

# New Diabetes Nutrition Therapy Recommendations: What You Need to Know

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The American Diabetes Association (ADA) has long recognized the integral role of nutrition therapy in overall diabetes management and recommends that each person with diabetes receive an individualized eating plan that has been developed in collaboration with his or her health care provider (HCP).<sup>1</sup> To ensure that members of the health care team are providing up-to-date, evidence-based clinical practice recommendations, the ADA issues official position statements on scientific or medical issues related to diabetes. Recently, the ADA published a position statement titled “Nutrition Therapy Recommendations for the Management of Adults With Diabetes.”<sup>2</sup> These recommendations replace those in previous position statements. This article reviews the development process for the 2013 nutrition recommendations, shares highlights from those guidelines, and discusses priority topics in the publication.

## Trustworthy Clinical Practice Guidelines/Position Statements

The 2013 ADA nutrition statement was written at the request of the ADA Professional Practice Committee. In August 2012, the ADA convened a committee of nutrition experts in clinical practice and research, as well as other members of the diabetes health care team (a registered nurse/advanced practice nurse practitioner, a physician, and a pharmacist) to review the scientific literature and develop recommendations. The multidisciplinary committee followed the Institute of Medicine

(IOM) Standards for Trustworthy Clinical Practice Guidelines.<sup>3</sup> Based on the IOM standards, conflict of interest disclosures were obtained before confirmation of appointment of the co-chairs and the members of the committee/writing group. Development of the position statement was funded from ADA general revenues and not with any corporate or industry financial support.

## Evidence-Based Diabetes Nutrition Therapy: Development of the Recommendations

The committee’s work on the position statement began with an introductory conference call. The group reviewed an outline for the statement and assigned sections to specific members. Committee members were instructed to conduct thorough literature searches and create evidence tables for all of the topics included in the statement. Inclusion criteria for research studies providing evidence included:

- Adult subjects with a diagnosis of diabetes in an ambulatory or outpatient setting
- Published in English
- ≥ 10 participants
- Retention rates > 80%

Study design preference in ascending order included:

- Systematic review
- Randomized, controlled trial
- Clinical controlled study
- Prospective observational study
- Cross-sectional observational study
- Case-control study

**Table 1. Evidence Levels**

Evidence Level	Description
A	<ul style="list-style-type: none"> <li>• Clear evidence from well-conducted, generalizable, randomized, controlled trials that are adequately powered, including:                             <ul style="list-style-type: none"> <li>○ Supportive evidence from well-conducted, randomized, controlled trials that are adequately powered</li> </ul> </li> </ul>
B	<ul style="list-style-type: none"> <li>• Supportive evidence from well-conducted cohort studies, including:                             <ul style="list-style-type: none"> <li>○ Supportive evidence from a well-conducted case-control studies</li> </ul> </li> </ul>
C	<ul style="list-style-type: none"> <li>• Supportive evidence from poorly controlled or uncontrolled studies, including:                             <ul style="list-style-type: none"> <li>○ Evidence from randomized, clinical trials with ≥ 1 major or ≥ 3 minor methodological flaws that could invalidate the results</li> </ul> </li> </ul>
E	<ul style="list-style-type: none"> <li>• Expert consensus or expert opinion</li> </ul>

Meal studies were excluded. Other exclusion criteria included research in individuals with:

- Prediabetes/metabolic syndrome
- Gestational diabetes/pregnancy
- Poor health status/diabetes complications or critical illness

The ADA’s “Macronutrients, Food Groups, and Eating Patterns in the Management of Diabetes: A Systematic Review of the Literature,”<sup>24</sup> published in 2012, served as a foundation for development of the new position statement. However, three crucial components of diabetes nutrition therapy were not addressed in this systematic review: effectiveness of diabetes nutrition therapy, energy balance, and healthful eating patterns in people with diabetes. For these three topics and others not included in the 2012 systematic review, PubMed data searches were conducted for articles published from January 2001 through April 2013. A table listing the supporting research for each recommendation is available online at <http://professional.diabetes.org/nutrition>.

A grading system developed by the ADA and modeled on existing methods was used to clarify and codify the evidence that forms the basis for the recommendations.<sup>1</sup> Depending on the quality of evidence, recommendations were assigned ratings of A, B, C, or expert

opinion or expert consensus (E) based on no evidence from clinical trials (Table 1).<sup>1</sup> All of the 2013 recommendations and their corresponding evidence grades can be found in Table 2.

The recommendation development process continued with a face-to-face meeting of the entire committee, one subgroup writing meeting, numerous teleconferences, and multiple revisions via e-mail communications. The document received a comprehensive external review by leading diabetes nutrition clinicians and researchers in the United States. The statement was then reviewed and approved by the ADA Professional Practice Committee before being submitted to the ADA Executive Committee for final approval.

**Definitions: Diabetes Medical Nutrition Therapy Versus Diabetes Nutrition Therapy**

A notable difference between this statement and previous ones is the use of the term “nutrition therapy” instead of “medical nutrition therapy” (MNT). MNT is an evidence-based application of the nutrition care process provided by a registered dietitian/nutritionist (RD/N) and is the legal definition of nutrition counseling by an RD/N in the United States,<sup>5</sup> whereas the IOM defines nutrition therapy as the treatment of a disease or condition

through the modification of nutrient or whole-food intake. Therefore, nutrition therapy has a broader definition than MNT.<sup>6</sup>

Nutrition therapy research included in the 2013 position statement was conducted around the world by a wide variety of nutrition professionals, as well as physicians and registered advanced-practice nurses. HCPs administering nutrition interventions in studies conducted outside the United States did not provide MNT as it is legally defined.<sup>2</sup> Thus, the term “nutrition therapy” was adopted in an effort to be more inclusive of the range of health professionals providing nutrition interventions and to recognize the broader definition of nutrition therapy. However, the unique academic preparation, training, skills, and expertise of RD/Ns make them the preferred members of the health care team to provide diabetes MNT.<sup>1</sup> Table 3 summarizes the Academy of Nutrition and Dietetics Evidence-Based Nutrition Practice Guidelines—recommended structure for the implementation of MNT for adults with diabetes.<sup>7</sup>

**Diabetes Nutrition Therapy Is Effective**

Review of the research conducted during the past decade reveals that diabetes nutrition therapy continues to be an effective management strategy for improving glycemic control and other metabolic parameters such as cholesterol and blood pressure levels. Effective nutrition therapy interventions can be provided either in one-on-one sessions with an RD/N or in group diabetes education classes.<sup>7-15</sup>

