

What's New On Diabetes

Godfrey Xuereb^a

his edition of Cajanus focuses on diabetes at both a Carib-L bean, regional through the Americas and global levels. Many times we hear it quoted that the prevalence of diabetes in the Caribbean is "high" but where are the data to support this claim? A few studies have been conducted within the Caribbean countries to calculate the prevalence of this chronic condition. The studies that we have show a grave situation and in the article by Xuereb and Ragoobirsingh a collation of the available published data has been done. This information better informs both our readers and policy makers in the Caribbean region. The trends in the prevalence of diabetes are showing an ever increasing problem, and good epidemiological data are essential to allow policymakers to make informed decisions on strategies which not only improve quality of care but also aim at primary and secondary prevention of diabetes and its complications.

The aspect of quality of care is further discussed in the article by Penelope Scott and the Declaration of the Americas (DOTA). Dr. Scott looks at the dietary habits of two generations of Caribbean people in London, England and compares them with diabetes to those without the condition. She explores the issues of what is a "proper meal" and what is the understanding of "healthy eating" as well as the relationship between food and health. The findings of her studies have implications vis-à-vis patient education as well as the human rights obligations when delivering information to people with chronic diseases such as diabetes. This obligation is one of the key pillars for the Declaration of the Americas which from its inception had education as one of its main core functions. The Declaration of the Americas, or as commonly known DOTA, states that there is a need to incorporate diabetes education as an indispensible medical service in order to achieve the active participation of patients in controlling and treating the disease. For the article in this edition of Cajanus, the education committee of DOTA outlines the conditions and standards that a patient diabetes education-programme should meet. The committee emphasizes that in order to be effective, the education requires a series of conditions such as formation, knowledge and pedagological skills, good capacity of

^aGodfrey Xuereb, Public Health Nutritionist, CFNI.

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communication and the ability to listen and negotiate. Another important aspect of education is an evaluation of the impact. The committee recommends that to ensure positive impact, it is necessary that whoever performs the education must have the necessary background knowledge and experience.

In support of the criteria recommended by the DOTA Education Committee, this edition of Cajanus has also tried to include information which could update the scientific knowledge of our readers who largely are involved in some form of educational activities with persons living with Diabetes. In the article by Godfrey Xuereb, the author describes the role of glycosylated haemoglobin in the control of diabetes mellitus. Glycosylated Haemoglobin (HbA₁c) is still not a popular monitoring test for most persons with diabetes in the Caribbean. This, nothwithstanding the fact that the International Diabetes Federation (IDF) and the World Health Organisation (WHO) consider this test as one of the best monitoring tools; and evidence-based data show that it is the most efficient predictor of glucose control and secondary complications. The article gives a detailed review of the action of heamoglobin A_1C and the ways in which this is used as a predictor of glycaemic control. The information in this article is of value not only to healthcare professionals but also to persons with diabetes, should be proactive in who demanding bio-chemical tests such as HbA1c and knowing how to interpret the results of such tests, to be able to better manage their condition and improve their quality of life.

The final article is being reproduced with the kind permission of the International Diabetes Federation and is the Global Guideline for Type 2 Diabetes. These guidelines have been updated to reflect the latest evidence based medicine and highlight the aspects of primary and secondary prevention of diabetes.

The new recommendations stress the importance of structured patient education as an integral part of the management of all people with Type 2 diabetes. They also emphasize the importance of comprehensive care through lifestyle management especially nutrition and physical activity.

By focusing our attention on diabetes, we hope that this edition of Cajanus increases the awareness of our readers to this chronic condition which is so prevalent in the Caribbean and is on a constant increase, both with regard to numbers and its complications. Although most of this edition focuses on the management and care of the disease, our final words need to be that "prevention is the best way to reduce diabetes and its

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The Prevalence of Diabetes in the Caribbean

Godfrey C. Xuereb^a and Dalip Ragoobirsingh^b

The global prevalence of diabetes is on the increase and this is being directly linked to the increased incidence of obesity. The prevalence of type 2 diabetes among populations of the African diaspora has been extensively studied (Cooper et al, 1997; Hennis et al, 2002; Luke et al, 2001; Cruickshank et al, 2001). These studies show that the rates of Type 2 diabetes in the Caribbean are much higher than the rates in sub-Saharan Africa but comparable to those in the same ethnic groupings in the United States and the United Kingdom. In addition the studies indicate that the Body Mass Index (BMI) is also higher in the Caribbean than in Africa.

A rising trend has been observed in the prevalence of diabetes in the Caribbean region with the mortality rate for

diabetes also increasing. It was estimated that over the five year period 1995-2000, the number of cases of non-insulin dependent diabetes (NIDDM) would increase from 1.3 million to almost 1.5 million (Amos et al, 1997). King et al (1998) also predicted high figures for the Caribbean region (Table 1). Wild et al (2004) has also predicted that the global prevalence of diabetes will move from 2.8% in 2000 to 4.4% in 2030. The prevalence in developed countries is predicted to change from 4.7% (2000) to 6.8% (2030), whilst that of the developing countries is predicted to change from 2.4% to 4.0% within the same 30 year period. Wild et al (2004) also calculated the predicated rates for the various regions and the figures show that the Caribbean has one of the highest incidences of diabetes in

^aGodfrey Xuereb is Public Health Nutritionist.

bDalip Ragoobirsingh is Senior Lecturer and Consultant - Diabetes & Metabolism, Dept. of Bicochemistry, UWI, Mona Campus, Kingston 7, Jamaica.

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the World. From calculations done by Wild et al (2004) Jamaica is predicted to see an increase from 3.1% in 2000 to 5.5% by 2030.

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Ragoobirsingh et al (1995), using a national two-stage stratified random sampling design of 2,109 persons and an abbreviated glucose tolerance test, found that the rate of Type 2 diabetes mellitus in Jamaica was 17.9%. If one compares the rates predicted by Wild with these results it can be seen that the rates predicated for 2000 are a gross underestimate. Thus the increase predicted for 2030 will definitely be greater than the 5.5% quoted by Wild.

Morrison et al (1980), was one of the first to measure capillary blood glucose from a cross section of the population in Jamaica. Using a sample of 3 per 1,000 population they measured the fasting capillary blood glucose using a reflectance meter. They showed an increasing age on the development of hyperglycaemia with a prevalence close to 15% in those 55 years and over. They also estimated the population prevalence rate at 6.1%.

Despite sparse available data and the limited nature of information gleaned from death certificates, research findings suggest that diabetes is a major cause of mortality and morbidity in the Caribbean. Alleyne et al (1989), using death certificates of 137,015 people who died during the decade 1970-1979, showed that 30.2% of deaths recorded in Jamaica had diabetes mellitus as the first underlying cause of death. McDougall (2002), on the other hand, reported that this was recorded in 53.8% of deaths between the years 1991-1995.

Three studies have been conducted on diabetes prevalence in Jamaica during the last decade. Only one has had a national coverage and this showed a prevalence rate of around 18% (Ragoobirsingh et al, 1995). Eldemire & Hagley (1996), studied persons aged 60 and over during the period 1989 to 1992 based on a representative sample of the population in all parishes of the island. They showed an overall prevalence of diabetes of 10.2%. A prevalence of 7.8% in males and 12.6% in females aged 60-97 was established using fasting blood glucose levels. Wilks et al (1999), using a random population sample of 1303, in the Spanish Town Study of 1998 showed a prevalence rate of 15.7% for females and 9.8% for males, with an overall prevalence rate of 13.4%. This was estimated using an oral glucose tolerance test. If

Table 1:			
	labeles for 1995 as C		ling et al (1998)
Country	Prevalence (%)	Number of People (000)	
		Male	Female
Antigua & Barbuda	4.5	1.5	1.6
Bahamas	4.1	3.4	3.5
Barbados	4.5	4.2	4.0
Belize	4.1	2.1	2.1
Dominica	4.5	1.5	1.6
Grenada	4.5	2.0	2.1
Guyana	3.0	7.5	7.1
Jamaica	3.6	28	24
St.Kitts & Nevis	4.5	0.9	0.9
St. Lucia	4.5	3.1	3.3
St.Vincent & the Grenadines	4.5	2.4	2.6
Suriname	3.8	4.5	4.4
Trinidad & Tobago	4.5	18	16
Global	4.0		
Developed Countries	5.9		
Developing Countries	3.3		

those in the IGT range are also included then the rates for males show a prevalence of 12.3% and 14.7% for females. When the Wilks and Ragoobirsingh studies are compared, the prevalence rates show similar trends (Table 2).

Foster et al (1993), using a stratified sample of 464 persons aged 40-79 years in Barbados, found a

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Table 2: Comparison Rates of Diabetes (excluding IGT) by Age Group for Jamaica			
Jamaica Both Sexes	Ragoobirsingh et al (1995)	Wilks et al (1999)	
Age (yrs)			
15-24	2.6		
25-34	10.9	2.4	
35-44	6.8	8.8	
45-54	13.5	16.7	
55-64	20.8	26.8	
65+	25.0	20.4	
Prevalence	17.9	13.4	

diabetes prevalence of 18% in women and 15% in men, with a population prevalence of 17%. This was corroborated by Hennis et al (2002), who found a prevalence rate of 17.5%. He reported a prevalence of 9.1% for the age group 40-49 years which increased to 24% for the age group 70-79 years. The sample was a simple random sample of Barbadian born citizens aged 40-84 years and used glycosylated haemoglobin levels as a marker of diabetes. This study showed that there were different rates within the ethnic groups with 12.5% in mixed race (black/white) and 6.0% in white/others. This racial difference was also shown by Poon-King et al (1968), in Trinidad who using a stratified

random sample of the entire population of Trinidad (sample of 24,069), showed an overall prevalence of 3.45% with a prevalence of 2.4% in those of East Indian origin as opposed to 1.4% from those of African origin. In this study, blood glucose was estimated by a modified Somogyi-Nelson method as well as a two hour glucose tolerance test.

No other national study has been literature referenced and although there might be other small studies in some of the other Caribbean islands these have not be documented in peerreview journals or do not convey a national picture. One such study is that done by Veen-de Vries et al (1999) who reported a

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prevalence of diabetes at 15% within the Marigot Health District in Dominica. The sample was 123 elderly persons who were already attending the Marigot Health District.

