Standards of Care in Diabetes—2023 Abridged for Primary Care Providers

American Diabetes Association

The American Diabetes Association's (ADA's) Standards of Care in Diabetes is updated and published annually in a supplement to the January issue of *Diabetes Care*. The Standards of Care is developed by the ADA's multidisciplinary Professional Practice Committee, which comprises expert diabetes health care professionals (HCPs). It includes the most current evidence-based recommendations for diagnosing and treating adults and children with all forms of diabetes. ADA's grading system uses A, B, C, or E to show the evidence level that supports each recommendation.

- A—Clear evidence from well-conducted, generalizable randomized controlled trials that are adequately powered
- B—Supportive evidence from well-conducted cohort studies
- C—Supportive evidence from poorly controlled or uncontrolled studies
- E—Expert consensus or clinical experience

This is an abridged version of the current Standards of Care containing the evidence-based recommendations most pertinent to primary care. The recommendations, tables, and figures included here retain the same numbering used in the complete Standards of Care. All of the recommendations included here are substantively the same as in the complete Standards of Care. The abridged version does not include references. The complete 2023 Standards of Care, including all supporting references, is available at professional.diabetes.org/standards.

1. IMPROVING CARE AND PROMOTING HEALTH IN POPULATIONS

Diabetes and Population Health

Person-centered care considers individual patient comorbidities and prognoses; is respectful of and responsive to patient preferences, needs, and values; and ensures that patient values guide all clinical decisions. Further, social determinants of health (SDOH)—often out of direct control of the individual and potentially representing lifelong risk—contribute to health care and psychosocial outcomes and must be addressed to improve all health outcomes.

Recommendations

1.1 Ensure treatment decisions are timely, rely on evidence-based guidelines, include social community support, and are made collaboratively with patients based on individual preferences, prognoses, comorbidities, and informed financial considerations. B

1.2 Align approaches to diabetes management with the Chronic Care Model. This model emphasizes person-centered team care, integrated long-term treatment approaches to diabetes and comorbidities, and ongoing collaborative communication and goal-setting between all team members. A

1.3 Care systems should facilitate in-person and virtual team-based care, including those knowledgeable and experienced in diabetes management as part of the team and utilization of patient registries, decision support tools, and community involvement to meet patient needs. B

Strategies for System-Level Improvement

Care Teams

Collaborative, multidisciplinary teams are best suited to provide care for people with diabetes and to facilitate patients' self-management with emphasis on avoiding therapeutic inertia to achieve recommended metabolic targets.

Telehealth

Telehealth may increase access to care for people with diabetes. Telehealth should be used complementary to in-person visits to optimize glycemic management in

https://doi.org/10.2337/cd23-as01

people with unmanaged diabetes. Evidence suggests that telehealth may be effective at reducing A1C in people with type 2 diabetes compared with or in addition to usual care. Interactive strategies that facilitate communication between HCPs and patients appear more effective.

Behaviors and Well-Being

Successful diabetes care requires a systematic approach to supporting patients' behavior change efforts, including high-quality diabetes self-management education and support (DSMES).

Tailoring Treatment for Social Context

Recommendations

1.5 Assess food insecurity, housing insecurity/homelessness, financial barriers, and social capital/social community support to inform treatment decisions, with referral to appropriate local community resources. A

1.6 Provide patients with additional self-management support from lay health coaches, navigators, or community health workers when available. A

Diabetes-related health inequities are well documented and have been associated with greater risk for diabetes, higher population prevalence, and poorer diabetes outcomes. Financial barriers to medication use continue to contribute to health disparities.

2. CLASSIFICATION AND DIAGNOSIS OF DIABETES

Classification

Diabetes can be classified into the following general categories:

1. Type 1 diabetes (due to autoimmune β-cell destruction, usually leading to absolute insulin deficiency including latent autoimmune diabetes of adulthood)
2. Type 2 diabetes (due to a progressive loss of β-cell insulin secretion frequently on the background of insulin resistance)
3. Specific types of diabetes due to other causes, e.g., monogenic diabetes syndromes (such as neonatal diabetes and maturity-onset diabetes of the young), diseases of the exocrine pancreas (such as cystic fibrosis and pancreatitis), and drug- or chemical-induced diabetes (such as with glucocorticoid use, in the treatment of HIV/AIDS, or after organ transplantation)
4. Gestational diabetes mellitus (GDM; diabetes diagnosed in the second or third trimester of pregnancy that was not clearly overt diabetes prior to gestation)

The classification of diabetes type is not always straightforward at presentation, and misdiagnosis may occur. Therefore, constant diligence and sometimes reevaluation is necessary. Children with type 1 diabetes typically present with polyuria and polydipsia, and approximately half present with diabetic ketoacidosis (DKA). Adults with type 1 diabetes can be diagnosed at any age and may not present with classic symptoms. They may have temporary remission from the need for insulin. The diagnosis may become more obvious over time and should be reevaluated if there is concern.

Screening and Diagnostic Tests for Prediabetes and Type 2 Diabetes

The diagnostic criteria for diabetes and prediabetes are shown in Table 2.2/2.5. Screening criteria for adults and children are listed in Table 2.3 and Table 2.4, respectively. Screening for prediabetes and type 2 diabetes risk through an informal assessment of risk factors

TABLE 2.2/2.5 Criteria for the Screening and Diagnosis of Prediabetes and Diabetes

	Prediabetes	Diabetes
A1C	5.7–6.4% (39–47 mmol/mol)*	≥6.5% (48 mmol/mol)†
FPG	100–125 mg/dL (5.6–6.9 mmol/L)*	≥126 mg/dL (7.0 mmol/L)†
2-hour plasma glucose during 75-g OGTT	140–199 mg/dL (7.8–11.0 mmol/L)*	≥200 mg/dL (11.1 mmol/L)†
Random plasma glucose	–	≥200 mg/dL (11.1 mmol/L)‡

Adapted from Tables 2.2 and 2.5 in the complete 2023 Standards of Care. *For all three tests, risk is continuous, extending below the lower limit of the range and becoming disproportionately greater at the higher end of the range. †In the absence of unequivocal hyperglycemia, diagnosis requires two abnormal test results from the same sample or in two separate samples. ‡Only diagnostic in a patient with classic symptoms of hyperglycemia or hyperglycemic crisis.

TABLE 2.3 Criteria for Screening for Diabetes or Prediabetes in Asymptomatic Adults

1. Testing should be considered in adults with overweight or obesity (BMI ≥25 kg/m^2 or ≥23 kg/m^2 in Asian American individuals) who have one or more of the following risk factors:
   - First-degree relative with diabetes
   - High-risk race/ethnicity (e.g., African American, Latino, Native American, Asian American, Pacific Islander)
   - History of CVD
   - Hypertension (≥130/80 mmHg or on therapy for hypertension)
   - HDL cholesterol level <35 mg/dL (0.90 mmol/L) and/or a triglyceride level >250 mg/dL (2.82 mmol/L)
   - Individuals with polycystic ovary syndrome
   - Physical inactivity
   - Other clinical conditions associated with insulin resistance (e.g., severe obesity, acanthosis nigricans)
2. People with prediabetes (A1C ≥5.7% [39 mmol/mol], IGT, or IFG) should be tested yearly.
3. People who were diagnosed with GDM should have lifelong testing at least every 3 years.
4. For all other people, testing should begin at age 35 years.
5. If results are normal, testing should be repeated at a minimum of 3-year intervals, with consideration of more frequent testing depending on initial results and risk status.
6. People with HIV.

IFG, impaired fasting glucose; IGT, impaired glucose tolerance.

or with an assessment tool, such as the ADA's Diabetes Risk Test (diabetes.org/socrisktest) is recommended and can inform who needs laboratory testing.

Marked discrepancies between measured A1C and plasma glucose levels should prompt consideration that the A1C assay may not be reliable for that individual, and one should consider using an alternate A1C assay or plasma blood glucose criteria for diagnosis. (An updated list of A1C assays with interferences is available at ngsp.org/interf.asp.)

If an individual has a test result near the margins of the diagnostic threshold, the clinician should follow that person closely and repeat the test in 3–6 months. If using the oral glucose tolerance test (OGTT), fasting or carbohydrate restriction 3 days prior to the test should be avoided, as it can falsely elevate glucose levels.

Screening Before Pregnancy

Recommendation

2.26a In individuals who are planning pregnancy, screen those with risk factors **B** and consider testing all individuals of childbearing potential for undiagnosed diabetes. **E**

See "15. MANAGEMENT OF DIABETES IN PREGNANCY" for additional information.

