

Commentary and translation: 1994 nutrition recommendations for diabetes

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The American Diabetes Association's 1994 "Nutrition recommendations and principles for people with diabetes mellitus" (1) provide a new direction for the oldest modality used to treat diabetes. The 1994 recommendations may require adjustments in beliefs about food and diabetes, alteration in methods used to provide nutrition care, and modification in practice patterns of dietitians, physicians, and nurses. Changes in philosophy, scientific recommendations, and terminology shift the nutrition management of diabetes from a mathematical to a cognitive process. The paradigm of the American Diabetes Association diet, as a prescription of caloric intake and macronutrient distribution, is now obsolete. The new model, *medical nutrition therapy for diabetes*, stresses a four-pronged approach that includes assessment of the individual's metabolic and lifestyle parameters to identify nutrition goals, an intervention designed to achieve these goals, and evaluation of therapeutic outcomes.

Treatment goals must be set collaboratively by the patient and clinician members of the team. The team then coordinates nutrition, exercise, and pharmacologic therapies to achieve the identified goals. The team uses metabolic outcomes to evaluate effectiveness and adjusts treatment to achieve and maintain treatment goals. Medical nutrition therapy for diabetes, therefore, must be both an ongoing and an integrated process.

In this commentary we discuss both the content of the 1994 recommendations and implications for translating them into diabetes management. We will (a) highlight major changes from previous recommendations (2), (b) describe the four key components of the process of providing medical nutrition therapy for diabetes, (c) briefly discuss the scientific issues underlying the major nutrition changes to provide a framework for the team to develop a care plan, and (d) describe some of the challenges associated with adoption of this new model of nutrition care.

CHANGES FROM 1986 TO 1994

Philosophy

The 1994 recommendations, the fifth published by the American Diabetes Association since 1950, present two major changes in the philosophy of nutrition care for diabetes. First, an individually developed dietary prescription based on metabolic, nutrition, and lifestyle requirements replaces the calculated caloric prescription tailored to meet individual needs. This change in philosophy is guided by the recognition that diabetes encompasses a variety of metabolic abnormalities and that a single diet formula does not adequately treat all types of diabetes.

The second philosophical change is in the approach to nutrition management of non-insulin-dependent (type II) diabetes. Glucose and lipid goals join weight loss as the focus of therapy for

overweight persons. A variety of strategies to achieve these metabolic goals are advocated, only one of which is weight loss. This change indicates that nutrition interventions besides weight loss can be effective in achieving blood glucose and lipid goals in persons with type II diabetes.

Scientific Recommendations

Definitive data and, when lacking, clinical experience and consensus, support the 1994 recommendations. Scientific data guided decisions and were used to justify recommendations that depart from established nutrition guidelines for the general population. This rigorous approach contributed to deletions, modifications, and additions to the previous recommendations, which were published in 1986 (2). Emphasis on the metabolic effect of amount of total carbohydrate rather than on type of carbohydrate led to recommendations on sucrose and fiber that are similar to those for individuals who do not have diabetes. The limitation on protein intake to 0.8 g/kg per day, introduced in 1986, has been liberalized to 10% to 20% of energy, a range that approximates consumption in the general US population (3).

Guidelines for carbohydrate and fat content in the diet suggest different levels for various types of metabolic abnormalities. This approach corresponds to the new focus on metabolic goals and offers some resolution to the controversies over the optimal composition of the diet for diabetes (4).

TERMINOLOGY

New terms and expanded definitions are used in the 1994 recommendations. *Medical nutrition therapy* replaces *diet therapy* and *self-management training* replaces *diabetes patient education*. The definition of *individualization* has been expanded to include assessment of metabolic and lifestyle determinants for each person. The goals of medical nutrition therapy now encompass assessment, intervention, and evaluation of outcomes.

