Lifestyle management for type 2 diabetes
Are family physicians ready and willing?

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Wendy Leadbetter, RN  Lynda Cranston

ABSTRACT

OBJECTIVE To determine practices and perceptions of family physicians regarding lifestyle interventions to prevent and manage type 2 diabetes (T2D).

DESIGN Confidential mailed survey.

SETTING Canadian family practices.

PARTICIPANTS Random, stratified sample of 1499 respondents to the 2001 National Family Physician Workforce Survey.

MAIN OUTCOME MEASURES Physicians’ self-reported practice patterns and perceptions of lifestyle counseling for patients at risk for, and diagnosed with, T2D.

RESULTS Response rate was 53% (749/1410). Respondents frequently asked patients at risk for, or diagnosed with, T2D about physical activity and weight loss, but far fewer provided written advice, particularly about physical activity. Respondents thought counseling with such interventions as generic patient handouts was preferable to more intensive lifestyle management strategies, such as appointments to provide stage-matched counseling on physical activity. Most respondents thought family physicians should perform lifestyle interventions but realized they are confounded by such barriers as patients’ lack of interest and limited referral resources.

CONCLUSION Family physicians keen to implement lifestyle interventions for T2D are hampered by barriers and use of ineffective strategies.

This article has been peer reviewed.
Cet article a fait l’objet d’une évaluation externe.

Type 2 diabetes (T2D) is a serious chronic illness that imposes a substantial social and economic burden in Canada. More than 2.25 million Canadians (>5% of the population) are estimated to have diabetes, 90% of which is T2D. It is likely, however, that the true prevalence of diabetes is dramatically underestimated.

Diabetes is a strong risk factor for cardiovascular disease and other complications that result in considerable morbidity and mortality. Family physicians (who care for 80% to 90% of patients with diabetes and see patients with T2D up to 9 times yearly) are ideally placed to provide appropriate diabetes care and to implement screening measures to detect undiagnosed T2D and impaired glucose tolerance (IGT) in patients presenting for routine care.

Numerous studies have demonstrated that physical activity and dietary interventions improve glycemic control in patients diagnosed with T2D. These interventions can also delay and possibly prevent onset of the disease in patients with identified IGT who are at risk. The Diabetes Prevention Program, a large randomized controlled trial, clearly showed that participants with IGT who followed a program of physical activity and diet reduced their chances of developing T2D by 58% at 3-year follow-up assessment.

To date, few trials have investigated the effectiveness of lifestyle interventions for T2D patients in primary care. While patients perceive family physicians as a trusted and preferred source of lifestyle counseling, implementing lifestyle interventions in practice is difficult. United States and UK studies of physicians’ attitudes toward diabetes care have shown that several factors (such as the complexity of diabetes management, limited clinical resources, pessimism about the effectiveness of lifestyle interventions, and perceived lack of support for their efforts from the health care system and society as a whole) act as barriers to incorporating lifestyle counseling into primary care.

This study was designed to survey and assess the practices and perceptions of Canadian family physicians regarding lifestyle interventions for T2D prevention and management. This is the pivotal first step in creating educational and practice-based initiatives that will facilitate delivery of effective lifestyle interventions in primary care.

**METHOD**

**Population setting and sample**

A random sample of College of Family Physicians of Canada (CFPC) members who responded to a question from the 2001 National Family Physician Workforce Survey (NFPWS) about their reported use of “counseling about regular physical activity to patients for whom [it is] indicated.” In the 2001 NFPWS, 87% of respondents reported offering this service to their patients frequently or very frequently.

Investigators believed this number to overestimate the level of advice offered to patients in daily practice. As a result, our survey was designed to elicit more specific details about lifestyle counseling.
from a sample of physicians who responded to the 2001 NFPWS, specifically regarding their T2D patients—both diagnosed and at risk (Figure 1). Only physicians in full-time family practice (ie, ≥ 50% of their practice is traditional family medicine, which would exclude those practising full-time emergency medicine or another specialty) were included in the survey. Results were weighted by geographic region, sex, and practice type.

Survey instrument
The Diabetes Lifestyle Intervention Survey was conducted by the CFPC and funded by Health Canada’s Canadian Diabetes Strategy, Prevention and Promotion Contribution Program.

The five basic stages necessary in survey preparation were completed during summer 2002 and included translation of the survey into French. The survey contained four parts: parts 1 and 2 explored practice behaviours with patients at risk for T2D diabetes and patients diagnosed with T2D, respectively; part 3 explored general perceptions about lifestyle counseling in practice, and part 4 assessed sociodemographic characteristics of respondents. A modified version of the Dillman method was used for the survey mailing (all surveys had a unique identifier to facilitate repeat mailings to nonrespondents).

