

Position of the Academy of Nutrition and Dietetics: The Role of Medical Nutrition Therapy and Registered Dietitian Nutritionists in the Prevention and Treatment of Prediabetes and Type 2 Diabetes



ABSTRACT

It is the position of the Academy of Nutrition and Dietetics that for adults with prediabetes or type 2 diabetes, medical nutrition therapy (MNT) provided by registered dietitian nutritionists (RDNs) is effective in improving medical outcomes and quality of life, and is cost-effective. MNT provided by RDNs is also successful and essential to preventing progression of prediabetes and obesity to type 2 diabetes. It is essential that MNT provided by RDNs be integrated into health care systems and public health programs and be adequately reimbursed. The Academy's evidence-based nutrition practice guidelines for the prevention of diabetes and the management of diabetes document strong evidence supporting the clinical effectiveness of MNT provided by RDNs. Cost-effectiveness has also been documented. The nutrition practice guidelines recommend that as part of evidence-based health care, providers caring for individuals with prediabetes or type 2 diabetes should be referred to an RDN for individualized MNT upon diagnosis and at regular intervals throughout the lifespan as part of their treatment regimen. Standards of care for three levels of diabetes practice have been published by the Diabetes Care and Education Practice Group. RDNs are also qualified to provide additional services beyond MNT in diabetes care and management. Unfortunately, barriers to accessing RDN services exist. Reimbursement for services is essential. Major medical and health organizations have provided support for the essential role of MNT and RDNs for the prevention and treatment of type 2 diabetes.

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POSITION STATEMENT

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MEDICAL NUTRITION THERAPY (MNT) is an effective intervention for the management of obesity, prediabetes, and diabetes, which have all increased dramatically in the United States and worldwide over the last 30 years.^{1,2} The estimated prevalence among the general US adult population is currently 35% for obesity,³ 33.9% for prediabetes,⁴ and 12.2% for diabetes.⁴ Compared with non-Hispanic whites, the highest rates of diabetes are among non-Hispanic blacks, Hispanics, American Indians, and Asians.^{5,6} Prevalence of obesity and diabetes among youth is also increasing,⁷⁻¹⁰ and approxi-

mately one in three adults 65 years or older has diabetes.⁵ Diabetes is recognized as a costly disease and, in 2012, the total estimated cost of diagnosed diabetes cases in the United States was \$245 billion, a 41% increase from the estimate of \$174 billion in 2007.¹¹ While it is encouraging to note that rates of diabetes-related complications have declined substantially over the past 20 years, unfortunately, the burden of diabetes continues because of the continued increase in prevalence.¹² MNT is defined as "Nutritional diagnostic, therapy, and counseling services for the purpose of disease management which are furnished by a registered dietitian or nutrition professional...".¹³ For the purposes of this article, MNT will be used to describe services provided by a registered dietitian nutritionist (RDN).

CLINICAL EFFECTIVENESS OF MNT IN THE MANAGEMENT OF OBESITY, PREDIABETES, AND TYPE 2 DIABETES

Impact of MNT on Obesity

The Academy of Nutrition and Dietetics has analyzed compelling evidence supporting the effectiveness of MNT in a broad range of topics, including obesity, diabetes prevention, and type 2 diabetes.¹⁴⁻¹⁹ As obesity is a key risk factor for the development of prediabetes and type 2 diabetes, adult weight management MNT delivered by an RDN is both clinically and economically effective for prevention and management.¹⁴ MNT results in both statistically significant and clinically meaningful weight loss in overweight or obese adults, as well as reduced risk for diabetes and disorders of lipid metabolism

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and hypertension.²⁰ The Academy's Adult Weight Management Evidence-Based Nutrition Practice Guideline states: "For weight loss, the RDN should schedule at least 14 MNT encounters (either individual or group) over a period of at least 6 months." To maintain weight loss, the nutrition practice guideline recommends "at least monthly MNT encounters over a period of at least 1 year."¹⁴ The Academy's Medical Nutrition Therapy Effectiveness Systematic Review also reviewed evidence supporting the effectiveness of frequent MNT visits.²¹ "Two to 12 visits (60-minute initial visit and 20- to 45-minute follow-ups) were associated with improved weight (−0.5 kg to −9.0 kg), body mass index (−0.2 to −7.8), waist circumference (−2.0 cm to −14 cm), fasting blood glucose (−5.2 mg to −9.5 mg/dL), total cholesterol (−4.3 mg to −59 mg/dL), low-density lipoprotein cholesterol (−15 mg to −47 mg/dL), low-density lipoprotein cholesterol (+2.0 mg to +11 mg/dL), and triglycerides (−12 mg to −60 mg/dL)."

