, and personalized communication was preferred to computerized links. (2) Patients also perceived the benefit of individualized assessment and self-care educational sessions allowing them to participate in their illness management. (3) A diabetes care flow sheet altered the management strategies of physicians. (4) Limited time prevented full development of networking efforts to promote community mobilization. Conclusions: Approaches to chronic diseases such as diabetes require integrative health care strategies to support patients and providers in their community. In spite of time constraints, patients perceived the value of education with increasing involvement in their illness, physicians reported changes in their practice, and steps were initiated to mobilize community resources.

Although health care systems of industrialized countries traditionally have developed around acute health care problems,1,2 the increase in chronic diseases appears to be one of the major factors now driving organizational changes in health care delivery.3 Consequently, a shift in health professional practices, particularly in primary care, is underway in Canada.4

From the Department of Family and Community Medicine, University of Toronto (Dr Nasmith); Department of Family Medicine (Drs Cote, Cox, Rubenstein, Jimenez, and Rodriguez) and Center for Strategy Studies in Organizations (Dr Rodriguez), McGill University; Direction à la Santé Publique de Montreal-Centre (Drs Cote and Cox); CLSC Cote-des-Neiges (Ms Inkell and Drs Rubenstein and Jimenez); Groupe de Recherche Interdisciplinaire en Sante (Drs Rodriguez and Contandriopoulos and Ms Larouche) and the Department d'Administration de la Sante (Dr Contandriopoulos), University of Montreal; and the Centre de Recherche Évaluative de l'Hôpital Notre-Dame de Montreal (Ms Larouche).

Collaboration and integration within a fragmented system constitute the core of these changes.5 Specifically, there is evidence that optimal care of patients with Type 2 diabetes requires an integrated approach by a multidisciplinary team,6,7 with emphasis on the role of family physicians, adherence to clinical practice guidelines, communication and coordination among providers, and patient education and empowerment.6,7

In the spring of 1999, the Department of Family Medicine at McGill University, the Centre Local de Services Communautaires (CLSC) Côte-des-Neiges, the Direction de la Santé Publique de Montreal-Centre, and the Groupe de Recherche Interdisciplinaire en Sante from the University of Montreal received funding from the Health Transition Fund of the federal government of Canada to elaborate and evaluate the implementation of an integrated model of care for patients with Type 2 diabetes. To develop such a system, the traditional
disease management model was combined with a population-based approach\textsuperscript{8,9} through which the needs of the community could be addressed.

The project involved three phases: the determination of community needs, the elaboration and delivery of the model, and a process evaluation. This article describes the process followed to develop and implement the model and the components of this new delivery system and describes the preliminary findings from the evaluation.

**Setting and Context**

The Côte-des-Neiges area of Montreal is the second most-populated area in the province of Quebec (130,448 inhabitants in 2000). Significant variations in socioeconomic status exist among the 127 different ethnic groups, and certain communities within the Côte-des-Neiges area represent the poorest in the city of Montreal. The Côte-des-Neiges health care system is comprised of 12 medical clinics, more than 50 solo practitioners’ offices, three acute care hospitals, and one CLSC. It is estimated that there are 15,000 individuals with diabetes, of which only half have been diagnosed.

In Quebec, the health care delivery institutions (physician offices, community clinics, hospitals, etc) have been historically characterized by provision of services in an isolated or silo-type fashion, quite independent of one another.\textsuperscript{10} This lack of coordination among different providers and institutions is detrimental to the care of complex patients such as the frail elderly and those with chronic illnesses.

In the case of patients with Type 2 diabetes, most receive their care from community-based family physicians, who may or may not follow current guidelines for optimal care. To access additional services such as nutrition counseling or foot care, patients either wait months to be seen in the publicly funded system, pay out of pocket, or use private insurance. In the CLSC Côte-des-Neiges region, most fall into the first category. In addition, little, if any, communication takes place among providers to ensure coordinated care.

