

Table 2—Academy of Nutrition and Dietetics evidence-based nutrition practice guidelines—recommended structure for the implementation of MNT for adults with diabetes (9)

Initial series of MNT encounters: The RDN should implement three to six MNT encounters during the first 6 months following diagnosis and determine if additional MNT encounters are needed based on an individualized assessment.

MNT follow-up encounters: The RDN should implement a minimum of one annual MNT follow-up encounter.

Cost-effectiveness of lifestyle interventions and MNT for the prevention and management of diabetes has been documented in multiple studies (12,17,24,25). The National Academy of Medicine recommends individualized MNT, provided by an RDN upon physician referral, as part of the multidisciplinary approach to diabetes care (7). Diabetes MNT is a covered Medicare benefit and should also be adequately reimbursed by insurance and other payers, or bundled in evolving value-based care and payment models, because it can result in improved outcomes such as reduced A1C and cost savings (12,17,25).

What nutrition therapy interventions best help people with prediabetes prevent or delay the development of type 2 diabetes?

The strongest evidence for type 2 diabetes prevention comes from several studies, including the DPP (26–28). The DPP demonstrated that an intensive lifestyle intervention resulting in weight loss could reduce the incidence of type 2 diabetes for adults with overweight/obesity and impaired glucose tolerance by 58% over 3 years (26). Follow-up of three large studies of lifestyle intervention for diabetes prevention has shown sustained reduction in the rate of conversion to type 2 diabetes: 43% reduction at 20 years in the Da Qing Diabetes Prevention Study (29); 43% reduction at 7 years in the Finnish Diabetes Prevention Study (DPS) (30); and 34% reduction at 10 years (28) and 27% reduction at 15 years extended follow-up of the DPP (31) in the U.S. Diabetes Prevention Program Outcomes Study (DPPOS). The follow-up of the Da Qing study also demonstrated a reduction in cardiovascular and all-cause mortality (32).

Substantial evidence indicates that individuals with prediabetes should be referred to an intensive behavioral lifestyle intervention program modeled on

the DPP and/or to individualized MNT typically provided by an RDN with the goals of improving eating habits, increasing moderate-intensity physical activity to at least 150 min per week, and achieving and maintaining 7–10% loss of initial body weight if needed (14,17,33,34). More intensive intervention programs are the most effective in decreasing diabetes incidence and improving cardiovascular disease (CVD) risk factors (35).

Both DPP-modeled intensive lifestyle interventions and individualized MNT for prediabetes have demonstrated cost-effectiveness (17,36) and therefore should be covered by third-party payers or bundled in evolving value-based care and payment models (25).

To make diabetes prevention programs more accessible, digital health tools are an area of increasing interest in the public and private sectors. Preliminary research studies support that the delivery of diabetes prevention lifestyle interventions through technology-enabled platforms and digital health tools can result in weight loss, improved glycemia, and reduced risk for diabetes and CVD, although more rigorous studies are needed (37–44).

MACRONUTRIENTS

Consensus recommendations

- Evidence suggests that there is not an ideal percentage of calories from carbohydrate, protein, and fat for all people with or at risk for diabetes; therefore, macronutrient distribution should be based on individualized assessment of current eating patterns, preferences, and metabolic goals.
- When counseling people with diabetes, a key strategy to achieve glycemic targets should include an assessment of current dietary intake followed by individualized guidance on self-monitoring carbo-

hydrate intake to optimize meal timing and food choices and to guide medication and physical activity recommendations.

- People with diabetes and those at risk for diabetes are encouraged to consume at least the amount of dietary fiber recommended for the general public; increasing fiber intake, preferably through food (vegetables, pulses [beans, peas, and lentils], fruits, and whole intact grains) or through dietary supplement, may help in modestly lowering A1C.

Do macronutrient needs differ for people with diabetes compared with the general population?

Although numerous studies have attempted to identify the optimal mix of macronutrients for the eating plans of people with diabetes, a systematic review (45) found that there is no ideal mix that applies broadly and that macronutrient proportions should be individualized. It has been observed that people with diabetes, on average, eat about the same proportions of macronutrients as the general public: ~45% of their calories from carbohydrate (see Table 3), ~36–40% of calories from fat, and the remainder (~16–18%) from protein (46–48). Regardless of the macronutrient mix, total energy intake should be appropriate to attain weight management goals. Further, individualization of the macronutrient composition will depend on the status of the individual, including metabolic goals (glycemia, lipid profile, etc.), physical activity, food preferences, and availability.

Do carbohydrate needs differ for people with diabetes compared with the general population?

Carbohydrate is a readily used source of energy and the primary dietary influence on postprandial blood glucose (8,49). Foods containing carbohydrate—with various proportions of sugars, starches, and fiber—have a wide range of effects on the glycemic response. Some result in an extended rise and slow fall of blood glucose concentrations, while others result in a rapid rise followed by a rapid fall (50). The quality of carbohydrate foods selected—ideally rich in dietary fiber, vitamins, and minerals and low in added sugars, fats, and sodium—should be addressed as part of an