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in Health



Agence canadienne  
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technologies de la santé

## OPTIMAL THERAPY REPORT

# COMPUS

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Current Practice Analysis of Health  
Care Providers and Patients on Self-  
Monitoring of Blood Glucose



*Supporting Informed Decisions*

*À l'appui des décisions éclairées*

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## Conflicts of Interest

**Dr. Lisa Dolovich** was a co-investigator in studies on behaviour change interventions funded by Merck Frosst Canada Ltd., GlaxoSmithKline Inc., Aventis Pharma Ltd., Eli Lilly Canada Inc., and Crystaal Corporation.

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## ABBREVIATIONS

A <sub>1</sub> C	Glycosylated hemoglobin
CAC	COMPUS Advisory Committee
CADTH	Canadian Agency for Drugs and Technologies in Health
CDA	Canadian Diabetes Association
CERC	COMPUS Expert Review Committee
COMPUS	Canadian Optimal Medication Prescribing and Utilization Service
SMBG	Self-monitoring of blood glucose
UK	United Kingdom
US	United States

# GLOSSARY

**A1C:** A glycosylated form of hemoglobin, formed by the attachment of sugars to the hemoglobin molecule when glucose levels are elevated. A1C levels increase with the average concentration of glucose in the blood.

**Cost-effectiveness analysis:** A form of economic evaluation that compares the costs and effects of two or more alternative treatments.

**Diabetes mellitus:** A group of common metabolic disorders characterized by hyperglycemia and caused by insufficient insulin secretion, reduced insulin sensitivity of target tissues, or both.

**Effectiveness:** The extent to which an intervention, procedure, regimen, or service produces the intended outcomes when deployed under routine (“real world”) circumstances.

**Fasting plasma glucose:** Plasma glucose level measured at least eight hours after caloric intake.

**Gestational diabetes mellitus:** Defined as glucose intolerance with first onset during pregnancy; usually a temporary condition.

**Hemoglobin A1C:** A glycated form of hemoglobin. Hemoglobin A1C levels reflect average glycemia over the course of 90 to 120 days, and are, therefore, commonly used as a measure of long-term glycemic control in diabetes.

**Hyperglycemia:** A qualitative term used to describe blood glucose that is above the normal range.

**Hypoglycemia:** A qualitative term used to describe blood glucose that is below the normal range. Definitions vary across studies, although one or both of the following is usually required to define a hypoglycemic event: autonomic or neuroglycopenic symptoms characteristic of low blood glucose (e.g., trembling, sweating, hunger, confusion, weakness) that respond to carbohydrate intake, and/or a plasma glucose level below a specific value (threshold is usually between 3.4 mmol/L to 4.0 mmol/L).

**Thematic analysis:** Thematic analysis is a method for identifying, analyzing, and reporting patterns (themes) within qualitative data. Phases of thematic analysis include familiarization with the data, generation of initial codes, a search for themes, a review of themes, definition and naming of themes, and production of report.

**Type 1 diabetes mellitus:** Diabetes characterized by a lack of insulin secretion caused by pancreatic beta cell destruction. This form includes cases due to an autoimmune process and those for which the etiology of beta cell destruction is unknown.

**Type 2 diabetes mellitus:** Diabetes characterized by insulin resistance and varying degrees of insulin deficiency, especially as the diabetes progresses.

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# 1 INTRODUCTION

In March 2004, the Canadian Optimal Medication Prescribing and Utilization Service (COMPUS) was launched by the Canadian Coordinating Office for Health Technology Assessment (CCOHTA) — now the Canadian Agency for Drugs and Technologies in Health (CADTH) — as a service to federal, provincial, and territorial jurisdictions and other stakeholders. COMPUS is a nationally coordinated program, funded by Health Canada.

The goal of COMPUS is to optimize drug-related health outcomes and cost-effective use of drugs by identifying and promoting optimal drug prescribing and use. Where possible, COMPUS builds on existing applicable Canadian and international initiatives and research. COMPUS goals are achieved through three main approaches:

- identifying evidence-based optimal therapy in prescribing and use of specific drugs
- identifying gaps between evidence-based optimal therapy and clinical practice, then proposing evidence-based interventions to address these gaps
- supporting the implementation of these interventions.

Direction and advice are provided to COMPUS through various channels, including the following:

- the COMPUS Advisory Committee (CAC): includes representatives from the federal, provincial, and territorial Health Ministries and related health organizations
- the COMPUS Expert Review Committee (CERC): advisory in nature and provides recommendations related to the identification, evaluation, and promotion of optimal drug prescribing and use in Canada
- stakeholder feedback.

## 1.1 COMPUS Expert Review Committee

The COMPUS Expert Review Committee (CERC) consists of eight Core Members appointed to serve for all topics under consideration during their term of office, and three or more Specialist Experts appointed to provide their expertise in recommending optimal therapy for one or more specific topics. For the insulin analogues and blood glucose test strips, four endocrinologists/diabetes specialists were appointed as Specialist Experts. Two of the Core Members are Public Members who bring a lay perspective to the committee. The remaining six Core Members hold qualifications as physicians, pharmacists, or health economists, or have other relevant qualifications, with expertise in one or more areas such as, but not limited to, family practice, internal medicine, institutional or community clinical pharmacy, pharmacoeconomics, clinical epidemiology, drug utilization expertise, methodology, affecting behaviour change (through health professional and/or patient and/or policy interventions), and critical appraisal. The Core Members, including Public Members, are appointed by the CADTH Board of Directors.

The mandate of CERC is advisory in nature and consists of providing recommendations and advice to CADTH's COMPUS Directorate on assigned topics that relate to the identification, evaluation, and promotion of optimal practices in the prescribing and use of drugs across Canada. The overall perspective used by CERC members in producing recommendations is that of public health care

policy makers in pursuit of optimizing the health of Canadians within available health care system resources.

## 2 ISSUE

The COMPUS Advisory Committee (CAC) has identified management of diabetes mellitus as being a priority area for optimal practice initiatives, based on the following criteria:

- large deviations from optimal utilization (overuse or underuse)
- size of patient populations
- impact on health outcomes and cost-effectiveness
- potential to effect change
- benefit to multiple jurisdictions
- measurable outcomes.

Within diabetes mellitus management, optimal use of blood glucose test strips in patients with type 1, type 2, and gestational diabetes mellitus was identified by CAC as a priority topic.

Despite widespread use, there is controversy regarding the benefits of self-monitoring of blood glucose (SMBG), especially in patients with type 2 diabetes mellitus not using insulin.<sup>1-4</sup> Moreover, the optimum frequency of testing has not been defined in any population.<sup>5,6</sup> A need exists for the identification of clinical and economic evidence relating to the optimal prescribing and use of SMBG. Costs associated with SMBG are rising due to the increasing prevalence of diabetes in Canada and higher rates of self-monitoring.<sup>7</sup> In 2005/2006, the Nova Scotia Seniors' Pharmacare Program spent \$4 million on blood glucose test strips, approximately 60% of which was spent on beneficiaries who were not using insulin agents.<sup>8</sup> In Saskatchewan, of the \$6.5 million spent on diabetic testing supplies in 2001 (most of it on blood glucose test strips), approximately half was for people who were not using insulin agents.<sup>9</sup> Evidence relating to the optimal prescribing and use of SMBG may assist policy decision makers, consumers, and health care providers in making informed decisions for patients with type 1, type 2, and gestational diabetes mellitus.

### 2.1 Diabetes Mellitus

Diabetes mellitus is a chronic disease characterized by the body's inability to produce sufficient insulin and/or properly use insulin.<sup>10</sup> Type 1 diabetes mellitus occurs in approximately 10% of patients with diabetes, and it results when little or no insulin is produced by the body.<sup>11</sup> Type 2 diabetes mellitus is a metabolic disorder caused by varying degrees of insulin resistance; the body usually produces insulin, but is unable to use it properly.<sup>10</sup> When inadequately managed, diabetes is likely to result in poor glycemic control.<sup>10</sup> Impaired glycemic control, if prolonged, may result in diabetes-related complications (e.g., ischemic heart disease, stroke, blindness, end-stage renal disease, lower limb amputation).<sup>12,13</sup>

The global prevalence of diabetes is estimated to be 246 million and is projected to increase to 380 million by 2025.<sup>14</sup> In 2004/2005, approximately 1.8 million (5.5%) Canadians aged 20 years and older had diagnosed diabetes.<sup>15</sup> However, it is estimated that 2.8% of the general adult population

has undiagnosed type 2 diabetes mellitus,<sup>5</sup> and the true prevalence of diabetes may approach 2.0 million.<sup>16</sup>

### **2.1.1 Management of blood glucose levels in diabetes mellitus**

One goal of diabetes mellitus management is to maintain control of blood glucose levels in order to reduce the patient's risk of developing long-term diabetes-related complications. Lifestyle modifications (i.e., weight control, proper nutrition, and adequate exercise), the use of medications (e.g., insulin and oral antidiabetes drugs), and SMBG are recommended approaches in improving glycemic control.<sup>5</sup> This report focuses on the use and frequency of blood glucose testing by patients with diabetes.

### **2.1.2 Technology description — self-monitoring of blood glucose**

The purpose of SMBG is to collect detailed information about glucose levels across various time points each day and take appropriate action should those levels be outside the desired range.<sup>7,17</sup> SMBG requires that patients prick their finger with a lancet device to obtain a small blood sample (0.3 µL to 5 µL).<sup>7,17</sup> The blood is applied to a reagent strip or blood glucose test strip, and glucose concentration is determined by inserting the blood-laden strip into a reflectance photometer, or an electrochemical sensor.<sup>7</sup> Results, based on an automated reading, are available from the photometer within five to 30 seconds.<sup>7</sup> The results can be stored in the glucose meter's electronic memory or recorded in the patient's logbook. It has been suggested that patients can adjust food intake, physical activity, and pharmacotherapy in response to their blood glucose readings and, thus, are better able to maintain optimal glycemic control on a day-to-day basis.<sup>7,17</sup>

### **2.1.3 Current practice knowledge of self-monitoring of blood glucose**

It is thought that health care professionals such as physicians, pharmacists, and diabetes educators can be guided by SMBG results in treatment planning for patients with diabetes,<sup>17</sup> and this may lead to better management of diabetes. Three surveys from the United States (US) and the United Kingdom (UK) on the behaviour of physicians and nurses regarding SMBG reported that a majority of health care professionals (78% to 98%) recommended SMBG to patients with type 2 diabetes.<sup>18-20</sup> A survey of nurses from the UK demonstrated a prevalent belief that patients with type 2 diabetes mellitus should be encouraged to perform SMBG whenever possible because an awareness of blood glucose levels could help patients better understand their condition and its management.<sup>20</sup> However, whether health care professionals imparted education, reviewed the results of SMBG with their patients, assessed perceived advantages and disadvantages of SMBG, and had knowledge of the clinical and economic evidence supporting SMBG was not explored in these studies.

Previous research has produced variable views from patients regarding SMBG. In a survey of patients from the US, Karter et al<sup>21</sup> reported a considerable gap between recommended and actual SMBG practices in 44,181 adult patients with diabetes. Sixty percent of those with type 1 diabetes mellitus and 67% of those with type 2 diabetes practiced SMBG less frequently than recommended by the American Diabetes Association.<sup>21,22</sup> In a study from a primary care centre in

the UK, Stewart et al<sup>23</sup> reported that 97% of the patients taking insulin and 75% of the patients taking oral antidiabetes drugs performed SMBG. In a longitudinal survey from the UK, patients with type 2 diabetes mellitus thought that physicians focussed on A<sub>1</sub>C levels and lacked interest in SMBG readings.<sup>24</sup> Other studies reported different disadvantages of SMBG.<sup>25-27</sup> The behaviour of Canadian health care professionals and patients with diabetes regarding SMBG is unknown.

### **3 OBJECTIVES**

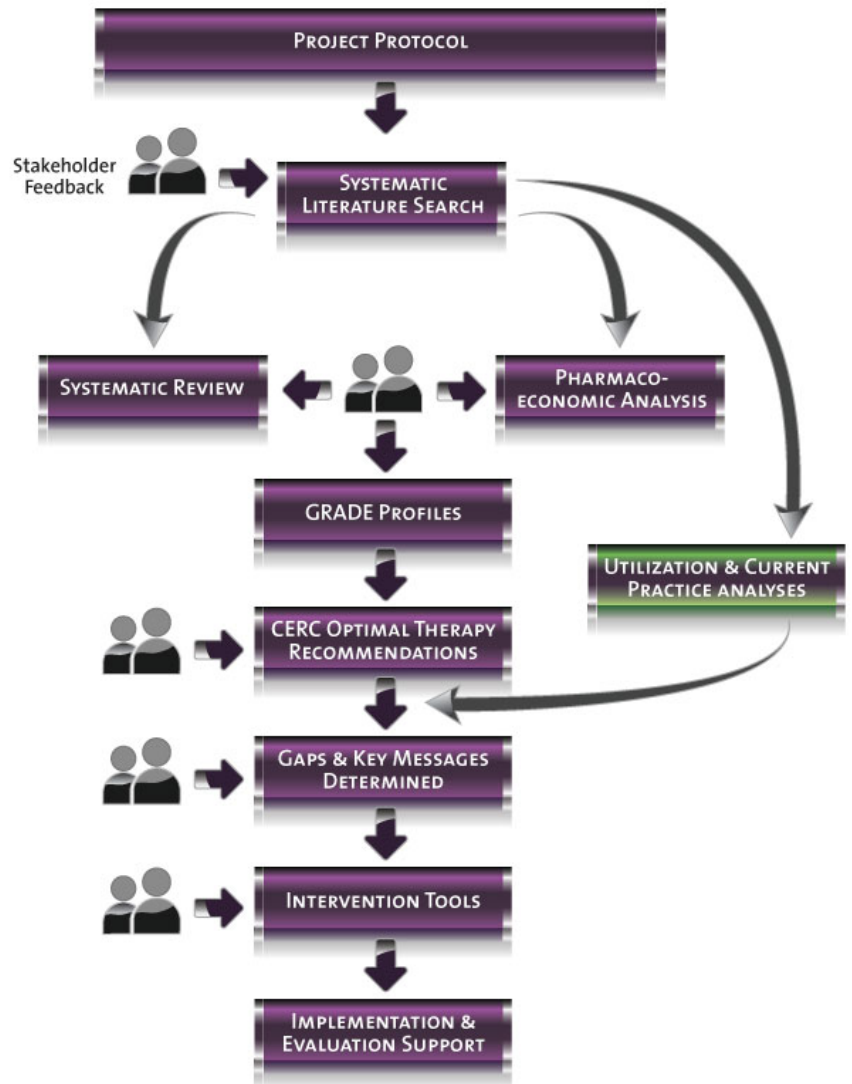
To explore the current views and experiences of health care professionals, and patients with type 1 or type 2 diabetes mellitus, regarding SMBG in the management of diabetes in Canada.

## 4 PROJECT OVERVIEW

Once a topic is selected, COMPUS undertakes activities related to key areas in the COMPUS procedure. The CAC provides advice and guidance throughout the process, from topic identification through to supporting intervention and evaluation tools. CERC, as described in Section 1.1, provides expert advice and recommendations on the topic area relating to the identification, evaluation, and promotion of optimal prescribing and use of drugs. A broad range of stakeholders are invited to provide feedback at key stages in the COMPUS process.

To identify and promote the implementation of evidence-based and cost-effective optimal therapy in the use of blood glucose test strips, COMPUS follows the process outlined in the flow chart to the right.

This report represents the Current Practice Analysis step (green box) toward the identification of practice and knowledge gaps related to the prescribing and use of blood glucose test strips.



## 5 RESEARCH QUESTIONS

1. What are the views and experiences of health care professionals — including physicians, pharmacists, and diabetes educators — who provide care for patients with type 1 and type 2 diabetes mellitus on the practice of SMBG?
2. What are the views and experiences of patients with type 1 and type 2 diabetes mellitus relating to the practice of SMBG, including their response to high and low readings, reasons for increasing or decreasing SMBG frequency, and their views on the advice and feedback from health care professionals?
3. How do patients or caregivers modify their behaviour in response to the results obtained from SMBG regarding:
  - a. medication use
  - b. diet
  - c. exercise
  - d. contact with health care professionals?