Research demonstrates that diabetes nutrition therapy can lower A1C levels by 0.3–1% in people with type 1 diabetes,<sup>11,16-18</sup> and people with type 2 diabetes can achieve A1C reductions of 0.5–2%.<sup>9,10,19-32</sup> Implementation of nutrition therapy in people newly diagnosed with type 2 diabetes who had an A1C of ~ 9% resulted in a decrease of ~ 2%,<sup>33</sup> whereas newly diagnosed people who had an A1C level of ~ 6.6% experienced a decrease of 0.4%.<sup>8</sup> In both instances, reductions were significant and clinically meaningful.<sup>34</sup>

Even in people with uncontrolled type 2 diabetes of ~ 9 years' duration, implementation of nutrition therapy significantly decreased A1C by ~ 0.5%, which was more cost-effective than adding a third medication.<sup>9</sup>

Because of the relationship between body weight (i.e., adiposity) and insulin resistance, weight loss has been recommended as a strategy for obese and overweight people

with type 2 diabetes.<sup>1</sup> Prevention of weight gain is also important.<sup>2</sup> Modest weight loss has been shown to improve glucose<sup>35,36</sup> and blood pressure,<sup>35-40</sup> increase HDL cholesterol,<sup>35-37,39-41</sup> and decrease triglyceride levels,<sup>35,36,39-42</sup> especially in those with newly diagnosed type 2 diabetes.

Effective nutrition therapy strategies for people with type 2 diabetes should emphasize reduced

energy intake along with simplified meal plans such as healthful food choices or education on portion control. To achieve modest weight loss, intensive lifestyle interventions (physical activity, counseling about nutrition, and behavior change) with ongoing support are recommended. Unfortunately, because of the progressive nature of type 2 diabetes, physical activity and nutrition therapy may not be effec-

**Table 2. Nutrition Therapy Recommendations**

Topic	Recommendation	Evidence Rating
Effectiveness of nutrition therapy	Nutrition therapy is recommended for all people with type 1 and type 2 diabetes as an effective component of the overall treatment plan.	A
	Individuals who have diabetes should receive individualized medical nutrition therapy (MNT) as needed to achieve treatment goals, preferably provided by a registered dietitian familiar with the components of diabetes MNT.	A
	<ul style="list-style-type: none"> <li>• For individuals with type 1 diabetes, participation in an intensive flexible insulin therapy education program using the carbohydrate-counting meal-planning approach can result in improved glycemic control.</li> </ul>	A
	<ul style="list-style-type: none"> <li>• For individuals using fixed daily insulin doses, consistent carbohydrate intake with respect to time and amount can result in improved glycemic control and reduce the risk for hypoglycemia.</li> </ul>	B
	<ul style="list-style-type: none"> <li>• A simple diabetes meal-planning approach such as portion control or healthful food choices may be better suited to individuals with type 2 diabetes identified with health literacy and numeracy concerns. This may also be an effective meal-planning strategy for older adults.</li> </ul>	C
	People with diabetes should receive diabetes self-management education according to national standards and diabetes self-management support when their diabetes is diagnosed and as needed thereafter.	B
	Because diabetes nutrition therapy can result in cost savings (B) and improved outcomes such as reduction in A1C (A), nutrition therapy should be adequately reimbursed by insurance and other payers (E).	B, A, E
Energy balance	For overweight or obese adults with type 2 diabetes, reducing energy intake while maintaining a healthful eating pattern is recommended to promote weight loss.	A
	Modest weight loss may provide clinical benefits (improved glycemia, blood pressure, and/or lipids) in some individuals with diabetes, especially those early in the disease process. To achieve modest weight loss, intensive lifestyle interventions (counseling about nutrition therapy, physical activity, and behavior change) with ongoing support are recommended.	A
Optimal mix of macronutrients	Evidence suggests that there is not an ideal percentage of calories from carbohydrate, protein, and fat for all people with diabetes (B); therefore, macronutrient distribution should be based on individualized assessment of current eating patterns, preferences, and metabolic goals (E).	B, E
Eating patterns	A variety of eating patterns (combinations of different foods or food groups) are acceptable for the management of diabetes. Personal preference (e.g., tradition, culture, religion, health beliefs and goals, and economics) and metabolic goals should be considered when recommending one eating pattern over another.	E

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**Table 2. Nutrition Therapy Recommendations, *continued from p. 123***

Topic	Recommendation	Evidence Rating
Carbohydrates	Evidence is inconclusive for an ideal amount of carbohydrate intake for people with diabetes. Therefore, collaborative goals should be developed with individuals with diabetes.	C
	The amount of carbohydrate and available insulin may be the most important factor influencing glycemic response after eating and should be considered when developing the eating plan.	A
	Monitoring carbohydrate intake, whether by carbohydrate counting or experience-based estimation, remains a key strategy in achieving glycemic control.	B
	For good health, carbohydrate intake from vegetables, fruits, whole grains, legumes, and dairy products should be advised over intake from other carbohydrate sources, especially those that contain added fats, sugars, or sodium.	B
Glycemic index (GI) and glycemic load (GL)	Substituting low GL foods for higher GL foods may modestly improve glycemic control.	C
Dietary fiber and whole grains	People with diabetes should consume at least the amount of fiber and whole grains recommended for the general public.	C
Substitution of sucrose for starch	Although substituting sucrose-containing foods for isocaloric amounts of other carbohydrate may have similar blood glucose effects, consumption should be minimized to avoid displacing nutrient-dense food choices.	A
Fructose	Fructose consumed as “free fructose” (i.e., naturally occurring in foods such as fruit) may result in better glycemic control compared to isocaloric intake of sucrose or starch (B), and free fructose is not likely to have detrimental effects on triglycerides as long as intake is not excessive (> 12% of energy) (C).	B, C
	People with diabetes should limit or avoid intake of sugar-sweetened beverages (from any caloric sweetener including high fructose corn syrup and sucrose) to reduce the risk for weight gain and worsening of cardiometabolic risk profile.	B
Non-nutritive sweeteners (NNSs) and hypocaloric sweeteners	Use of NNSs has the potential to reduce overall calorie and carbohydrate intake if substituted for caloric sweeteners without compensation by intake of additional calories from other food sources.	B
Protein	For people with diabetes and no evidence of diabetic kidney disease, evidence is inconclusive to recommend an ideal amount of protein intake for optimizing glycemic control or improving one or more cardiovascular disease risk measure; therefore, goals should be individualized.	C
	For people with diabetes and diabetic kidney disease (either micro- or macroalbuminuria), reducing the amount of dietary protein below usual intake is not recommended because it does not alter glycemic measures, cardiovascular risk measures, or the course of glomerular filtration rate decline.	A
	In individuals with type 2 diabetes, ingested protein appears to increase insulin response without increasing plasma glucose concentrations. Therefore, carbohydrate sources high in protein should not be used to treat or prevent hypoglycemia.	B