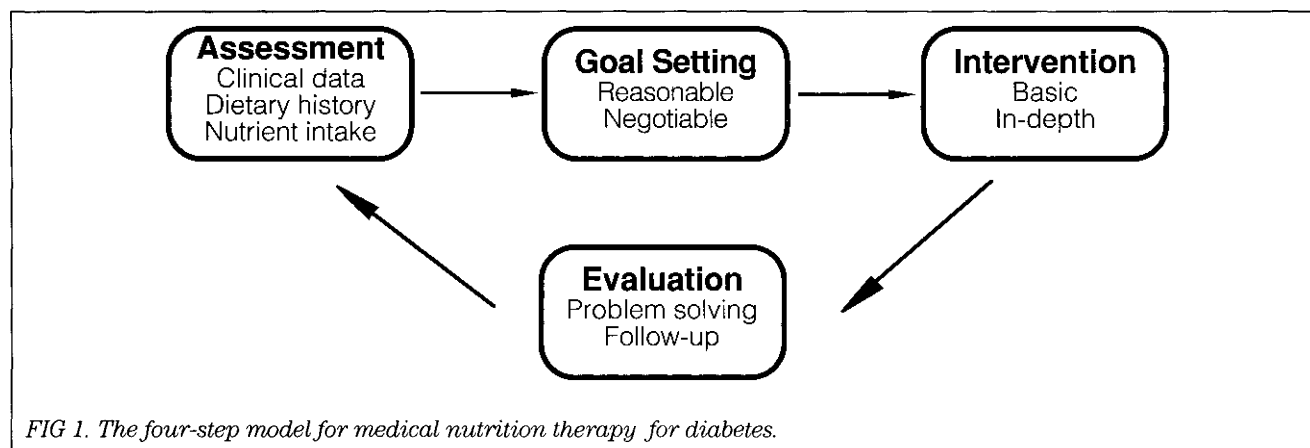
Overall, the 1994 recommendations make obsolete the concept of one diet for diabetes and physician orders for an "ADA diet." They mandate a comprehensive approach to nutrition management of diabetes that demands more resources than the mathematical method but also has the potential to be more effective. Success depends on all members of the treatment team understanding the ongoing and integrated process of medical nutrition therapy for diabetes.

THE PROCESS OF PROVIDING MEDICAL NUTRITION THERAPY FOR DIABETES

The complexity of medical nutrition therapy requires a team approach to enhance the ability of each patient to obtain good metabolic control. The diabetes management team should include a registered dietitian, a registered nurse, a physician, the person with diabetes, and other health care professionals as needed. The dietitian is the primary provider of medical nutrition therapy and the other team members ensure that adequate medical and lifestyle information are available to the dietitian. More importantly, the other team members provide support and reinforcement to the nutrition care plan.

The key to success of medical nutrition therapy is the involve-

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ment of the diabetes management team in conducting a thorough assessment, encouraging patient participation in goal setting, selecting an appropriate nutrition intervention, and evaluating the effectiveness of the nutrition care plan (Figure 1). These four steps are outlined with suggestions for implementation.

Assessment

The 1994 recommendations stress that medical nutrition therapy for the person with diabetes is assessment based (1,3). The assessment helps identify goals and determines the types of nutrition intervention to be used. During this stage, the dietitian establishes rapport with the client. The development of a trusting relationship will enhance the accomplishment of goals and further medical nutrition therapy (5).

The assessment involves obtaining clinical data, such as results from the patient's self-monitoring of blood glucose levels, blood lipid levels (total cholesterol, low-density lipoprotein cholesterol, high-density lipoprotein cholesterol, and triglycerides), and glycated hemoglobin (Figure 2). Clinical laboratory data that are critical to making appropriate decisions on the type of nutrition intervention are blood lipid levels and glycated hemoglobin. Results from self-monitoring of blood glucose levels will provide direction in determining whether the current pattern of meals and exercise needs any adjustment or whether present habits need reinforcement.

For the dietitian to do a thorough assessment, all medical and lifestyle data need to be available. All information gathered by the diabetes management team needs to be consolidated into the medical record so that the overall diabetes care plan can be developed and all members of the team can support the patient.

An assessment can be accomplished through an interview or by use of a questionnaire. A dietitian working in a hospital may find it helpful to use a simple questionnaire. The assessment must serve as a tool for developing the nutrition intervention. It should identify nutrition problems and misinformation (ie, the general misconceptions about diabetes treatment). However, it is important to use the assessment as a tool to provide positive feedback on a patient's current eating habits and lifestyle activities.