3. PREVENTION OR DELAY OF TYPE 2 DIABETES AND ASSOCIATED COMORBIDITIES

Recommendation

3.1 Monitor for the development of type 2 diabetes in those with prediabetes at least annually; modify based on individual risk/benefit assessment. **E**

TABLE 2.4 Risk-Based Screening for Type 2 Diabetes or Prediabetes in Asymptomatic Children and Adolescents in a Clinical Setting

Screening should be considered in youth* who have overweight (≥85th percentile) or obesity (≥95th percentile) **A** and who have one or more additional risk factors based on the strength of their association with diabetes:
- Maternal history of diabetes or GDM during the child's gestation **A**
- Family history of type 2 diabetes in first- or second-degree relative **A**
- Race/ethnicity (Native American, African American, Latino, Asian American, Pacific Islander) **A**
- Signs of insulin resistance or conditions associated with insulin resistance (acanthosis nigricans, hypertension, dyslipidemia, polycystic ovary syndrome, or small-for-gestational-age birth weight) **B**

*After the onset of puberty or after 10 years of age, whichever occurs earlier. If tests are normal, repeat testing at a minimum of 3-year intervals (or more frequently if BMI is increasing or risk factor profile deteriorating) is recommended. Reports of type 2 diabetes before age 10 years exist, and this can be considered with numerous risk factors.

Lifestyle Behavior Change for Diabetes Prevention

Recommendations

3.2 Refer adults with overweight/obesity at high risk of type 2 diabetes, as typified by the Diabetes Prevention Program (DPP), to an intensive lifestyle behavior change program to achieve and maintain a weight reduction of at least 7% of initial body weight through healthy reduced-calorie diet and ≥150 minutes/week of moderate-intensity physical activity. A

3.3 A variety of eating patterns can be considered to prevent diabetes in individuals with prediabetes. B

The DPP trial demonstrated that an intensive lifestyle intervention could reduce the risk of incident type 2 diabetes by 58% over 3 years. DPP has been proven to be cost-effective and technology-assisted programs may be effective and should be considered.

A list of the Centers for Disease Control and Prevention–recognized diabetes prevention lifestyle change programs is available (cdc.gov/diabetes/prevention/find-a-program.html).

Pharmacologic Interventions

Recommendations

3.6 Metformin therapy for the prevention of type 2 diabetes should be considered in adults at high risk of type 2 diabetes, as typified by the DPP, especially those aged 25–59 years with BMI ≥35 kg/m^2, higher fasting plasma glucose (FPG) (e.g., ≥110 mg/dL), and higher A1C (e.g., ≥6.0%), and in individuals with prior GDM. A

3.7 Long-term use of metformin may be associated with biochemical vitamin B12 deficiency; consider periodic measurement of vitamin B12 levels in metformin-treated individuals, especially in those with anemia or peripheral neuropathy. B

Various pharmacologic agents have been evaluated for type 2 diabetes prevention, and metformin has the strongest evidence base. However, no agents have been approved by the U.S. Food and Drug Administration (FDA) for diabetes prevention.

Prevention of Vascular Disease and Mortality

Recommendations

3.8 Prediabetes is associated with heightened cardiovascular (CV) risk; therefore, screening for and treatment of modifiable risk factors for cardiovascular disease (CVD) are suggested. B

3.9 Statin therapy may increase the risk of type 2 diabetes in people at high risk of developing type 2 diabetes. In such individuals, glucose status should be monitored regularly and diabetes prevention approaches reinforced. It is not recommended that statins be discontinued. B

3.10 In people with a history of stroke and evidence of insulin resistance and prediabetes, pioglitazone may be considered to lower the risk of stroke or myocardial infarction (MI). However, this benefit needs to be balanced with the increased risk of weight gain, edema, and fracture. A Lower doses may mitigate the risk of adverse effects. C

Person-Centered Care Goals

Recommendations

3.11 In adults with overweight/obesity at high risk of type 2 diabetes, care goals should include weight loss or prevention of weight gain, minimizing the progression of hyperglycemia, and attention to CV risk and associated comorbidities. B

3.12 Pharmacotherapy (e.g., for weight management, minimizing the progression of hyperglycemia, CV risk reduction) may be considered to support person-centered care goals. B

3.13 More intensive preventive approaches should be considered in individuals who are at particularly high risk of progression to diabetes, including individuals with BMI ≥35 kg/m^2, those at higher glucose levels (e.g., FPG 110–125 mg/dL, 2-hour postchallenge glucose 173–199 mg/dL, A1C ≥6.0%), and individuals with a history of GDM. A

4. COMPREHENSIVE MEDICAL EVALUATION AND ASSESSMENT OF COMORBIDITIES

Person-Centered Collaborative Care

Recommendations

4.1 A person-centered communication style that uses person-centered, culturally sensitive, and strength-based language and active listening; elicits individual preferences and beliefs; and assesses literacy, numeracy, and potential barriers to care should be used to optimize health outcomes and health-related quality of life (QoL). B

Diabetes treatment goals are to prevent or delay complications and optimize QoL (Figure 4.1). The use of

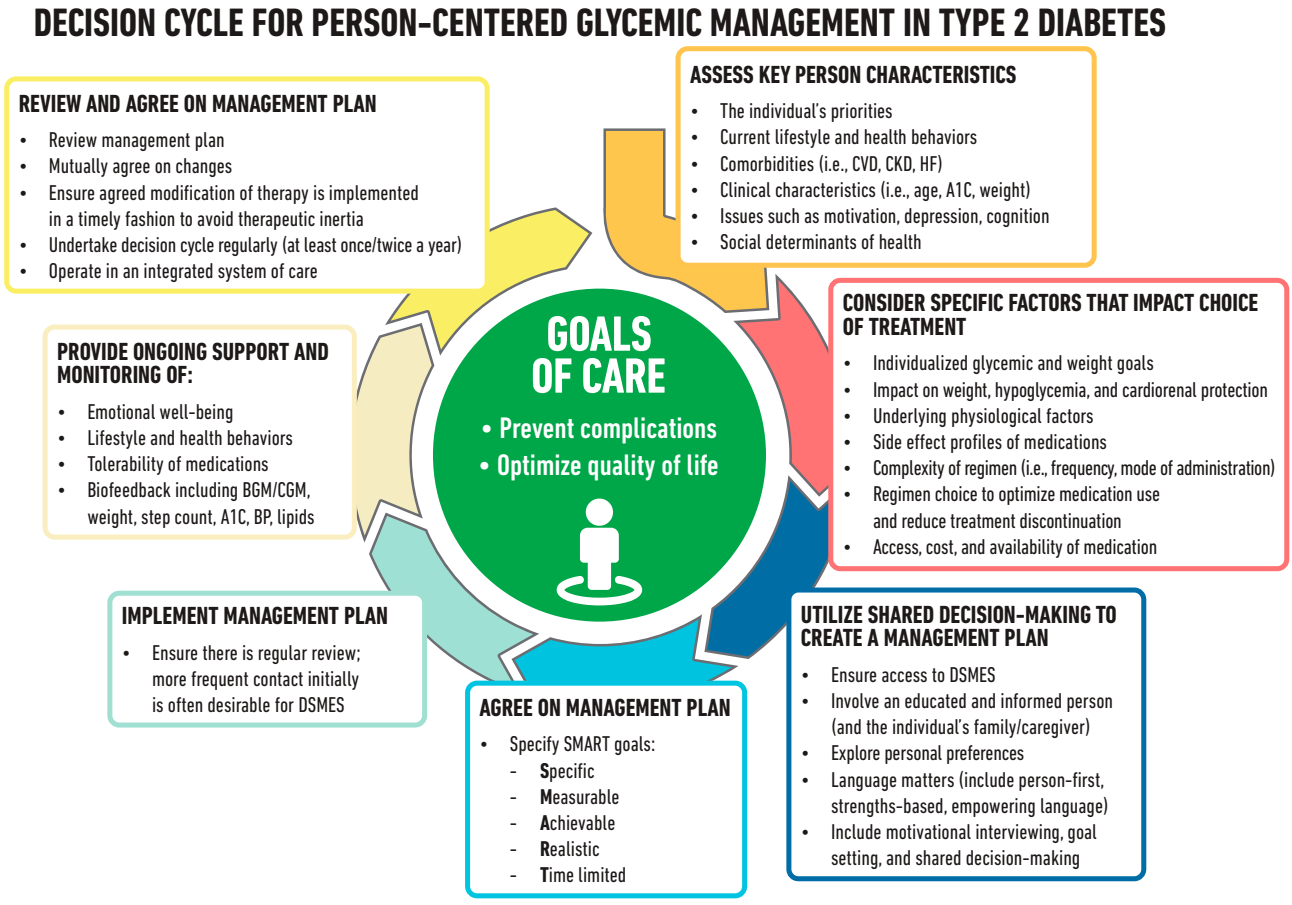


FIGURE 4.1 Decision cycle for person-centered glycemic management in type 2 diabetes. Adapted from Davies MJ, Aroda VR, Collins BS, et al. Diabetes Care 2022;45:2753–2786.

inclusive and empowering language that is respectful and free of stigma can help to inform and motivate people. Language that judges may undermine this effort.