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**Table 2. Nutrition Therapy Recommendations, continued from p. 124**

Topic	Recommendation	Evidence Rating
Total fat	Evidence is inconclusive for an ideal amount of total fat intake for people with diabetes; therefore, goals should be individualized (C). Fat quality appears to be far more important than quantity (B).	C, B
Monounsaturated fatty acids/polyunsaturated fatty acids	In people with type 2 diabetes, a Mediterranean-style eating pattern rich in monounsaturated fatty acids may benefit glycemic control and cardiovascular risk factors and can therefore be recommended as an effective alternative to a lower-fat, higher-carbohydrate eating pattern.	B
Omega-3 fatty acids	Evidence does not support recommending omega-3 (EPA and DHA) supplements for people with diabetes for the prevention or treatment of cardiovascular events.	A
	As recommended for the general public, an increase in foods containing long-chain omega-3 fatty acids (EPA and DHA) (from fatty fish) and omega-3 linolenic acid is recommended for individuals with diabetes because of their beneficial effects on lipoproteins, prevention of heart disease, and associations with positive health outcomes in observational studies.	B
	The recommendation for the general public to eat fish (particularly fatty fish) at least two times (two servings) per week is also appropriate for people with diabetes.	B
Saturated fat, dietary cholesterol, and <i>trans</i> fat	The amount of dietary saturated fat, cholesterol, and <i>trans</i> fat recommended for people with diabetes is the same as that recommended for the general population.	C
Plant stanols and sterols	Individuals with diabetes and dyslipidemia may be able to modestly reduce total and LDL cholesterol by consuming 1.6–3 g/day of plant stanols or sterols typically found in enriched foods.	C
Micronutrients and herbal supplements	There is no clear evidence of benefit from vitamin or mineral supplementation in people with diabetes who do not have underlying deficiencies.	C
	<ul style="list-style-type: none"> <li>• Routine supplementation with antioxidants such as vitamins E and C and carotene is not advised because of a lack of evidence of efficacy and concern related to long-term safety.</li> </ul>	A
	<ul style="list-style-type: none"> <li>• There is insufficient evidence to support the routine use of micronutrients such as chromium, magnesium, and vitamin D to improve glycemic control in people with diabetes.</li> </ul>	C
	<ul style="list-style-type: none"> <li>• There is insufficient evidence to support the use of cinnamon or other herbs/supplements for the treatment of diabetes.</li> </ul>	C
	It is recommended that individualized meal planning include optimization of food choices to meet recommended dietary allowance/dietary reference intake for all micronutrients.	E
Alcohol	If adults with diabetes choose to drink alcohol, they should be advised to do so in moderation ( $\leq 1$ drink/day for adult women and $\leq 2$ drinks/day for adult men).	E
	Alcohol consumption may place people with diabetes at increased risk for delayed hypoglycemia, especially if they are taking insulin or insulin secretagogues. Education and awareness regarding the recognition and management of delayed hypoglycemia is warranted.	C
Sodium	The recommendation for the general population to reduce sodium to $< 2,300$ mg/day is also appropriate for people with diabetes.	B
	For individuals with both diabetes and hypertension, further reduction in sodium intake should be individualized.	B

**Table 3. Academy of Nutrition and Dietetics Evidence-Based Nutrition Practice Guidelines<sup>7</sup>**

The Academy of Nutrition and Dietetics Evidence-Based Nutrition Practice Guidelines recommend the following structure for the implementation of MNT for adults with diabetes:

- MNT should be provided in a series of three to four encounters with an RD lasting from 45 to 90 minutes each.
- The RD should determine whether additional MNT encounters are needed.
- The series of encounters should begin at diagnosis of diabetes or at first referral to an RD for MNT for diabetes and should be completed within 3–6 months.
- At least one follow-up encounter is recommended annually to reinforce lifestyle changes and to evaluate and monitor outcomes that indicate the need for changes in MNT or medication(s); an RD should determine whether additional MNT encounters are needed.

tive in maintaining desirable blood glucose control; over time, many individuals will need to add diabetes medications to their treatment plan. However, after diabetes medication is started, nutrition therapy continues to be a key part of type 2 diabetes self-management.

Adjusting mealtime insulin doses based on carbohydrate intake by using the carbohydrate-counting meal-planning approach has been shown to improve glycemia for people with type 1 diabetes<sup>16,17,43–45</sup> without increased risk of hypoglycemia.<sup>11</sup> For individuals using fixed daily insulin doses, consistent carbohydrate intake with respect to time and amount can result in improved glycemic control.<sup>46,47</sup>

### Highlights of the 2013 Nutrition Recommendations

Although HCPs frequently recommend an “ADA diet” as a diabetes nutrition intervention strategy, research continues to show that there is no single ideal diabetes eating plan. Research is also inconclusive regarding an ideal macronutrient distribution that is expected to benefit all individuals with diabetes.<sup>4</sup> Therefore, the ADA does not endorse or advocate a specific diet or macronutrient distribution. The position statement writing group decided to use the term “eating plan” rather than “diet,” which historically has been negatively associated with restriction.

Because people eat food and not single nutrients such as carbohydrates, protein, and fat, the position statement includes a new section on eating patterns. Eating patterns can be defined as combinations of different foods or food groups. Many different types of eating patterns can be effective for

achieving personal health goals for people with diabetes. Examples of eating patterns that have been studied in people with diabetes include Mediterranean-style,<sup>4,7,34,48,49</sup> vegetarian or vegan,<sup>26,50–54</sup> low-carbohydrate,<sup>46,55–61</sup> low-fat,<sup>36,38–40,62–64</sup> and the American Heart Association’s Dietary Approaches to Stop Hypertension.<sup>65,66</sup> Dietary patterns are influenced by perceptions of the healthfulness of certain foods, as well as by individuals’ preferences, access to food and resources (e.g., budget/income), knowledge, health beliefs, religion, and culture.<sup>67</sup> Therefore, these factors should be considered when individualizing eating pattern recommendations.<sup>2</sup> Patients’ freedom to select from a variety of patterns given their individualized metabolic goals (i.e., for blood glucose, lipid, and blood pressure levels) and personal preferences should be supported by the health care team. When recommending particular eating patterns for an individual patient, the patient’s total energy intake (and thus portion sizes) is an important consideration as well.<sup>2</sup>