**Stage 1: Needs Assessment and Inventory of Resources**

The nominal group technique was chosen to obtain input from the major stakeholders in the community on the problems and potential solutions to care for patients with Type 2 diabetes. In total, six nominal groups were conducted, in English and in French, each with family physicians, patients, and other health care providers. The analysis of the findings identified specific themes that focused on patient education, physician knowledge, access to services, and communication among providers. In particular, patients were most concerned about their own lack of knowledge about the management of their illness, physicians focused on accessibility to allied diabetes health services, and other health care professionals raised concerns about poor communication among health care providers, as well as patient self-care.\textsuperscript{11} The findings subsequently guided the conceptualization of the model.

Concurrently, listings of health care providers in the territory were consulted, and surveys were mailed. The resulting inventory listed family physicians, endocrinologists, dieticians, foot care specialists, hospital diabetic clinics, pharmacists, and exercise facilities.

**Stages 2 and 3: Elaboration and Implementation of the Model**

**(1) Integration of Services (Figure 1).** Ten family practices representing the variety of practice types across the region (group, solo, and teaching) were recruited to the project by direct contact from the project director. Physicians in the practice agreed to refer patients to the project team. A total of 44 family physicians in these practices participated, and two endocrinologists agreed to provide consultations to the family physicians. The project team consisted of a coordinator, two nurses, a dietician, a foot care technician, a community organizer, a part-time social worker, and an exercise consultant, together with the original group of researchers from the four partner institutions. This phase of the project ran from January to December 2000. The team, which was based at the CLSC, offered services to patients and provided personalized contact with the family physicians.

In the 1-year period, 322 patients were referred by the 44 family physicians to the project team. Almost all of the patients came to the CLSC to be evaluated and receive educational services.

The two nurses functioned as the key members of the team, acting as the link between the doctor and the patient through the use of e-mail, fax, or telephone messages, as well as frequent visits to the physicians’ offices to provide feedback on the patients being followed by the project and who were receiving ongoing care by the physician.
Diabetes-specific software was developed and included a registration form, a clinical care flow sheet, and an allied health service plan. This software monitored the services being given and provided reminders of upcoming interventions that should be scheduled as per the Canadian Diabetes Association (CDA) guidelines. Each office was equipped with a new computer, and training sessions were given to the doctors and the clerical staff on how to use the system. Physicians were also provided with the names of the consulting endocrinologists and a fax consultation sheet to facilitate easy and quick access for their patients. Lastly, two newsletters were sent to all participating physicians to keep them informed of the progress of the project.

(2) Patient Education. To promote behavioral changes in patients and ultimately foster self-care, the team created an assessment tool based on the Stages of Change Model of behavior acquisition. Educational interventions were guided by this model and included individual and group sessions. Upon entry into the project, each patient was evaluated in six spheres: general knowledge about diabetes, nutrition, physical activity, foot care, medication use, and emotional stress. Subsequently, they were referred to individual or group sessions that provided either direct care, such as foot care or nutrition counseling, or education in one of the six domains. The nurses monitored the progress of each patient through close follow-up and a formal assessment of “patient staging” on the diabetes-related health behaviors. Due to the ethnic diversity of the region, educational materials and workshops were made available not only in English and French but also in Vietnamese, Spanish, Punjabi, and Tamil.

(3) Changing Physicians’ Practice. To assist physicians to practice according to the most current guidelines, a number of tools were introduced into their practices. Traditional continuing medical education (CME) sessions were offered in the evening as well as two CD-ROMs. A clinical care flow sheet based on the CDA guidelines was developed and made available on computer and for office charts. This form was to be completed at each visit by the physician to ensure that the guidelines were being followed. Physicians were offered CME credits from the College of Family Physicians of Canada for their participation in these activities.

(4) Community Action. Strategies within the community were initiated to mobilize local resources within patient and provider groups. Links were created with various groups in the community that included a variety of ethnic groups and health resources such as pharmacists, sports centers, and supervised housing for the elderly.