Comprehensive Medical Evaluation

Recommendations

4.3 A complete medical evaluation should be performed at the initial visit to:

- Confirm the diagnosis and classify diabetes. **A**
- Evaluate for diabetes complications, potential comorbid conditions, and overall health status. **A**
- Review previous treatment and risk factor management in people with established diabetes. **A**
- Begin engagement with the person with diabetes in the formulation of a care management plan including initial goals of care. **A**
- Develop a plan for continuing care. **A**

4.4 A follow-up visit should include most components of the initial comprehensive medical evaluation (see Table 4.1 in the complete 2023 Standards of Care). **A**

4.5 Ongoing management should be guided by the assessment of overall health status, diabetes complications, CV risk, hypoglycemia risk, and shared decision-making to set therapeutic goals. **B**

SARS-CoV-2 Vaccines and Other Immunizations

The importance of routine vaccinations for people with diabetes has been elevated by the coronavirus disease 2019 (COVID-19) pandemic. Preventing avoidable infections not only directly prevents morbidity, but also reduces hospitalizations, which may additionally reduce the risk of acquiring infections such as COVID-19. Children and adults with diabetes should receive vaccinations according to age-appropriate recommendations.

In people with diabetes, higher blood glucose levels prior to and during COVID-19 admission have been associated with poor outcomes, including mortality. People with diabetes should be prioritized and offered SARS-CoV-2 vaccines.

Assessment of Selected Comorbidities

Cancer

People with diabetes should be encouraged to undergo recommended age- and sex-appropriate cancer screenings and to reduce their modifiable cancer risk factors (obesity, physical inactivity, and smoking).

Cognitive Impairment/Dementia

See "13. OLDER ADULTS."

Nonalcoholic Fatty Liver Disease

Recommendation

4.10 People with type 2 diabetes or prediabetes with cardiometabolic risk factors, who have either elevated liver enzymes (ALT) or fatty liver on imaging or ultrasound, should be evaluated for presence of nonalcoholic steatohepatitis and liver fibrosis. C

5. FACILITATING POSITIVE HEALTH BEHAVIORS AND WELL-BEING TO IMPROVE HEALTH OUTCOMES

Essential to achieving diabetes treatment goals are DSMES, medical nutrition therapy (MNT), routine physical activity, tobacco cessation counseling when needed, health behavior counseling, and psychosocial care.

DSMES

Recommendations

5.2 There are four critical times to evaluate the need for DSMES to promote skills acquisition to aid treatment plan implementation, MNT, and well-being: at diagnosis, annually and/or when not meeting treatment targets, when complicating factors develop (medical, physical, psychosocial), and when transitions in life and care occur. E

5.4 DSMES should be person-centered, may be offered in group or individual settings, and should be communicated with the entire diabetes care team. A

5.5 Digital coaching and digital self-management interventions can be effective methods to deliver DSMES. B

5.9 Consider addressing barriers to DSMES access through telehealth delivery of care B and other digital health solutions. C

MNT

All HCPs should refer people with diabetes for individualized MNT provided by a registered dietitian nutritionist who is knowledgeable and skilled in providing diabetes-specific MNT.

Goals of Nutrition Therapy for Adults With Diabetes

1. To promote and support healthful eating patterns, emphasizing a variety of nutrient-dense foods in appropriate portion sizes, to improve overall health and:
   - Achieve and maintain body weight goals
   - Attain individualized glycemic, blood pressure (BP), and lipid goals
   - Delay or prevent diabetes complications
2. To address individual nutrition needs based on personal and cultural preferences, health literacy and numeracy, access to healthful foods, willingness and ability to make behavioral changes, and existing barriers to change
3. To maintain the pleasure of eating by providing nonjudgmental messages about food choices while limiting food choices only when indicated by scientific evidence
4. To provide an individual with diabetes the practical tools for developing healthy eating patterns rather than focusing on individual macronutrients, micronutrients, or single foods

Assessing Food Insecurity

Any member of the health care team can screen for food insecurity using The Hunger Vital Sign. Households are considered at risk if they answer either or both of the following statements as "often true" or "sometimes true" (compared with "never true"):

"Within the past 12 months, we worried whether our food would run out before we got money to buy more."

"Within the past 12 months, the food we bought just didn't last, and we didn't have money to get more."

Physical Activity

Recommendations

5.28 Children and adolescents with type 1 diabetes C or type 2 diabetes or prediabetes B should engage in 60 minutes/day or more of moderate- or vigorous-intensity aerobic activity, with vigorous muscle-strengthening and bone-strengthening activities at least 3 days/week.

5.29 Most adults with type 1 diabetes C and type 2 diabetes B should engage in 150 minutes or more of moderate- to vigorous-intensity aerobic activity per week, spread over at least 3 days/week, with no

more than 2 consecutive days without activity. Shorter durations (minimum 75 minutes/week) of vigorous-intensity or interval training may be sufficient for younger and more physically fit individuals.

5.30 Adults with type 1 diabetes C and type 2 diabetes B should engage in 2–3 sessions/week of resistance exercise on nonconsecutive days.

5.31 All adults, and particularly those with type 2 diabetes, should decrease the amount of time spent in daily sedentary behavior. B Prolonged sitting should be interrupted every 30 minutes for blood glucose benefits. C

5.32 Flexibility training and balance training are recommended 2–3 times/week for older adults with diabetes. Yoga and tai chi may be included based on individual preferences to increase flexibility, muscular strength, and balance. C

5.33 Evaluate baseline physical activity and sedentary time. Promote increase in nonsedentary activities above baseline for sedentary individuals with type 1 diabetes E and type 2 diabetes. B Examples include walking, yoga, housework, gardening, swimming, and dancing.

Smoking Cessation: Tobacco and E-Cigarettes

Recommendations

5.34 Advise all individuals not to use cigarettes and other tobacco products or e-cigarettes. A

5.35 After identification of tobacco or e-cigarette use, include smoking cessation counseling and other forms of treatment as a routine component of diabetes care. A

Psychosocial Care

Recommendations

5.38 Psychosocial care should be provided to all people with diabetes, with the goal of optimizing health-related QoL and health outcomes. Such care should be integrated with routine medical care and delivered by trained HCPs using a collaborative, person-centered, culturally informed approach. A When indicated and available, qualified mental health professionals should provide additional targeted mental health care. B

5.39 Diabetes care teams should implement psychosocial screening protocols that may include but are not limited to attitudes about diabetes, expectations for treatment and outcomes, general and diabetes-related mood, stress and/or QoL, available resources (financial, social, family, and emotional), and/or psychiatric history. Screening should occur at periodic intervals and when there is a change in disease, treatment, or life circumstances. C

5.40 When indicated, refer to mental health professionals or other trained HCPs for further assessment and treatment for symptoms of diabetes distress, depression, suicidality, anxiety, treatment-related fear of hypoglycemia, disordered eating, and/or cognitive capacities. Such specialized psychosocial care should use age-appropriate standardized and validated tools and treatment approaches. B

5.42 Routinely monitor people with diabetes, caregivers, and family members for diabetes distress, particularly when treatment targets are not met and/or at the onset of diabetes complications. Refer to a qualified mental health professional or other trained HCP for further assessment and treatment if indicated. B

Please refer to the ADA position statement "Psychosocial Care for People With Diabetes" for a list of assessment tools and additional details and the ADA Mental Health Toolkit (https://professional.diabetes.org/meetings/mental-health-toolkit) for assessment questionnaires and surveys.

Sleep Health

Recommendation

5.55 Consider screening for sleep health in people with diabetes, including symptoms of sleep disorders, disruptions to sleep due to diabetes symptoms or management needs, and worries about sleep. Refer to sleep medicine and/or a qualified behavioral health professional as indicated. B

The associations between sleep problems and diabetes are complex: sleep disorders are a risk factor for developing type 2 diabetes and possibly GDM. Moreover, sleep disturbances are associated with less engagement in diabetes self-management and may interfere with the achievement of glycemic targets among people with type 1 and type 2 diabetes.

6. GLYCEMIC TARGETS

Assessment of Glycemic Control

Glycemic control is assessed by the A1C measurement, continuous glucose monitoring (CGM) using time in range (TIR) and/or glucose management indicator (GMI), and blood glucose monitoring (BGM).

Glycemic Assessment

Recommendations

6.1 Assess glycemic status (A1C or other glycemic measurement such as TIR or GMI) *at least* two times a year in patients who are meeting treatment goals (and who have stable glycemic control). **E**

6.2 Assess glycemic status at least quarterly and as needed in patients whose therapy has recently changed and/or who are not meeting glycemic goals. **E**

Glucose Assessment by CGM

Recommendations

6.3 Standardized, single-page glucose reports from CGM devices with visual cues, such as the ambulatory glucose profile (AGP), should be considered as a standard summary for all CGM devices. **E**

6.4 TIR is associated with the risk of microvascular complications and can be used for assessment of glycemic control. Additionally, time below range (TBR) and time above range (TAR) are useful parameters for the evaluation of the treatment plan (Table 6.2). **C**

Glycemic Goals

Recommendations

6.5a An A1C goal for many nonpregnant adults of <7% (53 mmol/mol) without significant hypoglycemia is appropriate. **A**

6.5b If using AGP/GMI to assess glycemia, a parallel goal for many nonpregnant adults is TIR of >70% with TBR <4% and time <54 mg/dL <1%. For those with frailty or at high risk of hypoglycemia, a target of >50% TIR with <1% TBR is recommended. (See Figure 6.1 and Table 6.2.) **B**

6.6 On the basis of HCP judgment and patient preference, achievement of lower A1C levels than the goal of 7% may be acceptable and even beneficial if it can be achieved safely without significant hypoglycemia or other adverse effects of treatment. **B**

6.7 Less stringent A1C goals (such as <8% [64 mmol/mol]) may be appropriate for patients with limited life expectancy or where the harms of treatment are greater than the benefits. HCPs should consider deintensification of therapy if appropriate to reduce the risk of hypoglycemia in patients with inappropriate stringent A1C targets. **B**

The factors to consider in individualizing goals are depicted in Figure 6.2 in the complete 2023 Standards of Care. Recommended glycemic targets for many nonpregnant adults are shown in Table 6.3. For specific guidance, see "6. Glycemic Targets," "14. Children and Adolescents," and "15. Management of Diabetes in Pregnancy," and "16. Diabetes Care in the Hospital" in the complete 2023 Standards of Care. For information about glycemic targets for older adults, see Table 13.1 in "13. OLDER ADULTS."