## 6 METHODS

CADTH retained Vision Research Inc., Ottawa to undertake a series of focus groups with health care professionals (i.e., physicians, pharmacists, and diabetes educators) and patients with diabetes mellitus. A moderator's guide (Appendix A) containing a set of questions on current practices and attitudes of health care professionals related to SMBG was developed. The questionnaire covers various aspects of SMBG, including recommending SMBG, imparting training, reviewing glucometer results with patients, clinical and economic evidence supporting SMBG, advantages and disadvantages, and how they select a particular brand of glucometer.

A separate moderator's guide (Appendix B) was prepared for patients with type 1 and type 2 diabetes mellitus, which covered the current practice of and attitudes on SMBG; for example, whether or not they performed SMBG, who initially recommended the practice, whether they received any education regarding interpreting glucometer results, whether glucometer results were reviewed by their health care professionals, how they responded to high or low readings, and advantages and disadvantages of SMBG.

Samples of health care professionals and patients with diabetes were selected randomly from three Canadian cities (i.e., Ottawa, Vancouver, and Edmonton). Consent for participation in the study was obtained and an honorarium was offered to each participant. Focus group sessions of health care professionals and patients were led by an experienced moderator and lasted approximately 90 minutes. CADTH team members were invited to view the sessions via a one-way mirror and participants were informed that a client was monitoring the session. All focus group sessions were audio-recorded for analysis and reporting. Participant information and proceedings of the focus groups were kept strictly confidential at every stage of the research process.

A thematic approach\* was used to analyze the results. Themes were identified based on prevalence among the responses of all participants and organized around the structure of the moderator's guides. In analyzing the data, the focus was not only on prevalence, but also on range, indicating where participants diverged and noting the variety of responses.

## **7 RESULTS**

Focus group sessions were conducted during March 2008 in three Canadian cities: Ottawa, Vancouver, and Edmonton. A total of 20 focus group sessions involving 80 health care professionals and 40 patients were held. All sessions were conducted in English.

### **7.1 Health Care Professionals**

A total of 43 physicians, 19 pharmacists, and 18 diabetes educators participated in 14 focus groups from three different cities. All the participants completed focus groups. Their demographics are presented in Appendix C. The thematic analyses of the discussions with health professionals is presented in Appendix D, and a sample of actual responses is provided in Appendix E.

### **7.2 Patients**

A total of 40 patients with either type 1 or type 2 diabetes mellitus participated in six focus groups in three different cities. Demographics for the patient groups are presented in Appendix F. All patients completed their assigned focus group. The thematic analyses and samples of actual responses for the patient groups are provided in Appendices G and H.

## **8 DISCUSSION**

### **8.1 Health Care Professionals**

#### **8.1.1 Summary of main findings**

This study indicates that nearly all participating health care professionals recommend SMBG to the vast majority of their patients with diabetes. Most health care professionals believe that it is beneficial for patients to perform SMBG more frequently when they use insulin, are pregnant, ill, or changing medication, diet, and lifestyle. Health care professionals believe that SMBG is less beneficial in patients with type 2 diabetes managed by diet and/or oral antidiabetes drugs, whose blood glucose levels are within target range and are stable. Health care professionals instruct their patients on how to identify and resolve abnormal glucometer results. Physicians indicate that they review glucometer results to monitor their patients' conditions and discuss the issues related

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\* See Glossary for definition of thematic analysis.<sup>28</sup>



to glycemic control. Diabetes educators state that they review glucometer results with their patients to adjust therapy, encourage patients to continue testing, and create opportunities for learning (e.g., to discuss specific causes of abnormal values). Pharmacists express concern that they may not always have the time required to review glucometer results with their patients. Health care professionals perceive that the advantages of SMBG to patients include ownership of their diabetes, a sense of control, an enhanced ability to make informed lifestyle choices, and increased confidence. Disadvantages associated with SMBG that were identified in the focus groups include cost of blood glucose test strips, discomfort, incorrect testing, and errors or dishonesty in reporting.

The responses of health care professionals on the evidence to support the clinical and cost-effectiveness of SMBG are variable. Some of the physicians express scepticism regarding this evidence. A small number of physicians refer to recent research suggesting that tightly controlled blood sugars may not be clinically effective and that SMBG may not reduce complications of diabetes. They emphasize the need for additional research on the effectiveness of SMBG in reducing long-term complications of diabetes. Some diabetes educators mention that some information or research exists to support the use of SMBG and others identify clinical practice guidelines as suitable evidence to support SMBG. Health care professionals' views on receiving more information on SMBG are variable. Most of the physicians express the need for face-to-face learning from other family physicians, endocrinologists, or other health care professionals. A few physicians desire online sources or printed information, such as journal articles. Pharmacists conveyed that publications geared towards their profession can be helpful to learn more about SMBG. Diabetes educators express the desire for clinical practice guidelines and the need to attend conferences to learn more about SMBG practices. There is considerable recognition in a number of focus groups that glucometer advertising and family and friends of patients can play an influential role in initiation of blood glucose testing and selection of a glucometer.

### **8.1.2 Results in relation to other studies**

Three surveys, two exploring the views of physicians and one of nurses, were identified in the literature search.<sup>18-20</sup> Regarding recommendation of SMBG to patients with diabetes, the findings of the CADTH study are in agreement with two surveys of physicians: one from the US, which indicated that physicians recommended SMBG to nearly all patients (98%) with type 1 and type 2 diabetes;<sup>19</sup> and another from the UK, which indicated that 93% of physicians recommended SMBG to all or most patients with type 2 diabetes (including most patients on insulin).<sup>18</sup> Only 35% of physicians recommended SMBG to most, but not all, patients with type 2 diabetes.<sup>18</sup>

In agreement with the CADTH study, a survey of nurses from the UK showed that SMBG empowered patients and promoted self care,<sup>20</sup> and there was evidence and guidelines to support the use of SMBG in patients with diabetes.<sup>20</sup> Health care professionals from other studies did not report any disadvantages associated with SMBG.<sup>18-20</sup> It is possible that this aspect of SMBG was not explored in those surveys.

A survey of physicians from the UK reported that selection of a particular brand of glucometer was based on the functionality of the instrument, costs, preference of the patient, and influence from pharmaceutical manufacturers,<sup>18</sup> which is in alignment with the results of the CADTH study.

## 8.2 Patients

### 8.2.1 Summary of main findings

The views and perspectives of patients from the focus groups regarding the use of SMBG were variable. Most of the patients followed the advice of health care professionals and performed SMBG, with the frequency varying by the type of diabetes, whether the patients used insulin, and their current level of glycemic control. Many patients with type 1 diabetes had been performing SMBG since the technology was first made available. Patients recorded the results from SMBG in log books, spreadsheets, charts, graphs, or stored them in their glucometer to share with their health care professionals. Patients indicated that they shared their glucometer results with their physicians, though with varying frequency. Participants expected that physicians, if required, would adjust their medication(s) upon reviewing the glucometer results. Most patients reported that physicians frequently ordered A1C testing and made prescribing decisions based on A1C levels rather than glucometer results. A majority of participants knew how to manage their abnormal glucometer readings.

The advantages of SMBG reported by patients included a sense of control, peace of mind, and active management of their diabetes. The disadvantages of SMBG expressed by patients included the cost of blood glucose test strips, discomfort, and inconvenience related to frequent testing and carrying the required equipment and supplies. Patients also felt that SMBG negatively affect self-management when readings were counterintuitive.

Most patients stated that physicians were the first to motivate them to begin SMBG. Pharmacists and diabetes educators provided ongoing motivation, helped with selecting a glucometer, and provided instructions on appropriate glucometer use. Most patients agreed that their family doctor and the internet were the best sources of information on SMBG, and that pharmacists and manufacturers can also be good sources of information on glucometers. A number of patients expressed the need for simpler and more objective information on glucometers, blood glucose test strips, and the relative effectiveness of different brands and models.

### 8.2.2 Results in relation to other studies

Nine articles that surveyed patients with diabetes were identified in the literature search.<sup>19,21,23-25,27,29-31</sup> Of these, one study was on patients with type 1 diabetes,<sup>29</sup> three on patients with type 2 diabetes,<sup>19,24,31</sup> four on mixed population of patients with type 1 or type 2 diabetes,<sup>21,25,27,30</sup> and one did not specify the type of diabetes, but patients were managed with insulin or oral antidiabetes drugs.<sup>23</sup>

Regarding the performance of SMBG, the CADTH study is in agreement with a survey of older patients (age > 65 years) with type 1 or type 2 diabetes from the UK, which showed that the

majority of patients performed SMBG.<sup>30</sup> Another survey of adults with diabetes from the UK also showed that compliance with SMBG was 99% in patients taking insulin and 79% in patients taking oral antidiabetes drugs.<sup>23</sup> On the other hand, a survey from the US reported that 60% of patients with type 1 diabetes and 67% of those with type 2 diabetes practiced SMBG less frequently than recommended by the American Diabetes Association.<sup>21</sup> A survey of adolescents with type 1 diabetes and their parents from the US showed that due to social stigma, many adolescents did not perform SMBG as advised by their health care professionals.<sup>29</sup> On the other hand, compliance with SMBG was good in the CADTH study. A small Canadian study was identified which compared the effect of providing free glucose test strips to requiring patients to pay for glucose test strips, to determine performance of SMBG and glycemic control in patients with type 1 or type 2 diabetes managed with insulin. In this study, SMBG was performed less often on average in the paying group (1.4 tests per day) than in the free test strips group (2 tests per day). A1C was significantly less in the free strips test groups compared with the paying group. Subjects felt that they were not testing more often because test strips were expensive, SMBG did not help anyway, and they could feel their own blood sugar without testing.<sup>27</sup> A longitudinal study from the UK<sup>24</sup> in patients with type 2 diabetes revealed that compliance with SMBG was attenuated over time due to perceived disinterest of health care professionals in glucometer results. Maintenance of consistent readings over time and increased awareness of physical indicators of hypoglycemia were cited by subjects as reasons for discontinuing SMBG. Patients perceived health care professionals as being disinterested in SMBG results and primarily focussed on levels of A1C.<sup>24</sup> Views of patients in the CADTH study are very similar to those expressed in other studies.

Similar to the CADTH study, a focus group study from the US in patients with type 2 diabetes reported that when blood glucose readings were high or low, patients determined why the abnormalities occurred and planned their behaviour accordingly, indicating they had sufficient knowledge to manage their abnormal results.<sup>25</sup> A majority of participants in the CADTH study adjusted insulin, metformin, ate, drank water, or exercised when faced with an abnormal glucometer readings. Contrary to the COMPUS results, a focus group study from the UK showed that patients with type 2 diabetes experienced difficulty in interpreting results of SMBG and were puzzled and anxious when faced with high glycemic results. They considered the results to be little more than a number.<sup>24</sup> Patients also described certain situations in which health care professionals did not recommend discontinuing SMBG, even though the latter did not demonstrate interest in glucometer results.<sup>24</sup>

Regarding the advantages of SMBG, a survey of patients with type 2 diabetes from the UK showed that patients viewed low blood glucose readings as a sign of success that offered assurance and comfort, and encouraged self-regulation.<sup>31</sup> SMBG can heighten patients' awareness of the impact of their lifestyles (e.g., dietary choices) on blood glucose levels.<sup>24</sup> Similar to the CADTH study, patients from other studies reported different disadvantages of SMBG, including pain, inconvenience, physical difficulty in puncturing the site, emotional trauma, mental anguish, a sense of failure when readings were high, the constant reminder of the continuous presence of their diabetes, and cost.<sup>24,25,27,29,31,32</sup> Other patients viewed SMBG as disruptive and the least favourite aspect of managing their diabetes,<sup>29</sup> and that SMBG could also lead to anxiety, self-blame, and a sense of failure and abandonment of dietary regimens when readings were

persistently high.<sup>24,31</sup> Social stigma was a common barrier to SMBG in some adolescents with type 1 diabetes<sup>29</sup> and adults managed with insulin.<sup>32</sup>

### **8.3 Similarities and Differences in Views Across Different Populations**

In the CADTH study, views of health care professionals and patients with diabetes were in a similar vein regarding compliance to SMBG, reporting advantages and disadvantages of SMBG. The study reveals that Canadian health care professionals recommend SMBG to most of their patients with diabetes, and most patients with diabetes practice SMBG, as recommended. In agreement with the study, an American report showed that 98% of physicians recommended SMBG to their patients and 74% of the patients practiced SMBG as recommended.<sup>19</sup> Health care professionals advised their patients to test blood sugar more frequently when they were using insulin and some patients with type 1 diabetes expressed that they had been performing SMBG since the technology was first made available. Health care professionals explained that they educated their patients on how to manage abnormal glucometer readings. The majority of patients in the focus groups agreed and felt that they had sufficient knowledge to manage abnormal glucometer readings.

The CADTH study demonstrated a divergence in views regarding glucometer results between health care professionals and patients. Health care professionals indicated that they reviewed SMBG results with their patients, but most patients reported that their physicians ignored SMBG results and frequently ordered A1C testing. Patients also indicated that their physicians made prescribing decisions based on results from A1C rather than their glucometer readings.

### **8.4 Similarities and Differences in Views Across Different Jurisdictions**

In general, the views of health care professionals and patients with diabetes regarding SMBG did not differ appreciably between the three Canadian cities in the CADTH study. Still, a few differences were observed in the views of diabetes educators and patients. Although all the diabetes educators reported that they relied on the CDA guidelines to decide on whether or not to prescribe or recommend SMBG, diabetes educators in Ottawa and Edmonton expressed some reservation regarding the advantages of SMBG, based on their own experience or knowledge of studies showing little benefit.

When patients with diabetes were asked about the quality of information available to them on the topic of SMBG, those from Ottawa felt a need for less technical information, while those from Vancouver and Edmonton felt a need for more credible or impartial information.

## 8.5 Strengths and Limitations

There are a number of strengths in CADTH's COMPUS approach. First, the CADTH study is Canadian-specific. Even though there are studies from other countries,<sup>18-20</sup> no study from Canada has explored the behaviours of health care professionals related to SMBG. Second, COMPUS simultaneously explored the behaviours, attitudes, and perceptions of health care professionals (i.e., physicians, pharmacists, and diabetes educators) and patients with diabetes regarding SMBG. Simultaneous exploration of the different views provides a more comprehensive assessment of current practice of SMBG in Canada. Only one study from the US,<sup>19</sup> which simultaneously explored the behaviour of physicians and patients with diabetes regarding compliance with SMBG, has been reported (discussed in previous section). Third, the CADTH study explored whether or not Canadian health care professionals recommended SMBG, imparted education, and reviewed glucometer results with their patients, and perceived advantages and disadvantages of SMBG; and also studied the knowledge of the clinical and economic evidence supporting SMBG; whereas studies from other countries briefly explored compliance with SMBG. Furthermore, health care professionals were asked similar questions to explore for comparisons across disciplines. This is the only study which explored the views of pharmacists regarding SMBG. Fourth, the CADTH study explored the views of patients with diabetes in greater detail. Fifth, the interviewer was neither a health care professional nor a person living with diabetes; hence, bias towards type of health care professional, patient, or SMBG was minimized. Sixth, the CADTH study was conducted in three Canadian cities in separate parts of the country. For the majority of interview questions, the views of health care professionals and patients were highly consistent. Finally, CERC —which is comprised of endocrinologists, family physicians, pharmacists, and health economists — provided advice throughout the development of this report.

As with all analyses, limitations warrant mention. First, health care professionals and patients who elect to participate may be more likely to have an interest in diabetes management and, therefore, the results may overestimate their positive attitude towards SMBG. However, random sampling of health care professionals and patients in this study should have decreased the effect of this factor. Second, due to non-availability of medical records, the views of patients were not compared with their glycemic control. Finally, we explored the views of health care professionals and patients only once, due to the cross-sectional design of the study. Whether or not their views on SMBG change over time could not be explored in this study. The issue would best be addressed using a long-term longitudinal study.