Meetings were held with patient representatives to explore the establishment of additional patient support mechanisms such as support groups, becoming a leader and a resource to the community, and lobbying the government for such issues as improved medication insurance. Physical activity was promoted through group exercise sessions and walking groups, and links were established with a local sports center. In addition, the project explored ways to work with various ethnic communities.
Stage 4: Assessment

The preliminary assessment of the project focused on the stakeholder participating in the project: patients with diabetes, family physicians, the project team, project managers, and other decision makers (members of the steering committee and advisory board). Qualitative and early quantitative data were collected between January and December 2000. Sources included in-depth interviews (n=25) and three focus groups with patients, participant and nonparticipant observations, and varied documents relating to the intervention. Interviews and focus groups were audiotaped and transcribed. Thematic sequential analysis was carried out with the different dimensions of our conceptual framework, compounding the grid used for analysis. Focus groups also were audiotaped; the content of the discussions was analyzed through listening to the tapes.

Other data used in this analysis included minutes of the meetings of the intervention team, the steering committee, and the advisory board; a registry of e-mail communications between the nurse coordinators and family physicians; and a diary of observations made by the research team. No control group was included in this phase of the project due to time and budget limitations. A longer-term assessment based on quantitative measures currently is underway.

Assessment Results

As previously stated, 44 family physicians participated from 10 distinct practices. On average, each referred seven patients, with a range from 1 to 30. Of the 322 patients recruited, 52% were male and 48% female, and their ages ranged from 27 to 83, with a mean of 59 years. Sixty-nine percent and 43%, respectively, had suboptimal or inadequate pre-meal glucose and glycosylated hemoglobin levels. Two thirds of the patients were born outside Canada; 55% speak a language other than English or French (Bengali, Punjabi, Tamil, Urdu, Vietnamese, and Spanish). The number of services or educational sessions attended per patient ranged from one to four, with a mean of 2.5.

Focus groups and interviews indicated that both physicians and patients perceived the benefit of having access to services that otherwise were not available. Physicians appreciated the personalized contact with the nurses, but many found the computer system difficult and too time-consuming to integrate into their daily practice. They preferred visits, faxed messages, or telephone calls to keep informed of their patients’ progress. Many had availed themselves of the consultation with an endocrinologist by either phone or a rapid consultation visit.

Patients were appreciative of the educational services provided by the project and the ability to participate in the management of their illness. They considered the intervention as having improved their comprehension about the disease, as well as about improved diet, use of medications, and the link between glycemic control and the health of their eyes and feet. Similarly, physicians observed a difference in those patients who were part of the project in terms of their knowledge and willingness to make lifestyle changes. Some commented that follow-up visits did not take as much time. Although patients appreciated the time devoted by the project nurses to the initial assessment and subsequent visits, the team felt that the evaluation required too much time (1.5 hours), thus potentially limiting the number of patients who could be seen. However, they were skeptical as to whether a shorter assessment or attempting to perform a similar evaluation in a group setting could achieve the same results.

Few physicians attended the CME sessions or used either of the CD-ROMs available to them. The most useful tool was the flow sheet, which acted as an initial audit of their past care and as a reminder of best management strategies for their future care. All of the physicians used this sheet primarily in hard copy in the charts since few were comfortable on the computer. Many reported using the monofilament (for evaluating sensory function) as part of their routine care. Frequent contact from the project nurses and visits from the coordinator acted as a reminder for the project goals and thus reinforced the importance of adhering to the clinical practice guidelines.

Informal feedback from various groups in the community indicated that the few outreach activities that were held were perceived as beneficial. A few pharmacists became engaged in educational activities, exercise groups were created, and a small number of sensitization events were held in ethnic communities. However, the short time for the project implementation did not allow for a systematic approach to mobilize community resources to the extent that was originally intended.

Discussion

Type 2 diabetes and its complications are major public health problems that require integrated and comprehensive care within a disease management and population-based approach.6,9 Due to budgetary constraints in our health care system and lack of private insurance coverage in the population of this region, our patients had little if any access to the services needed to manage diabetes such as nutrition, nursing, or foot-care counseling. Our project provided these services, and our nominal groups indicated that they were valued by both physicians and patients.