TABLE 6.2 Standardized CGM Metrics for Clinical Care

1. Number of days CGM device is worn (recommend 14 days)	
2. Percentage of time CGM device is active (recommend 70% of data from 14 days)	
3. Mean glucose	
4. GMI	
5. Glycemic variability (%CV) target ≤36%*	
6. TAR: % of readings and time >250 mg/dL (>13.9 mmol/L)	Level 2 hyperglycemia
7. TAR: % of readings and time 181–250 mg/dL (10.1–13.9 mmol/L)	Level 1 hyperglycemia
8. TIR: % of readings and time 70–180 mg/dL (3.9–10.0 mmol/L)	In range
9. TBR: % of readings and time 54–69 mg/dL (3.0–3.8 mmol/L)	Level 1 hypoglycemia
10. TBR: % of readings and time <54 mg/dL (<3.0 mmol/L)	Level 2 hypoglycemia

*Some studies suggest that lower %CV targets (<33%) provide additional protection against hypoglycemia for those receiving insulin or sulfonylureas. %CV, percentage coefficient of variation. Adapted from Battelino T, Danne T, Bergenstal RM, et al. Diabetes Care 2019;42:1593–1603.

AGP Report: Continuous Glucose Monitoring

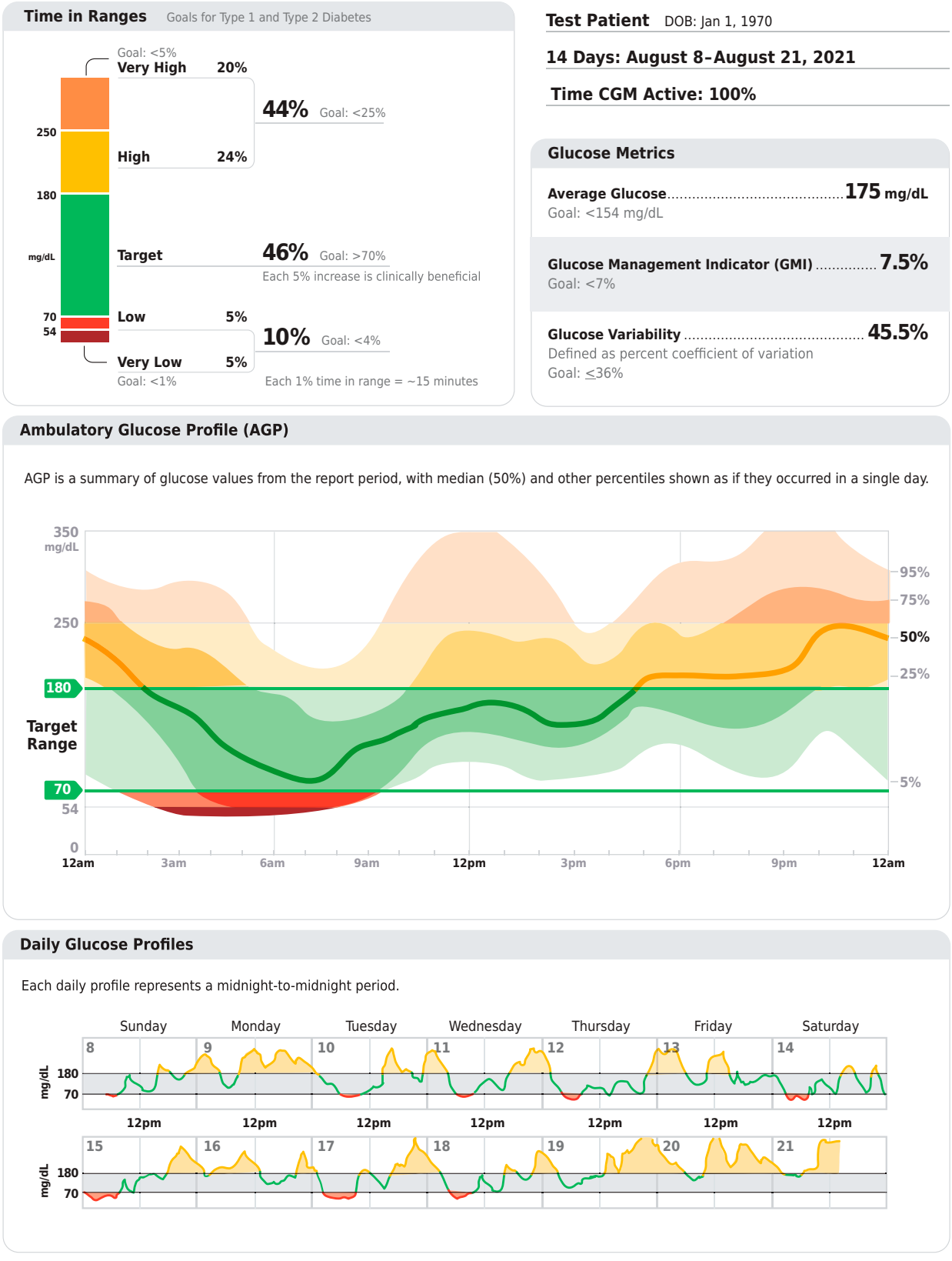


FIGURE 6.1 Key points included in standard AGP report. Reprinted from Holt RIG, DeVries JH, Hess-Fischl A, et al. Diabetes Care 2021;44:2589–2625.

TABLE 6.3 Summary of Glycemic Recommendations for Many Nonpregnant Adults With Diabetes

A1C	<7.0% (53 mmol/mol)*#
Preprandial capillary plasma glucose	80–130 mg/dL* (4.4–7.2 mmol/L)
Peak postprandial capillary plasma glucose†	<180 mg/dL* (10.0 mmol/L)

*More or less stringent glycemic goals may be appropriate for individual patients. #CGM may be used to assess glycemic target as noted in Recommendation 6.5b and Figure 6.1. Goals should be individualized based on duration of diabetes, age/life expectancy, comorbid conditions, known CVD or advanced microvascular complications, hypoglycemia unawareness, and individual patient considerations (as per Figure 6.2 in the complete 2023 Standards of Care). †Postprandial glucose may be targeted if A1C goals are not met despite reaching preprandial glucose goals. Postprandial glucose measurements should be made 1–2 hours after the beginning of the meal, generally peak levels in patients with diabetes.

Hypoglycemia

Recommendations regarding the classification of hypoglycemia are outlined in Table 6.4. See the complete 2023 Standards of Care for detailed hypoglycemia strategies.

Recommendations

6.10 Occurrence and risk for hypoglycemia should be reviewed at every encounter and investigated as indicated. Awareness of hypoglycemia should be considered using validated tools. C

6.11 Glucose (approximately 15–20 g) is the preferred treatment for the conscious individual with blood glucose <70 mg/dL (3.9 mmol/L), although any form of carbohydrate that contains glucose may be used. Fifteen minutes after treatment, if BGM shows continued hypoglycemia, the treatment should be repeated. Once the BGM or glucose pattern is trending up, the individual should consume a meal or snack to prevent recurrence of hypoglycemia. B

6.12 Glucagon should be prescribed for all individuals at increased risk of level 2 or 3 hypoglycemia, so that it is available should it be needed. Caregivers, school personnel, or family members providing support to these individuals should know where it is and when and how to administer it. Glucagon administration is not limited to HCPs. E

6.13 Hypoglycemia unawareness or one or more episodes of level 3 hypoglycemia should trigger hypoglycemia avoidance education and reevaluation and adjustment of the treatment plan to decrease hypoglycemia. E

6.14 Insulin-treated patients with hypoglycemia unawareness, one level 3 hypoglycemic event, or a pattern of unexplained level 2 hypoglycemia should be advised to raise their glycemic targets to strictly avoid hypoglycemia for at least several weeks in order to partially reverse hypoglycemia unawareness and reduce risk of future episodes. A

6.15 Ongoing assessment of cognitive function is suggested with increased vigilance for hypoglycemia by the clinician, patient, and caregivers if impaired or declining cognition is found. B

TABLE 6.4 Classification of Hypoglycemia

	Glycemic Criteria/Description
Level 1	Glucose <70 mg/dL (3.9 mmol/L) and ≥54 mg/dL (3.0 mmol/L)
Level 2	Glucose <54 mg/dL (3.0 mmol/L)
Level 3	A severe event characterized by altered mental and/or physical status requiring assistance for treatment of hypoglycemia

Reprinted from Agiostratidou G, Anhalt H, Ball D, et al. Diabetes Care 2017;40:1622–1630.