The initial sample consisted of 1499 CFPC NFPWS respondents from across all provinces in Canada. First mailing was in September 2002. Follow-up mailings to nonrespondents consisted of a reminder card at 5 weeks, a second survey mailing at 10 weeks, and a third survey mailing at 14 weeks. Eighty-nine of 1499 (59.4%) surveys returned were deemed ineligible, mainly due to practice focus changes by the closing date of January 31, 2003. In total, 749/1410 (53.1%) surveys were returned and available for analysis: 646/749 (86.2%) English and 73/749 (9.7%) French.

The survey had the power to represent those sampled with 80% confidence if at least 500 respondents replied to the survey (5 × 100 dependent variables = 500). Descriptive univariate and bivariate analysis was performed, noting statistical significance at the <.05 level using SPSS version 11.5.0.

RESULTS

Practice setting of respondents
Private offices or clinics were reported by 584/749 (78%) of respondents as the main settings in which they cared for patients: 4.5% reported academic teaching units and 4.4% reported community clinics or community health centres. Populations served by respondents’ practices are presented in Figure 2: typical patient groups served were adults 19 to 64 y (98%), seniors 65 and older (90.8%), adolescents 13 to 18 y (84.2%) and children 12 y and younger (83.2%). The largest special group of patients served by respondents was geriatric patients (> 65 y) (70.1%), followed by patients with chronic illness (68.8%) and low-income earners (47.4%).

Sociodemographic characteristics of respondents
Median age of respondents was 44 years (mode=46, standard deviation=8.46, minimum=27 y, maximum=65 y). Median year of medical school graduation was 1984 (mode=1996, standard deviation=8.93, minimum=1961, maximum=2000). Just over half the 749 respondents were male (405, or 54.1%); 325 (43.4%) were female; 19 (2.5%) chose not to answer the question.

Respondents’ efforts at prevention
Respondents reported higher numbers of patients at risk (median=25%) than diagnosed (median=10%) in their practices. When asked what prevention services they provided for patients at risk, most reported providing both physical activity counseling (652/749, or 87%) and diet and nutrition counseling (647/749, or 86.4%). Respondents reported that they asked their patients at risk about physical activity levels nearly all the time (719/749, or 96%); similar numbers were reported for diagnosed patients (695/749, or 92.8%). When asked whether they “advised with written directions for a physical activity program,” however, much lower numbers were reported for
Research  Lifestyle management for type 2 diabetes

**Figure 1. Definitions used in diagnosis of type 2 diabetes:** For national T2D lifestyle survey of CFPC members who responded to the 2001 National Family Physician Workforce Survey.15

*Diagnosis of T2D* (non–insulin-dependent diabetes)² is based on:
- Symptoms of diabetes plus random blood glucose level of ≥ 11.1 mmol/L (two readings)
- OR
- Blood glucose by FPG of ≥ 7.0 mmol/L or greater (two readings)
- OR
- Blood glucose by OGTT of ≥ 11.1 mmol/L at 2 hours with a 75-g OGTT

*At risk for T2D* category is based on:
- ≥ 45 y, first-degree relative with diabetes, member of high-risk ethnic group (of aboriginal/Hispanic/Asian/African descent), obesity, dyslipidemia, history of IGT or IFG, presence of complications associated with diabetes (eg, hypertension), history of gestational diabetes mellitus, birth weight >4 kg, presence of coronary artery disease
- OR
- FPG in the IFG (6.1-6.9 mmol/L) range or an OGTT in the IGT (7.8-11.0 mmol/L) range

CFPC—College of Family Physicians of Canada, FPG—fasting plasma glucose, IFG—impaired fasting glucose, IGT—impaired glucose tolerance, OGTT—oral glucose tolerance test, T2D—type 2 diabetes.

**Figure 2. Population primarily served by respondents’ practices (N=749)**
both patients at risk (253/749, or 33.8%) and for diagnosed patients (503/749, or 67.2%). Similar differences were seen with regard to weight-loss intervention (Table 1). Only 32.4% of respondents used a reminder system (paper or electronic) for patients at risk, and 53.3% of respondents used a reminder system for diagnosed patients.