All the studies reviewed show a very high prevalence of diabetes in the Caribbean region. This is corroborated by mortality data which in 2000 reported diabetes as the third cause of death for males and the leading cause for females (CAREC, 2001). These data reported the Caribbean as having the highest mortality from diabetes for all the sub-regions of the Americas. Diabetes is also the leading cause of potential years of life lost (PYLL) for the age group 45-64 years. This has a great societal impact not only through the economic burden, which has been estimated at 0.29% of the Caribbean GDP, but also on the health services and society at large.

The key to the halting of these trends is prevention. Strategies for the prevention of risk factors for diabetes need to become priority actions for the Caribbean Region. Strategies which improve the dietary habits, facilitate physical activity and promote the early screening for diabetes need to be implemented as national strategies. The problem of obesity, in the Caribbean, and especially childhood obesity, need to be addressed as a national priority. These actions can

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no longer be the sole responsibility of the Ministries of Health but need to become the responsibility of the whole nation. All government agencies, the private sector and civil society need to be on board to ensure that effective strategies are put in place to halt, or even better, reverse this pandemic of obesity and diabetes which is limiting the development of all the nations in the Caribbean.

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- changes in skin color
- swelling
- sores
- ingrown toenails
- cracks and cuts



The Role of Glycosylated Haemoglobin in the Control of Diabetes Mellitus

Godfrey C. Xuereba

iabetes mellitus is a chronic disease which is characterised by insulin deficiency, hyperglycaemia, and a high risk of development of complications. Diabetes is widely recognized as one of the leading causes of death and disability in the world, with approximately 7% of the global affected population by the condition. Monitoring of glycaemic status both by the patient and the healthcare provider has become a cornerstone of diabetes care. Results are used to assess the efficacy of therapy and to make adjustments in diet, physical activity and medications in order to achieve the best possible blood glucose control. Many of the research efforts in the past decade have focused on the development of new diagnostic tools for the benefit of people with diabetes. Biosensors and bioassays have been intensively used for the invitro diagnosis of diabetes. Most of these measurements are based on two important analytes, glucose and glycohaemoglobin, as they are

the major indicators directly involved in diabetes diagnosis and long-term management.

Glycohaemoglobin is formed in vivo by the nonenzymatic attachment of glucose to haemoglobin. Haemoglobin A1 (HbA₁) is a stable minor haemoglobin variant formed by post translational modification by glucose. The structure contains primarily glycated N-terminal valine of the β -chains. As glycation increases, the ratio of ß-chain to ßchain glycation increases and the number of glycation sites on the 13chain increases. HbA1 consists of three subtypes, HbA₁a, HbA₁b and HbA₁c, each having a different adducting sugar. HbA₁c is the glycated version and is the most common form of HbA₁. A clinical relationship between HbA1c and fasting plasma glucose and mean glucose concentrations over the preceding several weeks was described by Koening et al in 1976. The process of glycosylation is a slow chemical reaction which

^aGodfrey Xuereb is Public Health Nutritionist, CFNI.

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occurs throughout the lifespan of the erythrocyte with the prevailing plasma-glucose concentration being the most important factor governing the quantity of HbA1c formed. Gonen et al (1977), found a direct correlation between the level of HbA₁ and the physician's ratings of the degree of control and the fasting plasma glucose levels of the patients. They found that HbA₁ correlated significantly with mean fasting glucose, mean daily glucose and highest daily glucose values (Gonen et al, 1977). They also reported that those patients who had a raised HbA1 but whose physicians had classified them as being in good control, did in fact show high glucose concentrations when a 12-hour monitoring of plasma glucose was applied. This suggested that HbA1 measurement could be an effective screening test to identify those persons with diabetes who are in poor control. In their investigation they also found that HbA₁c can be separated from the major haemoglobin fraction as it is a fast-moving fraction through a cation-exchange resin. Peterson et al (1998) showed that the glycaemic control over the previous 3-4 months could be monitored by the determination of the ratio of glycated to nonglycated haemoglobin, as this was reflected by the HbA₁c chromatographic fraction.

Garlick et al (1983) reported that according to estimates based primarily on ion exchange chromatography, HbA₁c comprises 4-6% of Hb in normal erythrocytes and that only if the plasma glucose levels are elevated will the glycation be increased to a higher percentage. Using boronate affinity chromatography of protein and amino acids they precisely measured the levels of glycated Hb in people with and without diabetes. These measures correlated well with the previously estimated values obtained by exchange chromatography.

There are various adducts which can interfere with the results of these measurements. These include non-glucose adducts, haemoglobinopathies such as persistent HbF, which will falsely elevate the levels of HbA₁c and, especially of importance for the Caribbean, HbS, which falsely lowers the levels of HbA₁c (Stanaway et al, 2000). Haemolysis, blood loss, and pregnancy will all give falsely reduced HbA₁c values. Vitamins C and E are reported to falsely lower test results, possibly by inhibiting glycation of haemoglobin. Irondeficiency anaemia is reported to increase test results, while hypertriglyceridaemia, hyperalbuminaemia, uraemia, chronic alcoholism, chronic ingestion of salicylates and opiate addiction may all interfere with assay methods (Goldstein et al, 2004 and Sacks, 2002).

The HbA₁c test is versatile, in that blood can be obtained by venepuncture or by fingerprick capillary sampling. Blood tubes should contain anticoagulant or EDTA. Whole blood samples are stable for up to one week at four degrees centigrade (4°C); if they are stored at -70°C they are stable for at least one year. Storage at high temperatures can introduce artefacts which can affect the results and that may not be easily detectable. New collection systems have been experimented on and some have recently been introduced into the market. These include filter paper and small vials containing stabilizing and lysing reagent (Sacks et al, 2002). New integrated systems use whole blood which is collected by finger stick or venepuncture. A one microlitre sample is drawn into a pre-calibrated capillary holder and is placed into a cartridge which contains the reagents necessary for the assay. The machine does all the required reactions and a result is available in about 9 minutes. Other systems use disposable, battery operated devices which take 10 microlitres of whole blood which is diluted 70-fold into a dilution buffer and then applied to the device's sample port. The results are displayed in 8 minutes. The filter paper technique for spotting capillary blood with an immuno-

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turbidometric assay has been recently approved. In this system, the patients place 1-2 drops of fingerstick blood on each of the two target areas on filter paper in the test kit and these are then sent to the laboratory where the personnel elute the blood from one spot of the filter paper to assay for HbA_1c . Assay results are then mailed to the patient and their doctor. These systems would be better for field collection and for small communities where standardized laboratories are not economically feasible. Low-pressure liquid chromatography systems are designed for rapid and automated measurement of HbA₁c in a small laboratory or clinic. The results are available in less than 10 minutes and use a one-step sample preparation of venous or capillary blood.

The Diabetes Control and Complications Trial (DCCT, 1993) set the stage for establishing specific diabetes treatment goals using HbA₁c as an index of mean blood glucose. The correlation between HbA₁c levels and the outcome risks demonstrated in the DCCT and later in the UK Prospective Diabetes Study (UKPDS, 1998), strengthened the importance of the need to measure HbA₁c with high precision and in such a manner that results can be directly related to these studies and therefore to outcome risks. This led

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Table 1: Correlation Between HbA₁c Level and Mean Plasma Glucose

Levels (Goldstein et al, 2004)

	Mean Plasma	Glucose
HbA _{1c} (%)	mg/dl	mmol/l
6	135	7.5
7	170	9.5
8	205	11.5
9	240	13.5
10	275	15.5
11	310	17.5
12	345	19.5

to a standardised assay method using the DCCT reference, which is a high-performance liquid chromatography (HPLC) cation-exchange method. The International Federation of Clinical Chemistry (IFCC) has established a correlation between HbA₁c level and mean plasma glucose levels (Table 1) which is based on the data from the DCCT. In general, each 1% increase in HbA₁c corresponds to a 35 mg/dl (1.95 mmol/l) increase in mean plasma glucose.

After the DCCT and the UKPDS a more "evidence based" approach to the recommended targets for HbA1c have been adopted. The International Diabetes Federation (EDP, 1999) recommended that values $\leq 7.5\%$ should be the target to reduce the risk of microvascular complications. However, the 2005 American Diabetes Association Standards of Medical Care (ADA, 2005) recommended a target of <7.0% with a reference for nondiabetic range of 4.0-6.0%.

Proper interpretation of HbA₁c test results require an understanding of glycosylated haemoglobin kinetics. There are common misconceptions that since the test reflects mean glycaemia during the preceding weeks and months, large changes in glycaemia cannot be detected except after many weeks. Mathematical modelling predicts that although a change in mean blood glucose on day 1 is not fully reflected in the HbA1c level until 120 days later, a large change in mean blood glucose is accompanied by a large change in HbA_1c . This is confirmed by in-vivo experimentation which has also confirmed that regardless of the starting HbA₁c level, the time required to reach a midpoint between the starting level and the new steady state level is relatively constant at 30-35 days. This means that a large shift in plasma glucose, up or down, would be reflected in the HbA₁c levels within 1-2 weeks. Studies estimate that approximately 50% of the HbA1c value reflects the last 30 days, 25% reflects the last 60 days and 25% reflects the last 90 days (Sacks et al. 2002).

The DCCT study showed that HbA₁c measurement could be used

as a tool to stratify the risk of a patient developing microvascular complications because there was an exponential rise in the rate of these complications with increasing HbA₁c values. The study also showed that there was an apparent absence of a "glycaemic threshold" short of normal glycaemia below which small vessel complications did not occur (Kilpatrick, 2000). When all the trials were evaluated, the incidence in microvascular complications was reduced by 30% to 35% per 1% absolute reduction of glycated haemoglobin (American College of Endocrinology guidelines, 2002). The UKPDS confirmed these results, but also showed that the stability of glycaemic control is as important as the mean plasma glucose vis-à-vis the risk of small vessel disease.

Sub-group analysis from these two major studies have also shown a relationship between HbA₁c levels and coronary heart disease risks. An epidemiologic analysis of the entire patient population receiving intensive treatment in the UKPDS, revealed that a 1% reduction in HbA₁c was equated with a 14% reduction in macrovascular complications (American College of Endocrinology, 2002). Thus HbA₁c gives an indication of both micro and macrovascular risk in patients with diabetes. In the EPIC-Norfolk study (Khaw et al, 2001) glycated haemoglobin con-

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centration significantly predicted mortality, with increasing risk throughout the whole range of concentrations, even below the threshold commonly accepted for diagnosis of diabetes. This effect was independent of known risk factors and consistent after men with existing diabetes, heart disease and stroke were excluded. The predictive value of HbA₁c for total mortality was stronger than that documented for cholesterol concentrations, body mass index, and blood pressure.