## 8.6 Conclusion

Health care professionals recommend SMBG for their patients with type 1 and type 2 diabetes and most patients indicate compliance. Health care professionals believe that SMBG may be beneficial in patients with diabetes who are on insulin, or those who have altered their antidiabetes drugs or undergone lifestyle changes. Health care professionals also believe that SMBG may be less beneficial for patients with type 2 diabetes managed with diet or oral antidiabetes drugs and whose blood sugar is stable. Health care professionals reported that they reviewed glucometer results with their patients; however, most patients indicated that physicians relied more on A1C

results to adjust management strategies. Health care professionals impart education to patients regarding SMBG and a majority of the latter have sufficient knowledge to manage abnormal readings. A need for high-quality research evaluating the effects of SMBG on long-term complications of diabetes was identified by physicians. Unbiased, credible, and appropriate information on SMBG was identified as a need by patients with diabetes.

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# APPENDIX A: VISION RESEARCH MODERATOR’S GUIDE FOR BLOOD GLUCOSE TEST STRIPS CURRENT PRACTICE FOCUS GROUPS (HEALTH CARE PROFESSIONALS)

## Moderator’s Guide

Client:	Canadian Agency for Drugs and Technology in Health (CADTH)	
Contact:	Janet Crain	
Project:	COMPUS – Blood Glucose Testing Strips: Professionals	
Date:	March 3, 2008	Version: 2

### 1.0 Introduction

*5 minutes*

- 1.1 Before we start, I would like to explain a few things about this study and today’s focus group session.
- The group session will last 60 to 90 minutes.
  - The session will be audio-recorded to allow for a more detailed report; audio files will remain the property of the research firm and will be erased after 12 months.
  - Participation in the group session is strictly voluntary and participants need not answer any question that make them feel uncomfortable.
  - The identity of participants will be kept confidential in all aspects of the study and in the final report.
  - The study is being undertaken by the Canadian Agency for Drugs and Technology in Health (CADTH) — a not-for-profit agency funded by the federal and provincial governments and mandated by them to provide credible, impartial advice and evidence-based information about the effectiveness of drugs and other health technologies.
  - The study in which you have agreed to participate is part of a research project undertaken by CADTH, through its Canadian Optimal Medication Prescribing & Utilization Service (COMPUS) directorate. COMPUS works to identify and promote evidence-based, clinical and cost-effectiveness information on optimal drug prescribing and use. COMPUS then develops strategies, tools, and services to encourage the use of this information in decision making among health care providers and consumers.
  - COMPUS is currently focusing on management of diabetes mellitus as one of two priority areas where the adoption of optimal drug therapy is likely to have an impact on a large number of Canadians (the other being proton pump inhibitors [PPIs] for the treatment of gastrointestinal problems).
  - There may be staff from CADTH observing the focus group from behind the mirror. This is so that they can see and hear your comments first-hand and learn as much as possible from the study.
- 1.2 Are there any questions or concerns related to this study?

## 2.0 Blood Glucose Testing — Current Practices

25 minutes

- 2.1 Under what circumstances do you currently prescribe or recommend the use of blood glucose test strips for self-monitoring of blood glucose (SMBG) — as a teaching tool for patients with “pre-diabetes” or as part of managing a patient’s diabetes mellitus? Does your current practice vary between patients with type 1 and type 2 diabetes mellitus?
- 2.2 Does your current practice related to the use of blood glucose test strips vary according to the way diabetes mellitus is managed?
- For patients who manage their diabetes mellitus by diet alone?
  - For patients who manage through diet and oral antidiabetes drugs?
  - For patients taking different types of oral antidiabetes drugs?
  - For patients using insulin agents?
- 2.3 Do you think there are particular times or circumstances when prescribing or recommending blood glucose test strips is more useful?
- After the initial diagnosis of pre-diabetes?
  - After the initial diagnosis of diabetes mellitus?
  - While medications and diet are being adjusted?
  - During illness?
  - During pregnancy?
  - For athletes?
  - For very young patients?
- 2.4 Generally speaking, what action, if any, do you advise your patients to take when they have abnormal blood glucose test results?
- 2.5 Do you review your patient’s self-monitoring blood glucose results? Why or why not, and, if so, how do you use this information?
- 2.6 Who are the main drivers for recommending blood glucose test strips? (*i.e., Who is convincing physicians to recommend blood glucose test strips and who is convincing patients to use blood glucose test strips?*)

## 3.0 Advantages and Disadvantages of SMBG

25 minutes

- 3.1 Generally speaking, how convinced are you about the appropriateness of prescribing or recommending SMBG using blood glucose test strips? Does your conviction vary by type of diabetes mellitus?
- 3.2 What, in your opinion, are the notable advantages of prescribing or recommending SMBG using blood glucose test strips for patients with pre-diabetes?
- 3.3 What, in your opinion, are the advantages of prescribing or recommending SMBG for patients with type 1 diabetes mellitus? What might encourage you to prescribe or recommend SMBG?
- 3.4 What, in your opinion, are the advantages of prescribing or recommending SMBG for patients with type 2 diabetes mellitus? What might encourage you to prescribe or recommend SMBG?
- 3.5 Overall, what do you see are the disadvantages of SMBG for patients with pre-diabetes mellitus, type 1 or type 2 diabetes mellitus? What might discourage you from prescribing

or recommending this approach? (*Probe for cost, patient lifestyle or comfort, health professional's time, likelihood of patient following the advice*)

## 4.0 Evidence

40 minutes

- 4.1 In your opinion, is there convincing clinical evidence to support recommending SMBG using blood glucose test strips for patients with pre-diabetes?
- 4.2 Currently, what information do you rely upon when making a decision on whether or not to prescribe or recommend SMBG using blood glucose test strips? (*Probe for experience, CDA Guidelines, peer-reviewed journals, client's preferences, pharmaceutical company resources, meter makers, policy, etc.*)
- 4.3 How would you most like to receive and access information on SMBG using blood glucose test strips? (*Probe for didactic sessions, print materials, interactive sessions, online info/sessions, academic detailing, drug reps, specialists, colleagues, etc.*)
- 4.4 In your opinion, is there convincing clinical evidence to support recommending SMBG for patients with type 1 diabetes mellitus? If yes, how do you access this information?
- 4.5 In your opinion, is there convincing clinical evidence to support recommending SMBG for patients with type 2 diabetes mellitus? If yes, how do you access this information?
- 4.6 In your opinion, is there convincing evidence about the cost-effectiveness of SMBG with blood glucose test strips for patients with type 1 diabetes mellitus? If yes, how do you access this information?
- 4.7 In your opinion, is there convincing evidence about the cost-effectiveness of SMBG with blood glucose test strips for patients with type 2 diabetes mellitus? If yes, how do you access this information?
- 4.8 In your opinion, is SMBG being prescribed/used appropriately (in accordance with the clinical and economic evidence) in patients with type 1 and type 2 diabetes mellitus? (*Probe for gaps in current practice.*)
- 4.9 What other evidence would you like to see related to SMBG using blood glucose test strips? What questions remain to be answered in your view?

## 5.0 Conclusion

5 minutes

- 5.1 Does anyone have any final thoughts or comments relating to the practice of SMBG, and the use of blood glucose test strips, that we have not covered today?
- 5.2 Does anyone have any final thoughts or comments on the efforts by CADTH to research the clinical and cost-effectiveness of SMBG using blood glucose test strips and then to communicate its findings to health professionals, policy makers and patients to help them all make informed decisions?

Thanks very much for your participation today. I appreciate your time and your thoughts and remind you to see the receptionist on your way out to pick up your incentive.

# APPENDIX B: VISION RESEARCH MODERATOR’S GUIDE FOR BLOOD GLUCOSE TEST STRIPS CURRENT PRACTICE FOCUS GROUPS (PATIENTS)

## Moderator’s Guide

Client:	Canadian Agency for Drugs and Technologies in Health (CADTH)	
Contact:	Janet Crain	
Project:	COMPUS – Blood Glucose Testing Strips: <b>Patients</b>	
Date:	March 3, 2008	Version: 2

### 1.0 Introduction

*5 minutes*

- 1.1 Before we start, I would like to explain a few things about this study and today’s focus group session.
- The group session will last 60 to 90 minutes.
  - The group session will be audio-recorded to allow for a more detailed report; audio files will remain the property of the research firm and will be erased after 12 months.
  - Participation in the group session is strictly voluntary and participants need not answer any question that make them feel uncomfortable.
  - The identity of participants will be kept confidential in all aspects of the study and in the final report.
  - The study is being undertaken by the Canadian Agency for Drugs and Technologies in Health (CADTH) – a not-for-profit agency funded by the federal and provincial governments and mandated by them to provide credible, impartial advice and evidence-based information about the effectiveness of drugs and other health technologies.
  - The study in which you have agreed to participate is part of the Agency’s Canadian Optimal Medication Prescribing & Utilization Service (COMPUS). COMPUS works to identify and promote evidence-based, clinical and cost-effectiveness information on optimal drug prescribing and use. COMPUS then develops strategies, tools, and services to encourage the use of this information in decision making among health care providers and consumers.
  - This study is part of the COMPUS effort to research and identify the optimal ways to prescribe and use drugs — the ways that are most cost-effective and most effective for people’s health. COMPUS then shares the results of its research to encourage governments, health professionals and patients to adopt these optimal practices.
  - COMPUS is currently focusing on diabetes mellitus management as a priority area that could have an impact on a large number of Canadians. In particular, we will talk today about using blood glucose test strips to monitor your own blood glucose levels.

- There may be staff from CADTH observing the focus group from behind the mirror. This is so that they can see and hear your comments first-hand and learn as much as possible from the study.

1.2 Are there any questions or concerns related to this study?

## 2.0 Blood Glucose Testing — Current Attitudes *25 minutes*

2.1 As someone who lives with diabetes mellitus, do you currently self-monitor your blood glucose levels using a blood glucose test strip? If no, have you ever done so?

2.2 Two questions for you now: First, what type of diabetes mellitus do you have (1 or 2) and, secondly, if you do or have self-monitored your blood glucose levels, how often and for how long? If you have never self-monitored, why not? (*Probe for whether the frequency is as prescribed by a professional or not.*)

2.3 What do you do with the results of your blood glucose test strips? If the reading is too high? If the reading is too low?

2.4 In your opinion, what are the advantages of self-monitoring your blood glucose? (*Probe for education — i.e., to learn how diet and exercise can improve glycemia—curiosity, reassurance, fear of hypoglycaemia.*)

2.5 What are the disadvantages? (*Probe for cost, time, discomfort, self-chastisement.*)

## 3.0 Blood Glucose Test Strips and the Health Professional *30 minutes*

3.1 If you do or have self-monitored your blood glucose, what led you to do that? Did someone recommend it to you? Did you see or read some information and decide on your own?

3.2 Has someone (a doctor, pharmacist or diabetes mellitus educator) explained to you how to perform the test using the test strip? If yes, who provided you with that information and do you feel they did a good enough job to allow you to perform the test with confidence?

3.3 What else, if anything, could that person have told you that would have given you more confidence about deciding whether or not to monitor your blood glucose levels or about actually performing the test?

3.4 Has your health care provider ever asked to see the results of your blood glucose monitoring? If yes, which health care provider was that (e.g., family physician, diabetes mellitus educator)? What action did that person take after seeing the blood test readings? What did they advise you to do based on seeing the blood test readings?

3.5 Some blood glucose monitors can be used by patients to upload their blood test results to the computer in order to analyse the results. Does your monitor have this function? If yes, how often do you upload your data (if at all)? Does your doctor or other health care provider look at this analysis?

3.7 Did you ever experience a higher-than-normal reading and what did you do about it?

## 4.0 Information

*15 minutes*

4.1 If you were looking for information on SMBG using blood glucose test strips, where would you be most likely to look? *(Probe for health professional, Internet, family and friends, literature and ads from manufacturer.)*

4.2 In your opinion, is there enough information available to patients on the topic of SMBG using blood glucose test strips?

4.3 Who would be the best person or organization to provide education for Canadians on SMBG using blood glucose test strips? *(Probe for health professionals, professional associations, CDA, governments, manufacturers.)*

## 5.0 Conclusion

*10 minutes*

5.1 Does anyone have any final thoughts or comments relating to the practice of SMBG, and the use of blood glucose test strips, that we have not covered today?

Thanks very much for your participation today. I appreciate your time and your thoughts and remind you to see the receptionist on your way out to pick up your incentive.

## APPENDIX C: DEMOGRAPHICS OF HEALTH CARE PROFESSIONALS

Characteristics	Physicians n = 43	Pharmacists n = 19	Diabetes Educators n = 18
Cities			
▪ Ottawa n(N)	12 (2)	5 (1)	4 (1)
▪ Vancouver n(N)	15 (2)	6 (1)	6 (2)
▪ Edmonton n(N)	16 (2)	8 (1)	8 (2)
Sex			
▪ Male n(%)	28 (65)	5 (26)	0 (0)
▪ Female n(%)	15 (35)	14 (74)	18 (100)
Settings*			
▪ Group practice n(%)	21 (49)	--	--
▪ Solo practice n(%)	22 (51)	--	--
▪ Community pharmacy/care n(%)	--	8 (31)	7 (35)
▪ Retail pharmacy n(%)	--	11 (42)	--
▪ Long-term care centre pharmacy n(%)	--	5 (19)	--
▪ Hospital pharmacy/care n(%)	--	1 (18)	6 (30)
▪ Clinic pharmacy/care n(%)	--	1 (9)	7 (35)
Degree			
▪ University n(%)	43 (100)	19 (100)	10 (55)
▪ College n(%)	--	--	4 (22)
▪ Hospital diploma n(%)	--	--	4 (22)

n=number of patients; N=number of focus groups

\*= some pharmacists and diabetes educators had practices at two settings.



## APPENDIX D: THEMATIC ANALYSIS OF DISCUSSIONS WITH HEALTH CARE PROFESSIONALS

<b>Question 1:</b> Under what circumstances do you currently prescribe or recommend the use of blood glucose test strips for SMBG as a teaching tool for patients with diabetes mellitus? Does your current practice vary between patients with type 1 and type 2 diabetes mellitus?	
<b>Physicians</b>	<ul style="list-style-type: none"> <li>▪ A substantial proportion of participants reported that they prescribe or recommend SMBG to most if not all of their diabetic patients.</li> <li>▪ A number of participants described their broader recommendation that patients receive diabetes mellitus education in which, as part of the education, they are introduced to SMBG.</li> <li>▪ A few participants noted that they might not recommend it for very elderly patients and less educated patients who may have trouble with the procedure, or lower-income patients without coverage for blood glucose test strips.</li> </ul>
<b>Pharmacists</b>	<ul style="list-style-type: none"> <li>• Participants overwhelmingly suggested that they always recommend monitoring among their diabetic patients.</li> </ul>
<b>Diabetes Educators</b>	<ul style="list-style-type: none"> <li>▪ A strong majority expressed a preference for having all clients test blood sugar levels on a regular basis. Some participants recommended a similar strategy for pre-diabetic patients, as well, while others did not.</li> <li>▪ The reasons given in support of testing focused more on patient education and lifestyle management than therapy.</li> <li>▪ There was some recognition that elderly clients may not be required to test, owing to the dexterity required.</li> </ul>

<b>Question 2:</b> Does your current practice related to the use of blood glucose test strips vary according to the way diabetes mellitus is managed? Do you think there are particular times or circumstances when prescribing or recommending blood glucose test strips is more useful?	
<b>Physicians</b>	<ul style="list-style-type: none"> <li>▪ Most participants drew a clear line between patients using insulin and those managing with oral antidiabetes drugs or diet alone. Simply put, patients using insulin are required to test repeatedly in order to ensure the correct dosage.</li> <li>▪ SMBG gets patients using insulin accustomed to testing, improves understanding of the effect of meals, and allows for self-adjustment of insulin. Some participants felt that all patients with diabetes should begin SMBG early so as to “get used to” the testing and be ready as the condition progresses.</li> <li>▪ Upon prompting, participants agreed that they will ask diabetic patients who are otherwise ill, engaged in sport, adjusting to new medications or dosage levels, or are at risk for hypoglycemia to test more often.</li> </ul>
<b>Pharmacists</b>	<ul style="list-style-type: none"> <li>▪ Participants suggested that monitoring using blood glucose test strips is particularly important for patients on medication or insulin whose prescription has changed.</li> </ul>

