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Prediabetes, educational approaches for Lifestyle and Health Improvement

Prediabetes is defined as blood sugar or glucose levels that are higher than normal but not high enough for a diagnosis of type 2 diabetes mellitus (T2DM), according to the ADA in its 2024 standards(1). The World Health Organization (WHO), in its latest 2023 diabetes report, does not use the term "prediabetes" but instead refers to impaired fasting glucose (IFG), impaired glucose tolerance (IGT), or a combination of the 2 (IFG + IGT), all of which indicate a high risk of developing T2DM and cardiovascular complications such as myocardial infarction or stroke(2).

Diagnostic criteria are defined by HbA1c levelS between 5.7% AND 6.4%, impaired fasting glucose (IFG) of 100-125 mg/dL, and impaired glucose tolerance (IGT) with blood glucose levels between 140-199 mg/dL 2 hours after a 75 g oral glucose tolerance test (OGTT). ***Table 1***.

Prediabetes is generally considered a risk factor for diabetes, with a direct association with the development of cardiovascular complications. It is closely associated with the obesity pandemic and the overall increase in population weight seen in recent decades(3).

Approximately 5% to 10% of people with prediabetes progress to diabetes each year, while a similar proportion return to normal glucose levels(4, 5).

WHAT ARE THE MAIN CAUSES OF PREDIABETES?

1. **Insulin resistance:** The body becomes less sensitive to insulin, which helps glucose (sugar) enter the cells for energy.
2. **Reduced insulin production:** The pancreas does not produce enough insulin to keep blood glucose levels under control.
3. **Overweight and obesity:** Excess body fat, especially around the waist, is closely linked to prediabetes.
    - **Lack of physical activity:** A sedentary lifestyle increases the risk of insulin resistance.
    - **Family history of diabetes:** Having relatives with T2D increases the risk.
    - **Age:** The risk increases with age.
    - **Race or ethnicity:** Some ethnic groups have a higher risk of developing prediabetes.
    - **History of gestational diabetes:** Women who had gestational diabetes are at higher risk.
    - **High blood pressure:** Hypertension is a risk factor.
    - **High cholesterol:** Elevated cholesterol levels, particularly "bad" cholesterol (LDL), increase the risk.
    - **Metabolic syndrome:** A combination of high blood pressure, abnormal cholesterol levels, and central obesity.
    - **Sleep apnea:** A sleep disorder causing breathing pauses.
    - **Non-alcoholic fatty liver disease:** Fat accumulation in the liver.

WHY IS DIABETES INCREASING?

In recent years, our lifestyles have changed significantly. We spend more time sitting, have less time for exercise, and consume more fast and processed foods. These changes have led to weight gain and an increase in health problems such as obesity.

WHAT CAN BE DONE TO PREVENT OR REVERSE IT?

The good news is that we can take many steps to prevent obesity, metabolic syndrome, and T2DM. Studies show that modifying diet and increasing physical activity can help maintain a healthy weight and reduce disease risk(6). Lifestyle interventions can return prediabetic individuals to normal glucose levels.

The first step is to assess the risk of diabetes or prediabetes.

Screening through a specific questionnaire »

THE WORLD HEALTH ORGANIZATION, IN ITS LATEST 2023 DIABETES REPORT, DOES NOT USE THE TERM "PREDIABETES" BUT INSTEAD REFERS TO IMPAIRED FASTING GLUCOSE, IMPAIRED GLUCOSE TOLERANCE, OR A COMBINATION OF THE TWO

TABLE 1. Diagnostic criteria for prediabetes according to ADA (2024)

DEFINITION OF PREDIABETES	
HbA1C or fasting IFG or ITG.	5.7-6.5% or 100-125 mg/dL or 140-199 mg/dL

PREDIABETES IS TYPICALLY CONSIDERED A RISK FACTOR FOR DIABETES, WITH A DIRECT ASSOCIATION TO THE DEVELOPMENT OF CARDIOVASCULAR COMPLICATIONS. IT IS CLOSELY LINKED TO THE OBESITY PANDEMIC AND THE GENERAL INCREASE IN POPULATION WEIGHT

» (FINDRISC test)(7) and/or fasting glucose measurement in high-risk individuals can identify those at risk, helping guide clinical management.