The American Diabetes Association (ADA, 2005) recommended that HbA₁c testing should be performed routinely in all patients with diabetes, first to document the degree of glycaemic control at initial assessment and then as part of continuing care. The HbA₁c test should be carried out approximately every 3 months, but the frequency should be dependent on the clinical situation, the treatment regimen used, and the judgement of the clinician.

When correlated with the oral glucose tolerance test (OGTT) criteria for diagnosing diabetes, the HbA1c has been found to be limited as a screening test, especially since it misses out all those who have either impaired glucose tolerance (IGT) or have frank diabetes but HbA1c within the normal range (Davidson, 1999).

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Anand et al (2003) showed that although a combination of fasting plasma glucose and HbA₁c improved the specificity and positive likelihood ratio of diagnosis, the combined tests did not yield satisfactory diagnostic properties for diagnosing IGT.

The EPIC-Norfolk study (Khaw, 2001) showed that raised glycated haemoglobin concentration, even in men without diabetes, is a marker of greater absolute risk. Preventive treatment with blood pressure or cholesterol lowering drugs should be considered in such patients. The study also showed that when men with diabetes were excluded, a reduction of just 0.1% HbA1c in the whole population would reduce the total mortality by 5%. These findings have great public health implications as, if it were possible to lower the popu-lation mean distribution of HbA₁c concentration by lifestyle means, such as diet and physical activity, many people could shift into lower risk categories and total mortality and morbidity rates would be reduced.

Beyond the use of HbA₁c as a measure of long-term glycaemia and of risk for chronic compli-cations in diabetes, routine HbA₁c testing has been shown to improve glycaemia per se. Larsen et al (1990), found that after one year of testing and making the test results available to the patients, the cohort showed a

substantial lowering of blood glucose and HbA_1c . Thus, knowledge of HbA_1c levels seems to alter behaviour of health care providers and/or patients, which in turn improves glycaemia and lowers the risk of developing chronic complications of diabetes. This is an important behavioural change tool which can be used both to reinforce changes in behaviour at an individual level but also as a tool in health promotion.

In a study conducted by McDermott et al (1981), patient performance of HbA₁c was useful in providing enhanced reinforcement for self-monitoring programmes. It also engaged patients in groups in the monitoring process and provided an educational tool with which to teach pathophysiologic principles involved in diabetes mellitus. The results of this study have more relevance now, since portable, homebased, HbA₁c monitors are available and hopefully will soon be more affordable.

In light of all the data supporting the benefits of "tighter" glycaemic control, HbA₁c testing offers an ideal tool for the person living with diabetes and the healthcare provider. HbA₁c testing will ensure accurate monitoring of the diabetes status and more accurate treatment goals. All of this translates to an ever improved quality of life for the person living with diabetes.

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5 Ways to Reduce Fat.....

- Ι. Bake broil or grill instead of frying your foods.
- 2. Use little or no butter, margarine or oil in baked products. Replace with apple sauce or crushed banana.
- 3. Limit fried foods to one item once per week. Drain and pat with paper towel or grease-proof paper to absorb excess oil.
- 4. Remove skin and visible fats from all meats and poultry.
- 5. Use low fat or 'lite' mayonnaise and salad dressings, non fat milk and dairy products, or water-based gravies.



Diabetes Nutrition Education and Human Rights: *Lessons from a Research Study Among Caribbean People in the UK*

Penelope Scott^a

This article presents selected findings of a study investigating the dietary habits among two generations of Caribbean people in London, England. Quantitative and qualitative methods were used to collect data from a sample of 80 people with diabetes and 80 people without the disease; on topics including food, the body, health and disease as well as diabetes knowledge. The article focuses on those findings related to (a) interviewees' concepts of what constitutes a "proper meal", (b) their understanding of "healthy eating" and the relationship between food and health and (c) their food classification system and understanding of food groups used in nutrition advice to diabetic patients. These findings are discussed in terms of their implications for patient education and the human rights obligations that should be considered when delivering information to people with a chronic disease such as diabetes.

Dietary advice is a cornerstone of diabetes management. However, its potential impact on moderating eating behaviour is to a large extent mediated by an individual's culturally located beliefs about food, eating and health. Providing appropriate dietary advice is, therefore, challenging. This is particularly so in multi-cultural societies such as Britain where Caribbean people constitute the second largest minority ethnic group and among whom there is a high prevalence of diabetes¹ and poor outcomes from the disease.^{2,3}

With few exceptions, the task of dieticians is made more difficult by the general lack of research based information on the dietary habits and beliefs of this group. This article addresses these issues by answering the following questions: what do Caribbean people consider to be a 'proper meal' and how does this compare with national

^aDr. Penelope Scott, is Visiting Lecturer, Alice Salomon University of Applied Sciences, Berlin, Germany.

lines on having balanced meals? What are their concepts of 'healthy eating'? How do they classify their foods and what are their views on the relationship between food and health? It is argued that information generated by such questions is integral to the development of more suitable dietary education material, particularly when considering states' human rights obligations.

METHODS

The study had two research components:

- 1. A survey of 160 Caribbeans consisting of two sub-samples:
 - The first comprised 80 Caribbean diabetic patients selected according to two criteria:
 - a) they had been diagnosed as having diabetes within the previous 10 years;
 - b) equal numbers were selected from the age groups of 25-45 and 55-75.
- The other sub-sample comprised 80 Caribbean people who did not have the disease. The subsamples were matched for age group and sex.
- 2. Ethnographic (In-depth) interviews were held with 12 Caribbean diabetic patients and

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12 Caribbean people who did not have the disease. The subsamples were taken from the survey sample and were matched for age and sex. These interviews allowed an in-depth exploration of the survey topics.

The study used a purposive sampling frame: the sub-sample of 80 Caribbean diabetic patients were selected from the patients' list at the out-patients clinic of a South London Hospital which is based in an area with a high concentration of Caribbean people. The subsample without diabetes was recruited in two ways: through referrals from the interviewees with diabetes and through five different community organisations in South London. The principal researcher and a research interviewer, both of whom are of Caribbean origin, collected the survey data from participants using a structured questionnaire. This questionnaire was first piloted by recruiting Caribbean interviewees through two other London hospitals. The semi-structured questionnaire developed for the ethnographic interviews was piloted among members of the survey sample.

The sample was stratified according to sex, age (25-45 and 55-75) and health status (people with diabetes, people without diabetes). The majority of the interviewees

(53%) were from Jamaica. One in five (20%) among the 25-45 age group was born in the UK to Caribbean parents and all the interviewees in the older age group were born in the Caribbean. The majority (58%) were home owners and the others were living in rented accommodation.

Nine (9%) of the sample were unemployed, 37% were retired, 38% were in full-time employment and the remainder were either in parttime employment or coded as 'other'.

The survey results were analysed with the SPSS package and the independent variables used included health status, age, sex and country of birth. The ethnographic interviews were analysed with the NU*DIST programme and analytical categories were developed from the data and the study's hypotheses. Since the project sample was purposively selected, clinic non-attenders were excluded and it is not possible to generalise the findings to all Caribbean communities.

FINDINGS

What interviewees consider to be a 'proper meal': concepts of 'balanced and 'unbalanced' meals.

Interviewees were asked to define a 'proper meal' by describing what food items they would like to see on their plate. This hypothetical question was intended

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to provide some indication of the combination of food groups people are likely to have in their main meal. The answers were analysed by comparing them with the 'plate model' of dietary guidelines given to people with diabetes at the South London Hospital where part of the fieldwork was conducted. This advice is similar to the healthy eating guidelines issued by the Health Education Authority^{4,5} which stresses the importance of meals with a balance of proteins, carbohydrates and vegetables.⁶

Responses to this question were categorised as either 'balanced' or 'unbalanced' depending on whether or not the food groups and the number of food groups listed matched those suggested in the dietary guidelines mentioned previously. No information on portion sizes was collected. The data show that almost half the sample (49%) described a 'proper meal' classified as 'unbalanced' while 39% gave a 'balanced' description; 6% gave responses which were 'undefinable' - this group included people who listed soup and who said that they would eat anything or did not have a special preference. A further 6% said they could not give an answer - for some this was because there are a lot of foods which they claimed they could not eat because of an existing health condition.

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A breakdown of the definitions of proper meals as 'balanced' and 'unbalanced' by health status, sex and age/place of birth is as follows:

As Table 1 shows, that 'unbalanced' concepts of a 'proper meal' were highest among interviewees with diabetes. This would appear to contradict the expectation that they would be more likely to give 'correct' answers as typical treatment for diabetes incorporates dietary advice which stresses the importance of balanced meals. It may well be that, given the fairly strict dietary guidelines the diabetic sample must observe, this trend in the answers reflects what their preferred or idealised choices are. The diabetic sample was also more likely to give answers that were 'undefinable' (this group included people who listed soup or who did not have a specific choice) or to say that they did not know what answer to give; as noted previously, this was usually qualified with concerns relating to their health.

Gender also influenced responses to this question: men were more likely to offer definitions of proper meals which were unbalanced and they were also more likely to say that they could not answer the question. Interviewees in the older age group (55-75) were also least likely to give balanced descriptions and more likely to give undefinable answers or to not answer the question at all.

Table 1:				
Definitions of a 'Proper Meal' by Health Status, Gender, Age				
	Balanced	Unbalanced	Undefinable	DK
	%	%	%	%
Diabetic	29	51	11	9
Non-diabetic	50	46	1	3
Female	46	45	6	3
Male	33	53	6	9
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<45 born UK	41	53	6	_
<45 born WI	44	50	2	4
55+ born WI	36	46	9	9

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In what ways were the descriptions of meals unbalanced?

