

## ARTICLE INFO

## Article history:

Received 27 May 2022

Received in revised form

1 August 2022

Accepted 2 August 2022

Available online 27 September 2022

## Key words:

antihyperglycemic medications  
 atherosclerotic cardiovascular disease  
 cardiovascular diseases  
 diabetes  
 gestational  
 diabetes mellitus  
 diabetes mellitus, type 1  
 diabetes mellitus, type 2  
 diabetic nephropathies  
 diabetic neuropathies  
 diabetic retinopathy  
 dyslipidemias  
 guideline  
 hospitalization  
 hypertension  
 hypoglycemia  
 infertility  
 interdisciplinary communication  
 metabolic syndrome  
 obesity  
 occupations  
 prediabetic state  
 pregnancy  
 secondary diabetes  
 sleep apnea syndromes  
 telemedicine  
 vaccination

## ABSTRACT

**Objective:** The objective of this clinical practice guideline is to provide updated and new evidence-based recommendations for the comprehensive care of persons with diabetes mellitus to clinicians, diabetes-care teams, other health care professionals and stakeholders, and individuals with diabetes and their caregivers.

**Methods:** The American Association of Clinical Endocrinology selected a task force of medical experts and staff who updated and assessed clinical questions and recommendations from the prior 2015 version of this guideline and conducted literature searches for relevant scientific papers published from January 1, 2015, through May 15, 2022. Selected studies from results of literature searches composed the evidence base to update 2015 recommendations as well as to develop new recommendations based on review of clinical evidence, current practice, expertise, and consensus, according to established American Association of Clinical Endocrinology protocol for guideline development.

**Results:** This guideline includes 170 updated and new evidence-based clinical practice recommendations for the comprehensive care of persons with diabetes. Recommendations are divided into four sections: (1) screening, diagnosis, glycemic targets, and glycemic monitoring; (2) comorbidities and complications, including obesity and management with lifestyle, nutrition, and bariatric surgery, hypertension, dyslipidemia, retinopathy, neuropathy, diabetic kidney disease, and cardiovascular disease; (3) management of prediabetes, type 2 diabetes with antihyperglycemic pharmacotherapy and glycemic targets, type 1 diabetes with insulin therapy, hypoglycemia, hospitalized persons, and women with diabetes in pregnancy; (4) education and new topics regarding diabetes and infertility, nutritional supplements, secondary diabetes, social determinants of health, and virtual care, as well as updated recommendations on cancer risk, nonpharmacologic components of pediatric care plans, depression, education and team approach, occupational risk, role of sleep medicine, and vaccinations in persons with diabetes.

**Conclusions:** This updated clinical practice guideline provides evidence-based recommendations to assist with person-centered, team-based clinical decision-making to improve the care of persons with diabetes mellitus.

© 2022 AACE. Published by Elsevier Inc. All rights reserved.

## Lay Abstract

Advances in medications and tools to monitor blood sugar are helping persons with diabetes greatly improve control of their blood sugar levels, excess weight, high blood pressure, and quality of life. This American Association of Clinical Endocrinology guideline provides recommendations for the diagnosis and treatment of persons with prediabetes and diabetes and its prevention.

Care of persons with prediabetes and diabetes includes change in lifestyle with a focus on sleep, healthy eating, and exercise. Reaching goals for blood sugar, blood pressure, fats like cholesterol, and weight can prevent harm from diabetes to eyes, kidneys, heart, and nervous system. Many newer, safer drugs control blood sugar and reduce risk of heart and kidney disease. Some drugs also lower cholesterol and weight. Ways to check blood sugar levels with fingersticks or sensors placed under the skin (continuous glucose monitors) have improved, making it easier and safer for persons with diabetes to avoid both low and high blood sugars.

A team approach helps people best manage diabetes. The individual with diabetes is the center of the team and should help make decisions together with their doctors. In addition to doctors, the team may include educators, nurses, dietitians, pharmacists, foot doctors, psychologists, and other specialists.

This guideline addresses other topics of interest to those living with or at risk for diabetes such as health care visits by computer or phone, access to care, management of diabetes at work, sleep disorders, depression, infertility, risk of cancer, safety of nutritional supplements, and benefits of vaccines. Also included are specific care and treatment needs of pregnant women and those who are hospitalized.

The American Association of Clinical Endocrinology hopes that this guideline will improve the management of diabetes and benefit all who live with prediabetes or diabetes and their caregivers.

## Abbreviations

AACE, American Association of Clinical Endocrinology; ABCD, adiposity-based chronic disease; ABPM, ambulatory BP monitoring; ACCORD, Action to Control Cardiovascular Risk in Diabetes; ACE, angiotensin-converting enzyme; ACIP, CDC Advisory Committee on Immunization Practices; ADA, American Diabetes Association; ADVANCE, Action in Diabetes and Vascular Disease: Preterax and Diamicron Modified Release Controlled Evaluation; AHA, American Heart Association; AHEI, Alternative Healthy Eating Index; aHR, adjusted hazard ratio; AID, automated insulin delivery; AKI, acute kidney injury; apo B, apolipoprotein B; ARB, angiotensin II receptor blocker; ASCVD, atherosclerotic cardiovascular disease; A1C, hemoglobin A1c; BG, blood glucose; BGM, blood glucose monitoring; BMI, body mass index; BP, blood pressure; CAN, cardiovascular autonomic neuropathy; CDC, Centers for Disease Control and Prevention; CDCEs, certified diabetes care and education specialist; CFRD, cystic fibrosis-related diabetes; CGM, continuous glucose monitoring; CHF, congestive heart failure; CKD, chronic kidney disease; CKD-EPI, Chronic Kidney Disease Epidemiology; CMD, cardiometabolic disease; CPAP, continuous positive airway pressure; CPG, clinical practice guideline; CRP, C-reactive protein; CSII, continuous subcutaneous insulin infusion; CV, cardiovascular; CVA, cerebrovascular accident; CVD, cardiovascular disease; CVOT, cardiovascular outcome trial; DASH, Dietary Approaches to Stop Hypertension; DKA, diabetic ketoacidosis; DKD, diabetic kidney disease; DM, diabetes mellitus; DPN, diabetic peripheral neuropathy; DPP-4, dipeptidyl peptidase 4; DSMES, diabetes self-management education and support; eGFR, estimated glomerular filtration rate; EL, evidence level; FDA, Food and Drug Administration; FIELD, Fenofibrate Intervention and Event Lowering in Diabetes; FPG, fasting plasma glucose; GDM, gestational diabetes mellitus; GFR, glomerular filtration rate; GI, gastrointestinal; GLP-1 RA, glucagon-like peptide-1 receptor agonist; HAPO, Hyperglycemia and Pregnancy Outcomes; HCL, hybrid closed-loop; HDL-C,