The addition of services, however, does not guarantee integration of services. True integration requires, as one key element, communication and adoption of common health care strategies across professionals and between community providers and institutions.13,14 To
support these processes, a computerized system and software program were used. This aspect of the program required intensive training sessions and frequent visits to “troubleshoot” by the project coordinator and contact nurse. In spite of this, physicians experienced great difficulty in this aspect of the project and stated that they preferred more traditional forms of contact. This does not mean that computer technology should be abandoned as a tool for integrating diabetes services but rather that other methods must also be fostered that fit into existing paradigms of care, since not all physicians can easily adapt to computerized systems of information exchange.

Promoting self-care through patient education and empowerment are key elements to the successful management of diabetes.\(^5\)\(^,\)\(^7\)\(^,\)\(^9\)\(^,\)\(^15\) Recently established clinical practice guidelines highlight the importance of having educators skilled in promoting patient behavior change, but few validated tools are available. Our project team developed their assessment instruments, which included an individualized assessment and the development of a personalized educational plan with regular reevaluation and documentation of progress. The major drawback of this model was the time required for the initial individualized assessment and ultimately the cost of hiring a sufficient number of nurses and other diabetes educators to serve a large multi-ethnic population. However, it is difficult to imagine an alternative way of providing individualized assessments or whether this approach can be used successfully in groups.

The multi-ethnic diversity of patients is a reality in many urban centers, which also must be factored into any educational program.\(^16\) Translation of materials and the use of interpreters pose financial and logistical challenges that require creative measures to overcome—hence, the importance of including family members with appropriate language skills and building leadership expertise within specific ethnic communities.

Many barriers exist that affect physician adherence to clinical practice guidelines, and an understanding of these is crucial to design effective educational strategies.\(^17\)\(^-\)\(^21\) A variety of strategies to assist them in following the guidelines was offered but not proscribed, making physicians free to choose whichever intervention best suited them. In their review of effective CME strategies, Davis et al.\(^22\) showed that change was brought about by interventions that included an assortment of activities such as outreach visits, reminders, and opinion leaders.

In our project, physicians found the flow sheet to be the most useful tool since it pertained to patient care on a daily basis. As well, they appreciated the regular visits and calls from the nurse, who attempted to reinforce adherence to the guidelines through her feedback about patients. Involvement in the community through outreach activities is integral to a population-based approach.\(^2\) This task was the responsibility of the community organizer in our project with the support of the other members of the team. However, due to the short time and the focus on patient- and physician-related activities, less was achieved in this area than originally anticipated. Particularly in a culturally diverse setting, it will be important to establish support groups in the community, identify leaders, and further sensitize the population about prevention and health promotion around diabetes.\(^23\)\(^-\)\(^25\)

Given the short time frame and limited funding available for this project, the evaluation focused on larger process issues using qualitative self-reports from the stakeholders. A control group was not included at this stage. Additional funding has been secured to conduct a longer-term study evaluating health outcomes such as glycosylated hemoglobin, lipid levels, blood pressure, and patient and provider satisfaction.

Conclusions

The Côte-des-Neiges Diabetes Pilot Project attempted to render health care services more accessible, promote self-care in patients, assist family physicians in modifying their practices, and mobilize community resources. Approaches to chronic illnesses such as diabetes require integrative health care strategies to support patients and providers within their community. Additional studies are needed to evaluate the long-term health benefits and cost of such models of integrated care.

Acknowledgments: This project was funded by the Health Transition Fund of the Federal Government of Canada (1999–2000).

Corresponding Author: Address correspondence to Dr. Nasmith, University of Toronto, Department of Family and Community Medicine, 256 McCaul Street, Second Floor, Toronto, Ontario, Canada M5T 1W5. 416-738-6473. Fax: 416-738-3912. louise.nasmith@utoronto.ca.

REFERENCES