<b>Question 2:</b> Does your current practice related to the use of blood glucose test strips vary according to the way diabetes mellitus is managed? Do you think there are particular times or circumstances when prescribing or recommending blood glucose test strips is more useful?	
	<ul style="list-style-type: none"> <li>▪ Other participants suggested that there are other circumstances under which they feel self-monitoring using blood glucose test strips is necessary, including when a patient is ill or has been diagnosed as having pre-diabetes.</li> <li>▪ Few distinctions were made between type 1 and type 2 patients.</li> </ul>
<b>Diabetes Educators</b>	<ul style="list-style-type: none"> <li>▪ A clear distinction was made between type 1 clients using insulin and type 2 clients using diet and/or oral antidiabetes drugs to manage their diabetes — the former requiring regular testing.</li> <li>▪ It was acknowledged that regular testing for patients not using insulin may not provide substantial benefits. Some participants believed that patients controlled on diet or exercise should monitor three times per week, while others felt such patients should focus more on post-prandial values.</li> <li>▪ Upon prompting, some did agree that they will ask patients with diabetes who are otherwise ill, under stress, pregnant, adjusting their medication, or experiencing unexplained changes in their levels to test more frequently.</li> </ul>

<b>Question 3:</b> Generally speaking, what action, if any, do you advise your patients to take when they have abnormal blood glucose test results?	
<b>Physicians</b>	<ul style="list-style-type: none"> <li>▪ Participants provided a range of advice. Their answers varied based on the individual patient context and included both short-term “fixes” and longer-term learning and behaviour modification.</li> <li>▪ Short-term solutions varied between patients on insulin and those managing with oral antidiabetes drugs or diet alone, with the former group having a clear directive to use insulin to bring down high blood sugar levels. It was felt that patients on oral medications and managing with diet alone had fewer options.</li> <li>▪ Participants agreed that, in the longer term, patients with type 2 diabetes managing through diet alone could spot patterns and learn and modify their lifestyle based on the readings.</li> <li>▪ For patients on oral medications, physicians felt that an abnormal reading was perhaps cause to review compliance or reconsider the medication.</li> <li>▪ SMBG as a means of instructing patients on identifying and resolving hypoglycemia caused by oral medications was also mentioned.</li> </ul>
<b>Pharmacists</b>	<ul style="list-style-type: none"> <li>▪ Unlike physicians, the answers focused on learning, lifestyle adjustments and non-medicinal responses.</li> <li>▪ Some participants indicated that patients on oral medications and insulin have other options to consider when readings are abnormal.</li> <li>▪ Immediate strategies were also described for low or high readings.</li> </ul>
<b>Diabetes Educators</b>	<ul style="list-style-type: none"> <li>▪ Diabetes educators seemed more concerned with using abnormal readings as learning opportunities than with providing instant fixes to most of their clients.</li> <li>▪ While some did mention solutions, such as drinking water or going for a walk,</li> </ul>

**Question 3:** Generally speaking, what action, if any, do you advise your patients to take when they have abnormal blood glucose test results?

	<p>most focused their answers on looking for patterns and learning to identify the root causes of high readings.</p> <ul style="list-style-type: none"> <li>▪ Most diabetes educators did draw a distinction between patients managing through diet alone and those on oral medications or insulin therapy, such that the latter group may require dose or medication changes in response to abnormal SMBG values.</li> </ul>
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**Question 4:** Do you review your patient’s self-monitoring blood glucose results? Why or why not, and, if so, how do you use this information?

<b>Physicians</b>	<ul style="list-style-type: none"> <li>▪ Participants mostly indicated that they review self-monitoring results with patients, though with varying degrees of interest.</li> <li>▪ For patients on oral medications and insulin, the review is part of assessing the extent to which the prescribed treatment is effective.</li> <li>▪ For all diabetic patients, the review of results is seen as an opportunity to monitor the patient’s condition, identify specific issues related to glycemic control and how they may be resolved, provide education and reinforcement regarding treatment goals and targets, meet expectations, and show support.</li> </ul>
<b>Pharmacists</b>	<ul style="list-style-type: none"> <li>▪ Participants pointed to the need to put aside time to review abnormal results or, in some cases, to not having the opportunity to review results at all due to lack of time.</li> <li>▪ There was very little distinction in this answer between patients on oral medications or insulin and those managing through diet alone.</li> </ul>
<b>Diabetes Educators</b>	<ul style="list-style-type: none"> <li>▪ All participants agreed that they take the time to review clients’ test results. This was described as an opportunity for learning; a time to identify specific causes for abnormal values; provide positive feedback, reassurance, motivation, and empowerment; and to determine if medication is working.</li> </ul>

**Question 5:** Who are the main drivers for recommending blood glucose test strips? In other words, who is convincing physicians to recommend blood glucose test strips and who is convincing patients to use blood glucose test strips?

<b>Physicians</b>	<ul style="list-style-type: none"> <li>▪ Participants offered a number of answers to this question: other health care providers (notably pharmacists and diabetes educators), peers, organizations such as the Canadian Diabetes Association, and industry.</li> <li>▪ Many pointed out that physicians also play a determining role in first recommending self-monitoring and education to patients.</li> <li>▪ The answers to this question were largely consistent between type 1 and type 2 patients.</li> </ul>
<b>Pharmacists</b>	<ul style="list-style-type: none"> <li>▪ Participants provided a full range of sources they felt were driving recommendations to use blood glucose test strips.</li> <li>▪ The majority suggested that doctors were the primary source for blood glucose test strips recommendations.</li> </ul>

<b>Question 5:</b> Who are the main drivers for recommending blood glucose test strips? In other words, who is convincing physicians to recommend blood glucose test strips and who is convincing patients to use blood glucose test strips?	
	<ul style="list-style-type: none"> <li>Others felt that recommendations to use blood glucose test strips stemmed from pharmaceutical companies.</li> </ul>
<b>Diabetes Educators</b>	<ul style="list-style-type: none"> <li>Participants in these groups had a clear sense that they and their colleagues play a determining role in introducing clients to SMBG and educating them on its use.</li> <li>In addition, several participants understood that other health professionals — notably family physicians, endocrinologists and pharmacists — are also influential in driving patients to test their blood.</li> <li>The role of manufacturers and their ad campaigns was also mentioned.</li> </ul>

<b>Question 6:</b> What, in your opinion, are the notable advantages of prescribing or recommending SMBG using test-strips for patients with diabetes mellitus? Overall, what do you see are the disadvantages of SMBG?	
<b>Physicians</b>	<ul style="list-style-type: none"> <li>Participants pointed mostly to behaviour modification and patient education as the chief advantages of having all diabetic patients (types 1 and 2) monitor their own blood glucose.</li> <li>The idea of a patient “taking control” of their diabetes was repeated a number of times in the discussions.</li> <li>Physicians did note more clinical advantages of self-monitoring for those patients on oral medications and insulin (i.e., adjusting medications and reducing the incidence of hypoglycemia).</li> <li>In terms of disadvantages, physicians were quick to mention the costs and discomfort experienced by patients. They seemed more focused, however, on broader disadvantages, such as the concern that patients become fixated on SMBG numbers and do not place enough emphasis on other important aspects (e.g., weight, exercise, cholesterol and blood pressure control). As well, some patients may not be able to understand or manage the information requirements of SMBG.</li> </ul>
<b>Pharmacists</b>	<ul style="list-style-type: none"> <li>The majority of participants expressed that the ability and increased motivation for patients to control and better manage their diabetes mellitus was the primary benefit of SMBG using blood glucose test strips.</li> <li>There was little distinction made by most participants between types of diabetes mellitus or treatment. Some described more therapeutic advantages for patients on insulin and oral medication.</li> <li>The primary disadvantage was considered to be cost, particularly among patients who do not have health plans or insurance. Another disadvantage outlined by participants was related to the interpretation and accuracy of the results.</li> <li>Some felt that the monitor itself, problems with calibration, or patients’ misinterpretation of readings, could lead to inaccurate or inconsistent results.</li> </ul>

**Question 6:** What, in your opinion, are the notable advantages of prescribing or recommending SMBG using test-strips for patients with diabetes mellitus? Overall, what do you see are the disadvantages of SMBG?

<p><b>Diabetes Educators</b></p>	<ul style="list-style-type: none"> <li>▪ Diabetes educators were evenly split regarding the chief advantages of self-monitoring.</li> <li>▪ Many pointed to advantages that accrue to them as health professionals — data with which to adjust a patient’s medication and insulin, and with which to provide counselling.</li> <li>▪ Others pointed to advantages that accrue more directly to the patient — information with which they can take charge of their diabetes, play an active role in its management, and achieve better glycemic control. These advantages to the patient are irrespective of diabetes mellitus type or therapy.</li> <li>▪ Participants also mentioned the relative convenience and comfort of SMBG devices (small size, quick response time), as well as the fact that the devices themselves are free.</li> <li>▪ In terms of disadvantages, many educators pointed to the costs of blood glucose test strips, the fear of needles, the pain of testing, and the embarrassment of testing at school. Many also pointed to the fact that some patients will find testing difficult (i.e., due to cognitive or mobility impairments), while others will not test appropriately or will lie about the results.</li> </ul>
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**Question 7:** Currently, what information do you rely upon when making a decision on whether or not to prescribe or recommend SMBG using blood glucose test strips? In your opinion, is there convincing *clinical* evidence to support recommending SMBG for patients with diabetes mellitus? Is there convincing evidence about the *cost-effectiveness* of SMBG with blood glucose test strips?

<p><b>Physicians</b></p>	<ul style="list-style-type: none"> <li>▪ A preponderance of participants were unable to point to any specific evidence (i.e., studies, publications) as to the clinical- or cost-effectiveness of self-monitoring using blood glucose test strips.</li> <li>▪ Those who did suggest they had seen such evidence were often uncertain as to the exact source.</li> <li>▪ It is noteworthy that participants in one of the groups described a recent study suggesting that too tight a control of blood sugars could be detrimental.</li> </ul>
<p><b>Pharmacists</b></p>	<ul style="list-style-type: none"> <li>▪ When asked to provide suggestions for what clinical evidence exists to support SMBG, the majority of participants were unable to come up with concrete examples. However, some did point broadly to studies related to the subject, as well as guidelines.</li> <li>▪ Pharmacists were also less clear on evidence related to the cost-effectiveness of SMBG, although some participants indicated that the process overall can be less expensive than other methods for gathering blood glucose results and that the cost benefits are more evident over the long term.</li> <li>▪ There was also mention of a recent study that called into question the clinical- effectiveness of self-monitoring and tight control.</li> </ul>

**Question 7:** Currently, what information do you rely upon when making a decision on whether or not to prescribe or recommend SMBG using blood glucose test strips? In your opinion, is there convincing *clinical* evidence to support recommending SMBG for patients with diabetes mellitus? Is there convincing evidence about the *cost-effectiveness* of SMBG with blood glucose test strips?

<p><b>Diabetes Educators</b></p>	<ul style="list-style-type: none"> <li>▪ Participants were split on the clinical- and cost-effectiveness evidence in support of self-monitoring.</li> <li>▪ Some participants pointed to the CDA guidelines and the Diabetes Control and Complications Trial, while others simply expressed confidence that the evidence is there.</li> <li>▪ Other diabetes educators indicated that recent experience, studies, or professional development had called into question the clinical advantages of SMBG.</li> <li>▪ Some participants were not able to point to specific studies, but were confident in pointing to their own experience that SMBG is useful for optimizing glycemic control and protecting patients.</li> </ul>
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**Question 8:** In your opinion, is SMBG being prescribed/used appropriately (in accordance with the clinical and economic evidence) in patients with type 1 and type 2 diabetes mellitus?

<p><b>Physicians</b></p>	<ul style="list-style-type: none"> <li>▪ The answers to this question varied widely in all groups, including some respondents who felt certain patient types are testing more than required and other segments that are under-diagnosed and/or testing less than required.</li> <li>▪ In many instances, the type and stage of diabetes mellitus was a factor in the physician’s assessment. Physicians agreed that testing is a requirement for patients with type 1 diabetes, leading to higher compliance.</li> <li>▪ The group was split on whether SMBG is over- or under-prescribed/used for patients who are not insulin-dependent.</li> </ul>
<p><b>Pharmacists</b></p>	<ul style="list-style-type: none"> <li>▪ The need for education and direction on how to act on results was mentioned.</li> <li>▪ One respondent felt that SMBG was under-prescribed to newly-diagnosed patients with diabetes.</li> <li>▪ Two participants drew a distinction between patients with type 1 and 2 diabetes mellitus, though disagreeing on whether or not those in the latter group test too seldom or too often.</li> </ul>
<p><b>Diabetes Educators</b></p>	<ul style="list-style-type: none"> <li>▪ Participants were quick to point to segments of the population they felt were under-utilizing blood glucose test strips, usually due to socio-economic causes or inadequate access to health care.</li> <li>▪ Though prompted, the participants did not draw clear distinctions between types of diabetes mellitus or therapy.</li> <li>▪ Some diabetes-educators also pointed to segments of the population they felt might be over-utilizing blood glucose test strips, such as some newly-diagnosed patients with diabetes or those anxious about their condition.</li> </ul>

<b>Question 9:</b> What other evidence would you like to see related to SMBG using blood glucose test strips?	
<b>Physicians</b>	<ul style="list-style-type: none"> <li>▪ Participants had a strong sense that more evidence was needed to help them make informed decisions on the clinical- and cost-effectiveness of self-monitoring using blood glucose test strips.</li> <li>▪ Given their scientific education, many had clear requirements for the type of research required — requirements varied between type 1 and 2 diabetes mellitus or between types of therapy.</li> <li>▪ The need for research assessing whether or not SMBG impacted the long-term complications of diabetes mellitus was mentioned.</li> </ul>
<b>Pharmacists</b>	<ul style="list-style-type: none"> <li>▪ Participants provided a number of areas for further research, including gaps in treatment for those with and without a family doctor, and comparative effectiveness of various meters.</li> </ul>
<b>Diabetes Educators</b>	<ul style="list-style-type: none"> <li>▪ Diabetes educators had few ideas for additional evidence or research they would like to see, although a need to better define the patients for whom SMBG is of value was expressed by one respondent. Many seemed content with the information and the guidelines they currently use.</li> </ul>

<b>Question 10:</b> How would you most like to receive and access information on SMBG using blood glucose test strips?	
<b>Physicians</b>	<ul style="list-style-type: none"> <li>▪ Participants were quite consistent in their preference for face-to-face learning opportunities in which they could learn from other physicians or health professionals.</li> <li>▪ There was also some interest expressed for printed and online sources of information, though this varied greatly by individual.</li> </ul>
<b>Pharmacists</b>	<ul style="list-style-type: none"> <li>▪ Participants felt overall that the best way to share information was through professional publications geared toward pharmacists.</li> </ul>
<b>Diabetes Educators</b>	<ul style="list-style-type: none"> <li>▪ For the most part, participants recommended working with the CDA to share the results of the blood glucose test strips project with them and their colleagues. Through its clinical guidelines and conferences, the CDA is felt to be most effective in reaching this audience.</li> </ul>

## APPENDIX E: QUOTES FROM HEALTH CARE PROFESSIONALS REGARDING SMBG FOR PATIENTS WITH TYPE 1 AND TYPE 2 DIABETES

<p><b>Question 1:</b> Under what circumstances do you currently prescribe or recommend the use of blood glucose test strips for SMBG as a teaching tool for patients with diabetes mellitus? Does your current practice vary between patients with type 1 and type 2 diabetes mellitus?</p>	
<p><b>Physicians</b></p>	<ul style="list-style-type: none"> <li>▪ “I always recommend it, but it doesn’t always make the patients happy.” – <i>Edmonton</i></li> <li>▪ “I think mostly all diabetics should test. We do offer them what we have available, a sample, or we use smart cards, and we encourage all of them to test.” – <i>Edmonton</i></li> <li>▪ “In general, I try to prescribe it except for patients in their 80s because it is hard for them to test themselves.” – <i>Edmonton</i></li> <li>▪ “I like all my diabetic patients to go through diabetic education and try to ensure that they are committed to doing blood glucose monitoring, why they are doing it, and when they are doing it.” – <i>Edmonton</i></li> <li>▪ “I will usually send my patients for education. I send them to a community diabetic centre.” – <i>Ottawa</i></li> <li>▪ “I’m biased for blood glucose test strips because I’m diabetic. This being said, I think it’s incredibly important to track/monitor the blood glucose level at all times and blood glucose test strips is a great way to do so.” – <i>Ottawa</i></li> <li>▪ “I’m in east Vancouver, a traditional type of practice. I have a lot of diabetics in my practice, about fb are diabetic. I try and tell them all to monitor their sugar. Some less educated patients have trouble with using the apparatus. I try to get everyone to do it unless they are borderline.” – <i>Vancouver</i></li> <li>▪ “I’d like all my diabetic patients to monitor. The costs are an issue, though. They are very expensive if they aren’t covered.” – <i>Vancouver</i></li> </ul>
<p><b>Pharmacists</b></p>	<ul style="list-style-type: none"> <li>• “It’s imperative that we regularly review blood sugar levels.” – <i>Ottawa</i></li> <li>• “We use monitoring for lab tests and we help other staff learn how to use and read them.” – <i>Ottawa</i></li> <li>• “In terms of recommending monitoring, it’s across the board. I encourage every patient to monitor. Especially with type 2 diabetes mellitus, if there is a change in medication. With type 1, they need regular monitoring.” – <i>Edmonton</i></li> <li>• “If they are not on any medications, we have a protocol to follow. It is standard. We educate them on what they can do in their lifestyle. There is a whole approach to it.” – <i>Edmonton</i></li> <li>• “We are given a lot of educational material and we share it with staff and patients.” – <i>Edmonton</i></li> <li>• “I recommend monitors all of the time. I think all diabetics should test four times a day and they should know what to do with the results.” – <i>Vancouver</i></li> </ul>



**Question 1:** Under what circumstances do you currently prescribe or recommend the use of blood glucose test strips for SMBG as a teaching tool for patients with diabetes mellitus? Does your current practice vary between patients with type 1 and type 2 diabetes mellitus?