Perceptions of prevention management

Respondents thought that lifestyle interventions have a substantial role in preventing (725/749, or 96.8%) and managing (731/749, or 97.6%) T2D. Most respondents thought that family physicians should promote lifestyle change by advising and providing appropriate interventions, such as recommendations and generic patient handouts (711/749, or 94.9%). Fewer respondents (513/749, or 68.5%), however, thought that using behavioural change techniques (eg, scheduling specific appointments to provide stage-matched counseling on diet and physical activity) would be appropriate. Several respondents were unaware of the many tools and programs that facilitate these interventions (Table 2).

When asked which nutritional and physical activity interventions they would use, more respondents indicated they would advise both at-risk and diagnosed patients to reduce fat and carbohydrate consumption (652/749, or 87%) and to accumulate 30 to 60 minutes of moderate physical activity on most days of the week (671/749, or 89.6%) (Table 3).

Selecting from a list of barriers that arise when initiating lifestyle modification strategies, more respondents perceived the “patient not being interested in changing physical activity and eating habits” (658/749, or 87.9%) as the strongest impediment (Table 4).

DISCUSSION

This large national survey presents data on the attitudes and practices of Canadian physicians regarding management of at-risk and diagnosed T2D patients. The survey included a large set of eligible, representative respondents (N=1410) and, given the length of the survey, had a good response rate (53.1%) from a variety of Canadian family physicians.

### Table 1. Use of lifestyle interventions (N = 749)

<table>
<thead>
<tr>
<th>INTERVENTION</th>
<th>PATIENTS AT RISK</th>
<th>DIAGNOSED PATIENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Ask about physical activity levels</td>
<td>719</td>
<td>96.0</td>
</tr>
<tr>
<td>Advise with written guidance for physical activity program</td>
<td>252</td>
<td>33.6</td>
</tr>
<tr>
<td>Advise about weight loss when applicable</td>
<td>726</td>
<td>96.9</td>
</tr>
<tr>
<td>Advise with written guidance to a healthy eating program</td>
<td>480</td>
<td>61.4</td>
</tr>
</tbody>
</table>

### Table 2. Interventions for diagnosed patients: How respondents rated interventions for patients with type 2 diabetes.

<table>
<thead>
<tr>
<th>HOW DO YOU RATE THE FOLLOWING FAMILY PRACTICE INTERVENTIONS FOR PATIENTS WITH T2D? (N=749)</th>
<th>RESPONDENT UNAWARE OF INTERVENTION OR INTERVENTION INAPPLICABLE TO RESPONDENT</th>
<th>VERY INEFFECTIVE</th>
<th>INEFFECTIVE</th>
<th>NEUTRAL</th>
<th>EFFECTIVE</th>
<th>VERY EFFECTIVE</th>
<th>95% CONFIDENCE INTERVALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada’s Food Guide24</td>
<td>6.1</td>
<td>5.6</td>
<td>14.4</td>
<td>33.4</td>
<td>36.7</td>
<td>2.8</td>
<td>2.89-3.07</td>
</tr>
<tr>
<td>Canada’s Physical Activity Guide25</td>
<td>17.2</td>
<td>4.1</td>
<td>10.3</td>
<td>32.7</td>
<td>32.4</td>
<td>2.3</td>
<td>2.55-2.77</td>
</tr>
<tr>
<td>Healthy Heart Kit26</td>
<td>34.7</td>
<td>2.5</td>
<td>4.4</td>
<td>25.2</td>
<td>28.6</td>
<td>3.6</td>
<td>2.08-2.34</td>
</tr>
<tr>
<td>PACE Canada27</td>
<td>68.2</td>
<td>2.1</td>
<td>2.4</td>
<td>18.4</td>
<td>6.8</td>
<td>0.8</td>
<td>0.83-1.05</td>
</tr>
<tr>
<td>STEP test exercise prescription13,28</td>
<td>69.8</td>
<td>2.3</td>
<td>4.4</td>
<td>17.2</td>
<td>4.4</td>
<td>0.5</td>
<td>0.74-0.94</td>
</tr>
<tr>
<td>Go for Green Prescription29,30</td>
<td>69.3</td>
<td>2.4</td>
<td>3.9</td>
<td>17.4</td>
<td>5.2</td>
<td>0.5</td>
<td>0.77-0.97</td>
</tr>
</tbody>
</table>

T2D—type 2 diabetes.
Survey respondents agreed that lifestyle interventions are an important component of strategies to prevent and treat T2D. They believed that family physicians should have an active role in delivering them. These attitudes appeared to translate into practice, with most respondents asking their patients with T2D about physical activity and weight loss, when appropriate.

