Diabetes Care and Education
A dietetic practice group of the American Dietetic Association

Professional Resources

DCE JADA Supplement

April 2008

Evidence-Based Nutrition Practice Guidelines for Diabetes and Scope and Standards of Practice

by Marion J. Franz, MS, RD; Jackie L. Boucher, MS, RD; Joyce Green-Pastors, MS, RD; Margaret A. Powers, PhD, RD

Back to DCE JADA Supplement Menu

Figure 1: American Dietetic Association Evidence-Based Nutrition Recommendations for Diabetes and the American Diabetes Association Recommendations on the Same Topic.

Medical Nutrition Therapy

American Dietetic Association	American Diabetes Association Recommendations
Recommendation 1. Medical nutrition therapy (MNT) provided by a registered dietitian (RD) is recommended for individuals with type 1 and type 2 diabetes. An initial series of three to four encounters each lasting from 45 to 90 minutes is recommended within 3 to 6 months of diagnosis or at first referral to an RD for MNT for diabetes. The RD should determine if additional MNT encounters are needed after the initial series based on the nutrition assessment of learning needs and progress towards desired outcomes. Studies based on a range in the number (1-5 individual sessions or a series of 6-12 group sessions) and length (45-90 minutes) report positive outcomes at 1 year and longer. Studies implementing a variety of nutrition interventions report a reduction in HbA1c levels, and some studies also report improved lipid profiles, improved weight management, adjustments in medications, and reduction in the risk for onset and progression of comorbidities. **Strong**	Individuals who have prediabetes or diabetes should receive individualized MNT; such therapy is best provided by a registered dietitian familiar with components of diabetes MNT. (B) Nutrition counseling should be sensitive to the personal needs, willingness to change, and ability to make changes of the individual with prediabetes or diabetes. (E)
Recommendation 2. At least one annual encounter is recommended to reinforce lifestyle changes and to evaluate and monitor outcomes that impact the need for changes in MNT or medication. Studies involving regular lifestyle intervention sessions (up to one per month) report sustained positive outcomes at one year and longer. **Strong**	
Recommendation 3.	

The RD should assess usual food intake (focusing on carbohydrate), medication, metabolic control (glycemia, lipids, blood pressure) and physical activity to serve as the basis for the nutrition prescription, goals and intervention. Research does not support any ideal percentages of macronutrients. Nutrition guidelines (eg, Dietary Reference Intakes [DRI]) that apply to the general public also apply to persons with diabetes. **Fair**

Recommendation 4.
The RD should monitor and evaluate food intake, medication(s), glycemic control, and physical activity. Self-monitoring of blood glucose is primary in evaluating the achievement of goals and effectiveness of MNT. **Fair**

Carbohydrate

American Dietetic Association	American Diabetes Association Recommendations
Recommendation 1. In persons on MNT alone, glucose-lowering medications or fixed insulin doses, meal and snack carbohydrate intake should be kept consistent on a day-to-day basis. Consistency in carbohydrate intake results in improved glycemic control. **Strong** **Recommendation 2.** In persons with type 1 or type 2 diabetes who adjust their premeal insulin doses or on insulin pump therapy, insulin doses should be adjusted to match carbohydrate intake. This can be accomplished by comprehensive nutrition education on results interpretation, counseling on strategies for self-monitoring, nutritionrelated medication management and collaboration with the healthcare team. Adjusting insulin dose based on planned carbohydrate intake improves glycemic control and quality of life without any adverse effects.**Strong** **Recommendation 3.** If persons with diabetes choose to eat foods containing sucrose, the sucrose-containing foods should be substituted for other carbohydrate foods. Sucrose intakes of 10% to 35% of total energy intake do not have a negative effect on glycemic or lipid responses when substituted for isocaloric amounts of starch. **Strong** **Recommendation 4.** If use of glycemic index (GI) is proposed as a method of meal planning, advise on the conflicting evidence of effectiveness of this strategy. Studies comparing high versus low GI diets report mixed effects on HbA1c. **Weak**	Monitoring carbohydrate, whether by carbohydrate counting, exchanges, or experience-based estimation remains a key strategy in achieving glycemic control. (A) A dietary pattern that includes carbohydrate from fruits, vegetables, whole grains, legumes, and low-fat milk is encouraged for good health. (B) Sucrose-containing foods can be substituted for other carbohydrates in the meal plan or, if added to the meal plan, covered with insulin or other glucose-lowering medications. Care should be taken to avoid excess energy intake. (A) The use of the glycemic index (GI) and load may provide a modest additional benefit over that observed when total carbohydrate is considered alone. (B) As for the general population, people with diabetes are encouraged to consume a variety of fiber-containing foods. However, evidence is lacking to recommend a higher fiber intake for people with diabetes than for the population as a whole. (B) Sugar alcohols and nonnutritive sweeteners are safe when consumed within the daily intake levels established by the Food and Drug Administration. (A) (see Wheeler and colleagues [39] for additional information regarding carbohydrate