<p><b>Diabetes Educators</b></p>	<ul style="list-style-type: none"> <li>▪ “Even those who aren’t diabetic yet, but at risk, we encourage people to self-monitor at that stage. It’s more about helping people to be more in control of their illness and getting connected with what’s going on in their bodies... they see a number and it really hits home and becomes a teaching tool. There are some people who just can’t — some seniors who just can’t do it. I will try it but you can tell if you get them back a few times.” – <i>Ottawa</i></li> <li>▪ “Anybody with diabetes mellitus, I want them testing.” – <i>Edmonton</i></li> <li>▪ “Every one of our patients gets a meter, that is policy. Newly diagnosed and early diagnosed, especially, get meters.” – <i>Vancouver</i></li> <li>▪ “The guidelines do say if you have been diagnosed with diabetes mellitus, you should be taught how to manage your blood glucose and how to monitor your blood glucose... But again, there is a lot of variation in frequency within that because of therapy and costs — if you’re covered or not.” – <i>Ottawa</i></li> <li>▪ “Someone who is 88 may not need to test as much as someone who is 58.” – <i>Vancouver</i></li> <li>▪ “Pre-diabetes, we don’t recommend it unless their A1C is high and we think they have diabetes mellitus after all.” – <i>Vancouver</i></li> <li>▪ “I worry the insulin analogues can give them false security. Someone with pre-diabetes may test and think they don’t need to change everything, but they have to look at the whole picture.” – <i>Vancouver</i></li> </ul>
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**Question 2:** Does your current practice related to the use of blood glucose test strips vary according to the way diabetes mellitus is managed? Do you think there are particular times or circumstances when prescribing or recommending blood glucose test strips is more useful?

<p><b>Physicians</b></p>	<ul style="list-style-type: none"> <li>▪ “With multi-dosing, the only way you will be able to get used to what you need to use is by repeat testing. You have to get used to what your breakfast does, what your lunch does, what your dinner does. If you weren’t testing, you couldn’t do it.” – <i>Ottawa</i></li> <li>▪ “I can’t imagine somebody on insulin not testing.” – <i>Ottawa</i></li> <li>▪ “But once they have it, you can give them control over their insulin and they can change what they need to take in the insulin stage. You have to get them used to getting up at five in the morning, they have to get up and check.” – <i>Edmonton</i></li> <li>▪ “... you have to know where they are and at what point do you introduce medication.” – <i>Edmonton</i></li> <li>▪ “If the oral agent that they’re having is more likely to lead to hypoglycemia, I may be more likely to call for testing. But a lot of the time you’re playing an alliance with the patient, and whether the patient has bought into having diabetes mellitus, whether they’ve bought into testing or even being followed, and you’re sort of negotiating all these things with the patient, so I don’t think there’s one answer.” – <i>Ottawa</i></li> </ul>
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<b>Question 2:</b> Does your current practice related to the use of blood glucose test strips vary according to the way diabetes mellitus is managed? Do you think there are particular times or circumstances when prescribing or recommending blood glucose test strips is more useful?	
	<ul style="list-style-type: none"> <li>▪ “If they’re young, they’ll be on insulin and they may have to juggle it based on their sports and their food.” – <i>Ottawa</i></li> <li>▪ “If they are sick and they are having risks for hypoglycemia or if they have imbalanced insulin secretion and for titrating meds.” – <i>Vancouver</i></li> </ul>
<b>Pharmacists</b>	<ul style="list-style-type: none"> <li>▪ “I have always found that when you are on new medication, it’s important to test.” – <i>Vancouver</i></li> <li>▪ “I find that if they are given a new prescription, they need to use a monitor.” – <i>Ottawa</i></li> <li>▪ “When a patient gets ill, I do talk to them and monitor them more frequently.” – <i>Edmonton</i></li> <li>▪ “If a patient becomes ill, I definitely recommend regular monitoring.” – <i>Ottawa</i></li> <li>▪ “We tell them to keep up testing when they’re sick.” – <i>Edmonton</i></li> <li>▪ “I do for patients with pre-diabetes. Doctors want to monitor them for two weeks to see if there are any trends.” – <i>Edmonton</i></li> </ul>
<b>Diabetes Educators</b>	<ul style="list-style-type: none"> <li>▪ “Much as I don’t like to, I think you could make an argument for not monitoring if they’re not on medication. I don’t think it really makes a difference then, and they can’t do anything with the number.” – <i>Ottawa</i></li> <li>▪ “Type 2s, if they are on insulin, need to test regularly. If they are on oral or diet control, then there is really no huge benefit of testing on a regular basis.” – <i>Edmonton</i></li> <li>▪ “I agree with the insulin and type 1 testing four to seven times a day. I think that type 2’s needs to test three times a week if their exercise and diet routines are working.” – <i>Edmonton</i></li> <li>▪ “People who are on no medication at all, we focus on the PC [post cibum; i.e., after meals] Sugars. The amount they test varies by what medication they are on.” – <i>Vancouver</i></li> <li>▪ “When they see a change in their A1C, they have to do the detective work and see what is going on.” – <i>Vancouver</i></li> <li>▪ “If they are on other drugs when insulin levels should be increased, I want them to have the device so they know what is going on, and don’t drive while they’re under 5.” – <i>Vancouver</i></li> <li>▪ “Pregnancy, yes definitely they should be testing more often.” – <i>Edmonton</i></li> <li>▪ “If you’re going to be making changes to your activity and to your food, then testing is going to tell you if the changes are working.” – <i>Ottawa</i></li> </ul>

<b>Question 3:</b> Generally speaking, what action, if any, do you advise your patients to take when they have abnormal blood glucose test results?	
<b>Physicians</b>	<ul style="list-style-type: none"> <li>▪ “It depends on what they are on. If they have a very high reading and they are on a rapid-acting insulin, then they can have that to bring it down.” – <i>Edmonton</i></li> </ul>

**Question 3:** Generally speaking, what action, if any, do you advise your patients to take when they have abnormal blood glucose test results?

	<ul style="list-style-type: none"> <li>▪ “On oral agents, I don’t know if there’s much you can do on the spur of the moment that is going to change things. About the only thing you can fix up quickly on oral agents is hypoglycemia. They would take a sugar tab or fizz tab to pop you up a few points. If they’re on insulin, you can give them a slide scale “in case of.” If you had to clean up a mess, you could take a short-acting and clean it up.” – <i>Ottawa</i></li> <li>▪ “If they’re panicking, we tell them to drink lots of water. They drink five or six glasses of water and repeat the test and it will have gone down. They’ll feel much better and they won’t have done any harm.” – <i>Ottawa</i></li> <li>▪ “If they’re a type 2, it gives them an opportunity to determine what the cause of the reading was.” – <i>Ottawa</i></li> <li>▪ “You talk to them about what is going on and you tell them what to do when their reading is low. You make sure they know what emergency measures they can take.” – <i>Edmonton</i></li> <li>▪ “I tell them what range to aim for; if they are too low or high they have to come back and see me and perhaps change their medication. The ideal range is always changing.” – <i>Vancouver</i></li> <li>▪ “I ask about their medications, and if they are taking them correctly, compliance and adherence is important.” – <i>Vancouver</i></li> </ul>
<b>Pharmacists</b>	<ul style="list-style-type: none"> <li>▪ “If their reading is high, I recommend that they exercise and then test again to see if it’s levelled out. I also recommend that they keep a log book for them to see what their levels are.” – <i>Vancouver</i></li> <li>▪ “I also recommend exercising if the reading is high. I also ask them to test if they don’t feel well.” – <i>Vancouver</i></li> <li>▪ “Depending on the reading, I may ask them about their diet control and recommend certain changes.” – <i>Vancouver</i></li> <li>▪ “I always want to know what a patient has eaten prior to taking the reading.” – <i>Ottawa</i></li> <li>▪ “It really depends on the value and when they last took their medication.” – <i>Ottawa</i></li> <li>▪ “With low, you tell them how to deal with low right there and then. If it’s below four, keep monitoring frequently.” – <i>Edmonton</i></li> <li>▪ “It’s all relevant. If they’re way up, they have to go to the hospital.” – <i>Vancouver</i></li> </ul>
<b>Diabetes Educators</b>	<ul style="list-style-type: none"> <li>▪ “If it’s really high, I tell them to drink water or go for walks. It’s more important, though, to be looking for patterns and not isolated numbers. Be objective about it.” – <i>Vancouver</i></li> <li>▪ “I tell them to look for trends; don’t react to that number.” – <i>Vancouver</i></li> <li>▪ “There is some learning they need to do to trace it back to what caused that reading; that is part of the classes.” – <i>Vancouver</i></li> <li>▪ ”I think it is important for people with diabetes mellitus to start testing so they can become connected with what’s going on in their bodies. Even if they can’t take insulin, they can go for a walk, they can evaluate what they ate</li> </ul>

**Question 3:** Generally speaking, what action, if any, do you advise your patients to take when they have abnormal blood glucose test results?

	<p>two hours ago. There's a lot they can do." – <i>Ottawa</i></p> <ul style="list-style-type: none"> <li>▪ "Yes, and we want them to get their families involved too. It is for later down the road. We don't care what their numbers are, we want them to learn it for themselves, too." – <i>Edmonton</i></li> <li>▪ "I help them look at it to decide whether or not they should adjust medicine or if they just had supper, should they just exercise." – <i>Edmonton</i></li> <li>▪ "In essence, if they are on insulin, we need to know that as well, so it is for both." – <i>Edmonton</i></li> <li>▪ "You look for a pattern — maybe if it's the odd high one, you look at what they ate, was there some stress involved in their life — kind of evaluate the snapshot at that time. If it's always up at that time, perhaps there's a need to adjust medications. You look for patterns and trends." – <i>Ottawa</i></li> <li>▪ "If somebody is on a long-lasting and rapid-acting analogue, they need to be testing at least four times a day to maximize the use of the insulin that they're on." – <i>Ottawa</i></li> <li>▪ "If they are on other drugs when insulin levels should be increased, I want them to have the device so they know what is going on, don't drive under 5." – <i>Vancouver</i></li> </ul>
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**Question 4:** Do you review your patients' self-monitoring blood glucose results? Why or why not, and, if so, how do you use this information?

<p><b>Physicians</b></p>	<ul style="list-style-type: none"> <li>▪ "I like to see them because it helps me choose different classes of meds. If they are high, it can show insulin sensitivity, so it can guide my therapeutic choices." – <i>Vancouver</i></li> <li>▪ "It is important. Each patient needs educating and the majority is about what level you need to get to and is understanding, and it is part of the way of building rapport with them." – <i>Edmonton</i></li> <li>▪ "I sit down and say, "Okay, what are you doing wrong?" There are some patients you are telling them what they are doing wrong and so I have diet plans now." – <i>Edmonton</i></li> <li>▪ "A lot of the patients want to show them to you so it's part of my job to review them. Every patient has an individual plan and this is a way to monitor that." – <i>Ottawa</i></li> <li>▪ "Numbers are important. You ask the patient to test with the glucometer and it's important that you look at them; to not have feedback would make it a ludicrous exercise... we ask the patient to bring in a log and make comments; it's not just about poking your finger." – <i>Vancouver</i></li> </ul>
<p><b>Pharmacists</b></p>	<ul style="list-style-type: none"> <li>▪ "Unfortunately, we don't have the time to zero in on their results. If I notice that a patient needs special attention, I will take the extra time to make sure that they are well informed." – <i>Vancouver</i></li> <li>▪ "I usually ask them to come back to review their results when I have an overlap, another pharmacist who comes in." – <i>Vancouver</i></li> <li>▪ "Lack of staff makes it hard to monitor properly." – <i>Edmonton</i></li> </ul>

<b>Question 4:</b> Do you review your patients' self-monitoring blood glucose results? Why or why not, and, if so, how do you use this information?	
	<ul style="list-style-type: none"> <li>▪ It takes a lot of time to teach patients to monitor.” – <i>Edmonton</i></li> <li>▪ “The monitor never lies and helps to track a patient’s progress.” – <i>Ottawa</i></li> <li>▪ “I do check results. I check them against a patient’s current therapy to see if the levels are appropriate.” – <i>Ottawa</i></li> </ul>
<b>Diabetes Educators</b>	<ul style="list-style-type: none"> <li>▪ “That’s what nurse educators do. Physicians just don’t have the time because it’s very labour-intensive.” – <i>Ottawa</i></li> <li>▪ “You can point out that they’re always high at this time and ask them what’s going on there. You get the brainstorming going.” – <i>Ottawa</i></li> <li>▪ “Some of the reasons you are looking for is you have to give the client reassurance to what they are doing. If you have to notice high blood sugar, you have to give them the feedback.” – <i>Edmonton</i></li> <li>▪ “It depends on how they are doing. I might see them every three months, six months, or a year. I don’t want to see them if they are doing well.” – <i>Vancouver</i></li> <li>▪ “I ask them what they think when they look at the numbers. I use it to coach, educate, and motivate them.” – <i>Vancouver</i></li> <li>▪ “Reviewing the numbers puts them in charge otherwise, it’s like driving your car without the headlights.” – <i>Vancouver</i></li> </ul>

<b>Question 5:</b> Who are the main drivers for recommending blood glucose test strips? In other words, who is convincing MDs to recommend blood glucose test strips and who is convincing patients to use blood glucose test strips?	
<b>Physicians</b>	<ul style="list-style-type: none"> <li>▪ “A lot of the diabetes mellitus class focuses on the use of the glucometer. Some people go for the certificate; we put in our time, but I’m not the biggest driver, for sure.” – <i>Vancouver</i></li> <li>▪ “CDA receives a lot of funding and they get together and get the experts and write the guidelines and then the government says who gets the funding.” – <i>Vancouver</i></li> <li>▪ “I think the physician has the least influence. When you are in a class setting, you are with others that are motivated, it’s a learning mode, and you are so motivated to get one.” – <i>Vancouver</i></li> <li>▪ “Pharmacists have so much influence on the patient, while the physician has very little influence on the glucometer and which brand they use.” – <i>Vancouver</i></li> <li>▪ “I think it’s a bit of all of those (pharmacists, educators, doctors, industry) — and maybe family and friends of the patient.” – <i>Ottawa</i></li> <li>▪ “The diabetic educators, they’re the prime instigator of this and I wish we had more of them. I think we all refer to the diabetes educators whenever our patients become diabetic. They need far more counselling than we can provide... That’s where they’re going to get the initial push and I guess it’s up to us to encourage them to continue.” – <i>Ottawa</i></li> <li>▪ “I don’t think you can say it is just one person. At the beginning, it is the physicians. More and more, we use pharmacists who need to explain how to</li> </ul>

**Question 5:** Who are the main drivers for recommending blood glucose test strips? In other words, who is convincing MDs to recommend blood glucose test strips and who is convincing patients to use blood glucose test strips?