WHAT MEASURES HAVE THE STRONGEST EVIDENCE?

The primary goal of diabetes education is to empower patients to adopt and maintain behaviors that lead to optimal disease management(8).

Overweight or obese adults at risk for T2DM should enroll in an intensive lifestyle change program to achieve and sustain at least a 7% weight loss, through a low-calorie diet and 150 minutes of moderate-intensity physical activity per week.

Additionally, the possibility of following various dietary guidelines to prevent T2DM in individuals with diabetes can be considered, with a cost-effectiveness ratio for lifestyle modification programs aimed at diabetes prevention. These programs should be offered to adults at high risk of developing T2DM (1).

Based on individual preferences, certified technology-assisted diabetes prevention programs may be effective in preventing T2DM and should be taken into consideration.

WHAT EDUCATIONAL APPROACHES ARE MOST USEFUL FOR PATIENTS WITH PREDIABETES?

Table 2 provides detailed educational approaches, including descriptions and practical examples. D

CONCLUSIONS

Prediabetes can progress to T2DM and cardiovascular complications. The main causes include insulin resistance, insufficient insulin production, and risk factors such as obesity, lack of physical activity, family history, hypertension, and metabolic syndrome. The growing prevalence of prediabetes is linked to lifestyle changes, such as reduced physical activity and unhealthy diets.

To prevent and reverse prediabetes, making dietary changes and increasing physical activity is essential, particularly for high-risk individuals. Education programs that emphasize nutrition, weight monitoring, stress management, and improved sleep habits have shown effectiveness. Continuous education and patient empowerment are fundamental in achieving optimal management and reducing the risk of progression to T2DM.

TABLE 2. Educational approaches with practical examples

APPROACH	DESCRIPTION	EXAMPLES
PERSONALIZED NUTRITIONAL EDUCATION	Encourage consumption of fiber-rich foods like fruits, vegetables, legumes, and whole grains. Reduce intake of added sugars and refined carbohydrates.	Nutritional education programs that teach patients to read food labels and control portions. Healthy cooking workshops, personalized weekly meal planning, guidance on fruit, vegetable, whole grain, and lean protein consumption.
PROMOTION OF REGULAR PHYSICAL ACTIVITY	Recommend at least 150 minutes of moderate exercise per week. Activities like walking, swimming, or cycling can improve insulin sensitivity and glucose control.	Walking groups or exercise classes organized by health-care centers. Incorporate physical activity into daily routines (taking stairs, walking more, etc.).
REGULAR WEIGHT MONITORING AND CONTROL	Teach patients to track their weight regularly, identify patterns, and connect habits with weight changes.	Use of mobile applications that log weight and provide recommendations for maintaining a healthy weight.
STRESS MANAGEMENT	Stress can increase glucose levels. Educate patients on stress-reduction techniques such as meditation, deep breathing, or yoga.	Mindfulness programs or cognitive-behavioral therapy. Relaxation techniques (deep breathing, meditation), yoga, tai chi.
IMPROVING SLEEP HABITS	Promote a regular sleep routine, as lack of sleep can negatively affect glucose control and appetite.	Sleep hygiene workshops that educate on the importance of adequate rest.
SOCIAL SUPPORT PROGRAMS AND PATIENT EMPOWERMENT EDUCATION	Create support groups where patients with prediabetes can share experiences and motivate each other to adopt a healthier lifestyle.	Community or online support groups providing continuous education on prediabetes.
REGULAR GLUCOSE LEVEL MONITORING	Educate patients on the importance of measuring glucose levels regularly to identify patterns and make adjustments in diet and physical activity.	Practical demonstrations on glucometer use, daily glucose tracking, and identifying factors that influence glucose levels. Use of real-time glucose monitoring devices.
REDUCING ALCOHOL AND TOBACCO CONSUMPTION	Educate patients on the metabolic health risks of alcohol and tobacco use and offer cessation or reduction programs.	Counseling and support programs for quitting smoking or reducing alcohol consumption.

AUTHOR: Own work.

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