7. DIABETES TECHNOLOGY

Diabetes technology includes insulin delivery devices such as insulin pumps (also called continuous subcutaneous insulin infusion [CSII]) and connected insulin pens, glucose monitoring devices via CGM systems and glucose meters, automated insulin delivery (AID) systems that integrate CGM and insulin delivery with algorithms to modulate insulin delivery, and diabetes self-management support software.

General Device Principles

Recommendations

7.1 The type(s) and selection of devices should be individualized based on a person's specific needs, preferences, and skill level. In the setting of an individual whose diabetes is partially or wholly managed by someone else (e.g., a young child or a person with cognitive impairment or dexterity, psychosocial, and/or physical limitations), the caregiver's skills and preferences are integral to the decision-making process. E

TABLE 7.3 CGM Devices

Type of CGM	Description
rtCGM	CGM systems that measure and display glucose levels continuously.
isCGM with and without alarms	CGM systems that measure glucose levels continuously but require scanning for visualization and storage of glucose values.
Professional CGM	CGM devices that are placed on the person with diabetes in the HCP's office (or with remote instruction) and worn for a discrete period of time (generally 7–14 days). Data may be blinded or visible to the person wearing the device. The data are used to assess glycemic patterns and trends. Unlike rtCGM and isCGM devices, these devices are clinic-based and not owned by the person with diabetes.

7.2 When prescribing a device, ensure that people with diabetes/caregivers receive initial and ongoing education and training, either in-person or remotely, and ongoing evaluation of technique, results, and their ability to utilize data, including uploading/sharing data (if applicable), to monitor and adjust therapy. C

7.5 Initiation of CGM, CSII, and/or AID early in the treatment of diabetes can be beneficial depending on a person's/caregiver's needs and preferences. C

BGM

Recommendations

7.7 People who are on insulin using BGM should be encouraged to check their blood glucose levels when appropriate based on their insulin therapy. This may include checking when fasting, prior to meals and snacks, after meals, at bedtime, prior to exercise, when hypoglycemia is suspected, after treating low blood glucose levels until they are normoglycemic, when hyperglycemia is suspected, and prior to and while performing critical tasks such as driving. B

7.9 Although BGM in individuals on noninsulin therapies has not consistently shown clinically significant reductions in A1C, it may be helpful when altering nutrition plan, physical activity, and/or medications (particularly medications that can cause hypoglycemia) in conjunction with a treatment adjustment program. E

CGM Devices

Table 6.2 summarizes CGM-derived glycemic metrics, and Table 7.3 defines the available types of CGM devices.

Recommendations

7.11 Real-time CGM (rtCGM) A or intermittently scanned CGM (isCGM) B should be offered for diabetes management in adults with diabetes on multiple daily injections (MDI) or CSII who are capable of using the devices safely (either by themselves or with a caregiver). The choice of device should be made based on the individual's circumstances, preferences, and needs.

7.12 rtCGM A or isCGM C should be offered for diabetes management in adults with diabetes on basal insulin who are capable of using the devices safely (either by themselves or with a caregiver). The choice of device should be made based on the individual's circumstances, preferences, and needs.

7.15 In people with diabetes on MDI or CSII, rtCGM devices should be used as close to daily as possible for maximal benefit. A isCGM devices should be scanned frequently, at a minimum once every 8 hours. A People with diabetes should have uninterrupted access to their supplies to minimize gaps in CGM. A

7.17 Periodic use of rtCGM or isCGM or use of professional CGM can be helpful for diabetes management in circumstances where continuous use of CGM is not appropriate, desired, or available. C

7.18 Skin reactions, either due to irritation or allergy, should be assessed and addressed to aid in successful use of devices. E

Inpatient Care

Recommendation

7.30 People with diabetes who are competent to safely use diabetes devices such as insulin pumps and CGM systems should be supported to continue using them in an inpatient setting

or during outpatient procedures, once competency is established and proper supervision is available. E

Other Technologies

See "7. Diabetes Technologies" in the complete 2023 Standards of Care for more information on insulin delivery systems, including insulin syringes, pens, connected pens, pumps, and AID systems; software systems; and digital health systems that combine technology with online or virtual coaching.

An ADA resource available at consumerguide.diabetes.org can help HCPs and people with diabetes make decisions as to the initial choice of devices. Other sources, including HCPs and device manufacturers, can help people troubleshoot when difficulties arise.

8. OBESITY AND WEIGHT MANAGEMENT FOR THE PREVENTION AND TREATMENT OF TYPE 2 DIABETES

Strong evidence exists that obesity management can delay the progression from prediabetes to type 2 diabetes and is highly beneficial in treating type 2 diabetes.

Assessment

Recommendations

8.1 Use person-centered, nonjudgmental language that fosters collaboration between individuals and HCPs, including person-first language (e.g., "person with obesity" rather than "obese person"). E

8.2 Measure height and weight and calculate BMI at annual visits or more frequently. Assess weight trajectory to inform treatment considerations. E

8.5 Individuals with diabetes and overweight or obesity may benefit from modest or larger magnitudes of weight loss. Relatively small weight loss (approximately 3–7% of baseline weight) improves glycemia and other intermediate CV risk factors. A Larger, sustained weight losses (>10%) usually confer greater benefits, including disease-modifying effects and possible remission of type 2 diabetes, and may improve long-term CV outcomes and mortality. B

Nutrition, Physical Activity, and Behavioral Therapy

Recommendations

8.6 Nutrition, physical activity, and behavioral therapy to achieve and maintain ≥5% weight loss are recommended for most people with type 2 diabetes and overweight or obesity. Additional weight loss usually results in further improvements in the management of diabetes and CV risk. B

8.7 Such interventions should include a high frequency of counseling (≥16 sessions in 6 months) and focus on nutrition changes, physical activity, and behavioral strategies to achieve a 500–750 kcal/day energy deficit. A

8.10 Evaluate systemic, structural, and socioeconomic factors that may impact nutrition patterns and food choices, such as food insecurity and hunger, access to healthful food options, cultural circumstances, and SDOH. C

8.11 For those who achieve weight loss goals, long-term (≥1 year) weight maintenance programs are recommended when available. Such programs should, at minimum, provide monthly contact and support, recommend ongoing monitoring of body weight (weekly or more frequently) and other self-monitoring strategies, and encourage regular physical activity (200–300 minutes/week). A

8.12 Short-term nutrition intervention using structured, very-low-calorie meals (800–1,000 kcal/day) may be prescribed for carefully selected individuals by trained practitioners in medical settings with close monitoring. Long-term, comprehensive weight maintenance strategies and counseling should be integrated to maintain weight loss. B

Pharmacotherapy

Recommendations

8.16 Obesity pharmacotherapy is effective as an adjunct to nutrition, physical activity, and behavioral counseling for selected people with type 2 diabetes and BMI ≥27 kg/m^2. Potential benefits and risks must be considered. A

8.17 If obesity pharmacotherapy is effective (typically defined as ≥5% weight loss after 3 months' use), further weight loss is likely with continued use. When early response is insufficient (typically <5% weight loss after 3 months' use) or if

there are significant safety or tolerability issues, consider discontinuation of the medication and evaluate alternative medications or treatment approaches. A

See Table 9.2 and Figure 9.3 for information on glucose-lowering medications with weight efficacy.

Approved Obesity Pharmacotherapy Options

Medications approved by the FDA for the treatment of obesity are summarized in Table 8.2 of the complete 2023 Standards of Care. Nearly all of these medications can improve glycemia in addition to weight loss for people with type 2 diabetes.

Metabolic Surgery

Recommendations

8.18 Metabolic surgery should be a recommended option to treat type 2 diabetes in screened surgical candidates with BMI ≥40 kg/m^2 (BMI ≥37.5 kg/m^2 in Asian American individuals) and in adults with BMI 35.0–39.9 kg/m^2 (32.5–37.4 kg/m^2 in Asian American individuals) who do not achieve durable weight loss and improvement in comorbidities (including hyperglycemia) with nonsurgical methods. A

8.19 Metabolic surgery may be considered as an option to treat type 2 diabetes in adults with BMI 30.0–34.9 kg/m^2 (27.5–32.4 kg/m^2 in Asian American individuals) who do not achieve durable weight loss and improvement in comorbidities (including hyperglycemia) with nonsurgical methods. A

8.21 People being considered for metabolic surgery should be evaluated for comorbid psychological conditions and social and situational circumstances that have the potential to interfere with surgery outcomes. B

8.22 People who undergo metabolic surgery should receive long-term medical and behavioral support and routine micronutrient, nutritional, and metabolic status monitoring. B

9. PHARMACOLOGIC APPROACHES TO GLYCEMIC TREATMENT

Pharmacologic Therapy for Adults With Type 1 Diabetes

See "9. Pharmacologic Approaches to Glycemic Treatment" in the complete 2023 Standards of Care for detailed information on pharmacologic approaches to type 1 diabetes management.

