



The Primary Prevention of Type 2 Diabetes American Association of Diabetes Educators (AADE) Position Statement

Introduction

The prevalence of type 2 diabetes is reaching epidemic proportions with more than 8.3% of adults in the U.S. being affected.¹⁻⁵ In addition, the number of persons in the U.S. with diabetes is increasing rapidly; and is currently expected to double over the next 30 years.^{1,4} Perhaps more alarming, it is estimated that over 79 million American adults have “prediabetes,” defined by impaired glucose tolerance (IGT) 140-199 mg/dL, fasting glucose (IFG) 100-125 mg/dL, or A1C 5.7–6.4% which places them at substantially increased risk for developing diabetes.^{1-4,7} Over a 3-5 year period, persons with pre-diabetes have a 5- to-15fold higher risk of developing type 2 diabetes than persons with normal blood glucose levels.⁸ While treatment prevents some of the devastating complications of diabetes,⁹ it does not usually restore normal blood glucose levels or eliminate all of the adverse events associated with the disease. Moreover, the diagnosis of type 2 diabetes (and indeed prediabetes as well) is often delayed, being made at a time when evidence of complications is already present.^{1,9} Since it has proved challenging to deliver high quality care to all persons with diabetes, the enormous and growing economic and social cost of this disease makes a compelling case for prevention.

Background/Definitions

Epidemiological studies have demonstrated that type 2 diabetes results from an interaction between a genetic predisposition and lifestyle factors including patterns of eating and sedentary behavior that lead to obesity. Fortunately, there is increasing evidence that type 2 diabetes can be delayed or prevented by changes in these lifestyle factors.^{4,10,11} A recent large systematic review summarized the worldwide clinical trials evidence for the effectiveness of formal lifestyle interventions to prevent or delay the development of type 2 diabetes.¹² Pooled estimates from 12 trials showed that lifestyle interventions reduce the risk of developing diabetes by 49% (95% CI 40% - 56%) compared to standard advice alone. This translates into a need to treat an average of 6.4 persons for one year to prevent one case of diabetes. Moreover, the relative reduction in diabetes risk resulting from lifestyle interventions did not depend on participants’ absolute risk level for developing diabetes (i.e. “pre-diabetes severity”), which varied from 2.6% to 30% per year across the different studies.¹²

The largest and most compelling evidence for the risk reducing benefits of lifestyle modification in the United States comes from the Diabetes Prevention Program (DPP), which was also the first randomized trial to compare lifestyle and a pharmacologic intervention to placebo.¹³ According to the DPP protocol, weight loss was the predominant predictor of reduced diabetes incidence, with a 16% reduction in risk per every 1 kilogram of weight lost.¹⁵ However, those who achieved exercise goals, but not weight loss goals, also experienced some reduction in diabetes risk (44%). Changes in physical activity and eating habits (primarily reduced calories from fat) predicted weight loss, and weight loss in turn, was associated with reduced diabetes risk, resulting in the conclusion that interventions to reduce diabetes risk (in overweight or obese individuals) should target weight reduction. Lifestyle modification was also exceptionally effective in preventing diabetes in older individuals due to the greater weight loss and physical activity achieved by this group.^{4,16} As has been found elsewhere, increased physical activity

was important to help sustain weight loss. Self-monitoring and meeting activity goals were related to achieving and sustaining weight loss.¹⁷

There is also strong evidence that the DPP lifestyle intervention is cost effective as delivered in the DPP trial.^{18, 19, 20} Moreover, there is increasing evidence that this lifestyle intervention can be effectively delivered in a group format, rather than the one-on-one format used in the DPP.²¹ This significantly reduces the cost of the program, thus, increasing its cost-effectiveness.

Role of the Diabetes Educator

Because of the dramatic increases in obesity across all subsets of our population, the burden of pre-diabetes and diabetes is projected to continue to grow rapidly over the next 30 years unless there is a major change. Diabetes educators build upon the evidence that type 2 diabetes can be prevented or delayed in those with pre-diabetes by decreases in weight and increases in physical activity and/or by the use of selected medications. The diabetes educator is in a unique position to incorporate prevention into self-management skills and education to patients. Each person with pre-diabetes needs a personalized education plan, which may incorporate risk reduction and other prevention-related elements of the AADE 7™ Self-Care Behaviors. As studies have shown, while both the medication and lifestyle interventions reduced the risk of conversion, the lifestyle intervention was significantly more effective. Recognizing that the benefit to risk ratio of medications is not entirely clear, educators help patients to understand that treatment must be continued indefinitely to delay the development of diabetes. Lifestyle modification, which has been shown to be the most effective approach for reducing risk, and is a key component of self-management education, should be regarded as the first line approach in high risk persons and continued even if a medication is used.

Recommendations

In maintaining AADE's commitment to promoting optimal diabetes education and patient counseling, the following recommendations relative to incorporating diabetes primary prevention are proposed.

- The patient/client and caregivers should be instructed so as to develop a basic understanding of risk factors for developing type 2 diabetes including age, family history, history of gestational diabetes, ethnicity, body mass index, waist circumference, impaired fasting glucose, and impaired glucose tolerance^{12, 16, 22}
- Communicate the importance of risk reduction to other health care providers and individuals at risk for developing type 2 diabetes, that modest lifestyle changes can help to significantly reduce this risk^{14, 17}
- Use a combination of risk screening questions, BMI calculation, and a metabolic test such as a fasting plasma glucose or oral glucose tolerance test to assess an individual's risk factors. Candidate populations include family members of persons with diabetes, and patients with other risk factors such as hypertension, obesity, and hyperlipidemia.^{12, 14, 17, 23}
- The AADE7™ healthy behavior construct, is appropriate for clients with increased risk to adopt healthy lifestyle changes, with goals for dietary change and physical activity that are intended to achieve modest weight loss (between 5-7%). Patients should be taught that effective weight loss does not involve a short-term or fad diet, rather it involves adoption of a healthier eating style that limits caloric and fat intake for the long term and coaching them through the impediments to change.^{6, 14, 17, 23}
- Evidence-based approaches that start with small changes assist clients by helping to set achievable, incrementally increasing goals regarding weight loss and physical activity. Goal setting should be a collaborative process that takes into consideration the clients unique situation.^{14, 17, 23}

- Self-management education includes information about how to monitor one's food intake, determine total daily food intake, assess the percentage of daily calories that are from fat intake, and set an appropriate calorie goal. Excellent educational support materials are available on line from the National Diabetes Education Program^{4, 14, 16} High risk clients will need to increase their level of physical activity to at least 150 minutes per week. Physical activity should be the equivalent of brisk walking. Safety is an important consideration before initiating an activity plan. so it is important to obtain a health history to ensure that the client does not have any factors that may counter-indicate adopting an exercise program.^{14, 17}
- Establish accountability to maintain weight loss goals by scheduling regular follow-up visits to assess weight and to help clients solve problems that may mitigate their maintaining healthy lifestyle goals.^{14, 17, 24}
- All materials, education, and coaching approaches should target the uniqueness of each individual as necessary for success.
- Diabetes self-management and prevention programs can be effective when provided in a group format to improve cost-effectiveness and reach.¹⁷

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