



# CLASSIFICATION OF DIABETES MELLITUS 2019



World Health  
Organization

# 1. Diabetes: Definition and diagnosis

The term diabetes describes a group of metabolic disorders characterized and identified by the presence of hyperglycaemia in the absence of treatment. The heterogeneous aetio-pathology includes defects in insulin secretion, insulin action, or both, and disturbances of carbohydrate, fat and protein metabolism. The long-term specific effects of diabetes include retinopathy, nephropathy and neuropathy, among other complications. People with diabetes are also at increased risk of other diseases including heart, peripheral arterial and cerebrovascular disease, obesity, cataracts, erectile dysfunction, and nonalcoholic fatty liver disease. They are also at increased risk of some infectious diseases, such as tuberculosis.

Diabetes may present with characteristic symptoms such as thirst, polyuria, blurring of vision, and weight loss. Genital yeast infections frequently occur. The most severe clinical manifestations are ketoacidosis or a non-ketotic hyperosmolar state that may lead to dehydration, coma and, in the absence of effective treatment, death. However, in T2DM symptoms are often not severe, or may be absent, owing to the slow pace at which the hyperglycaemia is worsening. As a result, in the absence of biochemical testing, hyperglycaemia sufficient to cause pathological and functional changes may be present for a long time before a diagnosis is made, resulting in the presence of complications at

(41, 42). Many of those who are not obese by BMI criteria have a higher proportion of body fat distributed predominantly in the abdominal region, indicating visceral adiposity compared to people without diabetes (43). However, in some populations, such as Asians,  $\beta$ -cell dysfunction appears to be a more notable prominent than in populations of European descent (44). This is also observed in thinner people from low- and middle-income countries such as India (45), and among people of Indian descent living in high-income countries (46, 47).

For most people with T2DM, insulin treatment is not required for survival but may be required to lower blood glucose to avert chronic complications. T2DM often remains undiagnosed for many years because the hyperglycaemia is not severe enough to provoke noticeable symptoms of diabetes (48). Nevertheless, these people are at increased risk of developing macrovascular and microvascular complications (49). Complications are a particular problem in young-onset T2DM – increasingly recognized as a severe phenotype of diabetes and associated with greater mortality rates, more complications, and unfavorable cardiovascular disease risk factors when compared to T1DM of similar duration (50, 51). In addition, the response to oral blood glucose medications is often poor among young people with diabetes (52).

Many factors increase the risk of developing T2DM including age, obesity, unhealthy lifestyles and prior