For the first time in an ADA nutrition position statement, the 2013 statement devotes a section to total fat intake. Research to date has provided inconclusive evidence to support a specific recommendation for total fat intake for people with diabetes.<sup>68</sup> However, the quality of the fat, rather than the quantity, appears to be a key component of a healthful eating plan.<sup>48,69,70</sup> The document advises that foods containing unsaturated fat (liquid oils) be substituted for those higher in saturated or *trans* fat and that leaner protein sources and meat alternatives should be preferred.<sup>69</sup>

With regard to carbohydrates, the recommendations advise that people with diabetes should choose nutrient-dense, high-fiber foods, as opposed to processed foods with added fat, sugars, and sodium.<sup>71,72</sup>

Also new, the 2013 guidelines specifically call for the avoidance of sugar-sweetened beverages (SSBs; sweetened with any caloric sweetener including sucrose and high fructose corn syrup) to reduce the risk for weight gain and worsening of cardiometabolic risk profile.<sup>2</sup> SSBs include soft drinks, fruit drinks, iced tea, energy drinks, and vitamin water containing sucrose, high-fructose corn syrup, or fruit juice concentrates. The evidence for this recommendation is abundant from studies in individuals without diabetes; there is little reason to suspect that the diabetic state would mitigate the adverse effects of SSBs.<sup>73–77</sup> The ADA nutrition recommendations also advise that the use of non-nutritive sweeteners has the potential to reduce overall calorie and carbohydrate intake if substituted for caloric sweeteners without compensation by intake of additional calories from other food sources.<sup>78</sup>

In another change from the 2008 ADA nutrition recommendations, the limit for sodium is given as 2,300 mg/day—the same as for the general population.<sup>79–81</sup> Alternate individualized sodium targets are recommended for patients with both diabetes and hypertension.<sup>65,82</sup> Previously, the recommendation had been < 2,000 mg/day for all diabetes patients.

Regarding the use of vitamin and mineral supplements and herbal products, the literature review revealed a predominance of short-term, small, human studies (i.e.,

limited number of study participants) or animal studies. These studies are often poorly designed, making it difficult to prove efficacy based on their findings. Unfortunately, results from such studies are frequently extrapolated to clinical practice.<sup>83</sup> Based on its review of existing literature, the committee concluded that the benefit of pharmacological doses of supplements is unknown.<sup>84,85</sup> Similarly, evidence does not support recommending omega-3 supplements for people with diabetes as a way of preventing or treating cardiovascular disease.<sup>4</sup>

### Practical Application of the New Recommendations

In an effort to help translate the position statement's recommendations into clinical practice, the writing group included for the first time in the 2013 statement a table titled "Summary of Priority Topics." This table provides evidence-based nutrition management talking points that can be used by all members of the health care team. Topics include nutrition strategies for all people with diabetes and coordination of food with different classes of diabetes medications, including fixed-dose or basal-bolus insulin regimens, insulin secretagogues, incretin mimetics, and others.

The new position statement does not include sample meal plans because research conducted during the past decade has provided evidence that individualization is a key element of effective eating plans for people with diabetes.

### Summary

A variety of eating patterns and meal-planning approaches can be effective for achieving individual metabolic goals for adults with diabetes. To eat well, it is best to eat nutrient-dense foods (i.e., fiber-rich foods that offer high levels of nutrients in appropriate portion sizes). Nutrition therapy goals should be developed collaboratively with individual diabetes patients. These goals should be based on assessment of individual patients' current eating patterns, personal and cultural preferences, access to healthful food choices, and willingness and abil-

ity to make changes in food and beverage choices, as well as their metabolic goals. Ideally, an eating plan should be developed early in the course of the disease in collaboration with an RD/N or through participation in a diabetes self-management group education class. Ongoing follow-up with a diabetes HCP is crucial for success; diabetes is a disease that is largely self-managed by patients who require professional support. Recommendations also may need to be adjusted over time based on changes in patients' life circumstances, preferences, and disease course.

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### References

- <sup>1</sup>American Diabetes Association: Standards of medical care in diabetes—2014. *Diabetes Care* 37 (Suppl. 1):S14–S80, 2014
- <sup>2</sup>Evert AB, Boucher JL, Cypress M, Dunbar S, Franz MJ, Mayer-Davis EJ, Neumiller JJ, Nwankwo R, Verdi CL, Urbanski P, Yancy WS: Nutrition therapy recommendations for the management of adults with diabetes. *Diabetes Care* 36:3821–3842, 2013
- <sup>3</sup>Institute of Medicine: *Standards for Developing Trustworthy Clinical Practice Guidelines*. Washington D.C., National Academies Press, 2011
- <sup>4</sup>Wheeler ML, Dunbar SA, Jaacks LM, Karmally W, Mayer-Daves EJ, Wylie-Rosett J, Yancy WJ: Macronutrients, food groups, and eating patterns in the management of diabetes: a systematic review of the literature. *Diabetes Care* 35:434–334, 2012
- <sup>5</sup>Lacey K, Pritchett E: Nutrition care process and model: ADA adopts road map to quality care and outcomes management. *J Am Diet Assoc* 103:1061–1072, 2003
- <sup>6</sup>Institute of Medicine: *The Role of Nutrition in Maintaining Health in the Nation's Elderly: Evaluating Coverage of Nutrition*

*Services for the Medicare Population*. Washington, D.C., National Academies Press, 2000

<sup>7</sup>Franz MJ, Powers MA, Leontos C, Holzmeister LA, Kulkarni K, Monk A, Wedel N, Gradwell E: The evidence for medical nutrition therapy for type 1 and type 2 diabetes in adults. *J Am Diet Assoc* 110:1852–1889, 2010

<sup>8</sup>Andrews RC, Cooper AR, Montgomery AA, Norcross AJ, Peters TJ, Sharp DJ, Jackson N, Fitzsimons K, Bright J, Coulman K, England CY, Gorton J, McLenaghan A, Paxton E, Polet A, Thompson C, Dayan CN: Diet or diet plus physical activity versus usual care in patients with newly diagnosed type 2 diabetes: the Early ACTID randomized controlled trial. *Lancet* 20378:129–139, 2011