Goal Setting

After completing the assessment, the dietitian needs to review the assessment with the patient in preparation for setting goals. The patient must be asked to identify what his or her needs are in relation to overall diabetes management.

To help negotiate goals with the client, the dietitian may want to use some of the following questions to obtain information about the client's understanding and about his or her willingness and interest in making changes:

- What would you like from nutrition counseling?
- What is the most important goal for you in managing your diabetes and the way you eat?
- Regarding your present plan of eating, what are some changes you are willing to make?
- What would you do to make these changes?
- Of these changes we've discussed, what could you do first?

Now the client and dietitian are engaged in goal setting. Goal setting allows the client to establish realistic and specific goals that can be evaluated over a period of time. Goal setting is not the responsibility of the dietitian, but rather the responsibility of the client. The dietitian helps negotiate goals that meet the client's needs and capabilities.

The goals established should help the patient with diabetes make positive changes in eating and exercise habits that will result in outcomes such as improvements in blood glucose levels and blood lipid levels and improved nutrient intake. But remember, goals are NOT permanent, and will change for a variety of reasons. Therefore, goal setting must be part of all aspects of medical nutrition therapy to help the client achieve metabolic control.

Nutrition Intervention

The information obtained from the nutrition assessment and the established goals of the patient form the base for the nutrition intervention. The nutrition intervention does not simply provide a meal plan with a set nutrition prescription based on percentages. The nutrition intervention is tailored to address any metabolic abnormalities. It provides the patient with the opportunity to acquire knowledge and skills necessary to change or maintain eating habits. The dietitian functions as an information provider and counselor. The dietitian needs to consider how much information to provide, what literacy level to use, and what type of audiovisual material (eg, handout, video, audiotape, flip chart, food models) to use. Nutrition intervention is intended to provide the patient with practical information that can be applied to daily living skills.

Nutrition intervention involves two stages of information giving:

- Basic nutrition intervention — This stage provides an overview of nutrition and nutrient requirements, diabetes nutrition management guidelines, and survival-skill information deemed appropriate to the patient (eg, label reading, sick-day management) (5).
- In-depth nutrition intervention — This stage involves the use of a meal planning approach that provides more structure, such as menus, calorie counting, fat counting, exchanges lists, and carbohydrate to insulin ratio(s) (5).

Some persons will never be able or willing to acquire more

information beyond the basic nutrition intervention stage. However, if the client is able to meet the overall goals of diabetes management, then the dietitian has done what is necessary to support the client.

Evaluation

Evaluating the client's goals is an extremely important part of the process wherein the dietitian and client determine the effect of the intervention. At this point in therapy, problem solving may be necessary to help the patient succeed at the established goals or new goals may be established and further nutrition intervention provided. The evaluation, like the assessment, must include clinical data (blood lipids, glycated hemoglobin) and results of self-monitoring of blood glucose to determine the effectiveness of the nutrition intervention.

The client should consider follow-up as needed after the first session of medical nutrition therapy. Follow-up may be appropriate as lifestyle and life cycle change or as significant advances or changes occur in diabetes management. It is recommended that follow-up for children occur every 3 to 6 months and for adults every 6 to 12 months (6).

SCIENTIFIC ISSUES

One needs to understand the scientific issues underlying the 1994 recommendations in order to implement medical nutrition therapy. Certain of the recommendations vary from previous recommendations and deserve attention. In this section we will discuss improvement of blood glucose and lipid values and weight loss as outcomes for overweight persons; nonnutrition therapy for persons with refractory obesity; the amount and type of dietary fat; the ratio of fat to carbohydrate; and the proportions of simple and complex carbohydrate within total dietary carbohydrate. We will also compare the 1994 American Diabetes Association recommendations for pregnancy and protein with the Recommended Dietary Allowances (RDAs) (7). A detailed review of the literature has been published elsewhere (3).