	<p>use it, and, very definitely, diabetic education people. One has to be a session on cooking and diet, and there might be a different session on monitoring glucose.” – <i>Edmonton</i></p> <ul style="list-style-type: none"> <li>▪ “It is a sequence. It starts with us and continues, but a lot of people don’t have the blood glucose test strips.” – <i>Edmonton</i></li> <li>▪ “Their friends are the biggest group. I pick and choose who I give the glucometer to. I don’t give it to the obsessive early type 2’s, and I have to explain why I don’t give it to them while their friend has it.” – <i>Vancouver</i></li> </ul>
<b>Pharmacists</b>	<ul style="list-style-type: none"> <li>▪ “Most patients go to their doctors and get recommendations from them.” – <i>Vancouver</i></li> <li>▪ “I think most of them are first being diagnosed by their doctor.” – <i>Vancouver</i></li> <li>▪ “I think that the initiation of monitoring comes from health professionals, but the choice to initiate comes from the pharmaceutical companies.” – <i>Edmonton</i></li> <li>▪ “I think it’s the pharmaceutical representatives who are convincing doctors and patients.” – <i>Ottawa</i></li> </ul>
<b>Diabetes Educators</b>	<ul style="list-style-type: none"> <li>▪ “They have endocrinologists, dieticians, nurse educators, doctors who all say you need to test yourself.” – <i>Edmonton</i></li> <li>▪ “I can tell you that 80% don’t go to a diabetes clinic; they are in primary care.” – <i>Edmonton</i></li> <li>▪ “I think the doctors drive it too, but then they send them to the nurses.” – <i>Edmonton</i></li> <li>▪ “I think we are more driving it than physicians and pharmacists. We steer the patients in what they are capable of doing and what is good management scenarios. We don’t have any vested interest in any of the meters other than insuring they get the one that suits their needs.” – <i>Vancouver</i></li> <li>▪ “Even if the newly diagnosed patient may be told they may want to get a monitor but until you see us, you can’t get the deductible.” – <i>Vancouver</i></li> <li>▪ “I think we are, for sure, and physicians. We promote them.” – <i>Ottawa</i></li> <li>▪ “The drug companies. Have you seen how many ads for blood glucose test strips? ‘The smallest blood tester on the market. The least painful.’” – <i>Ottawa</i></li> <li>▪ “They bring the ads in to us. They want the one that doesn’t hurt or that doesn’t take any blood.” – <i>Ottawa</i></li> </ul>

**Question 6:** What, in your opinion, are the notable advantages of prescribing or recommending SMBG using blood glucose test strips for patients with diabetes mellitus? Overall, what do you see are the disadvantages?

<b>Physicians</b>	<ul style="list-style-type: none"> <li>▪ “It helps put the patient in control and helps them understand what they can do to help themselves.” – <i>Ottawa</i></li> <li>▪ “It helps them take the responsibility. I can only do so much because ultimately it’s up to them.” – <i>Ottawa</i></li> <li>▪ “The biggest advantage is the guilt; it reinforces behaviour by giving them</li> </ul>
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**Question 6:** What, in your opinion, are the notable advantages of prescribing or recommending SMBG using blood glucose test strips for patients with diabetes mellitus? Overall, what do you see are the disadvantages?

	<p>feedback on what they do.” – <i>Vancouver</i></p> <ul style="list-style-type: none"> <li>▪ “It’s their disease. You can’t see them every day. They have to control their own illness.” – <i>Edmonton</i></li> <li>▪ “It is really easy for the most part. The meters are free.” – <i>Edmonton</i></li> <li>▪ “The advantage is safety because I’m worried about causing hypoglycemia and having them pass out while driving and kill someone.” – <i>Vancouver</i></li> <li>▪ “If they are good about it and bring it in, it makes it easier for us to adjust their medications. It tells me that they are interested, people who aren’t aware, or people think they will be fine, many diabetics are asymptomatic, patients are more likely to stick with the treatment, shows motivation.” – <i>Vancouver</i></li> <li>▪ “With self-monitoring, you can know what is going on over the long- term.” – <i>Edmonton</i></li> <li>▪ “It’s not just a number; you have to get a sense of the patient, and be professionally assessed. Only about 20% of the population can take in the information and manage it, but the other 80%, that will be hard.” – <i>Vancouver</i></li> <li>▪ “If it is normal or not, and if it skyrockets, then you have to stop them from panicking.” – <i>Edmonton</i></li> <li>▪ “It glamorizes just checking sugars and that isn’t the most important issue, there’s blood pressure control, cholesterol; it puts the emphasis on the wrong issue.” – <i>Vancouver</i></li> <li>▪ “There is nothing wrong with blood sugar testing, but it clouds the other issues.” – <i>Vancouver</i></li> <li>▪ “Even if all my patients were compliant in testing regularly, hardly any of my patients are compliant in exercising, losing weight, and watching their diet. They all know what they have to do but, boy, a very small percentage of them follow the guidelines and they’re constantly cheating and don’t lose any weight whatsoever. I can’t make them do it. I can tell them what to do and what the complications will be if they don’t, but again, it’s their disease and they have to take responsibility for it.” – <i>Ottawa</i></li> <li>▪ “If they feel they are getting numbers, they won’t come and see you. They are just taking a look at one area, but there are other areas of diabetes mellitus that are equally important, like kidneys.” – <i>Edmonton</i></li> </ul>
<p><b>Pharmacists</b></p>	<ul style="list-style-type: none"> <li>▪ “I would prescribe it anyway, despite the type of diabetes mellitus, and would make sure that patients are monitoring their diets.” – <i>Ottawa</i></li> <li>▪ “The monitors provide tighter controls, especially for patients who can identify what foods make their levels either too high or too low.” – <i>Vancouver</i></li> <li>▪ “Self-monitoring gives patients the motivation to control their eating habits.” – <i>Edmonton</i></li> <li>▪ “They can manage their disease and they feel like they have control.” – <i>Vancouver</i></li> </ul>

**Question 6:** What, in your opinion, are the notable advantages of prescribing or recommending SMBG using blood glucose test strips for patients with diabetes mellitus? Overall, what do you see are the disadvantages?

	<ul style="list-style-type: none"> <li>▪ “I think it’s more important for those who use insulin; in fact, it should be mandatory.” – <i>Ottawa</i></li> <li>▪ “It tells you whether the current therapy is working effectively or not.” – <i>Ottawa</i></li> <li>▪ “It can let you know if you should modify dosages of medication.” – <i>Ottawa</i> “Some people don’t have insurance so it makes it difficult for them to get what they need.” – <i>Edmonton</i></li> <li>▪ “Money is not always an issue, but it has been a barrier for some of my patients.” – <i>Ottawa</i></li> <li>▪ “Cost is an issue. The blood glucose test strips can be covered, but it’s income-based, not everyone is covered.” – <i>Vancouver</i></li> <li>▪ “When they don’t calibrate the machines properly the test results may not be accurate.” – <i>Vancouver</i></li> <li>▪ “Many patients don’t give you accurate information about their results.” – <i>Ottawa</i></li> <li>▪ “There can be a lot of confusion about reading results. There is a need to educate patients.” – <i>Ottawa</i></li> <li>▪ “Sometimes patients can’t interpret the results themselves.” – <i>Edmonton</i></li> </ul>
<p><b>Diabetes Educators</b></p>	<ul style="list-style-type: none"> <li>▪ “Doctors respond to numbers — if the patient increases the testing and can show the physician what they have noticed and the data is all there.” – <i>Vancouver</i></li> <li>▪ “You can see their pattern with their blood sugars throughout the day. How can you adjust medication without knowing that?” – <i>Vancouver</i></li> <li>▪ “So you can find out what is happening to them, so you can see what it is affecting them.” – <i>Edmonton</i></li> <li>▪ “How can we make recommendations with clients if we don’t have data? I am making decisions based on these numbers. How do I adjust insulin if I don’t know what their sugars are?” – <i>Ottawa</i></li> <li>▪ “When you test, you are in the driver’s seat as the patient.” – <i>Vancouver</i></li> <li>▪ “People who regularly test have better control according to studies; they pick up on things more quickly and know where to adjust, that’s where education comes in...what does the number mean, what do they do if it’s outside the range, what affects the blood sugar.” – <i>Vancouver</i></li> <li>▪ “Give the client the opportunity to make lifestyle changes.” – <i>Edmonton</i></li> <li>▪ “It puts you in charge, puts you in control of your health.” – <i>Ottawa</i></li> <li>▪ “There are those who just don’t get it, no matter how much you help them analyze.” – <i>Vancouver</i></li> <li>▪ “Money isn’t a real issue with my population; but for them, it’s age, meaning they are confused, technology is beyond them. The arthritic don’t see the value, they are 91, give them a break. Otherwise, it’s the discomfort of the testing, they don’t like the pain.” – <i>Vancouver</i></li> <li>▪ “Pediatric patients say they are testing, but they are kids. Kids pretend to</li> </ul>



**Question 6:** What, in your opinion, are the notable advantages of prescribing or recommending SMBG using blood glucose test strips for patients with diabetes mellitus? Overall, what do you see are the disadvantages?

	<p>test.” – <i>Vancouver</i></p> <ul style="list-style-type: none"> <li>▪ “People usually remember to test before their meal, but forget two hours after.” – <i>Edmonton</i></li> <li>▪ “With kids, they don’t want to test at school; it’s the embarrassment.” – <i>Edmonton</i></li> <li>▪ “If they can’t remember the steps, there’s cognitive reasons why they can’t learn, or have a physical disability; those are reasons we can’t teach them. That’s a very small percentage of the population, though.” – <i>Ottawa</i></li> <li>▪ “There is a small number that I don’t think it makes any difference and I wonder if they fudge the results. They just don’t want to do it, they’re not interested.” – <i>Ottawa</i></li> </ul>
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**Question 7:** Currently, what information do you rely upon when making a decision on whether or not to prescribe or recommend SMBG using blood glucose test strips? In your opinion, is there convincing clinical evidence to support recommending SMBG for patients with diabetes mellitus? Is there convincing evidence about the cost-effectiveness of SMBG with blood glucose test strips?

<p><b>Physicians</b></p>	<ul style="list-style-type: none"> <li>▪ “I vaguely remember a study from a pharma rep. It’s usually a very soft study and I never remember them, they look bogus.” – <i>Vancouver</i></li> <li>▪ “I’m not aware that there is evidence.” – <i>Ottawa</i></li> <li>▪ “I think that there’s evidence that the better control, the less complications there are; but I’m not sure that there’s evidence regarding the advantages of self-monitoring.” – <i>Ottawa</i></li> <li>▪ “I just think it’s common sense that all responsible diabetics monitor themselves.” – <i>Ottawa</i></li> <li>▪ “There was a few years ago, but does it make a difference? Well, I read somewhere that it does help.” – <i>Edmonton</i></li> <li>▪ “The PBS showed the outcomes of that much better.” – <i>Edmonton</i></li> <li>▪ “I’m not familiar with Asian studies for diabetes mellitus.” – <i>Vancouver</i></li> <li>▪ “A study that was published a month ago in the New York Times, showing there was higher morbidity and mortality for those at 6. They were using glucometers and were dying with tighter control. When we quote stats, we have to be careful; if you are selling glucometers, you will create studies to support that. The evidence is clear that too tight control is bad, and glucometers push you in that direction, and over-monitoring may be a disservice.” – <i>Vancouver</i></li> </ul>
<p><b>Pharmacists</b></p>	<ul style="list-style-type: none"> <li>▪ “I think I saw a study that connected self-monitoring and tighter control with better results.” – <i>Vancouver</i></li> <li>▪ “I usually rely on US studies.” – <i>Ottawa</i></li> <li>▪ “I have referred to clinical trials and guidelines related to diabetes mellitus management.” – <i>Edmonton</i></li> <li>▪ “There was an article suggesting more intensive monitoring did not</li> </ul>

**Question 7:** Currently, what information do you rely upon when making a decision on whether or not to prescribe or recommend SMBG using blood glucose test strips? In your opinion, is there convincing clinical evidence to support recommending SMBG for patients with diabetes mellitus? Is there convincing evidence about the cost-effectiveness of SMBG with blood glucose test strips?

	<p>necessarily ensure better patient outcome.” – <i>Edmonton</i></p> <ul style="list-style-type: none"> <li>▪ “It is much cheaper than running a blood test at a lab.” – <i>Ottawa</i></li> <li>▪ “In the long-run, it would be more expensive to treat the health impacts.” – <i>Ottawa</i></li> <li>▪ “I would like to see more studies on the gaps in treatment between those who have a family doctor and those who don’t.” – <i>Ottawa</i></li> <li>▪ “I would be curious to see a study that compares the effectiveness of different monitors.” – <i>Edmonton</i></li> <li>▪ “I would like to see more statistics and concrete numbers.” – <i>Vancouver</i></li> </ul>
<p><b>Diabetes Educators</b></p>	<ul style="list-style-type: none"> <li>▪ “The evidence behind the benefits of testing is there.” – <i>Vancouver</i></li> <li>▪ “Why do I try to get type 2’s to monitor? For me, it came out of the clinical practice guidelines.” – <i>Vancouver</i></li> <li>▪ “I turn to the Canadian Diabetes Association practice guidelines; the research behind that is huge.” – <i>Vancouver</i></li> <li>▪ “We are so governed by clinical studies, and some of them are grade C and some are grade B. When you read a guideline, it will read grade A, B, or Consensus, because there is no study but everybody agrees. The Diabetes Association uses that method.” – <i>Edmonton</i></li> <li>▪ “Is there evidence? Absolutely, no doubt.” – <i>Ottawa</i></li> <li>▪ “How convinced am I? 100%!” – <i>Edmonton</i></li> <li>▪ “I am not 100%. We work in a health care system where it is an accepted norm. I have done it, depends on what you are measuring, what keeps a person who has a chronic disease. I am not convinced that the finger pointer is a motivator.” – <i>Edmonton</i></li> <li>▪ “I have a doctor who handed me a research article that says it is not necessary.” – <i>Edmonton</i></li> <li>▪ “I attended a seminar: it was a two-day research thing, so I did take part in that and yes, it did convince me that it really wasn’t significant clinically.” – <i>Edmonton</i></li> <li>▪ “I seem to recall seeing information about monitoring not working, but I don’t know enough about the studies.” – <i>Ottawa</i></li> <li>▪ “Some studies suggest that not all patients benefit.” – <i>Ottawa</i></li> <li>▪ “There has been a study that testing didn’t change the outcome, but I have a hard time believing that, because it changes their role in their self-management.” – <i>Vancouver</i></li> <li>▪ “Evidence? In my practice there is.” – <i>Ottawa</i></li> <li>▪ “I have seen, first-hand, how monitoring works and protects patients; that’s all the evidence I need.” – <i>Ottawa</i></li> <li>▪ “Not just anecdotally; you see it.” – <i>Vancouver</i></li> <li>▪ “When they test more frequently, they have better blood sugar control;</li> </ul>

**Question 7:** Currently, what information do you rely upon when making a decision on whether or not to prescribe or recommend SMBG using blood glucose test strips? In your opinion, is there convincing clinical evidence to support recommending SMBG for patients with diabetes mellitus? Is there convincing evidence about the cost-effectiveness of SMBG with blood glucose test strips?

that’s why I encourage testing their blood.” – *Vancouver*

**Question 8:** In your opinion, is SMBG being prescribed/used appropriately (in accordance with the clinical and economic evidence) in patients with type 1 and type 2 diabetes mellitus?