Recommendation 5.
Recommendations for fiber intake for people with diabetes are similar to the recommendations for the general public (DRI: 14 g/1,000 kcal). While diets containing 44 to 50 g fiber daily are reported to improve glycemia; more usual fiber intakes (up to 24 g daily) have not shown beneficial effects on glycemia. It is unknown if freeliving individuals can daily consume the amount of fiber needed to improve glycemia. **Fair**

Recommendation 6.
If persons with diabetes choose to use nonnutritive sweeteners approved by the Food and Drug Administration, at levels that do no exceed the Accepted Daily Intake, they can be safely consumed. However, products containing nonnutritive sweeteners may contain energy and carbohydrate that needs to be accounted for. Research on nonnutritive sweeteners report no effect on changes in glycemic responses. **Fair**

Protein

American Dietetic Association	American Diabetes Association Recommendations
Recommendation 1. In persons with type 1 or type 2 diabetes with normal renal function, usual protein intake of approximately 15% to 20% of daily energy intake does not need to be changed. Although protein has an acute effect on insulin secretion, usual protein intake in long-term studies has minimal effects on glucose, lipids, and insulin concentrations. **Fair**	For individuals with diabetes and normal renal function, there is insufficient evidence to suggest that usual protein intake (15-20% of energy) should be modified. (E) In individuals with type 2 diabetes, ingested protein can increase insulin response without increasing plasma glucose concentrations. Therefore, protein should not be used to treat acute or prevent nighttime hypoglycemia. (A) Reduction of protein intake to 0.8 to 1.0 g/kg/day in individuals with diabetes and the earlier stages of CKD and to 0.8 g/kg/day in the later stages of CKD may improve measures of renal function (urine albumin excretion rate, glomerular filtration rate) and is recommended. (B)
Recommendation 2. In persons with diabetic nephropathy, a protein intake of 1.0 g or less/kg/day is recommended. In persons with diabetes, diets with protein <1.0 g/kg/day have been shown to improve albuminuria; however, they have not been shown to have substantial effects on glomerular filtration rates (GFR). **Fair**	
Recommendation 3. For persons with later stage diabetic nephropathy (chronic kidney disease [CKD], stages 3-5), hypoalbuminemia (an indicator of malnutrition), and energy intake must be monitored and changes in	

protein and energy intake made to correct deficits. A protein intake of approximately 0.7 g/kg/day has been associated with hypoalbuminemia, whereas a protein intake of approximately 0.9 g/kg/ day has not. **Fair**	