Blood Glucose, Blood Lipids, and Weight Loss Should Be Emphasized for Overweight Persons

Switching the emphasis from weight loss to other parameters can lead to dietary changes that subsequently result in weight loss, which is important for overweight persons with diabetes. For example, the Women's Health Trial (WHT) included a dietary intervention of 20% of energy from fat with the goal of testing the hypothesis of the relationship of dietary fat and breast cancer (8). Women in the WHT intervention group consumed an average of 22% of energy from fat and, without attempting to lose weight or restrict caloric intake, lost an average of 3 kg after 1 year (9).

Although the WHT did not include persons with diabetes, the efficacy of a low-fat, low-calorie diet providing 20% of energy from fat has been shown in obese persons with type II diabetes who lost more weight after 16 weeks than controls consuming a low-calorie intervention (10). Both groups showed improvements in serum cholesterol, high-density lipoprotein cholesterol, and glycated hemoglobin.

Persons With Refractory Obesity May Need to Consider Nonnutrition Weight Loss Therapy

The 1994 recommendations offer surgery and pharmacologic therapy as options for persons resistant to weight loss by traditional dietary, exercise, or behavioral strategies or by very-low-calorie diets (VLCDs). Although VLCDs do not usually result in long-term maintenance of weight loss, blood glucose and lipid levels do improve (11). VLCDs have been safely implemented and are likely the appropriate therapy for some individuals (12). Perhaps VLCDs emphasizing improved blood glucose and lipid

outcomes over weight loss would provide yet another therapeutic option for persons with diabetes and refractory obesity.

Recommended Amount and Type of Dietary Fat Will Vary According to Blood Glucose and Blood Lipid Levels

The new guidelines recommend a specific amount of saturated fat but not total dietary fat, which differs from the 30% total fat recommended previously by the American Diabetes Association (2) and currently in the US Department of Agriculture *Dietary Guidelines* (13). Depending on individual assessment, a person with diabetes may choose a diet containing less than 30% energy from fat, another person may follow a diet containing 30% of energy from fat, and another person may consume greater than 30% of energy from fat. The 1994 recommendations describe several scenarios of when the type and amount of dietary fat might vary (1).

Ratio of Carbohydrate to Fat Will Vary Among Individuals

Choosing an optimal eating plan can pose a dilemma for persons with diabetes. A low-fat diet is one strategy to reduce saturated fat intake, yet this usually results in a high carbohydrate intake. Persons with hypertriglyceridemia might be sensitive to dietary carbohydrate and want to avoid a high-carbohydrate diet in addition to decreasing saturated fat. A meal plan high in monounsaturated fat is one way to reduce saturated fat without increasing carbohydrate. An eating plan high in monounsaturated fat is quite feasible to achieve and usually includes nuts, avocado, or olive oil.

A low-fat diet is not necessarily a high-carbohydrate diet. Decreasing absolute fat intake without increasing carbohydrate or protein intake will result in a hypocaloric diet relative to the original diet without raising the amount of carbohydrate. Wing et al (10) showed no adverse lipid effects from a low-fat and low-calorie diet compared with a low-calorie diet only. For obese persons, evidence is mounting that a low-fat diet, independent of energy reduction, may be beneficial for weight loss and that a high-fat diet may contribute to obesity in ways that are independent of caloric intake (14).

Proportions of Simple and Complex Carbohydrate Will Vary Within the Total Carbohydrate Allocation

The 1994 recommendations focus on the total amount of carbohydrate rather than the type. Recommendations have been liberalized for sucrose, reexamined for fructose, and made more conservative for dietary fiber. Intuition and tradition have so instilled beliefs about the role of sucrose, fructose, and fiber in diabetes management that these tenets have been slow to change, even though 15 years of carbohydrate metabolism studies have shown no difference in glycemic effect related to molecular structure (15, 16), and clinical evidence on the glycemic benefits of fiber is limited (17).