<sup>9</sup>Coppell KJ, Kataoka M, Williams SM, Chisholm AW, Vorgers SM, Mann JI: Nutritional intervention in patients with type 2 diabetes who are hyperglycaemic despite optimized drug treatment: Lifestyle Over and Above Drugs in Diabetes (LOADD) study: randomized controlled trial. *BMJ* 341:c3337, 2010

<sup>10</sup>DAFNE Study Group: Training in flexible, intensive insulin management to enable dietary freedom in people with type 1 diabetes: Dose Adjusted For Normal Eating (DAFNE) randomized controlled trial. *BMJ* 325:746–752, 2002

<sup>11</sup>Robbins JM, Thatcher GE, Webb DA, Valdmans VG: Nutritionist visits, diabetes classes, and hospitalization rates and charges: the Urban Diabetes Study. *Diabetes Care* 31:655–660, 2008

<sup>12</sup>Gary TL, Genkinger JM, Guallar E, Peyrot M, Brancati FL: Meta-analysis of randomized educational and behavioral interventions in type 2 diabetes. *Diabetes Care* 29:488–501, 2003

<sup>13</sup>Norris SL, Lau J, Smith SJ, Schmid CH, Engelgau MM: Self-management education for adults with type 2 diabetes: a meta-analysis of the effect on glycemic control. *Diabetes Care* 25:1159–1172, 2002

<sup>14</sup>Renders CM, Valk GD, Griffin SJ, Wagner EH, Eijk Van JT, Assendelft WJ: Interventions to improve the management of diabetes in primary care, outpatient, and community settings: a systematic review. *Diabetes Care* 24:1821–1833, 2001

<sup>15</sup>Deakin T, McShane CE, Cade JR, Williams RD: Group based training for self-management strategies in people with type 2 diabetes. *Cochrane Database Syst Rev* 2:CD003417, 2005

<sup>16</sup>Rossi MC, Nicolucci A, Di Bartolo P, Bruttomesso D, Girelli A, Ampudia FJ, Kerr D, Ceriello A, De La Questa Mayor C, Pellegrini F, Horwitz D, Vespasiani G: Diabetes Interactive Diary: a new telemedicine system enabling flexible diet and insulin therapy while improving quality of life: an open-label, international, multicenter, randomized study. *Diabetes Care* 33:109–115, 2010