<p><b>Physicians</b></p>	<ul style="list-style-type: none"> <li>▪ “The type 1 diabetics need it; 80% are type 2 diabetes mellitus. The very mild diabetics don't need it and are obsessive. In the mild diabetics, the personalities that need numbers get glucometers and create more problems. Some of them can't let go; they overuse it and it's hard to back off and use it less frequently.” – <i>Vancouver</i></li> <li>▪ “I think it’s correctly prescribed for the insulin-dependent and probably under-prescribed for the type 2, because I think a lot of these people don’t get sent for education and a lot of these people don’t invest the time in the education.” – <i>Ottawa</i></li> <li>▪ “A lot of people don’t get diagnosed so they don’t even know and they’re not even getting educated or tested.” – <i>Ottawa</i></li> <li>▪ “I think it might be over-prescribed. Almost anybody who goes to a diabetic clinic will get a self-monitoring prescription. I can’t imagine anybody being diagnosed and not going for education.” – <i>Ottawa</i></li> <li>▪ “It’s industry-driven. Pick up your weekend newspaper and the ad bag that falls out of it has three different monitors in it. Pick your style.” – <i>Ottawa</i></li> <li>▪ “The people that go to the diabetic educator groups, they are the empowered people already. The people who don't have education and really need to monitor don't even care; it's over-prescribed to the wrong group.” – <i>Vancouver</i></li> <li>▪ “The guys that are self-empowered have got it figured out already. A lot get it that don't need it anyway; I’d say it's mal-distributed.” – <i>Vancouver</i></li> <li>▪ “Those who have trouble with vision will not test a lot.” – <i>Edmonton</i></li> </ul>
<p><b>Pharmacists</b></p>	<ul style="list-style-type: none"> <li>▪ “Overall, yes. But I think patients need to know more about how to act on the results. They need to be regularly monitoring their diets.” – <i>Ottawa</i></li> <li>▪ “Education and post-follow-up is key to the success.” – <i>Ottawa</i></li> <li>▪ “I think that certain people who have just received their diagnosis are under-prescribed.” – <i>Edmonton</i></li> <li>▪ “I think there is a problem with under-prescription, particularly for patients with type 2.” – <i>Vancouver</i></li> <li>▪ “There are some people who take advantage of the system because they are type 2 and should only test once a day, yet they pick up two boxes of blood glucose test strips a month.” – <i>Vancouver</i></li> </ul>
<p><b>Diabetes Educators</b></p>	<ul style="list-style-type: none"> <li>▪ “A lot of people in downtown eastside would benefit, but circumstances don't allow it. The prescription is right, but the use is wrong, so the application doesn't come to fruition.” – <i>Vancouver</i></li> </ul>

<b>Question 8:</b> In your opinion, is SMBG being prescribed/used appropriately (in accordance with the clinical and economic evidence) in patients with type 1 and type 2 diabetes mellitus?	
	<ul style="list-style-type: none"> <li>▪ “When Pharmacare coverage changed, there was a change in testing amongst seniors. Back then, their blood glucose test strips were all free.” – <i>Vancouver</i></li> <li>▪ “We don’t see the majority of people who have diabetes mellitus; of the people we see, we advocate it and they do it.” – <i>Vancouver</i></li> <li>▪ “A lot of people can’t get family doctors. They just came here to get a job.” – <i>Edmonton</i></li> <li>▪ “Some seniors don’t have the resources to have insulin, so they cut back on testing.” – <i>Edmonton</i></li> <li>▪ I would suspect that those in rural communities are under-prescribed. There’s a need for continuity in care, for proper referrals to get patients the right information.” – <i>Ottawa</i></li> <li>▪ “I do some work in a men’s shelter and I see several diabetics there. They’ve lost their monitor, they’re not taking insulin regularly, and there’s no follow-up.” – <i>Ottawa</i></li> <li>▪ “Some people are numbers people.” – <i>Edmonton</i></li> <li>▪ “Some parents are so paranoid, they are scared so they are testing lots. So they are waking the kids up at midnight and then 3:00 am.” – <i>Edmonton</i></li> <li>▪ “People who are early in their diagnosis tend to over-monitor. That has more to do with anxiety about their diagnosis.” – <i>Ottawa</i></li> </ul>

<b>Question 9:</b> What other evidence would you like to see related to SMBG using blood glucose test strips?	
<b>Physicians</b>	<ul style="list-style-type: none"> <li>▪ “Yes, I would really like to see that evidence, because are we spending a lot of time and effort and money on something that is not really valuable. I mean, medicine is absolutely littered with years of doing all kinds of things in all kinds of fields, doing things which aren’t cost-effective for years and years. I think I’ll go back and do a literature search tonight.” – <i>Edmonton</i></li> <li>▪ “Especially complications and the differences between those who test and those who don’t test. What kinds of complications are there differences in? Things like retinal deterioration and morbidity.” – <i>Edmonton</i></li> <li>▪ “A study to show the reduced incidence of cardiovascular disease and microvascular disease that comes from self-monitoring.” – <i>Vancouver</i></li> <li>▪ “Research done by family physicians, showing acceptance of their recommendations by patients, how honest the reporting is, how many people lie, and is it misreading or bad technique.” – <i>Vancouver</i></li> <li>▪ “Why are the testers so expensive? It’s a con job! The pharmaceutical industry sees this as a cash cow. It’s industry-driven.” – <i>Ottawa</i></li> <li>▪ “What’s the best value and where’s the best place to get things — I think that’s useful.” – <i>Ottawa</i></li> </ul>
<b>Pharmacists</b>	<ul style="list-style-type: none"> <li>▪ No comment</li> </ul>
<b>Diabetes Educators</b>	<ul style="list-style-type: none"> <li>▪ “I would like to see what other countries are doing.” – <i>Ottawa</i></li> <li>▪ “I am really interested in knowing more about the adult population between</li> </ul>

<b>Question 9:</b> What other evidence would you like to see related to SMBG using blood glucose test strips?	
	<p>type 1 or 2. I want to know what it takes to get a person to adjust their insulin. What does it take to get a person to learn to comfortably understand controlling their insulin?” – <i>Edmonton</i></p> <ul style="list-style-type: none"> <li>▪ “I have seen, first-hand, how monitoring works and protects patients. That’s all the evidence I need.” – <i>Ottawa</i></li> <li>▪ “It would be great if we had more definition behind who are highly recommended to test and for whom it is of very little value.” – <i>Vancouver</i></li> <li>▪ “Why are blood glucose test strips so expensive? It makes me question the industry.” – <i>Vancouver</i></li> </ul>

<b>Question 10:</b> How would you most like to receive and access information on SMBG using blood glucose test strips?	
<b>Physicians</b>	<ul style="list-style-type: none"> <li>▪ “We all see drug reps on a regular basis and they’re often giving us studies of some kind. This would just be another way to share this.” – <i>Ottawa</i></li> <li>▪ “An endocrinologist or specialist presenting this information and showing where it fits into our practice — I think that would be useful.” – <i>Ottawa</i></li> <li>▪ “Medical Journals, like the CMAJ — a journal that everybody gets that’s credible.” – <i>Ottawa</i></li> <li>▪ “I think if you get the reps involved, I would tend to think it was biased. I think if you get an organization involved like this one tonight and it’s a consensus sort of thing, just talking about monitors.” – <i>Ottawa</i></li> <li>▪ “A lecture or discussion group.” – <i>Vancouver</i></li> <li>▪ “I can’t read anymore journals, I will end up throwing it away.” – <i>Vancouver</i></li> <li>▪ “Some live being has to stand in front of me and tell me in 10 minutes.” – <i>Vancouver</i></li> <li>▪ “Not email; paper mail or fax – <i>Vancouver</i></li> <li>▪ “Invite the family doctors, have a family physician moderator, and ask what they want to learn about and have it case-based.” – <i>Vancouver</i></li> <li>▪ “Something separately mailed out. If it is mailed out in a journal, it needs to come with a “Results of Study” section.” – <i>Edmonton</i></li> <li>▪ “The Medical Post, but it has to be on the front page” – <i>Edmonton</i></li> </ul>
<b>Pharmacists</b>	<ul style="list-style-type: none"> <li>▪ “Through colleges, and by using the Pharmacist’s Letter publication.” – <i>Vancouver</i></li> <li>▪ “In published journals like Pharmacy Practice and Pharmacist’s Letter.” – <i>Edmonton</i></li> <li>▪ “Distribute information through diabetes mellitus representatives at community clinics.” – <i>Edmonton</i></li> </ul>
<b>Diabetes Educators</b>	<ul style="list-style-type: none"> <li>▪ “Go through the CDA. It can’t be contradictory; it should be done through the Canadian Diabetes Association guidelines.” – <i>Vancouver</i></li> <li>▪ “The CDA is at every conference you go to. They are coming out with 2008 guidelines, which is in print, on the website, at their conferences. They even send us emails through Info@diabetes.ca.” – <i>Vancouver</i></li> <li>▪ “The Internet is a good way to get this kind of information to us.” – <i>Edmonton</i></li> </ul>

<b>Question 11:</b> Does anyone have any final thoughts or comments relating to the practice of SMBG, and the use of blood glucose test strips, that we have not covered today?	
<b>Physicians</b>	<ul style="list-style-type: none"> <li>▪ “First and foremost, it should be a clinical assessment, but then it should be cost-effectiveness, too.” – <i>Edmonton</i></li> <li>▪ “If your highs are too high and your lows are too low, your average may be ok, but it's not ok; so it's the mix of the whole picture, it's never just one variable. That's what blood glucose test strips can show.” – <i>Vancouver</i></li> <li>▪ “Anything that helps public awareness of diabetes mellitus education is a great thing, but it's only going to get bigger so the sooner they get it done, the better.” – <i>Ottawa</i></li> <li>▪ “We may have a doctor shortage; therefore, it will be important for patients to self-monitor.” – <i>Ottawa</i></li> </ul>
<b>Pharmacists</b>	No comment
<b>Diabetes Educators</b>	No comment

## APPENDIX F: DEMOGRAPHICS OF PATIENTS

Characteristics	Patients n = 40
Cities <ul style="list-style-type: none"> <li>▪ Ottawa n(N)</li> <li>▪ Vancouver n(N)</li> <li>▪ Edmonton n(N)</li> </ul>	14 (2) 16 (2) 10 (2)
Sex <ul style="list-style-type: none"> <li>▪ Male n(%)</li> <li>▪ Female n(%)</li> </ul>	14 (35) 26 (65)
Type of diabetes and managed with <ul style="list-style-type: none"> <li>▪ Type 1 n(%)</li> <li>▪ Type 2 n(%)               <ul style="list-style-type: none"> <li>○ Insulin</li> <li>○ Oral antidiabetes drugs</li> <li>○ Diet and or exercise</li> </ul> </li> </ul>	15 (37) 25 (63) 6 (24) 17 (68) 2 (8)
Duration of diabetes <ul style="list-style-type: none"> <li>▪ &lt; 1 year n(%)</li> <li>▪ ≥ 1-5 years n(%)</li> <li>▪ &gt; 5-10 years n(%)</li> <li>▪ &gt; 10 years n(%)</li> </ul>	2 (5) 4 (10) 12 (30) 22 (55)
Type of work <ul style="list-style-type: none"> <li>▪ Full-time worker n(%)</li> <li>▪ Part-time worker n(%)</li> <li>▪ Working from home n(%)</li> <li>▪ Retired n(%)</li> </ul>	24 (60) 5 (13) 4 (10) 7 (13)

n = Number of patients; N = Number of focus groups

## APPENDIX G: THEMATIC ANALYSIS OF DISCUSSIONS WITH PATIENTS

**Question 1:** As someone who lives with diabetes mellitus, do you currently self-monitor your blood glucose levels using a blood glucose test strip? If no, have you ever done so? If you do, or have self-monitored your blood glucose levels, how often and for how long? If you have never self-monitored, why not?

- The vast majority of the participants said that they currently perform SMBG. Among the few patients who were not currently using SMBG (all but one of whom were patients with type 2 diabetes), several mentioned that they had used them in the past, while another participant (a type 2) expressed that she will begin using blood glucose test strips in the very near future.
- Given that all of the patients had different lifestyles, health issues, and eating habits, there was no consensus response regarding when and how often they tested themselves. “At least three times a day, starting with one as soon as I wake up,” seemed to be the most common answer.
- Some patients with type 1 diabetes tested as frequently as seven times daily, while others did not currently test on a regular basis.
- Some patients with type 2 diabetes tested as frequently as two to four times daily, others tested regularly once daily or three to four times per week, and a few did not test regularly or test at all. Patterns regarding the frequency of testing according to type of therapy for type 2 diabetes mellitus could not be assessed since participants did not consistently report what medications they were using.
- The patient with gestational diabetes mellitus mentioned that she tested “many” times per day.
- A few participants mentioned that they would test more frequently than usual if they felt something was awry.

**Question 2:** What do you do with the results of your blood glucose test strips? If the reading is too high? If the reading is too low?

- Participants were evenly divided into three groups when asked this question. A third of the participants said that they input the results of their tests in a log book or an excel-type spreadsheet. Another group said that they had self-recording monitors and either uploaded the results to their own computers or brought the monitors to their doctor when needed. The third group of participants said that they did not track unless the results were unusually low or high. We noted no consistent differences in responses of type 1 and patients with type 2 diabetes to this question.
- Many subjects reported that their physician reviewed SMBG results.
- Those on insulin or medication often adjusted therapy. Changes in exercise, diet, or other lifestyle choices were mentioned as responses to abnormal SMBG values, regardless of therapy.



**Question 3:** In your opinion, what are the advantages of self-monitoring your blood glucose?

- Participants almost unanimously felt that the major advantage of SMBG was the sense of control and empowerment associated with the management of their disease. Some participants also expressed that SMBG gives them confidence and reassurance, and motivates them to follow dietary measures.

**Question 4:** In your opinion, what are the disadvantages of self-monitoring your blood glucose?

- Feedback pertaining to the disadvantages of self-monitoring fell into one of the three following categories: cost, inconvenience, or pain.
- From time restraints to lugging monitors around, participants covered a wide array of convenience issues.
- Another disadvantage was felt to be cost. Many participants did not understand why the cost of blood glucose test strips and other SMBG supplies have not decreased much over the years.
- The third complaint that some participants had with SMBG was the pain associated with testing.

**Question 5:** If you do or have self-monitored your blood glucose, what led you to do that? Did someone recommend it to you? Did you see or read some information and decide on your own?

The majority of participants indicated that their physicians led them to self-monitor. A significant number of participants said that a nurse educator introduced them to self-monitoring. Very few participants said that they decided on their own and several others mentioned that their dietician played a large part in their initiation to self-monitoring.

**Question 6:** Has someone (a doctor, pharmacist, or diabetes mellitus educator) explained to you how to perform the test using the test strip? If yes, who provided you with that information and do you feel they did a good enough job to allow you to perform the test with confidence?

- Many participants were appreciative of the additional advice and help that they received when they were originally introduced to SMBG.
- Pharmacists, nurses, dieticians, and diabetes-educators are among the health professionals who have helped patients learn how to properly use SMBG.
- A significant number of participants also mentioned that they attended diabetes mellitus education programs that were very valuable to them.

**Question 7:** What else, if anything, could that person have told you that would have given you more confidence about deciding whether or not to monitor your blood glucose levels, or about actually performing the test?

- Although there were a few exceptions, an overwhelming majority of the participants felt that they received enough information to make an informed decision about whether or not they should self-monitor. However, one respondent mentioned that he/she was not told what to do with the test results, and another described problems with meter calibration and a lack of understanding of why calibration is necessary.
- Ongoing diabetes mellitus education regarding SMBG and other strategies to deal with diabetes mellitus was also mentioned as being important to maintain motivation.

**Question 8:** Has your health care provider ever asked to see the results of your blood glucose monitoring? If yes, which health care provider was that (e.g., family physician, diabetes mellitus educator)? What action did that person take after seeing the blood test readings? What did they advise you to do based on seeing the blood test readings?

- Most participants said that their physician asks to see SMBG results. The frequency with which results were provided to physicians varied from once weekly to every three months or more.
- A small number of participants said that their physicians would adjust their medication upon seeing the results, if needed.
- We also took this opportunity to investigate whether or not their physicians asked the patients to do an A1C test, and we asked them which test their doctor thought was more important. Most participants said that their doctors did perform the A1C test, with several adding that their doctor only paid attention to this test and basically ignored their SMBG results.