Descriptions of meals were defined as unbalanced where there were 'deficits' and 'surpluses' in the types and numbers of food groups given (protein, carbohydrate/ starch, vegetables). Among the interviewees describing a 'proper meal', the following deficits and surpluses were recorded:

As the figures show definitions of a proper meal were 'unbalanced' mainly in terms of surplus carbohydrate foods. Approximately one in

Deficits:		Surplus:	
Vegetables	14%	Starch	33%
Starch	6%	Starch & Protein	3%
Protein	2%	Protein	7%

every three persons described meals which consisted of more than one carbohydrate food which is contrary to the 'plate model' of dietary guidelines. The percentage of people listing extra starch food items is in real terms higher when the 'starch' and 'starch and protein' categories are considered together. Examples of these meals described by interviewees are:

• 'Grilled fish or chicken, green vegetables, green bananas, yam, rice' (69 year old woman with diabetes).

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- 'Rice and peas, potatoes, chicken, salad' (70 *year old man*).
- 'Chicken, green bananas, potatoes, peas and carrots' (43 year old man with diabetes).
- 'Lamb, fish, vegetables, rice, dumplings, potatoes, plantain' (30 year old woman with diabetes).

Age and place of birth were directly related to deficits in the types of food groups listed. Whereas deficits in all food groups were lowest among the younger interviewees who were born in the

> UK, deficits for all food groups, except proteins, were highest amongst the sample aged 55-75 who were all born in the Caribbean. Surplus carbohydrate foods

were more likely to be listed by members of the non-diabetic sample, particularly those in the age group 45 and younger. The influence of gender was again apparent in answers to this question as men were more likely than women to state more than one starch in their definitions.



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CONCEPTS OF HEALTHY EATING

Interviewees were asked to define what they understood by the term 'healthy eating'. Three different conceptual categories of answers were recorded:

1. Answers focusing on the nutritional/health value of food and the types of food groups consumed. More specifically, these definitions usually included references to:

- No fat, no sugar, no sugar or fat, being low in carbohy-drates and or fat (30%);
- No salt (6%)
- Having foods which provide proteins, vitamins, fibre (6%)

"Cutting out all fats off meat, eating lots of vegetables, fruits and doing exercises" (39 year old woman with diabetes)

"Having salads and fruits." (75 year old man).

2. Answers relating to the concepts of balance (22%), eating regularly and in moderation (18%):

"A mixed, balanced diet, substantial amount of starch foods, fruit, vegetables, fish and chicken." (43 year old man with diabetes).

"Not eating too much at one time" (67 year old man).

- 3. Answers focusing on the types of foods consumed: this was usually defined as foods which are the:
 - 'Right kind of food' (3%)
 - Foods which are not convenience foods (3%)
 - Fresh foods and vegetables (20%)

"Eating healthy foods like fish and chicken." (42 year old woman with diabetes).

'Home made foods, fresh foods, lots of water." **(40 year old woman).**

Interviewees with diabetes were more likely to give definitions of healthy eating which included 'low fat' and 'no sugar' as well as 'fresh fruits and vegetables'. The nondiabetic sample was more likely to mention 'no salt' and the concepts of balance and regularity in their definitions of healthy eating. The relationships between these answers and those of the nondiabetic sample were statistically significant.

HEALTHY EATING AND SERIOUS ILLNESSES

Interviewees' definitions of healthy eating were followed by a question on whether or not they thought healthy eating could stop people getting serious illnesses. Although the vast majority of the sample (72%) responded positively

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to this question, interviewees with diabetes were more likely to disagree. More than half of this subsample (64%) expressed doubts regarding the relationship between healthy eating and the prevention of illness, compared with 36% of their non-diabetic counterparts.

Age group and place of birth also proved statistically significant in a further analysis of answers to this question. Generally, the older interviewees were more likely to agree that there was a positive link between healthy eating and the prevention of illness, while younger members of the sample, born in the UK, were least likely to do so.

Often interviewees qualified their answers with expressed reservations about the positive impact of healthy eating because of the perceived inevitability of illness:

> "Healthy eating is an added bonus for the body, it helps to fight off germs but if you are going to get something you will get it regardless of healthy eating." (25 year old male with diabetes).

> "Sometimes its just destiny to get these illness, your life is planned out so you get sick." (61 year old female).

FOOD AND HEALTH

The issue of the relationship between food and health was further pursued in the qualitative inter-

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views. There were mixed views on how healthy Caribbean foods are. Some considered the high starch content of many traditional foods, the amount of oil used in cooking, and the traditional cuts of meat eaten as unhealthy. However, most considered the Caribbean diet healthy, primarily because of the **variety** of foods eaten, the **freshness** of the foods and their **nutritional** value.

"To me, I would say definitely yes (Caribbean foods and diet are healthy) 'cos they have a variety of different food in the West Indies you can choose from yeah? You can have all sort of different things but here every day in the English is either chips or roast, yeah? Or mash but in the ...right now in Britain in the market you got lots of different West Indian to choose from, in Brixton market you see so many different yam, dasheen, ripe plantain, the green plantain, they got it, you know for soup so you got everything" (73 year old Barbadian woman).

There were repeated concerns about the use of chemicals and sprays on food items available in the UK and the bad effect this was viewed as having on health. By contrast, the food in the Caribbean was usually described as much healthier because it was 'fresher' and unlikely to be contaminated by chemicals and fertilisers. Cajanus

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"West Indians are getting a high rate of cancer, practically everyone I know is dying of cancer right? Especially when they come here but in the West Indies it's not as high as it is here. Well, I believe it's all the damn chemicals they are shoving down on us – we 're actually catching up with the heart problems of the Europeans, right?... how many people do you know dying of cancer back home...not many. But once they start eating all the Western products - all the chemicals are in there – they 're going to drop down dead of cancer soon and start eating loads of MacDonalds. Because when you're home how often do you eat red meat? There's more fish and more fresh fruits and vegetables and everything else there. You can't afford to eat a cow right? Here, look at the cows, this shoving this hormone in it, that bit of antibiotic, you 're eating a chemical factory. And they say it (the chemicals) comes out - how the hell is it going to come out? And I don't believe half the time the scientists what they say ... " (40 year old St. Lucian man with diabetes).

Suspicions were also voiced about the quality and safety of frozen and tinned foods and they were often referred to as unhealthy:

> "I do not like frozen things. I do not like tinned stuff. I don't like baked beans for a start – yes I don't believe in tinned stuff...I never know what food poisoning is – I don't like nothing tinned – tinned stuff to eat" (73 year old woman from Montserrat).

FOOD CLASSIFICATION

Previous research⁷ has suggested that firstly, Caribbean people have culturally specific terms to classify different foods and secondly, they may have difficulty understanding technical terms used to describe various food groups such as carbohydrates, starch, fibre, roughage, protein which are used in much of the literature on healthy eating. These findings were further investigated in the survey and interviewees were asked whether they understood and/or could give examples of these latter terms. As the following data show, an understanding of these terms was not high and generally interviewees were unaware of the important function of each food group in the diet.

- *Carbohydrates:* 38% of the interviewees were able to give correct examples of carbohydrate foods. Most of this group defined carbohydrates as starch. Only 6 people (4%) could describe carbohydrates as energy giving foods.
- Starch: 88% were able to give correct examples of starch, usually Caribbean foodstuffs such as yam and cocoa; other foods listed were dumplings, potatoes, rice, bread and biscuits. Only one person was able to define starch as 'giving energy'.

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- *Roughage:* Slightly more than half the sample (52%) gave at least one correct example of roughage cereal, fruit, vegetables, bread, bran. Only four people said that roughage 'helped the bowels'.
- *Protein:* Half the sample (50%) were able to give correct examples of protein foods and 5 people were able to define proteins as being 'good for the body'.

Of all the variables, age and place of birth emerged as the most significant in an analysis of the answers: with the exception of the term starch, there was a statistically significant trend for the terms to be least well understood by the 55's – 75's while the 25's-45's, specifically those born in the UK, were more familiar with them.

In contrast, interviewees had their own terms for classifying foods. They understood and/or used terms such as *'hard food'* (76%) and *'ground provisions'* (45%) to describe all

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Caribbean starches such as yam, green bananas, sweet potato, cassava, cocoa, plantain, breadfruit and dumplings. The term 'provisions' (44%) was used/understood in two different ways: (a) to refer to Caribbean starches such as yam, green bananas etc.; (b) groceries or foods that are purchased and stored such as fish, meat, chicken, fruits and vegetables. 'Dry food' was used by 64% of interviewees to describe foods such as bread, biscuits, crackers, bun, bulla as well as meals without gravy or meals without fish, meat or chicken. 'Fresh food' was the most widely recognised and used term (81%) and it embraced several different understandings of food: (a) freshly harvested foods or slaughtered meats; (b) home cooked foods; (c) foods which are not frozen or processed. The majority of these terms were more commonly understood and used by the older age groups. Additionally, some terms were used or defined differently by Jamaican interviewees when compared to interviewees from the other islands.

DISCUSSION

The findings of this study raise several points which health professionals could consider when providing dietary advice to Caribbean people. First, the data suggest that some have definitions of 'proper meals' which are unbalanced Cajanus

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when compared with healthy eating guidelines used in health education and dietary advice to diabetes patients. These definitions were unbalanced mainly in terms of a tendency for people to list more than one carbohydrate food as part of these meals. The study did not include data collection on the actual portion sizes of these starches. However, from the expressed concerns about the portion sizes in diabetic diets, voiced by interviewees and from other data collected both in this and a previous study⁸, it is most likely that portion sizes are generous. This is, therefore, an issue which could be addressed in health education on healthy eating and weight control aimed at the Caribbean community. Ideally, the approach should be gender sensitive given the trend for more males than females to indicate a preference for more than one carbohydrate food.

Second, the definitions of healthy eating held by the sample without diabetes were least likely to embrace the concepts of eating more fresh fruit and vegetables and cutting down on fat and sugar consumption. This point considered together with the finding that only a minority of interviewees defined healthy eating in terms of 'balance', a concept used by health educators, is perhaps indicative that health promotion messages about healthy eating are not reaching sections of the

Caribbean community. This would be consistent with the views of other researchers that health promotion campaigns are not reaching ethnic minority groups.9 It also points to the clear need for the development of other strategies designed to get 'healthy eating' and other health promotion messages across to this group, particularly given the increasing prevalence of diabetes in this group. These strategies, however, should reflect the heterogeneity of the community by taking account of the variations reflected in the data according to age group and gender.