When asked to be more specific about the interventions they provide in practice, however, respondents reported they were far more likely to counsel about lifestyle behaviours (eg, advising and providing generic patient handouts) than to use more aggressive lifestyle management techniques (eg, scheduling specific appointments to provide stage-matched interventions). Underscoring this finding was respondents’ relative lack of awareness of appropriate programs and tools to support behaviour change.

**Barriers**

The ability to provide more effective and intensive lifestyle management is hampered by several barriers identified by respondents, including patients’ lack of interest and long-term commitment, comorbidity, limited provider time, and inadequate access to community-based referrals. Other studies have cited similar barriers, as well as lack of renumeration and insufficient training for physicians.

Addressing these barriers is critical, given that an intensive management strategy is more likely to achieve lasting behaviour change. Kreuter et al. found that linking physicians’ lifestyle advice (on smoking, diet, and exercise) with personalized written materials was more likely to achieve intermediate outcomes (recall, interest, and perceived relevance) that are “important precursors to behaviour change.” For sedentary patients in primary care, written prescriptions and verbal advice were more effective than advice alone in increasing physical activity. A recent study demonstrated that oral and written advice with follow-up support was better than usual care in increasing physical activity and improving quality of life over 12 months. Among older patients, targeted prescriptions of exercise training to improve heart rate given by family physicians was superior to usual care in improving fitness and self-efficacy.

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**Table 3. Perceptions of lifestyle interventions**

<table>
<thead>
<tr>
<th>INTERVENTIONS</th>
<th>WOULD USE INTERVENTION FOR BOTH “AT RISK” AND “DIAGNOSED” PATIENTS</th>
<th>WOULD NOT USE INTERVENTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td><strong>NUTRITIONAL INTERVENTIONS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Advise patient to reduce fat and carbohydrate consumption</td>
<td>652</td>
<td>87.0</td>
</tr>
<tr>
<td>• Canada’s Food Guide</td>
<td>521</td>
<td>69.6</td>
</tr>
<tr>
<td>• Refer patient to diabetes education centre or registered nutritionist or dietitian</td>
<td>463</td>
<td>51.8</td>
</tr>
<tr>
<td>• Schedule specific appointments to provide diet or nutrition counseling</td>
<td>348</td>
<td>46.5</td>
</tr>
<tr>
<td><strong>PHYSICAL ACTIVITY INTERVENTIONS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Advise adults to accumulate 30-60 min of moderate physical activity on most (preferably all) days of the week</td>
<td>671</td>
<td>89.6</td>
</tr>
<tr>
<td>• Identify patient behaviours that need to be changed, using Canada’s Physical Activity Guide(s)</td>
<td>428</td>
<td>57.1</td>
</tr>
<tr>
<td>• Advise patients to go to a fitness specialist</td>
<td>344</td>
<td>45.9</td>
</tr>
<tr>
<td>• Schedule specific appointments to provide physical activity counseling</td>
<td>259</td>
<td>34.6</td>
</tr>
</tbody>
</table>

**Table 4. Barriers to implementing lifestyle interventions**

<table>
<thead>
<tr>
<th>DIFFICULTIES ENCOUNTERED IN PROMOTING LIFESTYLE CHANGE FOR PATIENTS</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient uninterested in changing physical activity and eating habits</td>
<td>658</td>
<td>86.9</td>
</tr>
<tr>
<td>Lack of long-term commitment from patient</td>
<td>573</td>
<td>76.5</td>
</tr>
<tr>
<td>Lack of time to spend with patients in regular office visit</td>
<td>571</td>
<td>76.2</td>
</tr>
<tr>
<td>Patients have comorbidity</td>
<td>540</td>
<td>72.1</td>
</tr>
<tr>
<td>Limited access to community-based referrals (eg, nutritionist or dietitian, activity programs, weight-loss centres)</td>
<td>402</td>
<td>53.7</td>
</tr>
</tbody>
</table>
Why intervention is important

More intensive interventions (incorporating written materials, behavioural change strategies, and physician training) might further improve the effect of physical activity interventions in the general patient population.38 The US Preventive Services Task Force39 states that “multicomponent interventions combining provider advice with behavioural interventions ... appear the most promising” for promoting physical activity in primary care. As there are few studies on lifestyle interventions for T2D patients based in primary care,42 however, further research is needed to fully support such interventions.