Sucrose Sucrose consumption, as part of total carbohydrate, is not contraindicated for persons with diabetes according to scientific evidence to date (3). Sucrose has a glycemic effect similar to that of many starchy foods and the reported lipemic effects of sucrose are not consistent. The recommendation to liberalize sucrose consumption may be difficult to accept and challenging not to abuse. Nutritional quality can provide some general guidelines. Specific limits for sucrose consumption can be based on individual goals. It would be impractical to expect that people will accept a meal plan without any sweeteners on a long-term basis. However, consuming a variety of foods has more to offer nutritionally than foods with sucrose as the sole nutrient.

Clinical data

Obtain height and weight
 Determine body frame
 Determine desirable/reasonable weight
 Obtain blood pressure
 Assess laboratory data:
 ■ blood glucose and lipids
 ■ glycated hemoglobin
 Identify medication prescribed for diabetes:
 ■ insulin
 ■ oral hypoglycemic agents
 Determine daily energy needs

Dietary history

Determine usual food intake
 Assess attitudes toward nutrition and health
 Assess previous dietary education and outcomes

Nutrient intake

Assess overall nutritional adequacy
 Assess caloric intake
 Assess nutrient distribution
 Assess type of carbohydrate, protein, and fat
 Determine appropriate nutrition intervention

FIG 2. Components of nutrition assessment.

Fructose The 1994 recommendations suggest that the usual amounts of fructose in the diet, such as found in fruits and vegetables, are quite acceptable. However, fructose consumed in double the usual amounts by person with diabetes can have adverse effects on serum cholesterol (18). Although fruits and fruit products contribute approximately 22% of fructose in the American diet, high fructose corn syrup in regular soft drinks and sweets contribute nearly 40% to Americans' fructose consumption (19). Thus, persons consuming excessive amounts of regular soft drinks or sweets could be consuming double the usual amount of sucrose. The question to ask is whether the person with diabetes you are counseling is consuming large amounts of regular soft drinks and sweets.

Dietary fiber The 1994 recommendations for dietary fiber are the same for persons with or without diabetes. This recommendation is based on the premise that it is difficult to consume the amount of dietary fiber necessary to blunt the glycemic or lipemic response unless supplements are used. Average American dietary fiber consumption from foods is 8 g for women and 10 g for men (20), which is low compared with populations with a low prevalence of chronic disease. Triple these amounts of dietary fiber, particularly soluble fiber sources, are needed to show glycemic or lipid effects. Americans could double their dietary fiber intake by consuming more beans, legumes, whole grains, vegetables, and fruits. As should all Americans, persons with diabetes should be encouraged to adopt a goal to increase their dietary fiber intake. Persons with diabetes who achieve an increased dietary fiber intake should monitor their plasma glucose and lipids, then reevaluate their therapy. Adding soluble fiber supplements to the diet is worth considering before prescribing lipid-lowering medications.

A Nutritional Free-For-All?

On first glance it may seem that the 1994 fat and carbohydrate recommendations are a nutritional free-for-all. Among individuals, eating plans will vary, which should facilitate designing an eating plan the individual can attain and maintain. For the individual, consistency within an eating pattern is important. Consistency within an eating pattern results in lower glycated hemoglobins than does following a haphazard eating style (21).

1994 Recommendations for Pregnancy and for Protein Intake

The 1994 nutrition recommendations for energy intake during pregnancy and for adult protein intake are based on individual needs and, thus, differ slightly from the RDAs. The RDAs were designed as a tool for assessing nutrient intake of the American population, although they are frequently used as a yardstick for assessing individuals. The RDAs for most nutrients are set to meet

the needs of 95% of the American population, and the RDA for energy is set to meet the average population needs.

Pregnancy The technical review paper accompanying the 1994 recommendations (3) discusses using an individualized approach to medical nutrition therapy during pregnancy. The 1994 recommendations for additional energy intake follow a sliding scale based on desired weight gain, which should be monitored throughout pregnancy. Scientific support stems from the National Academy of Sciences (NAS) recommendations for pregnancy. The RDAs, in contrast, provide a fixed increment of 300 kcal/day for pregnancy (7) by dividing the approximate total energy cost of pregnancy (80,000 kcal) by the approximate number of gestational days after the first month (250 days) to yield an approximate daily addition of 300 kcal. The RDAs and the NAS recommendations draw from the same scientific data and agree scientifically. The difference is in the translation—NAS addresses individual needs and the RDAs address average healthy population needs. The intended outcome in both instances is a healthy pregnancy.