Weight Management

American Dietetic Association	American Diabetes Association Recommendations
Recommendation 1. If weight loss is a goal for persons with type 2 diabetes who are overweight or obese, the RD should advise that glycemic control is the primary focus. While decreasing energy intake may improve glycemic control, it is unclear whether weight loss alone will improve glycemic control. Sustained weight loss interventions lasting one year or longer report inconsistent effects on HbA1c. The addition of weight loss medications to lifestyle interventions modestly improves weight management outcomes. **Fair** **(For more specific recommendations on weight management, see the ADA Adult Weight Management Evidence-Based Nutrition Guidelines [40].)**	In overweight and obese insulin-resistant individuals, modest weight loss has been shown to improve insulin resistance. Thus, weight loss is recommended for all such individuals who have or are at risk for diabetes. (A) Structured programs that emphasize lifestyle changes, including education, reduced energy and fat (30% of total energy) intake, regular physical activity, and regular participant contact, can produce long-term weight loss on the order of 5-7% of starting weight. Thus, lifestyle change should be the primary approach to weight loss. (A) Low-carbohydrate diets (restricting total carbohydrate to <130 g/day) are not recommended in the treatment of overweight/obesity. The longterm effects of these diets are unknown and although such diets produce short-term weight loss, maintenance of weight loss is similar to that from low-fat diets and impact on cardiovascular disease (CVD) risk profile is uncertain. (B) Weight-loss medications may be considered in the treatment of overweight and obese individuals with type 2 diabetes and can help achieve a 5-10% weight loss when combined with lifestyle modification. (B) Bariatric surgery may be considered for some individuals with type 2 diabetes and BMI ≥35 and can result in marked improvements in glycemia. The long-term benefits and risks of bariatric surgery in individuals with diabetes continue to be studied. (B) **(see Apovian and Cummings [41] for additional information on obesity surgery and medications)**

Physical Activity

American Dietetic Association	American Diabetes Association Recommendations
Recommendation 1. In persons with type 2 diabetes, 90 to 150 minutes of accumulated moderate-intensity physical activity per week and/or resistance/strength training distributed over at least three days per week and with no more	To improve glycemic control, assist with weight maintenance, and reduce risk of CVD, at least 150 min/week of moderate-intensity aerobic physical activity (50-70% of maximum heart rate) and/or at least 90 min/week of vigorous aerobic exercise (70% of

than two consecutive days without physical activity is recommended. Both aerobic and resistance training improve glycemic control, independent of weight loss. Physical activity also improves insulin sensitivity and decreases risk for cardiovascular disease and all-cause mortality. **Strong** **Recommendation 2.** Although exercise is not reported to improve glycemic control in persons with type 1 diabetes, individuals are encouraged to engage in regular physical activity to receive the same benefits from exercise as the general public—decreased risk for cardiovascular disease and improved sense of well-being. **Fair** **Recommendation 3.** The RD should instruct individuals on insulin or insulin secretagogues on the safety guidelines to prevent hypoglycemia frequent blood glucose monitoring and possible adjustment in insulin dose or carbohydrate intake). **Fair**	maximum heart rate) is recommended. The physical activity should be distributed over at least 3 day/week and with no more than 2 consecutive days without physical activity. (A) In the absence of contraindications, people with type 2 diabetes should be encouraged to perform resistance exercise 3 times a week, targeting all major muscle groups, progressing to three sets of 8-10 repetitions at a weight that cannot be lifted more than 8-10 times. (A)

Self-Monitoring of Glucose

American Dietetic Association	American Diabetes Association Recommendations
Recommendation 1. For individuals on nutrition therapy alone or nutrition therapy in combination with glucose-lowering medications, self-monitoring of blood glucose (SMBG) is recommended. Frequency and timing is dependent on diabetes management goals and therapies (i.e., MNT, diabetes medications and physical activity). When SMBG is incorporated into diabetes education programs and the information from SMBG is used to make changes in diabetes management, SMBG is associated with improved glycemic control. **Fair** **Recommendation 2.** R2. For persons with type 1 or type 2 diabetes on insulin therapy, at least three to eight blood glucose tests per day are recommended to determine the accuracy of the insulin dose(s) and to guide adjustments in insulin dose(s), food intake and physical activity. Some insulin regimens require more testing to establish the best integrated therapy (insulin, food, and activity). Once established, some insulin regimens will require less frequent SMBG. Intervention studies that include selfmanagement training and adjustment of insulin doses based on SMBG result in improved glycemic control. **Strong** **Recommendation 3.** Persons experiencing unexplained elevations in HbA1c or unexplained hypo- and hyperglycemia may benefit from the use of continuous glucose monitoring (CGM)	Clinical trials using insulin that have demonstrated the value of tight glycemic control have used SMBG as an integral part of the management strategy. (A) SMBG should be carried out 3 or more times daily for patients using multiple insulin injections. (A) For patients using less frequent insulin injections or oral agents or MNT alone, SMBG is useful in achieving glycemic goals. (E) To achieve postprandial glucose target, postprandial SMBG may be appropriate. (E) Instruct the patient in SMBG and routinely evaluate the patient's technique and ability to use data to adjust therapy. (E)