- <sup>17</sup>Laurenzi A, Bolla AM, Panigoni G, Doria V, Uccellatore AC, Peretti E, Saibene A, Galimberti G, Bosi E, Scavini M: Effects of carbohydrate counting on glucose control and quality of life over 24 weeks in adult patients with type 1 diabetes on continuous subcutaneous insulin infusion: a randomized, prospective clinical trial (GIOCAR). *Diabetes Care* 34:823–827, 2011
- <sup>18</sup>Kulkarni K, Castle G, Gregory R, Holmes A, Leontos C, Powers M, Snetselaar L, Splett P, Wylie-Rosett J; The Diabetes Care and Education Dietetic Practice Group: Nutrition practice guidelines for type 1 diabetes mellitus positively affect dietitian practices and patient outcomes. *J Am Diet Assoc* 98:62–70, 1998
- <sup>19</sup>Rickheim PL, Weaver TW, Flader JL, Kendall DM: Assessment of group versus individual diabetes education: a randomized study. *Diabetes Care* 25:269–274, 2002
- <sup>20</sup>Miller CK, Edwards L, Kissing G, Sanville L: Nutrition education improves metabolic outcomes among older adults with diabetes mellitus: results from a randomized controlled trial. *Prev Med* 34:252–259, 2002
- <sup>21</sup>Ash S, Reeves MM, Yeo S, Morrison G, Carey D, Capra S: Effect of intensive dietetic interventions on weight and glycaemic control in overweight men with type II diabetes: a randomised trial. *Int J Obes Relat Metab Disord* 27:797–802, 2003
- <sup>22</sup>Goldhaber-Fiebert JD, Goldhaber-Fiebert SN, Tristan ML, Nathan DM: Randomized controlled community-based nutrition and exercise intervention improves glycemia and cardiovascular risk factors in type 2 diabetic patients in rural Costa Rica. *Diabetes Care* 26:24–29, 2003
- <sup>23</sup>Ziemer DC, Berkowitz KJ, Panayioto RM, El-Kebbi IM, Musey VC, Anderson LA, Wanko NS, Fowke ML, Brazier CW, Dunbar VG, Slocum W, Bacha GM, Gallina DL, Cook CB, Phillips LS: A simple meal plan emphasizing healthy food choices is as effective as an exchange-based meal plan for urban African Americans with type 2 diabetes. *Diabetes Care* 26:1719–1724, 2003
- <sup>24</sup>Takahashi M, Araki A, Ito H: Development of a new method for simple dietary education in elderly patients with diabetes mellitus. *Geriatr Gerontol Int* 4:111–119, 2004
- <sup>25</sup>Wolf AM, Conaway MR, Crowther JQ, Hanzen KY, Nadler JL, Oneida B, Bovbjerg VE: Translating lifestyle intervention to practice in obese patients with type 2 diabetes: Improving Control with Activity and Nutrition (ICAN) study. *Diabetes Care* 27:1570–1576, 2004
- <sup>26</sup>Barnard ND, Cohen J, Jenkins DJ, Turner-McGrievy G, Gloede L, Jaster B, Seidl K, Green AA, Talpers S: A low-fat vegan diet improves glycemic control and cardiovascular risk factors in a randomized clinical trial in individuals with type 2 diabetes. *Diabetes Care* 29:1777–1783, 2006
- <sup>27</sup>Nield L, Moore HJ, Hooper L, Cruickshank JK, Vyas A, Whitaker V, Summerbell CD: Dietary advice for treatment of type 2 diabetes mellitus in adults. *Cochrane Database Syst Rev* 3:CD004097, 2007
- <sup>28</sup>Davis RM, Hitch AD, Salaam MM, Herman WH, Zimmer-Galler IE, Mayer-Davis EJ: Telehealth improves diabetes self-management in an underserved community: Diabetes TeleCare. *Diabetes Care* 33:1712–1717, 2010
- <sup>29</sup>Huang MC, Hsu CC, Wang HS, Shin SJ: Prospective randomized controlled trial to evaluate effectiveness of registered dietitian-led diabetes management on glycemic and diet control in a primary care setting in Taiwan. *Diabetes Care* 33:233–239, 2010
- <sup>30</sup>Al-Shookri A, Khor GL, Chan YM, Loke SC, Al-Maskari M: Effectiveness of medical nutrition treatment delivered by dietitians on glycaemic outcomes and lipid profiles of Arab, Omani patients with type 2 diabetes. *Diabet Med* 29:236–244, 2012
- <sup>31</sup>Tan MY, Magarey JM, Chee SS, Lee LF, Tan MH: A brief structured education programme enhances self-care practices and improves glycaemic control in Malaysians with poorly controlled diabetes. *Health Educ Res* 26:896–907, 2011
- <sup>32</sup>Battista MC, Labonté M, Ménard J, Jean-Denis F, Houde G, Ardilouze JL, Perron P: Dietitian-coached management in combination with annual endocrinologist follow up improves global metabolic and cardiovascular health in diabetic participants after 24 months. *Appl Physiol Nutr Metab* 37:610–620, 2012
- <sup>33</sup>Academy of Nutrition and Dietetics: Disorders of lipid metabolism [article online]. Available from <http://andevidecencelibrary.com/topic.cfm?cat=53582&auth=51>. Accessed 30 November 2013
- <sup>34</sup>Franz MJ, Boucher JL, Evert AB: Evidence-based diabetes nutrition therapy recommendations are effective: the key is individualization. *Diabetes Metab Syndr Obes*. In press
- <sup>35</sup>Esposito K, Maiorino MI, Ciotola M, Di PC, Scognamiglio P, Gicchino M, Petrizzo M, Saccomanno F, Beneduce F, Ceriello A, Giugliano D: Effects of a Mediterranean-style diet on the need for antihyperglycemic drug therapy in patients with newly diagnosed type 2 diabetes: a randomized trial. *Ann Intern Med* 151:306–314, 2009
- <sup>36</sup>Pi-Sunyer X, Blackburn G, Brancati FL, Bray GA, Bright R, Clark JM, Curtis JM, Espeland MA, Foreyt JP, Graves K, Haffner SM, Harrison B, Hill JO, Horton ES, Jakicic J, Jeffery RW, Johnson KC, Kahn S, Kelley DE, Kitabchi AE, Knowler WC, Lewis CE, Maschak-Carey BJ, Montgomery B, Nathan DM, Patricio J, Peters A, Redmon JB, Reeves RS, Ryan DH, Safford M, Van DB, Wadden TA, Wagenknecht L, Wesche-Thobaben J, Wing RR, Yanovski SZ: Reduction in weight and cardiovascular disease risk factors in individuals with type 2 diabetes: on-year results of the Look AHEAD trial. *Diabetes Care* 30:1374–1383, 2007
- <sup>37</sup>Metz JA, Stern JS, Kris-Etherton P, Reusser ME, Morris CD, Hatton DC, Oparil S, Haynes RB, Resnick LM, Pi-Sunyer FX, Clark S, Chester L, McMahon M, Snyder GW, McCarron DA: A randomized trial of improved weight loss with a prepared meal plan in overweight and obese patients: impact on cardiovascular risk reduction. *Arch Intern Med* 160:2150–2158, 2000
- <sup>38</sup>Brehm BJ, Lattin BL, Summer SS, Boback JA, Gilchrist GM, Jandacek RJ, D'Alessio DA: One-year comparison of a high-monounsaturated fat diet with a high-carbohydrate diet in type 2 diabetes. *Diabetes Care* 32:215–220, 2009
- <sup>39</sup>Guldbrand H, Dizdar B, Bunjaku B, Lindstrom T, Bachrach-Lindstrom M, Fredrikson M, Ostgren CJ, Nystrom FH: In type 2 diabetes, randomisation to advice to follow a low-carbohydrate diet transiently improves glycaemic control compared with advice to follow a low-fat diet producing a similar weight loss. *Diabetologia* 55:2118–2127, 2012
- <sup>40</sup>Look AHEAD Research Group: Cardiovascular effects of intensive lifestyle intervention in type 2 diabetes. *N Eng J Med* 369:145–154, 2013
- <sup>41</sup>Larsen RN, Mann NJ, Maclean E, Shaw JE: The effect of high-protein, low-carbohydrate diets in the treatment of type 2 diabetes: a 12 month randomized controlled trial. *Diabetologia* 54:731–740, 2011
- <sup>42</sup>Li TY, Brennan AM, Wedick NM, Mantzoros C, Rifai N, Hu FB: Regular consumption of nuts is associated with a lower risk of cardiovascular disease in women with type 2 diabetes. *J Nutr* 139:1333–1338, 2009
- <sup>43</sup>Samann A, Muhlhauser I, Bender R, Kloos C, Muller UA: Glycaemic control and severe hypoglycaemia following training in flexible, intensive insulin therapy to enable dietary freedom in people with type 1 diabetes: a prospective implementation study. *Diabetologia* 48:1965–1970, 2005
- <sup>44</sup>Lowe J, Linjawi S, Mensch M, James K, Attia J: Flexible eating and flexible insulin dosing in patients with diabetes: results of an intensive self-management course. *Diabetes Res Clin Pract* 80:439–443, 2008
- <sup>45</sup>Scavone G, Manto A, Pitocco D, Gagliardi L, Caputo S, Mancini L, Zaccardi F, Ghirlanda G: Effect of carbohydrate counting and medical nutritional therapy on glycaemic control in type 1 diabetic subjects: a pilot study. *Diabet Med* 27:477–479, 2010
- <sup>46</sup>Rabasa-Lhoret R, Garon J, Langelier H, Poisson D, Chiasson JL: Effects of meal carbohydrate content on insulin requirements in type 1 diabetic patients treated intensively with the basal-bolus (ultralente-regular) insulin regimen. *Diabetes Care* 22:667–673, 1999
- <sup>47</sup>Wolever TM, Hamad S, Chiasson JL, Josse RG, Leiter LA, Rodger NW, Ross SA, Ryan EA: Day-to-day consistency in amount and source of carbohydrate intake associated with improved blood glucose control in type 1 diabetes. *J Am Coll Nutr* 18:242–247, 1999