Third, there was a generally low understanding among the sample of the food classification terms used in much of the health promotion literature and patient education on healthy eating. This suggests the need to incorporate culturally based food classification terms in patient education and dietary advice to persons with diabetes. This finding is also a salutary reminder of the different frames of reference for understanding and managing health and illness subscribed to by professional clinic staff and lay persons.¹⁰ As most dietary and nutritional advice to diabetes patients is offered within a hospital or clinical setting, this institutional context will influence how information and knowledge are constructed. Inevitably, scientific values and approaches may lead to an orientation of this

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information and advice towards biomedical interpretations of what is to be presented. In contrast, individuals with diabetes bring to the clinical encounter their own culturally defined food categories and their own beliefs and discriminating attitudes towards food. This was clearly exemplified by the sample in their own food classifications, their articulated concerns about tinned and frozen foods, the value of freshness and variety in the diet, as well as the perceived relationship between food and health. These collective beliefs constitute a coherent system by which nutritional advice will be evaluated and in turn reacted to.

The significance of this for dietitians and health educators, particularly when working with individuals from minority ethnic groups, is the need for inter-disciplinary, research based approaches to developing nutritional advice and dietary guidelines. Disciplines such as anthropology and sociology can contribute to an understanding of how individuals classify foods and with what consequences; the processes by which food choices are made; the cultural context of eating; and the various factors or influences that lead an individual to accept or reject advice. The potential success of conceptualising dietary advice in this way with the aim of positively influencing patient cooperation is

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exemplified by studies where patients' health beliefs and concerns are matched with appropriate health education.^{11,12,13}

Such an approach appears an imperative when considering the human rights obligations of national governments that are state parties to the International Covenant on Economic, Social and Cultural Rights (ICESCR). Article 12 of the ICESCR recognises "the right of everyone to the enjoyment of the highest attainable standard of physical and mental health". In a clarification of this right, General Comment No. 14 on the Right to the Highest Attainable Standard of Health¹⁴, specifies tasks and responsibilities for states. Among these are the need for "all health facilities, goods and services....(to be) culturally appropriate, i.e. respectful of the culture of individuals, minorities, peoples and communities" (Paragraph § 12c). General Comment 14 is also explicit about the obligations that states have towards the fulfilment of the right to health. Of specific relevance to the provision of dietary advice to persons with diabetes, particularly those from ethnic minorities, is the requirement for a state to ensure that "health services are culturally appropriate" and that the state "meets its obligations in the dissemination of appropriate information relating to healthy lifestyles and nutrition"

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(Paragraph § 37). When considering these human rights obligations, the provision of appropriate dietary information to persons with diabetes is not only a matter of effective diabetes management but an inalienable right and a question of social justice.

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This article is a substantially revised and extended version of a previously published paper.

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Standards for the Development of Programmes for Education on Diabetes in America

Committee of Education, DOTA

ABSTRACT

The Declaration of the Americas (DOTA) recognizes the severity of diabetes in the region of the Americas and the commitment of the governments of the region to implement strategies and actions that can reduce the socioeconomic cost of diabetes and improve the quality of life of those who suffer from the disease. Given that, there is a need to incorporate diabetes education as an indispensable medical service in order to achieve the active participation of patients in controlling and treating the disease. The DOTA Education Committee prepared this document to specify the conditions and standards that a patient diabetes-education program should meet.

The Declaration of the Americas (Declaration of the Americas: DOTA) is a recognition of the severity of diabetes in the continent and a commitment of the governments of the Region to implement strategies and capable actions of reducing the socioeconomic cost of the disease and improving the quality of life of those who suffer from it. In this context, there is a need to incorporate diabetes education as an indispensable medical provision to achieve the active participation of the patient in the control and treatment of the disease.

The promotion of education of the patient as a fundamental

premise for the treatment of diabetes has already been made by Bouchardat in 1875, and its value has been demonstrated repeatedly by various authors in communities of very different socioeconomic characteristics. However, only a small number of patients of some countries receive adequate diabetes education. Consequently, the patients are unaware of the fundamental aspects of the disease and the steps to follow in order to control it. This situation is due partly, to the fact that education still does not have the scientific prestige and its results are not well known by the opinion leaders and

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by those responsible for the public health.

In order to be effective, the education requires a series of conditions such as formation, knowledge and pedagogical skills, good capacity of communication and the ability to listen, include and negotiate. In order to ensure a positive impact of the education it is necessary that whoever performs it has the necessary education and experience and that it is recognized as an essential provision and, as a result, there is satisfactorily remuneration.

In order to facilitate the achievement of these objectives, the Education Committee of the DOTA prepared the current document which lists the conditions that should be brought together in an education program for patients with diabetes. To this end we analyzed various documents which referred to the subject, such as those of the 'International Diabetes Federation' (International Federation of Diabetes: IDF), the 'American Diabetes Association' (American Diabetes Association: ADA) and the American Association of Educators in Diabetes (American Association of Diabetes Educators: AADE). Many of the concepts in the present document agree with those included in the consulted documents.

The 'Region of the Americas' is heterogeneous from the ethnic

standpoint, the cultural aspects, traditions, the grade of literacy, health systems and socioeconomic status. This heterogeneity is also reflected in the grade of dissemination, granted importance, implementation, and effectiveness of the programs for education in diabetes. Thus, the task of establishing guidelines is not simple, since we run the risk of setting lower objectives than those already in effect for some, and goals that seem unattainable for others. In these circumstances, the Education Committee of the DOTA tried to standardize criteria and establish common standards that permit the diabetics of the region to agree to a reasonable diabetes education that incorporates effectively the control and treatment of the disease.

The Education Committee desires that the standards listed should not only be met, but that they will be surpassed in the programmes run throughout the region. However, aware of the situation of many countries, in which these programmes are still in their embryonic phase and in order to avoid the inactivity, we have defined the minimum criteria by which a programme will be considered effective. We consider that the content of the document will facilitate the task both of those responsible for the education of patients as well as of those who have the power of accreditation of the educational programmes.

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The Education Committee hopes that this document will be updated on a periodic basis after evaluating its results in order to ensure its effects and effectiveness. That will be our commitment and challenge.

The application of these standards offers the people with diabetes the opportunity to prevent the development of chronic complications of the disease and improve their quality of life. Although we are aware that this is not an easy task, we believe that the eventual benefits justify the effort.

STANDARDS

Organization

A group will be created and be responsible for the design and implementation of the education program in diabetes. This group will be made up of skilled personnel with a Coordinator and an Advisory Committee.

- *Standard 1:* The organization will define clearly and will state in writing the objectives of the programme, establishing that education is a building block for the treatment of diabetes.
- *Standard 2:* The organization will provide the necessary resources for achieving these objectives, taking into account

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the characteristics and sociocultural aspects of the target population. These resources should be sufficient with regard to space/site, personnel, budget and educational materials (audiovisual, manual for the participants, slides with educational information and others).

• *Standard 3:* The structure and teaching-administrator will include the following components: the team and its members, the Coordinator and the Advisory Committee.

Characteristics of the Personnel of the Organization

- *Standard 4:* The personnel of the organization will meet the following requirements:
 - a) They should have knowledge of diabetes, its different aspects, such as diagnosis, control and treatment and the educational principles (pedagogical aspects, motivational, evaluative).
 - b) The team will be formed, at a minimum, by a physician and an educator in diabetes, who can be a health professional or another professional that has specific training and sufficient diabetes education, certified by a responsible authority.

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- c) It is also desirable to incorporate other members of the health team, such as nutritionists/dietitians, podiatrists, experts in physical education, psychologists and social workers.
- d) The team will meet with the coordinator, at the very least three times a year, in order to exchange opinions, evaluate the progress of the programme and to develop a report to the Advisory Committee.

The Coordinator

- *Standard 5:* The coordinator will be responsible for the planning, operation and evaluation of the programme. Furthermore:
 - a) They will act as liaison between the team and the Advisory Committee.
 - b) They will provide and coordinate the continuing and progressive education of the team and of other personnel within the organization.
 - c) Will meet periodically with the team, at the very least three times a year.
 - d) Will participate in the planning and annual review of the programme.

- e) Will participate in the preparation of the budget.
- f) Will be a member of the Advisory Committee.

Advisory Committee

- *Standard* 6: The Advisory Committee will have the following characteristics and modalities of operation:
 - a) It will have an interdisciplinary and intersectoral composition, with representation of the health team, the patients and the community.
 - b) All its members will have experience in the identification, treatment and management of diabetes.
 - c) It will meet at least twice a year.
 - d) Will participate annually in the programme planning: objectives, access, methods of teaching, resources, monitoring, and evaluation.
 - e) Will annually review and approve annually the programmes and recommendations.
 - f) Will approve new programmes that conform to the pre-established criteria.
 - g) It will certify the suitability (knowledge, skills

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and experience) of the educators.

Programme for Education

- *Standard 7:* Upon developing the programme it will be tested to ensure that it is accessible to all the population to whom it is directed, considering the different types of diabetes (Type 1, Type 2 and gestational diabetes), the different ages and the special needs of some specific groups of patients.
- *Standard 8*: It will be guaranteed that the programme is developed regularly and systematically, and ensures the continuous education of its participants (educators and students).

Population

- *Standard 9:* The population to be educated will be identified, taking into account the potential number of patients, the type of diabetes, the age, the language, the regional characteristics and the special educational needs (for example, grade of schooling and of illiteracy).
- *Standard* **10**: A document will be developed, that clearly stipulates the curriculum of the educational programme and reflects its objectives and

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contents, the methodology to use, the educational materials that will be used and the way of evaluating its achievements (instruments of evaluation, frequency of the same and responsibility for its realization).

Curriculum of the Programme

- *Standard* **11**: The educational programme will include the following aspects:
 - a) General aspects on diabetes.
 - b) Psychosocial factors and stress.
 - c) Social support and family participation.
 - d) Nutrition.
 - e) Physical activity.
 - f) Specific medication of the DM and of the associated risk factors.
 - g) Clinical and metabolic monitoring by the patient (self-monitoring), its application, interpretation of results and decisions that accompany it.
 - h) Relationship between feeding, physical activity, medication, and 'blood glucose' and other metabolic parameters.
 - i) Prevention, detection, and treatment of the acute and chronic complications.