Pharmacologic Therapy for Adults With Type 2 Diabetes

Figure 9.3 and Table 9.2 provide details for informed decision-making on pharmacologic agents for type 2 diabetes.

Recommendations

9.4a Healthy lifestyle behaviors, DSMES, avoidance of clinical inertia, and SDOH should be considered in the glucose-lowering management of type 2 diabetes. Pharmacologic therapy should be guided by person-centered treatment factors, including comorbidities and treatment goals. A

9.4b In adults with type 2 diabetes and established/high risk of atherosclerotic cardiovascular disease (ASCVD), heart failure (HF), and/or chronic kidney disease (CKD), the treatment regimen should include agents that reduce cardiorenal risk. A

9.4c Pharmacologic approaches that provide adequate efficacy to achieve and maintain treatment goals should be considered, such as metformin or other agents, including combination therapy. A

9.4d Weight management is an impactful component of glucose-lowering management in type 2 diabetes. The glucose-lowering treatment regimen should consider approaches that support weight management goals. A

9.5 Metformin should be continued upon initiation of insulin therapy (unless contraindicated or not tolerated) for ongoing glycemic and metabolic benefits. A

9.6 Early combination therapy can be considered in some individuals at treatment initiation to extend the time to treatment failure. A

9.7 The early introduction of insulin should be considered if there is evidence of ongoing catabolism (weight loss), if symptoms of hyperglycemia are present, or when A1C levels (>10% [86 mmol/mol]) or blood glucose levels (≥300 mg/dL [16.7 mmol/L]) are very high. E

9.8 A person-centered approach should guide the choice of pharmacologic agents. Consider the effects on CV and renal comorbidities, efficacy, hypoglycemia risk, impact on weight, cost and access, risk for side effects, and individual preferences. E

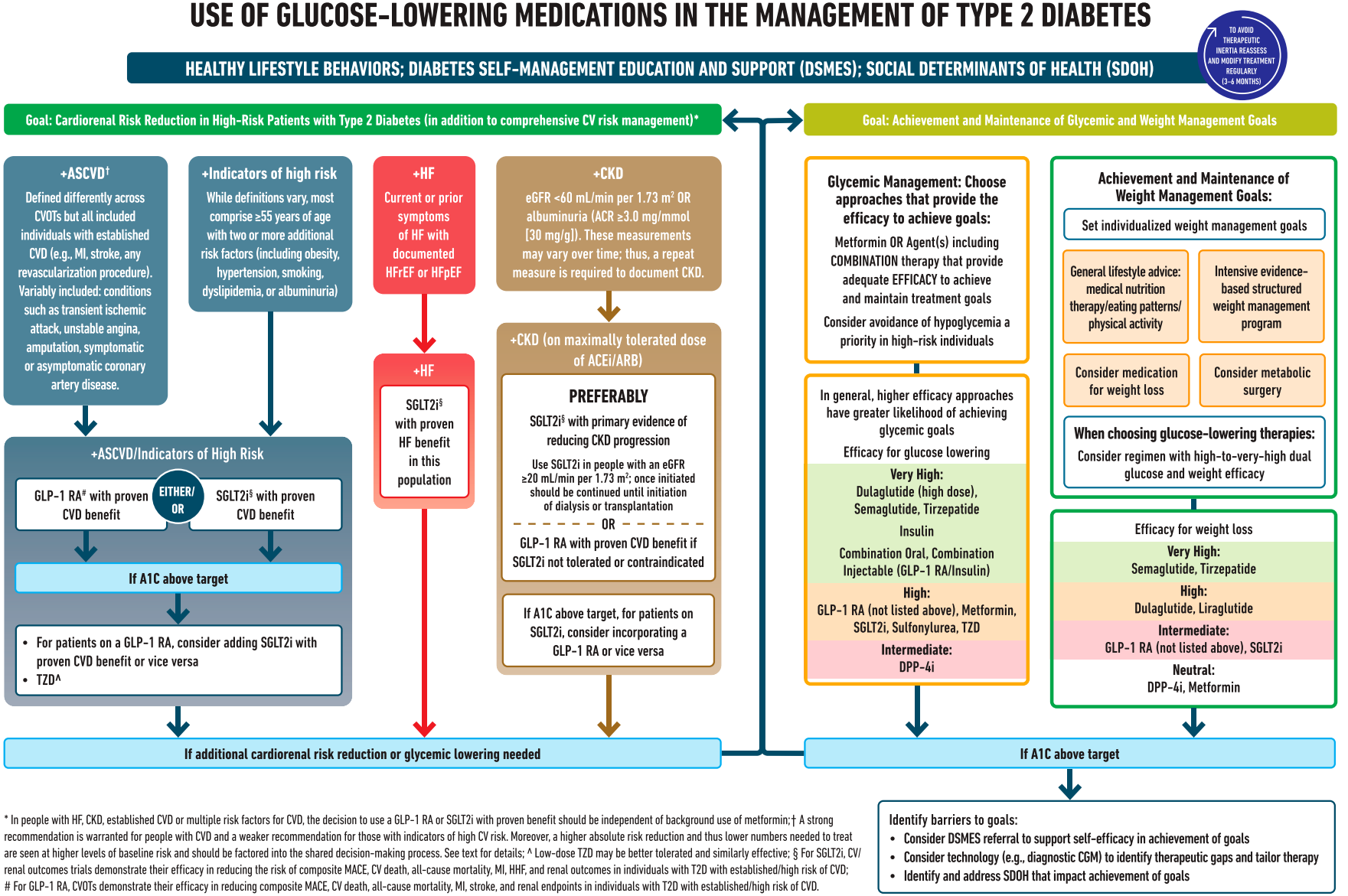
9.9 Among individuals with type 2 diabetes who have established ASCVD or indicators of high CV risk, established kidney disease, or HF, a sodium–glucose

TABLE 9.2 Medications for Lowering Glucose, Summary of Characteristics

	Efficacy[1]	Hypoglycemia	Weight change[2]	CV effects		Renal effects		Oral/SQ	Cost	Clinical considerations
				Effect on MACE	HF	Progression of DKD	Dosing/use considerations*			
Metformin	High	No	Neutral (potential for modest loss)	Potential benefit	Neutral	Neutral	• Contraindicated with eGFR <30 mL/min per 1.73 m^2	Oral	Low	• GI side effects common; to mitigate GI side effects, consider slow dose titration, extended release formulations, and administration with food • Potential for vitamin B12 deficiency; monitor at regular intervals
SGLT2 inhibitors	Intermediate to high	No	Loss (intermediate)	Benefit: canagliflozin, empagliflozin	Benefit: canagliflozin, dapagliflozin, empagliflozin, ertugliflozin	Benefit: canagliflozin, dapagliflozin, empagliflozin	• See labels for renal dose considerations of individual agents • Glucose-lowering effect is lower for SGLT2 inhibitors at lower eGFR	Oral	High	• DKA risk, rare in T2DM: discontinue, evaluate, and treat promptly if suspected; be aware of predisposing risk factors and clinical presentation (including euglycemic DKA); discontinue before scheduled surgery (e.g., 3–4 days), during critical illness, or during prolonged fasting to mitigate potential risk • Increased risk of genital mycotic infections • Necrotizing fasciitis of the perineum (Fournier gangrene), rare reports: institute prompt treatment if suspected • Attention to volume status, blood pressure; adjust other volume-contracting agents as applicable
GLP-1 RAs	High to very high	No	Loss (intermediate to very high)	Benefit: dulaglutide, liraglutide, semaglutide (SQ) Neutral: exenatide once weekly, lixisenatide	Neutral	Benefit for renal endpoints in CVOTs, driven by albuminuria outcomes: dulaglutide, liraglutide, semaglutide (SQ)	• See labels for renal dose considerations of individual agents • No dose adjustment for dulaglutide, liraglutide, semaglutide • Monitor renal function when initiating or escalating doses in patients with renal impairment reporting severe adverse GI reactions	SQ; oral (semaglutide)	High	• Risk of thyroid C-cell tumors in rodents; human relevance not determined (liraglutide, dulaglutide, exenatide extended release, semaglutide) • Counsel patients on potential for GI side effects and their typically temporary nature; provide guidance on dietary modifications to mitigate GI side effects (reduction in meal size, mindful eating practices [e.g., stop eating once full], decreasing intake of high-fat or spicy food); consider slower dose titration for patients experiencing GI challenges • Pancreatitis has been reported in clinical trials but causality has not been established. Discontinue if pancreatitis is suspected • Evaluate for gallbladder disease if cholelithiasis or cholecystitis is suspected
GIP and GLP-1 RA	Very high	No	Loss (very high)	Under investigation	Under investigation	Under investigation	• See label for renal dose considerations • No dose adjustment • Monitor renal function when initiating or escalating doses in patients with renal impairment reporting severe adverse GI reactions	SQ	High	• Risk of thyroid C-cell tumors in rodents; human relevance not determined • Counsel patients on potential for GI side effects and their typically temporary nature; provide guidance on dietary modifications to mitigate GI side effects (reduction in meal size, mindful eating practices [e.g., stop eating once full], decreasing intake of high-fat or spicy food); consider slower dose titration for patients experiencing GI challenges • Pancreatitis has been reported in clinical trials but causality has not been established. Discontinue if pancreatitis is suspected • Evaluate for gallbladder disease if cholelithiasis or cholecystitis is suspected
DPP-4 inhibitors	Intermediate	No	Neutral	Neutral	Neutral (potential risk, saxagliptin)	Neutral	• Renal dose adjustment required (sitagliptin, saxagliptin, alogliptin); can be used in renal impairment • No dose adjustment required for linagliptin	Oral	High	• Pancreatitis has been reported in clinical trials but causality has not been established. Discontinue if pancreatitis is suspected • Joint pain • Bullous pemphigoid (postmarketing): discontinue if suspected
Thiazolidinediones	High	No	Gain	Potential benefit: pioglitazone	Increased risk	Neutral	• No dose adjustment required • Generally not recommended in renal impairment due to potential for fluid retention	Oral	Low	• Congestive HF (pioglitazone, rosiglitazone) • Fluid retention (edema; heart failure) • Benefit in NASH • Risk of bone fractures • Weight gain: consider lower doses to mitigate weight gain and edema
Sulfonylureas (2nd generation)	High	Yes	Gain	Neutral	Neutral	Neutral	• Glyburide: generally not recommended in chronic kidney disease • Glipizide and glimepiride: initiate conservatively to avoid hypoglycemia	Oral	Low	• FDA Special Warning on increased risk of CV mortality based on studies of an older sulfonylurea (tolbutamide); glimepiride shown to be CV safe (see text) • Use with caution in persons at risk for hypoglycemia
Insulin **Human**	High to very high	Yes	Gain	Neutral	Neutral	Neutral	• Lower insulin doses required with a decrease in eGFR; titrate per clinical response	SQ; inhaled	Low (SQ)	• Injection site reactions • Higher risk of hypoglycemia with human insulin (NPH or premixed formulations) vs. analogs
Analogs								SQ	High	