**Question 9:** Some blood glucose monitors can be used by patients to upload their blood test results to the computer in order to analyse the results. Does your monitor have this function? If yes, how often do you upload your data (if at all)? Does your doctor or other health care provider look at this analysis?

- Approximately one in four participants owned a blood glucose monitor that could upload results to a computer. A pharmacist had recommended such a system to most of these individuals. A couple of participants were unsure if their monitors had this functionality, or knew that it did but did not bother to use it. Several were aggravated by the fact that they had to buy separate cables to use these devices.
- Barely any participants mentioned that they shared this analysis with their health care provider.

**Question 10:** If you were looking for information on SMBG using blood glucose test strips, where would you be most likely to look?

- “The Internet” and “my doctor” were the two most common responses to this question.
- While many patients turn to the internet for SMBG-related information, there does not seem to be a consensus on a one-stop website. Although the Canadian Diabetes Association’s website was often mentioned, many participants said that they simply “Googled” their way from one site to another.
- Pharmacists and other patients were also highlighted as sources of information.
- One respondent reported feeling overwhelmed by the amount of information.

**Question 11:** In your opinion, is there enough information available to patients on the topic of SMBG using blood glucose test strips?

- Answers to this question differed significantly from group to group. While a group of nine participants in Ottawa wholeheartedly agreed that there is enough information available on this topic, most of the participants from both of the Vancouver groups felt that there was insufficient credible information, adding that you can’t believe all that you hear from the companies who manufacture these products. Participants in Edmonton also believed

**Question 11:** In your opinion, is there enough information available to patients on the topic of SMBG using blood glucose test strips?

that there wasn't enough impartial information available to patients.

- Some participants felt that there was too much information available, and that it was too technical.
- One respondent mentioned the lack of a “unified front” in terms of how often SMBG should be performed.

**Question 12:** Who would be the best person or organization to provide education for Canadians on SMBG using blood glucose test strips?

- Although the Canadian Diabetes Association was by far the most popular answer to this question, a host of other local, national, and international entities were also mentioned.

## APPENDIX H: QUOTES FROM PATIENTS WITH TYPE 1 AND TYPE 2 DIABETES

**Question 1:** As someone who lives with diabetes mellitus, do you currently self-monitor your blood glucose levels using a blood glucose test strip? If no, have you ever done so? If you do or have self-monitored your blood glucose levels, how often and for how long? If you never have self-monitored, why not?

- “I haven’t used them in a while. I have had diabetes mellitus since I was sixteen and used them a lot at first.” – *Ottawa, type 1*
- “I do use them. I was doing it every day at different times. Now, I do it once every two days.” – *Ottawa, type 2*
- “I have type 2. I monitor three or four times a day. I have just found out, it’s only been a few months.” – *Ottawa, type 2*
- “At least seven times a day, for the past 25 years.” – *Ottawa, type 1*
- “Approximately seven times a day; maybe more if I feel dizzy or “shaky”. I’ve been testing for twenty years.” – *Ottawa, type 1*
- “I’ve been testing for eight years. I am still in denial. I do test once in a while and I don’t like the result.” – *Edmonton, type 2*
- “For 40 years — I’m never on pills, been on insulin, two shots, four shots, or six shots. As a child, all the time. As a teenager, not so much. Well, it’s back and forth. I know my body well. I know instantly when I am going low.” – *Edmonton, type 1*
- “Since January; I test four times a day. I have two younger children and my daughter makes sure I test.” – *Edmonton, type 2*
- “I was diagnosed in 1969. I monitor blood glucose about four times a day.” – *Edmonton, type 1*
- “I was diagnosed about 21 years ago. I’ve got everything to do it but I don’t.” – *Edmonton, type 2*
- “Diagnosed 33 years ago. Two times a day. I was better in the last year but not so good prior to that.” – *Edmonton, type 1*
- “I’ve been testing about 20 years, three times a day, because I didn’t behave myself; I use three different types of insulin.” – *Vancouver, type 2*
- “I have gestational diabetes mellitus. I’m on insulin now, so I’m not sure if I’m type 1 diabetes mellitus or type 2 diabetes mellitus. I test many, many times a day.” – *Vancouver, type 1*
- “I’ve been testing for 32 years. I use an insulin pump and test frequently. I should be testing more.” – *Vancouver, type 1*
- “I don’t use insulin, just diet and exercise, and my doctor says I’m doing great. I test once or twice a day; more if I think something is wrong.” – *Vancouver, type 2*
- “I’ve had diabetes mellitus, for 45 years. I’ve been testing since ’82. They were the hot ticket to have; I test eight to 10 times a day, 24/7. I’ve got an implant, they wire this into a pump; I’m trying to flatline my blood sugars right now.” – *Vancouver, type 1*
- “I was diagnosed seven years ago. I’m a lousy tester and I have sensitive fingertips and I’m needle-phobic, so unless something is weird or I feel sick, I don’t test. My doctor pushes me to do more. It’s an issue; I’m not stupid.” – *Vancouver, type 2*

**Question 2:** What do you do with the results of your blood glucose test strips? If the reading is too high? If the reading is too low?

- “I keep track of it in a book and show my physician. I see my specialist every three months. I show my physician whenever I see him.” – *Edmonton*
- “I have the One-Touch® Ultra®, so I never have to write anything down. I simply bring the machine to my doctor and he will analyze the results.” – *Ottawa*
- “With the monitor, I can download it from the sensor or the monitor, and you can print a graph, you can integrate the graphs, you make decisions about your behaviours. The downside is that it's \$6,000 for the unit.” – *Vancouver*
- “If they are high for a length of time, I write them down and go to the doctor if I can't figure out what I've done wrong.” – *Vancouver*
- “I'll up my meds (metformin.) It works – *Ottawa, type 2*
- “I exercise if my reading is high. I will usually take the dog for a walk and it will drop right away.” – *Ottawa, type 2*
- “I eat chocolate to increase my sugar levels.” – *Ottawa, type 2*
- “I log everything in and I write it all down along with the insulin I used the units. Every two weeks I make an appointment with my doctor and she sends it to my diabetes mellitus doctor.” – *Edmonton, type 1*
- “I test before meals, so that is your insulin you will take with that meal; you test before you go to bed, so you're not too low; you adjust your insulin or your behaviour.” – *Vancouver, type 1*
- “When I am using my blood glucose test strips to see if I am running low, I eat if I am. It will depend what I am drinking; it depends on if I went running, or if I had a drink that night. It is not always easy doing that balance thing to keep in your sugars in line.” – *Edmonton, type 2*
- “I don't do anything with my numbers unless if it's high. I ask what did I do or what didn't I do today.” – *Vancouver, type 2*
- “I used to write them down, but I don't anymore. If I'm high for a while, I'll write them down and adjust my pump.” – *Vancouver, type 1*

**Question 3:** In your opinion, what are the advantages of self-monitoring your blood glucose?

- “It's very important. You need to be able to measure the amounts of glucose in your blood. If you are in a situation when it's not managed properly, you need to do the tests regularly. A very important tool.” – *Ottawa*
- “I'm brittle, so there is a confidence in testing; if I couldn't test, I'd lose my confidence.” – *Vancouver*
- “I'm very sensitive to the highs and lows, but to be able to confirm that and make sure I'm right is peace of mind; you need to know.” – *Vancouver*
- “I watched all of my aunties go through this. I want to do better. I want to live longer.” – *Edmonton*

**Question 4:** In your opinion, what are the disadvantages of self-monitoring your blood glucose?

- “Having to do it first thing in the morning; I would love to simply get up and go. At times, it makes you feel like you are not normal.” – *Ottawa*
- “One of the cons I would like to bring up is the disposal of the blood glucose test strips.”

**Question 4:** In your opinion, what are the disadvantages of self-monitoring your blood glucose?

Where do you put it after you've used it?" – *Ottawa*

- "It's not convenient. You have to carry a purse with all this stuff in it. It's a pain in the butt." – *Vancouver*
- "I stopped carrying them around because it is cumbersome. The size of the machines and the things they are in, you have to go home and pick it up. I would like to see something more slim-line. It's another reason to test because I can't fit it in my purse." – *Edmonton*
- "Having to interrupt whatever you're doing." – *Edmonton*
- "The cost is a factor. I don't have a plan so I go to Costco to buy my blood glucose test strips for less than they sell them elsewhere." – *Ottawa*
- "It's very expensive, we don't want to do it, we have to do it to be alive, yet they aren't covered." – *Vancouver*
- "The cost is fierce. I understood 20 years ago it was a brand-new technology, but now it's \$1 a strip; that's \$10 a day!" – *Vancouver*
- "I don't like the fact that it's expensive and it can be inconsistent." – *Edmonton*
- "Your fingers get hard, sore, and callused. I would like a chip with a scanner." – *Edmonton*
- "My fingers get really sore and some people ask me why I have so many holes in my fingers. When you are doing regular day-to-day tasks afterwards, such as scrubbing pots and pans, you can feel the pain where you pricked yourself." – *Edmonton*
- "It hurts. For someone who has to do it several times a day, it can be painful." – *Ottawa*
- "Who wants to prick their finger every day? Three times a day!" – *Vancouver*

**Question 5:** If you do or have self-monitored your blood glucose, what led you to do that? Did someone recommend it to you? Did you see or read some information and decide on your own?

- "When I went to speak to a nurse about diabetes mellitus, she told me that self-monitoring would help me keep it under control." – *Vancouver*
- "A diabetes mellitus educator talked to me about monitoring and I have been doing it ever since." – *Edmonton*
- "I don't think I would have thought about monitoring my levels until my dietician told me it would be a good idea." – *Ottawa*

**Question 6:** Has someone (a doctor, pharmacist, or diabetes mellitus educator) explained to you how to perform the test using the test strip? If yes, who provided you with that information and do you feel they did a good enough job to allow you to perform the test with confidence?

- "An endocrinologist; but you have to remember that this was 26 years ago before the meters were popular. In regards to whether or not they did a good job, I wish they would have told me that the results aren't 100% accurate and that the reading is actually plus or minus 15% in relation to your actual level, which is a significant amount." – *Ottawa*
- "When I first found out, the doctor sent me to a four-day educational seminar. I am so glad I went, I learned a lot. There was a dietician and a diabetes mellitus nurse." – *Ottawa*
- "I had trouble with my first monitor, but my pharmacist helped me." – *Ottawa*
- "A diabetes clinic in Richmond is where I really got that I had diabetes mellitus; my doctor is just a really nice guy. He explained everything and took the time to explain to me, almost an hour, but I didn't "get it" until I went to the diabetes clinic, he suggested it. They told me

**Question 6:** Has someone (a doctor, pharmacist, or diabetes mellitus educator) explained to you how to perform the test using the test strip? If yes, who provided you with that information and do you feel they did a good enough job to allow you to perform the test with confidence?

a ton of different things.” – *Vancouver*

- “My doctor. I started using the blood glucose test strips at first to colour-match and I went to the clinic and I started a group and got free meters; my doctor told me immediately if I messed up.” – *Vancouver*
- “I went for diabetes mellitus education at Costco. They had a nurse come in and they’d do it once a month, but they don’t do it anymore. It would be good to start it again.” – *Vancouver*
- “It was my diabetes doctor. When I started taking insulin, this is when I started testing my blood and they showed me.” – *Edmonton*

**Question 7:** What else, if anything, could that person have told you that would have given you more confidence about deciding whether or not to monitor your blood glucose levels or about actually performing the test?

- “It’s fairly basic and easy. It’s basically cut and dried.” – *Ottawa*
- “Originally, no one had ever mentioned to me what I should do with the results.” – *Ottawa*
- “Not necessarily at first; however, I wish I would have been told at some point to keep up with the technology. I wish I’d done that more.” – *Vancouver*
- “I go to St. Paul’s every year, they show you the new equipment and go through the food groups and I always learn something, and I think everyone should attend those. If you get a little slack, you start getting motivated again.” – *Vancouver*
- “A friend of mine had a difficult time with her kit, claiming that it wasn’t calibrated right. Whoever had given her the machine hadn’t told her how to get the blood on the test strip right. It’s not always intuitive. Why do we have to continue to calibrate?” – *Edmonton*

**Question 8:** Has your health care provider ever asked to see the results of your blood glucose monitoring? If yes, which health care provider was that (e.g., family physician, diabetes mellitus educator)? What action did that person take after seeing the blood test readings? What did they advise you to do based on seeing the blood test readings?

- “When I’m proud, I do. When I’m not, I don’t! I see my physician every two weeks.” – *Ottawa*
- “I used to share my results with my doctor once a week, but I’ve improved my health and the frequency of my visits has decreased. I’ve lost 120 lbs. If there’s one thing you can do to improve type 2 diabetes mellitus, it’s to take the weight off.” – *Ottawa*
- “They will discuss it with me and if there is a need for a change in diet or medication, they will talk to me about it. I go about once every two weeks to look at results with my doctor.” – *Ottawa*
- “I share the results with my GP every three months.” – *Vancouver*
- “I used to bring my results in, but now I just report verbally. I have never been off medication, so it seems to be doing its job.” – *Vancouver*
- “Yes. For me, I get it done at least once a month because I have other problems besides the diabetes mellitus.” – *Ottawa*

**Question 8:** Has your health care provider ever asked to see the results of your blood glucose monitoring? If yes, which health care provider was that (e.g., family physician, diabetes mellitus educator)? What action did that person take after seeing the blood test readings? What did they advise you to do based on seeing the blood test readings?

- “I’ve had it done twice since I’ve found out, but I’ve only known for about ten months.” – *Ottawa*
- “My family doctor only cares about my A1C.” – *Edmonton*

**Question 9:** Some blood glucose monitors can be used by patients to upload their blood test results to the computer in order to analyse the results. Does your monitor have this function? If yes, how often do you upload your data (if at all)? Does your doctor or other health care provider look at this analysis?

- “I have one, but I haven’t loaded it because I’m technologically challenged! Furthermore, most of the meters store plenty of data so what is the necessity of loading it onto your computer? I was initially looking for something else when I got it and the pharmacist recommended this system. The system is easier to use than the blood glucose test strips.” – *Ottawa*
- “The first six months, I used to go to the doctor with charts and graphs, but I’m stable now.” – *Vancouver*
- “I don’t have a computer!” – *Edmonton*

**Question 10:** If you were looking for information on SMBG using blood glucose test strips, where would you be most likely to look?

- “I will either contact my doctor or go see my pharmacist, who is located close to my place.” – *Edmonton*
- “I would say my doctor. He’s always my first option since he knows my file.” – *Vancouver*
- “It depends on what I was looking for. If there was something wrong with my monitor, I would call the 1-800 number. I would turn to my doctor if it had anything to do with my health.” – *Vancouver*
- (After another participant said that he went to the Health Canada website.) “I don’t turn to the government. I go to the ones that came up on Google.” – *Vancouver*
- “I usually go online and Google “blood glucose test strips.” This will usually bring me to the AMA’s site or the Canadian Association. Some of these websites review the monitors in a “Consumer Report” fashion.” – *Ottawa*
- “I have so much information already, I feel overwhelmed. The pharmacist helped me sort it out.” – *Ottawa*



**Question 11:** In your opinion, is there enough information available to patients on the topic of SMBG using blood glucose test strips?

- “Three different people can give me three different suggestions on how often to test; there is not a unified front.” – *Vancouver*
- “People know more about the meters from advertisements than anything else.” – *Vancouver*
- “There isn’t enough unbiased information. They’re all trying to sell you their product. Credible information isn’t readily available. You have to do your own due diligence.” – *Edmonton*
- “Diabetes is on the short end of the promotional stick; more people die from complications of diabetes mellitus than other diseases.” – *Vancouver*
- “I think there’s enough information, but sometimes I feel that it’s too technical.” – *Ottawa*
- “I think there’s too much information, but it should be simplified.” – *Ottawa*

**Question 12:** Who would be the best person or organization to provide education for Canadians on SMBG using blood glucose test strips?

- *American Diabetes Association*
- *Capital Health*
- *Diabetes clinic*
- *Dieticians*
- *Doctors*
- *Ministry of Health*
- *Pharmacy*
- *Red Cross*
- *WebMD*