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- i) Dental and foot care. k) Benefits and risks of different alternatives which may be used to achieve a better metabolic control. l) Pre-conceptual care, during pregnancy, and in gestational diabetes. m) Utilization of the health services and resources in the community. n) Indications for special situations, such as other chronic diseases. o) Work environment. p) Negative consequences of habits such as smoking or alcohol consumption and ways of eliminating these behaviours. Strategies in order to q) change behaviour, establish and to meet the personal objectives with regard to the medical treatment, to reduce the risk factors and to overcome the conflicts in daily life. Standard 12: The educational
 - programme will use methods and appropriate materials according to the characteristics of the group to educate.

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Methodology of Teaching

The programme should include individual educational and group plans.

- Standard 13: The individual teaching will be a responsibility shared with the healthcare group in charge of the treatment to the patient and will be made in every consultation, so that every medical act is an educational act. The equipment to be used will be agreed on with the patient, who will also be involved in possible modifications in the development of the programme. This takes into account the individual's needs and the results of periodic evaluations.
- Standard 14: Group teaching is not a substitute for individual teaching, but is complementary. The formation of small groups (maximum of 15 people) should be promoted and should facilitate permanent communication between students and the educator. The decision-making process of the patient, with respect to adaptations and changes of habits, control and treatment, the prevention of complications and the improvement of quality of life will be promoted. The groups should be formed taking into account the age of the students, the type of diabetes, the sociocultural level

Cajanus Vol 39, No. 3, 2006 of the participants and the existence of potential barriers to the learning.

Evaluation

The results of the educational programme will be reviewed annually by the coordinator and the Advisory Committee. Future modifications of the programme will depend on the result of this evaluation. This will determine if the programme still meets the established standards. The results should be documented and used in the subsequent planning and updating of the programme. The Advisory Committee will be authorized to intervene and even to suspend the operation of the team if the evaluation process is not completed.

- *Standard* **15**: The Advisory Committee should make an annual evaluation of the educational programme, taking into account the following aspects:
 - a) Objectives.
 - b) Curriculum, methods, and materials.
 - c) Composition of the team.
 - d) Access of the programme and mechanisms of monitoring of the participants.
 - e) Resources of the programme (space, personnel and budget).

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- f) Strategies of marketing in order to achieve a greater access to the population of interest.
- g) Effectiveness of the programme based on objective data (clinical, biochemical, other parameters, economic and of satisfaction) the patients that attend the programme. The participants will be evaluated at the beginning of the programme, immediately after its conclusion and, at least, 6 and 12 months later.

The information obtained will be used to evaluate the effectiveness of the programme, identify the aspects that need to be strengthened or modified, to carry out adaptations in relation to the needs of the participants and to include subjects of interest in courses of continuing education.

- *Standard* **16**: The knowledge acquired on diabetes should be evaluated in accordance with the objectives of the programme, including at the very least the following parameters:
 - a. *Clinical changes:* weight, symptoms, hypoglycaemia, ketoacidosis, changes of medication, blood pressure.

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- b) Laboratory changes: `blood glucose`, glucosuria, ketonuria, HbA₁c, lipid profile.
- c) Attitudes: self-monitoring, adherence to the plan of feeding, physical activity.
- d) Utilization of services.
 - e) Psychosocial aspects, such as health beliefs, family support, socioeconomic level, satisfaction, and barriers to earning.

APPENDIX

The 16 standards described in this document should be followed by all the programmes of diabetes education that hope to reach an excellence level, especially, if they include not only patients, but also people who are going to be trained as educators. However, the latter requires a high grade of structural development, in addition to economic and human resources.

An educational programme that fulfills all the proposed standards can be implemented in Diabetes Centers, as defined by the World Health Organization (WHO).¹ The Diabetes Centers should offer a broader range of programmes by a multidisciplinary health care team and should have, at least, a diabetes specialist-endocrinologist, two professionals of education, several medical specialists that ensure an early diagnosis, the prevention and the treatment of the complications of diabetes, and other healthcare professionals that can contribute complementary knowledge. Unfortunately, the possibility of establishing Diabetes Centers in Latin America and the Caribbean is limited. These centers can serve as tertiary centers of assistance and can be connected to teams or primary care units.

In the area of primary care, the services should be provided by physicians that are capable of doing basic diagnoses, prescribing essential drugs and to organize simple educational programmes described in the standards 4, 7, 8, 9, 10, 11, 12, 14 and 16. Having a team made up of a physician with interest and experience in the control and treatment of diabetes and a professional of the education is optimal. This team could be setup, with the physician acting as coordinator that would fulfill standards 1, 2, 4b, 5 and 13.

In the area of the secondary care, the minimum desirable would be a Diabetes Team, although optimally this should be a Diabetes Unit. The team would be made up of a diabetologist-endocrinologist, an internist specialized in diabetes, a professional educator and, at

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least, three healthcare professionals that can provide multidisciplinary assistance. These personnel can implement the educational programme, although the Advisory Committee can be used to assist in areas where it is difficult to meet requirements, such as 15d, and f and g.

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Dietary measures and exercise are important in the control of diabetes. The type and severity of the condition will determine the method of treatment. Your doctor will decide which treatment is best for you.

IDF Global Guideline for Type 2 Diabetes^a

International Diabetes Federation



RECOMMENDATIONS

Standard care

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ED1: Make structured patient education an integral part of the management of all people with Type 2 diabetes:

- from around the time of diagnosis
- on an ongoing basis, based on annual assessment of need
- on request.

ED2: Use an appropriately trained multidisciplinary team to provide education to groups of people with diabetes, or individually if group work is considered unsuitable. Where desired, include a family member or friend.

ED3: Include in education teams a health-care professional with specialist training in diabetes and delivery of education for people with diabetes.

ED4: Ensure that education is accessible to all people with diabetes, taking account of culture, ethnicity, psychosocial, and disability issues,

perhaps delivering education in the community or at a local diabetes centre, and in different languages.

ED5: Use techniques of active learning (engagement in the process of learning and with content related to personal experience), adapted to personal choices and learning styles.

ED6: Use modern communications technologies to advance the methods of delivery of diabetes education.

• Comprehensive care

*ED_c*1: This would be as for Standard care but would also include the availability on demand of individual advice, through a named key contact.

• Minimal care

 ED_M1 : This would be as for Standard care but education would be provided by an appropriately skilled individual rather than a team.

 $ED_M 2$: Consider how available technologies can best be used to deliver education.

^aCopyright permission granted through the kind courtesy of IDF.



Education in the broadest sense underpins diabetes care, at every contact between the person with diabetes and the health-care team. This has made it difficult to isolate those aspects of education which best contribute to its effectiveness. Recognition that 95 % of diabetes care is provided by people with diabetes themselves, and their families, is reflected in the current terminology of 'diabetes selfmanagement education' (DSME) programmes. With the understanding that knowledge itself is not enough to enable people to change behaviour and improve outcomes 1,2, approaches emphasizing new active learning have been introduced and continue to be developed.

EVIDENCE-BASE

Systematic reviews of the evidence are generally critical of the quality of reporting and methodology in many of the studies in this field, and point out the need for further research, and possible strategies for this.³⁻⁷ In the technology report informing its guidance on the use of patienteducation models, NICE provided a review, rather than formal metaanalysis, due to differences in design, duration, outcome measures and reporting of studies.⁴

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NICE excluded foot self-care education but otherwise reviewed the evidence on both general and focused self-management education in Type 2 diabetes. The evidence from eight trials (6 RCTs, 2 CCTs) suggested that general self-management education has a limited impact on clinical outcomes, although few long-term data were available. The evidence from eight trials (7 RCTs, 1 CCT) of focused self-management education (focused on one or two aspects of self-management) suggested that this may have some effect in reducing or maintaining HbA₁c levels, although there was little evidence of impact on other clinical outcomes. This is partly because of short study durations. Also reviewed were four trials (3 RCTs, 1 CCT) that included people with Type 1 or Type 2 diabetes, where there was some evidence that education may improve glycaemic control and quality of life, but little evidence about the longer-term benefits of education. The other reviews painted a similar picture of educational interventions producing modest improvements in glycaemic control.5-7 The NICE review commented that generally those studies reporting significant results used group interventions.4

NICE found that costs depended on the type of programme offered, starting with a diabetes centre-based teaching programme Cajanus

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spread over three afternoons. Although there is very little evidence regarding the cost-effectiveness of patient education in general, it was concluded that, given the relatively small costs associated with educational programme when the need is identified, only small improvements in terms of morbidity or health-related quality of life were needed to make educational interventions cost effective.⁴

CONSIDERATION

Despite the patchy evidence, certain common principles emerge and are rejected in the recommendations. Assessment of needs is fundamental to tailoring education to the perspective of the person with diabetes, while identified needs of the population served will determine the curriculum. Delivery of advice on nutrition (see Lifestyle management) or foot-care (see Foot care) or any other aspect of diabetes care would apply the same underlying educational principles outlined in these recommendations. It is noted that diabetes education was an integral part of intensification of care in the DCCT (in Type 1 diabetes), and that nutritional advice made a significant impact in the UKPDS cohort prior to rando-misation. Accordingly, diabetes education is

taken as an essential part of diabetes care.

Major components of implementing these recommendations are the recruitment of personnel and their training in the principles of both diabetes education and behaviour change strategies. These staff then need to develop structured education programmes for people with diabetes, supported by suitable education materials matched to the culture of the community served. Attention needs to be given to provision of space in an accessible location, and access to communication tools such as telephones. Levels of literacy and understanding need to be considered.

EVALUATION

NICE suggests measures that could be used, for instance, to audit education for people newly diagnosed with diabetes.⁴ These will include the presence of the multidisciplinary team, space and education resources, together with a local curriculum. There will be an entry within individual records of the offering and provision of education around the time of diagnosis, of annual assessment of educational need subsequently, and of provision of such education when the need is identified.

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Other Useful Resources

Diabetes patient education is a large topic, and many health-care professionals are unfamiliar with modern educational principles. The following documents are chosen as helpful resources for those wishing to develop materials (curriculum) and skills in this area.

• IDF Consultative Section on Diabetes Education. International Curriculum for Diabetes Health Professional Education. Brussels: IDF, 2002. www.idf.org

> This comprehensive document deals with education of the diabetes health-care professionals, and is directed towards (though not solely applicable to) the diabetes educator.

