

## Dietary guidelines in diabetes – why are they so difficult to follow?

Zalecenia żywieniowe w cukrzycy – dlaczego tak trudno ich przestrzegać?

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### Dietary guidelines in diabetes

Nutrition is one of the elements of behavioral therapy that is a pillar of proper care and education of patients with diabetes, both type 1 and 2. The aim of nutritional therapy is to promote and support healthy eating patterns, meet the individual nutritional needs of patients, maintain pleasure evoked by food and provide a person with diabetes with tools to improve the quality of their diet. Diet in diabetes should be adjusted to exert a favorable effect on glycemia, glycosylated hemoglobin concentration and reduce the risk of acute and chronic complications. Cooperation with an experienced dietitian is extremely helpful in the development and implementation of an appropriate nutritional plan [1, 2].

No single, universal type of diet meets the needs of every patient. Recommended dietary models in diabetes may include: the Mediterranean diet, DASH diet (Dietary Approaches to Stop Hypertension), flexitarian diet, plant-based diets and low-carbohydrate diets. Most of the above-mentioned dietary models assume a significant share of non-starchy vegetables, maximum reduction of added sugars and refined grains, as well as a diet based on minimally processed foods.

According to the recommendations of numerous diabetic societies, an individualized meal plan should be based on the principles of healthy nutrition, which is also dedicated to healthy people [3–6]. These recommendations are illustrated in a simple and transparent way by the Healthy Eating Plate developed by the National Center of Nutrition Education [7]. As regards the version for a person with diabetes, it is based on non-starchy vegetables (tomato, lettuce, spinach, cucumber, radish, kohlrabi, bell peppers, kale, cabbage, brussels sprouts, green beans) and fruits, which together should occupy half of the plate. It is recommended that children aged 2 years and older consume 180 g of vegetables and 150 g of fruits during the day, and for children older than 4 years of age, the amount of vegetables and fruits should exceed 400 g [4].

Another quarter of the plate should contain products that are a source of complex carbohydrates and dietary fiber, i.e., whole grain cereals (whole grain bread, coarse-grained groats, whole grain flour pasta, pasta or rice with a low glycemic index) or starchy vegetables (potatoes, pumpkin, corn, green peas). The last quarter of the plate should contain protein products. These may be products of animal origin (lean poultry, fish, eggs, milk and dairy products) and vegetable origin (pulses, i.e., lentils, chickpeas, beans, peas, soy, nuts, seeds). The diet should be supplemented with a small amount of vegetable fats (vegetable oils and such products as nuts and seeds). Tropical oils, i.e., coconut and palm oil, should be avoided because they are a source of saturated fatty acids [3]. Regular meal times are also important factors influencing optimal glycemic outcomes. The meal schedule should be based on 3 main meals (breakfast, lunch and dinner) with possible healthy snacks for the second breakfast and/or afternoon snack.

Achieving and maintaining a normal body weight is an important goal in the clinical treatment of diabetes [8]. Therefore, when determining the energy requirement of the patient's diet, current body weight, physical activity, age and sex should be taken into account [9]. According to scientific evidence, there is no ideal percentage of calories from carbohydrates, proteins, and fats for everyone in a diet designed to prevent and treat diabetes. The distribution of macronutrients should be determined on the basis of an individualized assessment considering the patient's preferred nutritional pattern and its metabolic goals. It may fall within wide ranges: carbohydrates 40–50%, fats 25–40%, proteins 15–25% of energy from the diet [3–6].

It is recommended to avoid any restrictive diets that may be deficient and have an adverse influence on the growth and development of children. Although there is a lack of scientific evidence to support the practice of low-carbohydrate diets among young people with type 1 diabetes, the interest in their use continues to grow. According to some authors, low-carbohydrate diets (< 26% kcal from carbohydrates, < 130 g/d) and

very low-carbohydrate diets (< 10% kcal from carbohydrates, < 50 g/d) may be used as an additional treatment option for people with type 1 diabetes [10]. Strict adherence to very low-carbohydrate (ketogenic) diets may result in ketonemia or ketosis, dyslipidemia, and eating disorders [11]. The analyses of many data confirmed that ketogenic diets were unbalanced and might lead to stunted growth in children. Moreover, diets limiting the supply of carbohydrates may increase the risk of hypoglycemia or potentially weaken the effect of glucagon in the treatment of severe hypoglycemia [12]. Long-term studies on the use of low-carbohydrate diets in the treatment of diabetes are still lacking [4, 13]. Regardless of the amount of carbohydrates in the diet, effort needs to be made to minimize postprandial increase in glycemia, which is mainly caused by carbohydrates, through an appropriate time of insulin administration, moderate amount of protein and increased amount of dietary fiber in the meal, and the use of products with a low glycemic index [3–5].

### Why do patients often fail to follow dietary recommendations?

Non-adherence to therapeutic recommendations, including dietary ones, is among the most serious problems in the treatment of people with diabetes. This is one of the most important obstacles to achieving the benefits of diabetes therapy. As shown by research conducted by the Coalition to Fight Diabetes, adherence to a diet is a significant problem for people with diabetes [14]. Diabetics are reluctant to accept the need for nutritional restrictions. As a consequence of a poor diet, any, even the most sophisticated diabetes therapy, may prove to be ineffective. Not only patients underestimate the importance of diet therapy. Numerous physicians frequently underrate non-adherence to dietary recommendations, and many of them

show great tolerance towards patients who do not follow dietary recommendations [15].

Difficulties in complying with dietary recommendations are related to such issues as:

- difficult glycemic control due to a variety of factors (physical activity, stress, hormonal changes, concomitant diseases);
- the need to change eating habits, especially if the previous ones were inappropriate, eliminating or limiting the consumption of products such as sweets or processed foods;
- failure to adapt the diet to the individual needs and preferences of the patient;
- fatigue and routine associated with monitoring the diet and measuring blood glucose levels, lack of rapid improvement in glycemic control, which causes discouragement and weakens motivation;
- lack of regular education and support from medical caregivers, dietitians and family in understanding the importance of specific nutritional principles;
- failure to take account of the intellectual capacity to monitor carbohydrate intake, which is difficult and time-consuming, especially at the beginning;
- resignation from following a diet and choosing unhealthy products in response to difficult emotions (stress, anxiety, frustration);
- pressure in social situations, e.g., those related to meals in restaurants, during family or social gatherings, when people with diabetes feel pressure to eat what others eat [16–18].

It is worth understanding these challenges and talking to your healthcare team and dietitian to develop a personalized nutritional plan and coping strategies to increase the effectiveness of behavioral therapy. Psychological and social support may also play a key role in strengthening the sense of responsibility for one's health, increasing involvement in the therapeutic process, including adherence to dietary recommendations.

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