The Primary Prevention of Type 2 Diabetes
AADE Practice Synopsis
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Introduction
The prevalence of type 2 diabetes is reaching epidemic proportions with more than 9.3% of adults in the U.S. being affected and is currently expected to double over the next 30 years.\(^1\) Perhaps more alarming, it is estimated that 86 million American adults have prediabetes, defined by impaired glucose tolerance (IGT) 140-199 mg/dL, impaired fasting glucose (IFG) 100-125 mg/dL, or A1C 5.7–6.4% which places them at substantially increased risk for developing diabetes.\(^1,2\) Persons with an A1C of ≥6.0% have a very high risk of converting to diabetes in the near future with 5-year risks ranging from 25 to 50% and relative risks frequently 20 times higher compared with A1C <5%. However, persons with an A1C between 5.5 and 6.0% also have a substantially increased risk of diabetes with 5-year incidences ranging from 9 to 25%.\(^3\)

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.\(^1,4,5\) 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.

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.\(^6-9\) The largest and most compelling evidence for the risk reducing benefits of lifestyle modification in the U.S. comes from the Diabetes Prevention Program (DPP), which was also the first randomized trial to compare lifestyle and a pharmacologic intervention to placebo.\(^10\) 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.\(^11\) 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. As has been found elsewhere, increased physical activity was important to help sustain weight loss. Self-monitoring and achievement of activity goals were related to achieving and sustaining weight loss.

There is also strong evidence that the DPP lifestyle intervention is cost effective as delivered in the DPP trial. There is increasing evidence that this lifestyle intervention can be effectively delivered in a group format, rather than a one-on-one format used in the DPP. 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 prediabetes and diabetes is projected to continue to grow rapidly over the next 30 years unless there is a major change. The diabetes educator is in a unique position to incorporate prevention into self-management skills and education to patients. Each person with prediabetes needs an individualized 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 cost effectiveness and risk-benefit ratio of medications is not entirely clear, educators help patients to understand that lifestyle modification must be continued indefinitely to delay the development of diabetes. Thus, lifestyle modification 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**

- The AADE7™ Self-Care Behaviors construct is appropriate for individuals with increased risk of developing type 2 diabetes to adopt healthy lifestyle changes, with goals for dietary
change and physical activity that are intended to achieve modest weight loss (7% of body weight). Individuals 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 through the impediments to change.

- Evidence-based approaches that start with small changes assist individuals 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 individual’s unique situation.

- 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. At least 150 minutes per week of moderate activity, such as brisk walking, is recommended. Since safety is an important consideration before initiating an activity plan, it is important to obtain a health history to ensure that the individual does not have any factors that may counter-indicate adopting an exercise program.

Excellent educational support materials are available on line; several are from the National Diabetes Education Program.

- Establish accountability to maintain weight loss goals by scheduling regular follow-up visits to assess weight and to help individuals solve problems that may mitigate their maintaining healthy lifestyle goals.

- All materials, education, and coaching approaches should target the uniqueness of each individual as necessary for success.

References