European Diabetes Policy Group 1999. A Desktop Guide to Type 2 Diabetes Mellitus. Diabet Med 1999; 16: 716-30. www.staff. ncl.ac.uk/philip.home/guidelines.

This formal consensus guideline succinctly covers in three pages the appropriate approach to the education of someone with diabetes (initial and ongoing), and some of the content and issues which need to be addressed.

Diabetes Education Study Group of the European Association for the Cajanus Vol 39, No.3, 2006

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Study of Diabetes. Basic Curriculum for Health Professionals on Diabetes Therapeutic Education. 2001. www.desg.org

This approachable booklet sets out step by step to address the issues and skills which need to be understood and acquired by anyone seeking to deploy educational techniques in helping people with diabetes.

• WHO Working Group Report. Therapeutic Patient Education: Continuing education programmes for health-care providers in the field of prevention of chronic diseases. Copenhagen: WHO Regional Office for Europe, 1998.

This document again addresses the competencies needed by those delivering 'therapeutic patient education', and in so doing addresses to some extent the detail of areas to be covered in delivering a comprehensive education programme.



Psychological Care



Standard care

PS1: In communicating with a person with diabetes, adopt a whole-person approach and respect that person's central role in their care (see also Education, Lifestyle management).

Communicate non-judgementally and independently of attitudes and beliefs.

PS2: Explore the social situation, attitudes, beliefs and worries related to diabetes and self-care issues.

Assess well-being and psychological status (including cognitive dysfunction), periodically, by questioning or validated measures (e.g. WHO-51).

Discuss the outcomes and clinical implications with the person with diabetes, and communicate findings to other team members where appropriate.

PS3: Counsel the person with diabetes in the context of ongoing diabetes education and care.

PS4: Refer to a mental healthcare professional with a knowledge of diabetes when indicated. Indications may include: adjustment disorder, major depression, anxiety disorder, personality disorder, addiction, cognitive dysfunction.

• Comprehensive care

*PS*_c1: Principles of communication will be as for *Standard care*.

*PS*_c2:A mental health specialist (psychologist) would be included in the multidisciplinary diabetes care team.

*PS*_c3: Periodic assessment and subsequent discussion would be as for standard care, but could use additional measures²⁻⁴ and computer-based automated scoring systems. The mental health specialist in the team would be able to provide a more comprehensive (neuro) psychological assessment, if indicated.

PS_c4: Counselling would be as for *Standard care*, but the mental health specialist in the team would be available to offer psychological counselling, to participate in team meetings, and to advise other team members regarding behavioural issues.

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Minimal Care

PS_M1: Principles of communication will be as for *Standard care*.

 $PS_M 2$: Be alert to signs of cognitive, emotional, behavioural and social problems which may be complicating self-care, particularly where diabetes outcomes are sub-optimal.

 PS_M 3: Refer for mental health specialist advice according to local availability of such professionals.

RATIONALE

Psychological well-being is itself an important goal of medical care, and psychosocial factors are relevant to nearly all aspects of diabetes management. Being diagnosed with diabetes imposes a lifelong psychological burden on the person and his/her family. Having diabetes can be seen as an additional risk factor for developing psychological problems, and the prevalence of mental health problems in individuals with diabetes is therefore likely to exceed that found in the general population. Poor psychological functioning causes suffering, can seriously interfere with daily diabetes self-management, and is associated with poor medical outcomes and high costs.5-7 More serious psychological disorders need to be identified, and referral

to a mental health specialist for diagnosis and treatment considered.

Ways in which health-care professionals can directly or indirectly help resolve behavioural and psychological issues, with the aim to protect and promote emotional well-being (quality of life) can be considered in terms of: (1) communication with the patient; (2) assessment or monitor-ing; and (3) counselling.

EVIDENCE-BASE

Psychosocial aspects of diabetes care are included (to varying extents) in the guidelines from the CDA,8 SIGN,9 NICE (Type 1)10 and ICSI¹¹ and, for the first time in 2005, in the ADA standards of care.12 NICE examined evidence from studies including people with Type 2 diabetes, particularly in the area of depression, which is the only topic addressed by ICSI and (for adults) by SIGN. Depression has been found to be twice as prevalent in people with diabetes compared with the general population¹³ and is often under-detected.14

Evidence-based guidelines for psychosocial care in adults with diabetes have been published under the auspices of the German Diabetes Association (DDG), indicating the level of evidence for psychological interventions in different problem areas.¹⁵

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There is RCT support for efficacy of antidepressant treatment (in a mixed group of Type 1 and Type 2 diabetes with major depressive disorder), and for cognitive behaviour therapy (in Type 2 diabetes with major depression).^{8,14} There is growing evidence that psychological coun-selling can contribute to improved adherence and psychological outcomes in people with diabetes.¹⁶ A systematic review and meta-analysis has shown that, overall, psychological interventions are effective in improving glycaemic control in Type 2 diabetes.¹⁷

CONSIDERATION

People coping with diabetes are more likely to be affected by mental health problems, and self-management is likely to be more difficult in the presence of such disorders. Detection of emotional problems in relatively brief consultations with diabetes professionals is likely to be problematic without a formal or structured approach. Lastly there is a clear need for some basic training for diabetes professionals in management issues in this area, and for appropriate referral path-ways to mental health specialists with a knowledge of diabetes for people more seriously affected.

If followed by adequate treatment or referral, screening for mental health problems as part of

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routine diabetes care can help to improve patient satisfaction and psychological outcomes.

Agreement on the importance of psychological factors, and the underpinning philosophy of empowerment of people with diabetes, implies agreement within the care team on the relevance of psychological issues in diabetes. There is then a need for training of diabetes care team members in communication/interview skills, motivational techniques and counselling. Training of health-care professionals in the recognition of psychological problems will also be needed. Where resources allow, psychological assessment tools should be made available to diabetes teams, and health-care professionals should be trained in applying assessment/monitoring procedures. Collaboration with mental health specialists who already have an interest in diabetes can help to extend the education/ training of other mental health specialists in relation to diabetes.

EVALUATION

Evaluate by number of psychological assessments in a given time-period, level of wellbeing and satisfaction in the managed population over a period Cajanus

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of time (overall and by subgroups), and by number of referrals to mental health specialists, indications and outcomes. The training, and continuing education, of diabetes health-care team members can also be evaluated.

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Standard Care

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LS1: Advise people with Type 2 diabetes that lifestyle modification, by changing patterns of eating and physical activity, can be effective in controlling many of the adverse risk factors found in the condition.

LS2: Provide access to a dietitian (nutritionist) or other health-care professional trained in the principles of nutrition, at or around the time of diagnosis, offering one initial consultation with two or three follow-up sessions, individually or in groups.

LS3: Provide ongoing counselling and assessment yearly as a routine, or more often as required or requested, and when changes in medication are made.

LS4: Individualize advice on food/meals to match needs, preferences, and culture.

LS5: Advise control of foods with high amounts of sugars, fats or alcohol.

LS6: Integrate drug therapy, where needed, into the individual's chosen lifestyle.

LS7: For people choosing to use fixed insulin regimens, advise consistent carbohydrate intake at meals. For these people, as well as those on flexible meal-time <u>+</u> basal insulin regimens, offer education on assessment of carbohydrate content of different types of foods.

LS8: Provide advice on the use of foods in the prevention and management of hypoglycaemia where appropriate.

LS9: Introduce physical activity gradually, based on the individual's willingness and ability, and setting individualized and specific goals.

LS10: Encourage increased duration and frequency of physical activity (where needed), up to 30-45 minutes on 3-5 days per week, or an accumulation of 150 minutes of physical activity per week.

LS11: Provide guidelines for adjusting medications (insulin) and/or adding carbohydrate for physical activity.

LS12: Both nutrition therapy and physical activity training should be incorporated into more broadly based diabetes self-management training programmes (see Education).

LS13: For weight reduction in people with Type 2 diabetes who are obese, it may sometimes be appropriate to consider weight loss medications as adjunct therapy.

• Comprehensive Care

LS_c1: Advice on lifestyle management will in general be as for Standard care.

LS,2: Education might also be provided as a routine for special topics such as label reading, restaurant eating, special occasions.

LS_c3: Intensive personal counselling might be offered on a regular basis with a health-care professional specifically trained in the principles of nutrition, to facilitate maintenance of lifestyle modifications and support weight loss or weight maintenance.

LS_c4: Exercise testing could be available for those considering programmes of physical activity.

LS.5: Aerobic and resistance training sessions might be available, with individualized testing and education by exercise specialists, and continued support from them.

Minimal Care

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 LS_{M} 1: The principles of lifestyle management are as for Standard Care.

 $LS_M 2$: Offer basic nutrition guidelines (healthy food choices) for improved glycaemic control.

 LS_M3 : Advise on ways to reduce energy intake (carbohydrate, fat, alcohol as appropriate).

 LS_M4 : Provide nutritional counselling from someone with training in nutrition therapy, around the time of diagnosis, then as assessed as being necessary, or more often as required or requested.

 $LS_{M}5$: Advise and encourage participation in regular physical activity.

RATIONALE

People with Type 2 diabetes often have lifestyles (eating and physical activity) which contribute to their problem. It is essential they receive help soon after diagnosis to consider how they may modify lifestyle in ways which enable them to take control of their blood glucose, blood lipid and blood pressure abnormalities, even if they also require drug therapy in the short or longer term (see Glucose control: therapy). Cajanus

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EVIDENCE-BASE

Evidence supports the effectiveness of nutrition therapy and physical activity in the prevention and management of Type 2 diabetes.¹⁻⁴ This is reflected in the current ADA standards of medical care⁵ (which draw on a detailed evidence-based technical review on nutrition⁶ and a more recent review on physical activity²) and in the Canadian guideline.⁷ An earlier UK guideline⁸ pointed out that involvement in a lifestyle study, even in the control group, can be beneficial, but that lifestyle modification can be difficult to achieve and maintain. That guideline expressed some concern over methodological problems in trials of complex and multifactorial interventions. Most studies have been short-term (a problem currently being addressed in a US trial), and we do not yet know the ongoing contribution of lifestyle measures once medication has been introduced, or what kind of support is required on a continuing basis. It may be noted that in the UKPDS initial dietary education was very effective in lowering blood glucose after diagnosis, and that some people were then able to maintain target glucose control for many years by diet modification alone.9,10

Randomized controlled trials and outcome studies of medical nutrition therapy (MNT) in the management of Type 2 diabetes have reported improved glycaemic outcomes (HbA1c decreases of 1.0-2.0 %, depending on the duration of diabetes). MNT in these studies provided by was dietitians (nutritionists) as MNT only or as MNT in combination with diabetes self-management training. Interventions included reduced energy intake and/or reduced carbohydrate/ fat intake, and basic nutrition and healthy food choices for improved glycaemic control. Outcomes of the interventions were measurable by 3 months.6,7,11-15

In a meta-analysis of nondiabetic people, MNT restricting saturated fats to 7-10% of daily energy and dietary cholesterol to 200-300 mg daily resulted in a 10-13% decrease in total cholesterol, 12-16% decrease in LDL cholesterol and 8% decrease in triglycerides.¹⁶ An expert committee of the American Heart Association documented that MNT typically reduced LDL cholesterol 0.40-0.65 mmol/1 (15-25 mg/dl).17 Pharmacological therapy should be considered if goals are not achieved between 3 and 6 months after initiating MNT.

