

# Quality of diabetes care: problem of patient or doctor adherence?

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## Summary

Current guidelines for treatment of type 2 diabetes mellitus include disease prevention and the control of blood pressure and lipids in addition to blood glucose management. However, physician compliance with treatment guidelines is relatively poor. In any given year, HbA<sub>1c</sub> and blood lipids are measured only in about half of patients and are below target in even less, while blood pressure is frequently measured but controlled in less than 50%. Some reasons for this unsatisfactory situa-

tion are providers' beliefs, frustration and lack of knowledge, patient barriers and the fact that the guidelines are not easy to access and implement. Patient non-adherence can be changed by improving education, perception, motivation and self-management. Strategies for improving disease management are discussed.

*Key words:* type 2 diabetes mellitus; guidelines; adherence; compliance

## Treatment guidelines and change of the treatment goal paradigm

Treatment of type 2 diabetes mellitus has expanded from treating blood glucose in the diagnosed diabetic patient with a view to reducing diabetic complications to the prevention of new cases and early detection of the disease through frequent screening. Recent trials investigating lifestyle changes and various antidiabetic oral agents have been shown to delay or possibly even prevent the onset of type 2 diabetes mellitus [1-5]. At present, however, there are no clear guidelines for the prevention of type 2 diabetes. Concerning the screening of asymptomatic subjects, the American Diabetes Association recommends screening by fasting glucose at 3-year intervals in all persons aged 45 or over [6]. Where risk factors are present screening at a younger age and at more frequent intervals is recommended. However, the evidence is scarce for either recommendation and may not be cost-effective [7]. Furthermore, in the setting of prevention of complications the focus has been

widened from exclusive attention to blood glucose management to include control of blood pressure and lipids and prevention of platelet aggregation with aspirin. In addition, weight reduction, lifestyle modification and smoking cessation have gained increasing importance. Thus, regular review of blood pressure, weight, nutritional habits and physical activity, as well as measurement of glycated haemoglobin (HbA<sub>1c</sub>) every 3-6 months, are receiving stronger emphasis. In the absence of specific problems, annual dilated eye examinations, annual comprehensive foot examinations and checking for foot pulses and carotid bruits as well as yearly measurement of serum lipids and urinary albumin excretion are recommended. Guidelines for treatment goals, particularly for prevention of cardiovascular disease, differ slightly between the various professional organisations [6, 8] and are summarised in Table 1.

## How well do physicians manage their patients?

Although standards of care for diabetes have been widely publicised since the late 1980s, practitioners have been hesitant to adopt the recommended guidelines [6, 9]. The St. Vincent's Declaration Initiative in 1989 set the goal of reducing

diabetic complications by at least one third. More than 10 years later, the Cost of Diabetes in Europe-Type II (CODE-2) study measured the current quality of care for type 2 diabetes patients in Europe.

**Table 1**  
Guidelines for treatment goals as recommended by different professional organizations.

	HbA <sub>1c</sub>	LDL-cholesterol	Blood pressure
European Diabetes Policy Group (EDPG)	≤6.5%	<3 mmol/l	<140/85 mm Hg
Swiss Society of Endocrinology and Diabetology (SGED)	<7%	<2.6* mmol/l	<135/85 mm Hg

\* Newly revised by the Swiss Working Group for Lipids and Atherosclerosis (AGLA)

### Blood glucose control

During the 6 months of the CODE-2 study, HbA<sub>1c</sub> was tested in only 64% of the study population; 31% achieved blood glucose control at or below 6.5% and 45% at or below 7.5% [10]. Glycated haemoglobin measurements were not documented in 50% of Italian patients in the care of general practitioners, in part due to rare patient visits [11]. On the other hand, a large national survey from Sweden revealed that, in 1999, 48% of the type 2 diabetic patients had HbA<sub>1c</sub> at or below 6.5% [12].

### Blood pressure

Studies reviewing charts generally show good adherence to blood pressure measurements [13–16], but not to blood pressure control. In the CODE-2 study blood pressure was within the target ranges set by the European Diabetes Policy Group in only 53% [10]. Data from the Swedish National Survey even showed blood pressure at or below 140/85 in only 36% of patients [17]. Moreover, optimum blood pressure control appears to be even more difficult to achieve, since in two European surveys less than 10% had a blood pressure below 130/85 [17, 18].