*For agent-specific dosing recommendations, please refer to manufacturers' prescribing information. [1]Tsapas A, Avgerinos I, Karagiannis T, et al. Ann Intern Med 2020;173:278–286. [2]Tsapas A, Karagiannis T, Kakotrichi P, et al. Diabetes Obes Metab 2021;23:2116–2124. CVOT, cardiovascular outcomes trial; GIP, gastric inhibitory polypeptide; GLP-1 RA, glucagon-like peptide 1 receptor agonist; NASH, nonalcoholic steatohepatitis; SQ, subcutaneous; T2DM, type 2 diabetes mellitus. Reprinted from Davies MJ, Aroda VR, Collins BS, et al. Diabetes Care 2022;45:2753–2786.

USE OF GLUCOSE-LOWERING MEDICATIONS IN THE MANAGEMENT OF TYPE 2 DIABETES



* In people with HF, CKD, established CVD or multiple risk factors for CVD, the decision to use a GLP-1 RA or SGLT2i with proven benefit should be independent of background use of metformin;† A strong recommendation is warranted for people with CVD and a weaker recommendation for those with indicators of high CV risk. Moreover, a higher absolute risk reduction and thus lower numbers needed to treat are seen at higher levels of baseline risk and should be factored into the shared decision-making process. See text for details; ^ Low-dose TZD may be better tolerated and similarly effective; § For SGLT2i, CV/renal outcomes trials demonstrate their efficacy in reducing the risk of composite MACE, CV death, all-cause mortality, MI, HHF, and renal outcomes in individuals with T2D with established/high risk of CVD; # For GLP-1 RA, CVOTs demonstrate their efficacy in reducing composite MACE, CV death, all-cause mortality, MI, stroke, and renal endpoints in individuals with T2D with established/high risk of CVD.

FIGURE 9.3 Use of glucose-lowering medications in the management of type 2 diabetes. ACEi, ACE inhibitor; ACR, albumin-to-creatinine ratio; CVOT, cardiovascular outcomes trial; DPP-4i, dipeptidyl peptidase 4 inhibitor; GLP-1 RA, glucagon-like peptide 1 receptor agonist; HHF, hospitalization for heart failure; SGLT2i, sodium-glucose cotransporter 2 inhibitor; T2D, type 2 diabetes. Adapted from Davies MJ, Aroda VR, Collins BS, et al. Diabetes Care 2022;45:2753–2786.

cotransporter 2 (SGLT2) inhibitor and/or glucagon-like peptide 1 (GLP-1) receptor agonist with demonstrated CVD benefit (Figure 9.3, Table 9.2, and Tables 10.3*B* and 10.3*C* in the complete 2023 Standards of Care) is recommended as part of the glucose-lowering regimen and comprehensive CV risk reduction, independent of A1C and in consideration of person-specific factors. (See "10. CVD AND RISK MANAGEMENT," for details on CV risk reduction recommendations). A

9.10 In adults with type 2 diabetes, a GLP-1 receptor agonist is preferred to insulin when possible. A

9.11 If insulin is used, combination therapy with a GLP-1 receptor agonist is recommended for greater efficacy, durability of treatment effect, and weight and hypoglycemia benefit. A

9.13 Medication regimen and medication-taking behavior should be reevaluated at regular intervals (every 3–6 months) and adjusted as needed to incorporate specific factors that impact choice of treatment (Figure 4.1 and Table 9.2). E

9.14 Clinicians should be aware of the potential for overbasalization with insulin therapy. Clinical signals that may prompt evaluation of overbasalization include basal dose more than ∼0.5 units/kg/day, high bedtime–morning or post- to preprandial glucose differential, hypoglycemia (aware or unaware), and high glycemic variability. Indication of overbasalization should prompt reevaluation to further individualize therapy. E

Both comprehensive lifestyle modifications and pharmacotherapy should begin at diagnosis. Not all treatment modifications involve sequential add-on therapy, but may involve switching therapy or weaning current therapy to accommodate for changes in the patient's overall goals (e.g., the initiation of agents for reasons beyond glycemic benefit). See "9. Pharmacologic Approaches to Glycemic Treatment" in the complete 2023 Standards of Care for more detailed information on pharmacologic approaches to type 2 diabetes management, including Figure 9.4 for guidance on intensifying to injectable therapies in type 2 diabetes.

10. CVD AND RISK MANAGEMENT

ASCVD—defined as coronary heart disease, cerebrovascular disease, or peripheral arterial disease (PAD) presumed to be of atherosclerotic origin—is the leading cause of morbidity and mortality for individuals with diabetes. Controlling individual CV risk factors helps prevent or slow ASCVD in people with diabetes. HF is another major cause of morbidity and mortality from CVD.

Risk factors, including obesity/overweight, hypertension, dyslipidemia, smoking, family history of premature coronary disease, CKD, and the presence of albuminuria, should be assessed at least annually to prevent and manage both ASCVD and HF.

The Risk Calculator

The American College of Cardiology/American Heart Association ASCVD risk calculator (Risk Estimator Plus) is generally a useful tool to estimate 10-year risk of a first ASCVD event (available online at tools.acc.org/ASCVD-Risk-Estimator-Plus).

Hypertension/BP Control

Hypertension, defined as a systolic BP ≥130 mmHg or a diastolic BP ≥80 mmHg, is common among people with either type 1 or type 2 diabetes.

Screening and Diagnosis

Recommendations

10.1 BP should be measured at every routine clinical visit. When possible, individuals found to have elevated BP (systolic BP 120–129 mmHg and diastolic <80 mmHg) should have BP confirmed using multiple readings, including measurements on a separate day, to diagnose hypertension. A Hypertension is defined as a systolic BP ≥130 mmHg or a diastolic BP ≥80 mmHg based on an average of ≥2 measurements obtained on ≥2 occasions. A Individuals with BP ≥180/110 mmHg and CVD could be diagnosed with hypertension at a single visit. E

10.2 All people with hypertension and diabetes should monitor their BP at home. A

Treatment Goals

Recommendations

10.3 For people with diabetes and hypertension, BP targets should be individualized through a shared decision-making process that addresses CV risk, potential adverse effects of antihypertensive medications, and patient preferences. B

10.4 People with diabetes and hypertension qualify for antihypertensive drug therapy when the BP is persistently elevated ≥130/80 mmHg. The on-treatment target BP goal is <130/80 mmHg, if it can be safely attained. B

Treatment Strategies

Lifestyle Intervention

Recommendation

10.6 For people with BP >120/80 mmHg, lifestyle intervention consists of weight loss when indicated, a Dietary Approaches to Stop Hypertension (DASH)-style eating pattern including reducing sodium and increasing potassium intake, moderation of alcohol intake, and increased physical activity. **A**

Pharmacologic Interventions

Recommendations

10.8 Individuals with confirmed office-based BP ≥160/100 mmHg should, in addition to lifestyle therapy, have prompt initiation and timely titration of two drugs or a single-pill combination of drugs demonstrated to reduce CV events in people with diabetes. **A**

10.10 Multiple-drug therapy is generally required to achieve BP targets. However, combinations of ACE inhibitors and angiotensin receptor blockers (ARBs) and combinations of ACE inhibitors or ARBs with direct renin inhibitors should not be used. **A**

10.11 An ACE inhibitor or ARB, at the maximum tolerated dose indicated for BP treatment, is the recommended first-line treatment for hypertension in people with diabetes and urinary albumin-to-creatinine ratio (UACR) ≥300 mg/g creatinine **A** or 30–299 mg/g creatinine. **B** If one class is not tolerated, the other should be substituted. **B**

10.12 For patients treated with an ACE inhibitor, ARB, or diuretic, serum creatinine/estimated glomerular filtration rate (eGFR) and serum potassium levels should be monitored at least annually. **B**

See Figure 10.2 in complete 2023 Standards of Care for more information on hypertension treatment strategies.