or more frequent SMBG may be warranted. It is essential that persons with diabetes receive education as to how to calibrate CGM and how to interpret CGM results. Studies have proven the accuracy of CGM and most show that that using the trend/pattern data from CGM can result in less glucose variability and improved glucose control. **Fair**	

Prevention and Treatment of CVD	
American Dietetic Association	**American Diabetes Association Recommendations**
Recommendation 1. After focusing on achieving glycemic control, cardioprotective nutrition interventions for the prevention and treatment of CVD should be implemented in the initial series of encounters. Diabetes is associated with an increased risk for CVD and improved glycemic control and nutrition interventions may improve the lipid profile. **Strong** **Recommendation 2.** Cardioprotective nutrition interventions for the prevention and treatment of CVD include reduction in saturated and trans fats and dietary cholesterol, and interventions to improve blood pressure. Studies in persons with diabetes utilizing these interventions report a reduction in cardiovascular risk and improved cardiovascular outcomes. **Strong**	Limit saturated fat to <7% of total calories. (A) Intake of trans fat should be minimized. (E) In individuals with diabetes, limit dietary cholesterol to <200 mg/day.(E) Two or more servings of fish per week (with the exception of commercially fried fish filets) provide n-3 polyunsaturated fatty acids and are recommended. (B) Target HbA1c is as close to normal as possible without substantial hypoglycemia. (B) For patients at risk for CVD, diets high in fruits, vegetables, whole grains, and nuts may reduce the risk. (C) For patients with diabetes and symptomatic heart failure, dietary sodium intake of <2,000 mg/day may reduce symptoms. (C) In normotensive and hypertensive individuals, a reduced sodium intake (eg, 2,300 mg/day) with a diet high in fruits, vegetables, and low-fat dairy products lowers blood pressure. (A) In most individuals, a modest amount of weight loss beneficially affects blood pressure. (C)

Figure 1. American Dietetic Association evidence-based nutrition recommendations for diabetes and the American Diabetes Association recommendations on the same topic.

American Dietetic Association Statement Rating:

- Strong=the benefits of the recommended approach clearly exceed the harms (or the harms clearly exceed the benefits, and the quality of the supporting evidence is grade I or II;
- Fair=the benefits exceed the harms (or the harms clearly exceed the benefits) but the quality of the evidence is grade II or III;

- Weak=the quality of the evidence is suspect or that well-done studies (grade I, II, or III) show little clear advantage of one approach versus another:
- Consensus=Expert opinion (grade IV) supports the recommendation;
- Insufficient Evidence=there is both a lack of pertinent evidence (grade V) and/or an unclear balance between benefits and harms.

American Diabetes Association Statement Rating:

- A)=clear evidence from well-conducted, generalizable, randomized controlled trials that are adequately powered;
- (B)=supportive evidence from well-conducted cohort studies;
- (C)=supportive evidence from poorly controlled or uncontrolled studies.
- (E)=evidence is not available, expert opinion recommendations are based on expert consensus or clinical experience.

Source: American Dietetic Association. Evidence Analysis Library, http://www.adaevidencelibrary.com. (32); American Diabetes Association. Nutrition recommendations and interventions for diabetes (12) and Standards of medical care in diabetes—2007 (38).

Home • About DCE • News • Members • Mentoring • Professional Educational • Publications • Jobs • Recipe • Links • Contact