### Lipids

Even more surprisingly, LDL-cholesterol was measured in only 27% of patients in the European CODE-2 study [10]. In a recent Swedish study, LDL-cholesterol values were reported in 89% of the diabetic patients, but were below target in only 36% of these subjects [19].

Subgroup analyses underline the benefits of blood pressure and lipid control for prevention of diabetes-related endpoints [20–22]. Thus, lowering HbA<sub>1c</sub> in middle-aged type 2 diabetics from 7.9 to 7% prevents 5 out of 100 diabetes-related endpoints over the next 10 years, while lowering blood pressure from approximately 155/85 to 140/80 prevents 16 out of 100 endpoints [23]. In general, we appear to neglect management of lipids and blood pressure in particular, even though these concomitant risk factors are at least as important and can often be treated with less time and effort than blood glucose control.

### Weight and nutrition

Weight is usually recorded in the majority of subjects, while documentation of height is fairly

rare [24]. Hence it is often impossible to calculate BMI. Diet recommendations, concerning carbohydrate allowances and fat restriction in particular, are frequently omitted in daily practice. A nutritional survey throughout Europe found that patients had a low adherence rate to the recommendations, with too high a proportion of fat intake, especially saturated fat, and too low an intake of carbohydrates [25].

### Diabetic complications and preventive measures

Measures to prevent diabetic complications are often either neglected or underrecorded. In any year, primary care physicians document foot examinations in 8–52% of their diabetics and dilated eye examinations in 22–60%, and measure urinary protein or albumin in 33–91% of their patients [13–16, 19, 26, 27]. Structured annual diabetes check-ups are documented in 15%. Smoking habits, alcohol use and influenza and pneumococcal vaccines are recorded in a minority of patients [16, 24]. Referrals to a dietician are documented in one third of patients or less, and to diabetes nurses in 1–3% [15, 24], though such referrals are probably more frequent than documented. One study reviewed charts of dieticians and diabetes nurses and interviewed patients. They showed that about 75% of type 2 diabetic patients taking insulin had received diet instruction at least once and had at least one formal session with a diabetes education team, whereas this was true only of about half of type 2 diabetic patients not receiving insulin [28].

Are specialists doing any better? One report found no meaningful differences in health outcomes, including blood glucose control, in patients with diabetes who were treated by specialists or generalists [29], but several studies have shown better blood glucose control in patients treated by specialists [18, 30–32]. One study comprehensively assessed different risk factors and preventive measures in the context of routine endocrinology practices. In all type 2 diabetic patients HbA<sub>1c</sub> averaged 6.9%, while HbA<sub>1c</sub> was ≤8% in 87%. Blood pressure levels averaged 133/72 mm Hg. Over a 12-month period, lipid profiles were measured in 70%, with an average LDL-cholesterol value of 2.61 mmol/l, 74% of patients received dilated eye examinations and 55% had urine albumin screening [30].

## Why are physicians doing so poorly and what could be improved?

### Physician compliance

One reason for the lack of compliance with guidelines might be lack of knowledge of, or belief in, more recent guidelines, as most of them are based on relatively new data possibly unknown to the physician. Providers' beliefs and attitudes influence their adherence. In many cases type 2 diabetes is still considered a non-serious disease, or there is frustration concerning the effectiveness of the treatment if complications occur despite good quality therapy [33]. Blood glucose control seems harder to achieve than other conditions. The lack of clear symptoms or their immediate relief by treatment, frequent fluctuations in blood glucose levels, frustrating efforts to achieve lifestyle changes and prescribing of treatment that is also physically painful, such as finger sticks for glucose monitoring or insulin injections, render blood glucose control a difficult and tedious task for many physicians [9]. Lack of trained support personnel in and outside the office, lack of public support and potential financial concerns are additional barriers to good control [9, 34]. There is often indecision whether to start insulin, despite chronic hyperglycaemia, partly due to final attempts at changes in diet, patient unwillingness, fear of hypoglycaemia and weight gain, and, most importantly, physicians' unfamiliarity with the different insulin regimens and the new injection devices (pens). In particular, physicians are uncertain when to start insulin and which and how much insulin they should use. Workshops addressing these issues are currently ongoing in many European countries, including Switzerland.