- <sup>48</sup>Estruch R, Ros E, Salas-Salvadó J, Covas MI, Corella D, Arós, F, Gómez-Gracia E, Ruiz-Gutiérrez V, Fiol M, Lapetra J, Lamuela-Raventós RM, Serra-Majem L, Pintó X, Basora J, Muñoz MA, Sorlí JV, Martínez JA, Martínez-González MA; PREDIMED Study Investigators: Primary prevention of cardiovascular disease with a Mediterranean diet. *N Engl J Med* 368:1279–1290, 2013
- <sup>49</sup>Elhayany A, Lustman A, Abel R, Attal-Singer J, Vinker S: A low carbohydrate Mediterranean diet improves cardiovascular risk factors and diabetes control among overweight patients with type 2 diabetes mellitus: a 1-year prospective randomized intervention study. *Diabetes Obes Metab* 12:204–209, 2010
- <sup>50</sup>Turner-McGrievy GM, Barnard ND, Cohen J, Jenkins DJ, Gloede L, Green AA: Changes in nutrient intake and dietary quality among participants with type 2 diabetes following a low-fat vegan diet or a conventional diabetes diet for 22 weeks. *J Am Diet Assoc* 108:1636–1645, 2008
- <sup>51</sup>Nicholson AS, Sklar M, Barnard ND, Gore S, Sullivan R, Browning S: Toward improved management of NIDDM: a randomized, controlled, pilot intervention using a low fat, vegetarian diet. *Prev Med* 29:87–91, 1999
- <sup>52</sup>Tonstad S, Butler T, Yan R, Fraser GE: Type of vegetarian diet, body weight, and prevalence of type 2 diabetes. *Diabetes Care* 32:791–796, 2009
- <sup>53</sup>Kahleova H, Matoulek M, Malinska H, Oliyarnik O, Kazdova L, Neskudla T, Skoch A, Hajek M, Hill M, Kahle M, Pelikanova T: Vegetarian diet improves insulin resistance and oxidative stress markers more than conventional diet in subjects with type 2 diabetes. *Diabet Med* 28:549–559, 2011
- <sup>54</sup>Barnard ND, Cohen J, Jenkins DJ, Turner-McGrievy G, Gloede L, Green A, Ferdowsian H: A low-fat vegan diet and a conventional diabetes diet in the treatment of type 2 diabetes: a randomized, controlled, 74-wk clinical trial. *Am J Clin Nutr* 89:1588S–1596S, 2009
- <sup>55</sup>Wolever TM, Gibbs AL, Chiasson JL, Connelly PW, Josse RG, Leiter LA, Maheux P, Rabasa-Lhoret R, Rodger NW, Ryan EA: The Canadian Trial of Carbohydrates in Diabetes (CCD), a 1-y controlled trial of low-glycemic-index dietary carbohydrate in type 2 diabetes: no effect on glycated hemoglobin but reduction in C-reactive protein. *Am J Clin Nutr* 87:114–125, 2008
- <sup>56</sup>Jenkins DJ, Kendall CW, McKeown-Eyssen G, Josse RG, Silverberg J, Booth GL, Vidgen E, Josse AR, Nguyen TH, Corrigan S, Banach MS, Ares S, Mitchell S, Emam A, Augustin LS, Parker TL, Leiter LA: Effect of a low-glycemic index or a high-cereal fiber diet on type 2 diabetes: a randomized trial. *JAMA* 300:2742–2753, 2008
- <sup>57</sup>Jenkins DJ, Srichaikul K, Kendall CW, Sievenpiper JL, Abdunour S, Mirrahimi A, Meneses C, Nishi S, He X, Lee S, So YT, Esfahani A, Mitchell S, Parker TL, Vidgen E, Josse RG, Leiter LA: The relation of low glycaemic index fruit consumption to glycaemic control and risk factors for coronary heart disease in type 2 diabetes. *Diabetologia* 54:271–279, 2011
- <sup>58</sup>Jenkins DJ, Kendall CW, Augustin LS, Mitchell S, Sahye-Pudaruth S, Mejia SB, Chiavaroli L, Mirrahimi A, Ireland C, Bashyam B, Vidgen E, de Souza RJ, Sievenpiper JL, Coveney J, Leiter LA, Josse RG: Effect of legumes as part of a low glycemic index diet on glycemic control and cardiovascular risk factors in type 2 diabetes mellitus: a randomized controlled trial. *Arch Intern Med* 172:1653–1660, 2012
- <sup>59</sup>Thomas D, Elliott EJ: Low glycaemic index, or low glycaemic load, diets for diabetes mellitus. *Cochrane Database Syst Rev* 1:CD006296, 2009
- <sup>60</sup>Fabricatore AN, Wadden TA, Ebbeling CB, Thomas JG, Stallings VA, Schwartz S, Ludwig DS: Targeting dietary fat or glycemic load in the treatment of obesity and type 2 diabetes: a randomized controlled trial. *Diabetes Res Clin Pract* 92:37–45, 2011
- <sup>61</sup>Brazeau AS, Mircescu H, Desjardins K, Leroux C, Strychar I, Ekoe JM, Rabasa-Lhoret R: Carbohydrate counting accuracy and blood glucose variability in adults with type 1 diabetes. *Diabetes Res Clin Pract* 99:19–23, 2013
- <sup>62</sup>Davis NJ, Tomuta N, Schechter C, Isasi CR, Segal-Isaacson CJ, Stein D, Zonszein J, Wylie-Rosett J: Comparative study of the effects of a 1-year dietary intervention of a low-carbohydrate diet versus a low-fat diet on weight and glycemic control in type 2 diabetes. *Diabetes Care* 32:1147–1152, 2009
- <sup>63</sup>Papakonstantinou E, Triantafyllidou D, Panagiotakos DB, Koutsovasilis A, Saliaris M, Manolis A, Melidonis A, Zampelas A: A high-protein low-fat diet is more effective in improving blood pressure and triglycerides in calorie-restricted obese individuals with newly diagnosed type 2 diabetes. *Eur J Clin Nutr* 64:595–602, 2010
- <sup>64</sup>Kodama S, Saito K, Tanaka S, Maki M, Yachi Y, Sato M, Sugawara A, Totsuka K, Shimano H, Ohashi Y, Yamada N, Sone H: Influence of fat and carbohydrate proportions on the metabolic profile in patients with type 2 diabetes: a meta-analysis. *Diabetes Care* 32:959–965, 2009
- <sup>65</sup>Sacks FM, Svetkey LP, Vollmer WM, Appel LJ, Bray GA, Harsha D, Obarzanek E, Conlin PR, Miller ER, Simons-Morton DG, Karanja N, Lin PH, Aickin M, Most-Windhauser MM, Moore TJ, Proschan MA, Cutler JA; for the DASH-Sodium Collaborative Research Group: Effects on blood pressure of reduced dietary sodium and the Dietary Approaches to Stop Hypertension (DASH) diet. *N Engl J Med* 344:3–10, 2001
- <sup>66</sup>Appel LJ, Moore TJ, Obarzanek E, Vollmer WM, Svetkey LP, Sacks FM, Bray GA, Vogt TM, Cutler JA, Most-Windhauser MM, Lin PH, Karanja N, Simons-Morton D, McCullough M, Swain J, Steele P, Evans MA, Miller ER, Harsha DW; DASH Collaborative Research Group: A clinical trial of the effects of dietary patterns on blood pressure. *N Engl J Med* 336:1117–1124, 1997
- <sup>67</sup>Jones-McLean EM, Shatenstein B, Whiting SJ: Dietary patterns research and its applications to nutrition policy for the prevention of chronic disease among diverse North American populations. *Appl Physiol Nutr Metab* 35:195–198, 2010
- <sup>68</sup>Institute of Medicine: *Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids*. Washington, D.C., National Academies Press, 2002
- <sup>69</sup>U.S. Department of Health and Human Services and U.S. Department of Agriculture: *Dietary Guidelines for Americans*, 2010. Available from [www.health.gov/dietaryguidelines](http://www.health.gov/dietaryguidelines). Accessed 30 June 2011
- <sup>70</sup>Ros E: Dietary cis-monounsaturated fatty acids and metabolic control in type 2 diabetes. *Am J Clin Nutr* 78 (Suppl.):617S–625S, 2003
- <sup>71</sup>He M, vanDam RM, Rimm E, Hu FB, Qi L: Whole-grain, cereal fiber, bran, and germ intake and the risks of all-cause and cardiovascular disease-specific mortality among women with type 2 diabetes mellitus. *Circulation* 121:2162–2168, 2010
- <sup>72</sup>Burger KN, Beulens JW, van der Schouw YT, Sluijs I, Spijkerman AMW, Sluik D, Boeing H, Kaaks R, Teucher B, Dethlefsen C, Overvad K, Tjønneland A, Kyro C, Barricarte A, Bendinelli B, Krogh V, Tumino R, Sacerdote C, Mattiello A, Nilsson PM, Orho-Melander M, Rolandsson O, Huerta JM, Crowe F, Allen N, Nöthlings U: Dietary fiber, carbohydrate quality and quantity, and mortality risk of individuals with diabetes mellitus. *PLoS One* 7:e43127, 2012
- <sup>73</sup>Schulze MB, Manson JE, Ludwig DS, Colditz GA, Stampfer MJ, Willett WC, Hu FB: Sugar-sweetened beverages, weight gain, and incidence of type 2 diabetes in young and middle-aged women. *JAMA* 292:927–934, 2004
- <sup>74</sup>Malik VS, Popkin BM, Bray GA, Després JP, Willett WC, Hu FB: Sugar-sweetened beverages and risk of metabolic syndrome and type 2 diabetes: a meta-analysis. *Diabetes Care* 33:2477–2483, 2010
- <sup>75</sup>Stanhope KL, Schwarz JM, Keim NL, Griffen SC, Bremer AA, Graham JL, Hatcher B, Cox CL, Dyachenko A, Zhang W, McGahan JP, Seibert A, Krauss RM, Chiu S, Schaefer EJ, Ai M, Otokozawa S, Nakajima K, Nakano T, Beysen C, Hellerstein MK, Berglund L, Havel PJ: Consuming fructose-sweetened, not glucose-sweetened, beverages increases visceral adiposity and lipids and decreases insulin sensitivity in overweight/obese humans. *J Clin Invest* 119:1322–1334, 2009
- <sup>76</sup>Dhingra R, Sullivan L, Jacques PF, Wang TJ, Fox CS, Meigs JB, D'Agostino RB, Gaziano JM, Vasan RS: Soft drink consumption and risk of developing cardiometabolic risk factors and the metabolic syndrome in middle-aged adults in the community. *Circulation* 116:480–488, 2007