A meta-analysis of studies of non-diabetic people reported that reductions in sodium intake to ≤ 2.4

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g/day decreased blood pressure by 5/2 mmHg in hypertensive subjects. Meta-analyses, clinical trials and expert committees support the role of reduced sodium intake, modest weight loss (4.5 kg), increased physical activity, a lowfat diet that includes fruits, vegetables and low-fat dairy products, and moderate alcohol intake, in reducing blood pressure.¹⁸

A meta-analysis of exercise (aerobic and resistance training) reported an HbA1c reduction of 0.66%, independent of changes in body weight, in people with Type 2 diabetes.¹⁹ In long-term prospective cohort studies of people with Type 2 diabetes, higher physical activity levels predicted lower long-term morbidity and mortality and increases in insulin sensitivity. Interventions included both aerobic exercise (such as walking) and resistance exercise (such as weightlifting).^{2,20,21}

The Canadian guideline has a section on the management of obesity in Type 2 diabetes, which addresses lifestyle measures and also drug and surgical options.⁷



It is noted that in general costs of educational initiatives to change lifestyle are low, because unlike drug therapy they are provided on an intermittent rather than continuing basis. From a healthprovider perspective many of the costs fall outside their budget, healthier foods and exercise programmes and equipment generally being a cost met directly by the person with diabetes. For these reasons, and because, for glucose control, the gain from lifestyle modification is greater than that from any individual therapy, lifestyle measures are heavily promoted. Lifestyle modification is, however, sometimes difficult for the individual to maintain in the long term, or to develop further after early changes have been made. Where professional nutritionists are unavailable, it was noted that other health-care professionals should be trained in basic nutritional and other lifestyle education.

Recognition of the importance and cost-effectiveness of lifestyle interventions should drive allocation of resources required for care and self-management training. Implementation demands knowledgeable and competent personnel, dietitians/nutritionists and other health-care professionals may require training to be effective providers of lifestyle interventions. Consistency of approach to lifestyle issues across the diabetes care team is an important principle here. A process is needed to enable people

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to gain access to services as required.

Self-management counselling in nutrition (for individuals or groups) has four components: (1) assessment; (2) identification of the nutrition problem; (3) intervention that integrates nutrition therapy into overall diabetes management and implementation of selfmanagement training; and (4) nutrition monitoring and evaluation of outcomes. A similar approach needs to be taken for physical activity. Development of educational materials, or adaptation of them from elsewhere, is needed.

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Services should be able to show the availability of appropriately trained personnel, and records that individuals with diabetes have contact with them around the time of diagnosis and at regular intervals thereafter. Educational support materials should also be demonstrable. Outcomes can be assessed in terms of improvement in appropriate food choices and amounts, and responses to questioning about physical activity levels and, where appropriate, alcohol consumption. Metabolic measures are, however, likely to be confounded by changes in drug therapies.

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Caribbean Leaders Endorse Health Recommendations

Caribbean leaders meeting at a CARICOM summit in July embraced the recommendations of the "blue ribbon" Commission on Health and Development, headed by former Pan American Health Organization (PAHO) director Sir George Alleyne.



Addressing the changing health needs of citizens of the Caribbean will require higher national spending on health, according to a report by the Commission on Health and Development.© Armando Waak/PAHO

Officials agreed on the need to increase health budgets and resolved to disseminate the report widely to generate public support for stepped-up efforts in health.



Denzil Douglas, Prime Minister of St. Kitts and Nevis and the CARICOM leader responsible for health issues, said that after analyzing the commission's report his colleagues agreed that governments needed to boost health spending above the current average of 5 percent of national budgets.

The report noted that Caribbean countries have made significant gains in recent decades in areas including infant mortality and life expectancy. However, as a result of population aging, lifestyle changes, and the adoption of risky behaviours, chronic noncommunicable diseases have increased.

"Heart disease, cancer, cerebrovascular disease, and diabetes mellitus have continued to be the four major leading causes of death for the past two decades," the report notes. "Deaths from stroke, heart disease, and hypertension, at least in Barbados and Trinidad and Tobago, are three to four times more common than in North America. Death from coronary artery disease is particularly prevalent in Trinidad and Tobago, with rates doubling those found in North America. Diabetes has emerged as a major problem and must now be regarded as an epidemic in the region."

The report cites high rates of overweight and obesity in every

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country studied. The trend is particularly alarming among children, the report says. It concludes: "This epidemic must be addressed with urgency."

The report also notes that a lack of epidemiological data made it difficult to draw conclusions about needs in some areas, such as mental health.

Regarding the issue of health financing, the report rejects calls for the introduction of user fees, which it says would be "regressive and likely to be particularly damaging to the very poor and others who need the services most". The report notes that many of the region's poor people have been made poorer by having to shoulder higher health care costs.

Citing the impending increased movement of people in the region as a result of the implementation of the Caribbean Single Market and Economy (CSME), the commission also calls for the introduction of a regional health insurance scheme.

[Source: CARICOM Secretariat.]

Clinical Guidelines for the Management of Diabetes

The CHRC has completed the revision of its clinical guidelines "Managing Diabetes in Primary **Care in the Caribbean**". The production of clinical guidelines is consistent with the CHRC's mandate to promote health policy decisions and best practice, based on available evidence.

CHRC Diabetes Guidelines were first published in 1995 and since then, there have been significant advances in the management of Diabetes. Consequently, there was a need for an updated manual that would take into account the most recent international developments. The manual also takes into account the culture, economic situation and health care systems in the Caribbean and is designed to serve as a key tool in improving patient care.



The revision of the guidelines was conducted in collaboration with the Office of Caribbean Programme Coordination, Pan American Health Organization (PAHO/CPC).

[Source: CHRC News, Issue No. 2, April 2006.]

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Grain Fiber and Magnesium Intake Associated With Lower Risk for Diabetes

Higher dietary intake of fiber from grains and cereals and of magnesium may each be associated with a lower risk of Type 2 diabetes, according to a report and meta-analysis in the May 14 issue of Archives of Internal Medicine, one of the JAMA/Archives journals.

Projections indicate that the number of people diagnosed with diabetes worldwide may increase from 171 million in 2000 to 370 million by 2030, according to background information in the article. The associated illness, death and health care costs emphasize the need for effective prevention, the authors write. Fiber may help reduce the risk of diabetes by increasing the amount of nutrients absorbed by the body and reducing blood sugar spikes after eating, among other mechanisms. Current American Diabetes Association guidelines include goals for total fiber intake, but research suggests that some types of fiber may be more beneficial than others. Findings regarding magnesium and diabetes risk remain unclear.

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Matthias B. Schulze, DrPH, and colleagues at the German Institute of Human Nutrition Potsdam-Rehbruecke, Nuthetal, conducted a study of 9,702 men and 15,365 women age 35 to 65 years. Participants completed a food questionnaire when they enrolled in the study between 1994 and 1998, then were followed up through 2005 – an average of seven years - to see if they developed diabetes. In addition, the researchers performed a meta-analysis of previously published work related to intake of fiber or magnesium and risk of diabetes.

During the follow-up period, 844 individuals in the study developed Type 2 diabetes. Those who consumed more fiber through cereal, bread and other grain products (cereal fiber) were less likely to develop diabetes than those who ate less fiber. When the participants were split into five groups based on cereal fiber intake, those who ate the most (an average of 29 grams per day) had a 27% lower risk of developing diabetes than those in the group that ate the least (an average of 15.1 grams per day). Eating more fiber overall or from fruits and vegetables was not associated with diabetes risk, nor was magnesium intake.

In the meta-analysis, the researchers identified nine studies of fiber and eight studies of magnesium Cajanus

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intake. Based on the results of all the studies, in which participants were classified into either four or five groups according to their intake of fiber or magnesium, those who consumed the most cereal fiber had a 33% lower risk of developing diabetes than those who took in the least; while those who consumed the most magnesium had a 23% lower risk than those who consumed the least. There was no association between fruit or vegetable fiber and diabetes risk.

"In conclusion, the evidence from our study and previous studies, summarized by means of metaanalysis, strongly supports that higher cereal fiber and magnesium intake may decrease diabetes risk," the authors conclude. "Whole-grain foods are therefore important in diabetes prevention."

[Source: American Medical Association.]

Coffee is Number One Source of Antioxidants

Coffee provides more than just a morning jolt; that steaming cup of java is also the number one source of certain antioxidants in the US diet, accordidng to a new study by researchers at the University of Scranton (Pa). Their study was described at the 230th national meeting of the American Chemical Society.

"Americans get more of their antioxidants from coffee than any other dietary source. Nothing else comes close", says study leader Joe Vinson, PhD, a chemistry professor at the university. Although fruits and vegetables are promoted as good sources of antioxidants, the new finding is surprising because it represents the first time that coffee has been shown to be the primary source from which most Americans get their antioxidants, Vinson says. Both caffeinated and decaf versions appear to provide similar antioxidant levels, he adds.

High antioxidant levels in foods and beverages do not necessarily translate into levels found in the body. The potential health benefits of these antioxidants ultimately depends on how they are absorbed and utilized in the body, a process that is still poorly understood.

[Source: American Chemical Society Meeting. (Nutrition Today, November/ December 2005. Vol 40, No. 6).]



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