Protein The American Diabetes Association now recommends consuming 10% to 20% of energy from total protein. Suggestions that individuals with diabetes need higher or lower protein intakes than the general population were not found to be scientifically substantiated, except for the benefit of reducing protein intake to 0.8g/kg per day, which is the RDA for an adult, at onset of nephropathy. The RDA for protein is approximately 10% of energy for an adult, and an estimated 65% should be of high biological value. Meal patterns relying heavily on grains and vegetables may contribute substantial amounts of protein, however, the protein is of lower biological value. To ensure an adequate intake of protein of high biological value, total protein intake should be higher than 10% or fewer grains and vegetables should be consumed.

CHALLENGES OF ADOPTING A NEW MODEL OF CARE

Diabetes medical nutrition therapy is complex. Implementation will require changes in practice patterns and in systems providing diabetes nutrition care. Physicians and nurses can no longer depend on preprinted diet sheets, formulated meal patterns, or even computer-individualized meal plans to provide nutrition care to patients with diabetes. Even dietitians will need to rely more on their knowledge of nutrition, diabetes, behavior change, and self-management training and less on their calculators.

Although the registered dietitian is the ideal health professional to provide medical nutrition therapy for diabetes (22), studies show that many persons with diabetes are not referred to a dietitian (23, 24). Moreover, referral will not be sufficient if it does not include a coordinated team approach to diabetes manage-

ment. It is important to recognize that team care of diabetes requires interactive communication on patient goals and treatment, but does not require the health professionals to work in the same clinical setting.

Team relationships can be developed by physicians and dietitians working in the same hospital service area, provider network, or geographic region. Registered dietitians can be located nationally through The American Dietetic Association's Nutrition Network, which can be reached through the National Center for Nutrition and Dietetics Consumer Nationwide Nutrition Hot Line (800/366-1655), or locally through hospitals and clinics or listings in the yellow pages. Responsibility for establishing a team relationship does not rest solely with physicians. Dietitians can initiate a collaborative, team approach to patient care by discussing with physicians treatment goals for individual patient and the nutrition therapy planned to achieve those goals. (25).

The move away from a macronutrient definition of nutrition care for diabetes creates unique problems for institutional health care settings. Hospitals and nursing homes have used protocols based on caloric prescriptions to provide nutrition services to patients when individualized meal plans are not feasible or immediately available. Diet manuals, handbooks, and similar resources with caloric meal plans for diabetes have extended nutrition expertise to health care settings where a registered dietitian is not available. Expansion of institutional protocols to include a variety of goal specific nutrition strategies for diabetes will require time and in some situations may not be practical. A staged approach to medical nutrition therapy for diabetes would accommodate the use of precalculated meal patterns for interim care with individualized nutrition plans developed for ongoing care.

The American Diabetes Association and The American Dietetic Association have combined efforts to promote wide dissemination of the new guidelines. The recommendations are being published in the professional journals of both Associations. A jointly sponsored continuing education program for dietitians, conducted in 12 cities this spring, is available in a slide/script format for additional presentations. Publishers from both Associations are working with a steering committee of dietitians to develop a portfolio of nutrition resources to support different strategies that can be used in medical nutrition therapy.

Knowledge of new treatment guidelines is necessary but usually not sufficient to change clinical practice patterns (26). Studies show that many factors influence clinicians' decisions to adopt a new form of treatment including specialty training, use by respected peers, and the belief that the new therapy will be an improvement in the care they are providing to their patients (27). The Diabetes Control and Complications Trial has demonstrated the benefits of blood glucose control and the effectiveness of individualized nutrition therapy in achieving glycemic goals (28). The 1994 recommendations offer an opportunity to increase the effectiveness of nutrition therapy that will be attractive to dietitians, physicians, and nurses who have a special interest in diabetes care. Although adoption of the 1994 recommendations may be more rapid in some practice settings than others, all dietitians should take advantage of the new guidelines to evaluate ways to enhance their nutrition care of individuals with diabetes.

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