Impact of MNT on Prediabetes

The primary goal of intervening in individuals with prediabetes, also known as "categories of increased risk for diabetes"²² is to prevent and/or delay progression to type 2 diabetes. Strong evidence supports the role of MNT provided by RDNs as being effective for managing prediabetes^{15,16,23,24} via key positive clinical outcomes on body weight, energy balance, and healthy lifestyle changes.^{23–28} The Academy's Prevention of Type 2 Diabetes Evidence-Based Nutrition Practice Guideline reports that lifestyle intervention delivered to individuals with prediabetes "over at least a 3-month period" has been shown to decrease fasting blood glucose by 2 to 9 mg/dL (0.11 to 0.5 mmol/L), body weight by 2.6 to 7.1 kg, and waist circumference by 3.8 to 5.9 cm.¹⁵ Greater improvements were found in metabolic and anthropometric outcomes with increased frequency of MNT visits. The systematic review of MNT interventions provided by an RDN reported that in the majority of the publications significant improvements in weight, glycemic outcomes, waist circumference, and blood pressure were documented.¹⁶ Lifestyle interventions focused on healthy eating and physical

activity and, when compared, improved clinical outcomes more than metformin. More recently, the positive impact of lifestyle interventions was reaffirmed by several studies: two among adults with impaired glucose regulation,^{29,30} one among adults with obesity and/or diabetes,³¹ and in two 2017 systematic reviews^{32,33}—all indicated that small improvements in weight loss and waist circumference and/or glycemia can prevent the progression from prediabetes to type 2 diabetes over an extended period of time. Improvements in quality of life, an important measure of health-related outcomes, have also been reported in studies of MNT among adults and pediatric individuals with prediabetes.^{34–36}

The Diabetes Prevention Programs (DPPs) showed lifestyle changes improved clinical outcomes more than medication.²⁸ In addition to reducing the progression of prediabetes to diabetes, lifestyle interventions in the DPP, including a weight loss of 3 kg from baseline, also improved cardiovascular risk factors—hypertension and lipid profiles—compared with placebo and metformin therapy.³⁷ In a 15-year report of the DPP, lifestyle intervention continued to reduce diabetes incidence by 17%.³⁸ While the majority of evidence comes from studies in adults, there is also evidence that these efforts are effective in the general pediatric population.^{39,40}

Therefore, reducing obesity and prediabetes prevalence is vital to prevent type 2 diabetes. Substantial evidence indicates that duration and intensity of lifestyle interventions matter. Of interest is the report from the Community Preventive Services Task Force.⁴¹ They reviewed 53 studies (30 of diet and physical activity programs vs usual care; 13 of more intensive vs less intensive programs; and 13 single programs) from 66 programs around the United States. The report concluded that combined healthy diet and physical activity promotion programs are effective at decreasing diabetes incidence and improving cardiovascular disease risk factors in individuals at increased risk. More intensive programs were the most effective, and RDNs were the primary counselors in these programs.⁴¹

Impact of MNT on Type 2 Diabetes

Implementing MNT for the management of type 2 diabetes in adults is

essential and the Academy's Nutrition Practice Guidelines for Type 1 and Type 2 Diabetes in Adults documents the effectiveness of MNT on both clinical and quality of life outcomes.^{17,18} The nutrition practice guidelines recommend that RDNs, in collaboration with other members of the health care team, ensure that all overweight or obese adults at risk are screened for type 2 diabetes, and that all adults with type 2 diabetes be referred for MNT.^{17,18} RDNs should implement three to six MNT encounters during the first 6 months and, based on an individualized assessment, determine whether additional MNT encounters are needed. RDNs should implement a minimum of one annual MNT follow-up encounter based on strong evidence that continued MNT encounters produce maintenance and continued reductions of hemoglobin A1c (HbA1c) in adults with type 2 diabetes.

Strong evidence from the nutrition practice guidelines supports the role of MNT in the management of diabetes.^{17–19} In adults with type 2 diabetes, 21 study arms in 18 studies reported that MNT significantly lowered HbA1c by 0.3% to 2.0% at 3 months, and with ongoing MNT support, decreases were maintained or improved for more than 12 months. In studies with a control or usual care group, HbA1c remained unchanged or increased by 0.2%. Although MNT interventions were effective throughout the disease duration, the decreases in A1C were the largest when participants were newly diagnosed and/or had higher baseline HbA1c levels.^{17,18} Twelve study arms from 11 studies reported that MNT resulted in reductions in the dosing or the number of glucose-lowering medications used. However, due to the natural progression of type 2 diabetes, medication changes were needed to achieve glucose goals as study duration increased. Weight gain associated with medication use was also prevented by continued MNT support. Importantly, improvements in quality of life (improved self-perception of health status, increased knowledge and motivation, and decreased emotional stress) were reported.^{17,18}

In these studies, implementing an individualized nutrition therapy intervention was of critical importance. A variety of interventions, such as individualized nutrition therapy, energy

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