

Diabetes mellitus

The term diabetes mellitus describes diseases of abnormal carbohydrate metabolism that are characterized by hyperglycemia. It is associated with a relative or absolute impairment in insulin secretion, along with varying degrees of peripheral resistance to the action of insulin.

Clinical presentation

Type 2 diabetes – Type 2 diabetes is by far the most common type of diabetes in adults (>90 percent) and is characterized by hyperglycemia usually due to progressive loss of insulin secretion from the beta cell superimposed on a background of insulin resistance, resulting in relative insulin deficiency. The majority of patients are asymptomatic at presentation, with hyperglycemia noted on routine laboratory evaluation, prompting further testing. The classic symptoms of hyperglycemia (including polyuria, polydipsia, nocturia, blurred vision, and weight loss) are often noted only in retrospect after a blood glucose value has been shown to be elevated. Rarely adults with type 2 diabetes can present with a hyperosmolar hyperglycemic state or diabetic ketoacidosis (DKA).

Type 1 diabetes – Type 1 diabetes is characterized by autoimmune destruction of the pancreatic beta cells, leading to absolute insulin deficiency. Type 1 diabetes accounts for approximately 5 to 10 percent of diabetes in adults.

Diabetes education

Patients with newly diagnosed diabetes should participate in a comprehensive diabetes self-management education program, which includes individualized instruction on nutrition, physical activity, optimizing metabolic control, and preventing complications.

Medical nutrition therapy — Medical nutrition therapy (MNT) is the process by which the dietary plan is tailored for people with diabetes, based on medical, lifestyle, and personal factors. It is an integral component of diabetes management and diabetes self-management education.

Weight reduction — For patients with type 2 diabetes with overweight (BMI ≥ 25 to 29.9 kg/m²) or obesity (BMI ≥ 30 kg/m²), major emphasis should be placed on lowering caloric intake, increasing physical activity, and behavior modification to achieve weight loss. Improved glycemic control induced by

weight loss is associated with partial correction of the two major metabolic abnormalities in type 2 diabetes: insulin resistance and impaired insulin secretion.

Diet — Weight loss through dietary modification can improve many aspects of type 2 diabetes, including glycemic control and hypertension. The improvement in glycemic control is related both to the degree of caloric restriction and weight reduction. Consumption of sugar-sweetened beverages should be specifically queried and strongly discouraged. Modest weight reduction may also improve liver function in nonalcoholic steatohepatitis, which is associated with insulin resistance and type 2 diabetes.

Pharmacologic therapy — Pharmacotherapy for weight loss may be effective in patients with type 2 diabetes, but it is generally associated with high dropout rates due to medication side effects and is not recommended as primary therapy for diabetes.

Surgical therapy — Weight loss surgery in patients with obesity and type 2 diabetes results in the largest degree of sustained weight loss and, in parallel, improvements in blood glucose control. Weight loss surgery is an option to treat poorly controlled type 2 diabetes when other modalities have failed.

Exercise — Adults with diabetes are encouraged to decrease sedentary time and to perform 30 to 60 minutes of moderate-intensity aerobic activity on most days of the week (at least 150 minutes of moderate-intensity aerobic exercise per week, spread over at least three days per week, with no more than two consecutive days without exercise). Shorter-duration, intensive exercise may be appropriate for physically fit individuals. In the absence of contraindications (eg, moderate to severe proliferative retinopathy, severe coronary artery disease), people with type 2 diabetes should also be encouraged to perform resistance training (exercise with free weights or weight machines) at least twice per week. Regular exercise is beneficial in type 2 diabetes, independent of weight loss. It leads to improved glycemic control due to increased responsiveness to insulin; it can also delay the progression of impaired glucose tolerance to overt diabetes. These beneficial effects are directly due to exercise, but concurrent weight reduction plays a contributory role.

Intensive lifestyle modification — In patients with established type 2 diabetes, intensive behavioral modification interventions focusing on weight reduction and increasing activity levels are successful in reducing weight and

improving glycemic control while, at the same time, reducing the need for glucose-lowering and other medications.

Psychological interventions — Patients with type 2 diabetes often experience significant stress, a condition often called diabetes distress, related to the many self-care responsibilities to optimize glycemic control (lifestyle modifications, medication, and self-monitoring of blood glucose [SMBG])

Pregnancy planning — All women of childbearing age with diabetes should be counseled about the potential effects of diabetes and commonly used medications on maternal and fetal outcomes and the potential impact of pregnancy on their diabetes control and any existing complications.