On the other hand, physicians may have valid reasons for not complying with evidence-based guidelines, e.g. patient non-adherence, geriatric study populations and advanced comorbidities. In addition, the complexity and bulk of current guidelines for diabetic care in themselves inhibit their implementation within the time and money constraints of modern medicine. The effectiveness of physicians is enhanced by furthering their knowledge of diabetes [35] and in particular by influencing their attitudes [9]. In addition, providers could be trained to improve their communication skills further and to promote behavioural change [9]. Staff training and use of educational material for patients are helpful aids [34]. A team approach in conjunction with a diabetes nurse and a dietician, focusing on acceptance of illness and patient education, or involvement of expert consultants, can lighten the load for physicians and improve diabetes outcomes [36]. A case-control study has reported that patients who did not receive any form of educational intervention had a fourfold increased risk of developing complications analysed by multivariate logistic regression analysis [37]. Patient barriers should be identified, and action plans with realistic objectives and documented

physician and patient goals should be established. Guidelines have the best chance of changing physician behaviour when they are adapted and developed by the clinicians for whom they are intended, on the basis of national or international guidelines, and implemented via patient-specific reminders during consultations [38]. Furthermore, specific time for comprehensive annual check-ups, longer appointment times for patients with chronic diseases, provision of automated reminder systems and tools such as flowsheets or health care checklists have all been shown to improve diabetes care [6, 9, 39]. Use of non-physician providers to perform some examinations, such as blood pressure measurements or foot examinations, to refer patients to the ophthalmologist or order laboratory studies, appears to benefit patient care [16, 36].

### Patient barriers

Patient barriers to good management are non-acceptance and absence of symptoms, divergent cultural concepts, chronicity of the disease, specific expectations and beliefs, comorbid conditions and psychiatric disease [35, 40]. In addition, the consequences of non-adherence are delayed. Factors diminishing adherence are confusion regarding the drug regimen, fear of side effects, the progressive nature of the disease, and costs [35, 40]. Adherence declines with increasing number and frequency of the drugs prescribed and frequent changes in drug regimen [40, 41]. Patients follow treatment regimens more readily if they involve medication rather than lifestyle changes [9]. Patient satisfaction is generally increased in practices where physicians view their relation to patients as a partnership, and if the patients are kept informed and involved in medical decisions [42]. However, in one study increased satisfaction alone did not influence blood pressure or metabolic control, thus showing the additional importance of disease management [42]. On the other hand, giving patients more responsibility and involving them actively in their own care produces improvement in all cardiovascular risk factors and even microvascular complications [43].

Patient education is a fundamental prerequisite for diabetes self-management [44, 45]. It is important that both physicians and diabetes educators provide unequivocal and consistent information, with a view to modifying patient perceptions, attitudes and behaviour [46]. This is a necessity in designing and implementing a successful diabetes self-care plan with individual goals [44]. Blood glucose monitoring may serve as an additional tool in improving motivation and adherence. To further encourage self-care, some countries, such as Switzerland, have a patient diabetes passport showing the most recent findings for physical examination and laboratory values, together with the respective goals.

Health education was previously aimed at persuading the public to adopt a specific recommendation or persuading patients to comply with treatment. This has now changed, and education has shifted towards enabling persons to make in-

formed choices concerning health-related behavior [23]. Empowerment or self-management of patients can be achieved only if priority is given to enhancing education, motivation and skilled use of modern techniques in a structured team approach.

## Conclusions

In summary, diabetes is a silent, but serious disease. It is of the utmost importance for physicians to improve their own adherence and quality assessment, not only to improve glucose management but to tighten lipid and blood pressure control. Lifestyle changes represent the first step in management, and often a team approach is necessary. Even patients whose blood glucose control is good should have access to formal diabetes education, to train them in the use of technical aids and increase their knowledge of the disease and their therapy. They should be accompanied through the different stages of disease acceptance which form the basis for current and future treatment adherence [45]. In cases of poor metabolic control despite adequate medical management, or intolerance to lifestyle changes or therapy, patient barriers should be more thoroughly addressed. If fasting blood glucose or HbA<sub>1c</sub> rise above 8 mmol/l

or 7% respectively and the patient is already taking oral antidiabetic drugs, insulin should be started. Antihypertensives and statins should be used to attain the specific treatment goals. This, along with patient motivation and empowerment, is necessary to achieve a healthier life for all diabetics.

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