For weight loss and nutrition counseling, the intensity of the intervention is strongly associated with the degree of change.40 Ockene et al41 found that, among patients with hyperlipidemia, nutritional counseling plus an office-support program produced beneficial changes in diet (10.3% decrease in energy from saturated fat), weight (2.3-kg reduction) and blood lipids (decrease of 0.10 mmol/L [3.8 mg/dL] in low-density lipoprotein cholesterol levels).

According to the obesity and weight-loss literature, physicians can provide effective, adequate dietary counseling by providing brief advice and individualized written patient material,42 although consultation with a dietitian improves outcomes.43 More intensive behavioural strategies, such as patient self-monitoring, stimulus control, and social support, appear to improve long-term weight loss in the T2D population.7 These findings reflect primary care patients’ attitudes about weight management. While some obese and overweight patients want to be advised by their physicians to lose weight, many others prefer a more comprehensive approach (eg, dietary and exercise advice, goal setting).44

Finally, evidence shows that delivery of appropriate dietary counseling in primary care can be improved with office-level system supports.41,45 These supports, however, were not widely used by our respondents—twice as many reported they do not use a reminder system for patients at risk.

In general, our survey results appear to confirm the findings of previous studies that primary care physicians understand the importance of lifestyle management and are enthusiastic about providing it, but perceive many barriers that limit their ability to effect long-term behavioural change in their patients.46,47 particularly in the context of T2D.4,14,48 As evidence has recently shown, an intensive program of lifestyle intervention can substantially delay or prevent T2D in patients with IGT.9-11 Strategies that assist physicians promoting these interventions in practice are clearly needed.

Limitations

A shorter survey could have yielded a much larger response rate; yet, given the numerous demands on clinicians’ time, a response rate of 53% is impressive. Further, as our results are based on self-reported data, it is difficult to determine whether respondents practised what they reported; research shows that respondents tend to overestimate what are considered positive behaviours.49

This survey sampled only CFPC members, who (as a criterion of membership) must commit to continuing education. As a result, our sample potentially overrepresents physicians who are up-to-date on current recommendations. Finally, our survey did not differentiate between dietary strategies (eg, reduce fat and carbohydrate intake) and weight loss in general.

Conclusion

Recent literature clearly demonstrates the benefits of lifestyle intervention for prevention of T2D. Our findings indicate that family physicians not only understand the importance of lifestyle interventions for preventing and managing T2D, but are eager to deliver them. Family physicians do not, however, use effective strategies to bring about lifestyle behaviour change. What is more, there is strikingly little evidence evaluating these initiatives in primary health care.

There is an urgent need to develop and evaluate strategies to help physicians overcome identified barriers and effect long-term behaviour change in their patients. Failure to do so will severely
compromise family physicians’ efforts to battle the T2D epidemic.

Acknowledgment
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Contributors
Dr Harris, as Principal Investigator, was central to hypothesis development, design, implementation, and analysis of the study and to conception, writing, and editing of the manuscript. Dr Petrella, as Co-Principal Investigator, was integral to study planning, survey design and interpretation, analysis, and manuscript writing and review.
Ms Lambert-Lanning, as a Co-Investigator, assisted in survey and hypothesis development and was in charge of data collection, management, entry, and analysis, and wrote the Results section. Ms Leadbetter, as a Co-Investigator, was integral to initial survey development and to manuscript review. Ms Cranston, as medical writer, actively participated in writing and revising the manuscript.

Competing interests
This work is supported by a grant from Health Canada’s Canadian Diabetes Strategy Prevention and Promotion Contribution Program.

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References

POINTS DE REPÈRE DU RÉDACTEUR
• Les médecins de famille canadiens semblent conscients de la nécessité de modifier le mode de vie dans les cas de diabète de type 2 (DT2); de 85% à 90% conseillent leurs patients concernant l’activité physique et le régime alimentaire.
• Par ailleurs, ils utilisaient moins souvent des instructions ou des systèmes de rappel par écrit. Plusieurs médecins de famille n’étaient pas au courant de diverses interventions éprouvées sur le mode de vie comme PACE Canada ou les ordonnances eVert’action!
• Les principaux obstacles à des interventions plus élaborées en matière de mode de vie étaient le manque d’intérêt des patients et le temps limité.

EDITOR’S KEY POINTS
• Canadian family physicians appear to be aware of the need for lifestyle modification in type 2 diabetes (T2D); 85% to 90% advise their patients about physical activity and diet.
• Written directions for physical activity or reminder systems, however, were less often used. Many family doctors were unaware of several proven lifestyle interventions, such as PACE Canada or Go for Green prescriptions.
• The main barriers to wider lifestyle interventions were patients’ lack of interest and limited time.