<sup>77</sup>Nettleton JA, Lutsey PL, Wang Y, Lima JA, Michos ED, Jacobs DR Jr: Diet soda intake and risk of incident metabolic syndrome and type 2 diabetes in the Multi-Ethnic Study of Atherosclerosis (MESA). *Diabetes Care* 32:688–694, 2009

<sup>78</sup>Gardner C, Wylie-Rosett J, Gidding SS, Steffen LM, Johnson RK, Reader D, Lichtenstein AH; American Heart Association Nutrition Committee of the Council on Nutrition, Physical Activity and Metabolism, Council on Arteriosclerosis, Thrombosis and Vascular Biology, Council on Cardiovascular Disease in the Young; American Diabetes Association: Nonnutritive sweeteners: current use and health perspectives: a scientific statement from the American Heart Association and the American Diabetes Association. *Diabetes Care* 35:1798–1808, 2012

<sup>79</sup>Thomas MC, Moran J, Forsblom C, Harjutsalo V, Thorn L, Ahola A, Waden J, Tolonen N, Saraheimo M, Gordin D, Groop PH; FinnDiane Study Group: The association between dietary sodium intake, ESRD, and all-cause mortality in patients with type 1 diabetes. *Diabetes Care* 34:861–866, 2011

<sup>80</sup>Ekinci EI, Clarke S, Thomas MC, Moran JL, Cheong K, MacIssac RJ, Jerums G: Dietary salt intake and mortality in patients with type 2 diabetes. *Diabetes Care* 34:703–709, 2011

<sup>81</sup>Institute of Medicine: *Sodium Intake in Populations: Assessment of Evidence*. Washington, D.C., National Academy of Sciences, 2013

<sup>82</sup>Bray GA, Vollmer WM, Sacks FM, Obarzanek E, Svetkey LP, Appel LJ; DASH Collaborative Research Group: A further subgroup analysis of the effects of the DASH diet and three dietary sodium levels on blood pressure: results of the DASH-Sodium Trial. *Am J Cardiol* 94:222–227, 2004

<sup>83</sup>Neumiller JJ: Micronutrients and diabetes. In *American Diabetes Association Guide to Nutrition Therapy for Diabetes*. Franz M, Evert A, Eds. 2012, p. 41–68

<sup>84</sup>Sesso HD, Christen WG, Bubes V, Smith JP, MacFadyen J, Schvartz M, Manson JE, Glynn RJ, Buring JE, Gazian JM: Multivitamins in the prevention of cardiovascular disease in men: the Physicians' Health Study II randomized controlled trial. *JAMA* 308:1751–1760, 2012

<sup>85</sup>Macpherson H, Pipingas A, Pase MP: Multivitamin-multimineral supplementation and mortality: a meta-analysis of randomized controlled trials. *Am J Clin Nutr* 97:437–444, 2013

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