Resistant Hypertension

Recommendation

10.13 Individuals with hypertension who are not meeting BP targets on three classes of antihypertensive medications (including a diuretic) should be considered for mineralocorticoid receptor antagonist (MRA) therapy. **A**

Lipid Management

Lifestyle Intervention

Recommendations

10.14 Lifestyle modification focusing on weight loss (if indicated); application of a Mediterranean or DASH eating pattern; reduction of saturated fat and *trans* fat; increase of dietary n-3 fatty acids, viscous fiber, and plant stanols/sterols intake; and increased physical activity should be recommended to improve the lipid profile and reduce the risk of developing ASCVD in people with diabetes. **A**

10.15 Intensify lifestyle therapy and optimize glycemic control for patients with elevated triglyceride levels (≥150 mg/dL [1.7 mmol/L]) and/or low HDL cholesterol (<40 mg/dL [1.0 mmol/L] for men, <50 mg/dL [1.3 mmol/L] for women). **C**

Ongoing Therapy and Monitoring With Lipid Panel

Recommendations

10.16 In adults not taking statins or other lipid-lowering therapy, it is reasonable to obtain a lipid profile at the time of diabetes diagnosis, at an initial medical evaluation, and every 5 years thereafter if under the age of 40 years, or more frequently if indicated. **E**

10.17 Obtain a lipid profile at initiation of statins or other lipid-lowering therapy, 4–12 weeks after initiation or a change in dose, and annually thereafter, as it may help to monitor the response to therapy and inform medication taking. **E**

Statin Treatment

Primary Prevention

Recommendations

10.18 For people with diabetes aged 40–75 years without ASCVD, use moderate-intensity statin therapy in addition to lifestyle therapy. **A**

10.19 For people with diabetes aged 20–39 years with additional ASCVD risk factors, it may be reasonable to initiate statin therapy in addition to lifestyle therapy. **C**

10.20 For people with diabetes aged 40–75 at higher CV risk, including those with one or

more ASCVD risk factors, it is recommended to use high-intensity statin therapy to reduce LDL cholesterol by ≥50% of baseline and to target an LDL cholesterol goal of <70 mg/dL. B

10.21 For people with diabetes aged 40–75 years at higher CV risk, especially those with multiple ASCVD risk factors and an LDL cholesterol ≥70 mg/dL, it may be reasonable to add ezetimibe or a PCSK9 inhibitor to maximum tolerated statin therapy. C

10.22 In adults with diabetes aged >75 years already on statin therapy, it is reasonable to continue statin treatment. B

10.23 In adults with diabetes aged >75 years, it may be reasonable to initiate moderate-intensity statin therapy after discussion of potential benefits and risks. C

Secondary Prevention

Recommendations

10.25 For people of all ages with diabetes and ASCVD, high-intensity statin therapy should be added to lifestyle therapy. A

10.26 For people with diabetes and ASCVD, treatment with high-intensity statin therapy is recommended to target an LDL cholesterol reduction of ≥50% from baseline and an LDL cholesterol goal of <55 mg/dL. Addition of ezetimibe or a PCSK9 inhibitor with proven benefit in this population is recommended if this goal is not achieved on maximum tolerated statin therapy. B

10.27 For individuals who do not tolerate the intended intensity, the maximum tolerated statin dose should be used. E

See "10. Cardiovascular Disease and Risk Management" in the complete 2023 Standards of Care for detailed guidance on statin therapy in patients with diabetes.

Treatment of Other Lipoprotein Fractions or Targets

Recommendations

10.28 For individuals with fasting triglyceride levels ≥500 mg/dL, evaluate for secondary causes of hypertriglyceridemia and consider medical therapy to reduce the risk of pancreatitis. C

10.29 In adults with moderate hypertriglyceridemia (fasting or nonfasting triglycerides 175–499 mg/dL), clinicians should address and treat lifestyle factors (obesity and metabolic syndrome), secondary factors (diabetes, chronic liver or kidney disease and/or nephrotic syndrome, hypothyroidism), and medications that raise triglycerides. C

10.30 In individuals with ASCVD or other CV risk factors on a statin with controlled LDL cholesterol but elevated triglycerides (135–499 mg/dL), the addition of icosapent ethyl can be considered to reduce CV risk. A

Other Combination Therapy

Recommendations

10.31 Statin plus fibrate combination therapy has not been shown to improve ASCVD and is generally not recommended. A

10.32 Statin plus niacin combination therapy has not been shown to provide additional CV benefit above statin therapy alone, may increase the risk of stroke with additional side effects, and is generally not recommended. A

Lipid-Lowering Agents and Cognitive Function

The concern that lipid-lowering agents may adversely affect cognitive function is not currently supported by evidence and should not deter their use.

Antiplatelet Agents

Recommendations

10.33 Use aspirin therapy (75–162 mg/day) as a secondary prevention strategy in those with diabetes and a history of ASCVD. A

10.34 For individuals with ASCVD and documented aspirin allergy, clopidogrel (75 mg/day) should be used. B

10.35 Dual antiplatelet therapy (with low-dose aspirin and a P2Y12 inhibitor) is reasonable for a year after an acute coronary syndrome and may have benefits beyond this period. A

10.36 Long-term treatment with dual antiplatelet therapy should be considered for individuals with prior coronary intervention, high ischemic risk, and low bleeding risk to prevent major adverse cardiovascular events (MACE). A

10.37 Combination therapy with aspirin plus low-dose rivaroxaban should be considered for individuals with stable CAD and/or PAD and low bleeding risk to prevent major adverse limb and CV events. A

10.38 Aspirin therapy (75–162 mg/day) may be considered as a primary prevention strategy in those with diabetes who are at increased CV risk, after a comprehensive discussion with the patient on the benefits versus the comparable increased risk of bleeding. A

CVD

Screening

Recommendations

10.39 In asymptomatic individuals, routine screening for CAD is not recommended as it does not improve outcomes as long as ASCVD risk factors are treated. A

10.40 Consider investigations for CAD in the presence of any of the following: atypical cardiac symptoms (e.g., unexplained dyspnea, chest discomfort); signs or symptoms of associated vascular disease including carotid bruits, transient ischemic attack, stroke, claudication, or PAD; or electrocardiogram (ECG) abnormalities (e.g., Q waves). E

Treatment

Recommendations

10.41 Among people with type 2 diabetes who have established ASCVD or established kidney disease, an SGLT2 inhibitor or GLP-1 receptor agonist with demonstrated CVD benefit (see Tables 10.3*B* and 10.3*C* in the complete 2023 Standards of Care) is recommended as part of the comprehensive CV risk reduction and/or glucose-lowering regimens. A

10.41a In people with type 2 diabetes and established ASCVD, multiple ASCVD risk factors, or diabetic kidney disease (DKD), an SGLT2 inhibitor with demonstrated CV benefit is recommended to reduce the risk of MACE and/or HF hospitalization. A

10.41b In people with type 2 diabetes and established ASCVD or multiple risk factors for ASCVD, a GLP-1 receptor agonist with demonstrated CV benefit is recommended to reduce the risk of MACE. A

10.41c In people with type 2 diabetes and established ASCVD or multiple risk factors for ASCVD, combined therapy with an SGLT2 inhibitor with demonstrated CV benefit and a GLP-1 receptor agonist with demonstrated CV benefit may be considered for additive reduction in the risk of adverse CV and kidney events. A

10.42a In people with type 2 diabetes and established HF with either preserved ejection fraction (HFpEF) or reduced ejection fraction (HFrEF), an SGLT2 inhibitor with proven benefit in this patient population is recommended to reduce risk of worsening HF and CV death. A

10.42b In people with type 2 diabetes and established HF with either HFpEF or HFrEF, an SGLT2 inhibitor with proven benefit in this patient population is recommended to improve symptoms, physical limitations, and QoL. A

10.43 For people with type 2 diabetes and CKD with albuminuria treated with maximum tolerated doses of ACE inhibitor or ARB, addition of finerenone is recommended to improve CV outcomes and reduce the risk of CKD progression. A

10.44 In people with known ASCVD, particularly CAD, ACE inhibitor or ARB therapy is recommended to reduce the risk of CV events. A

10.45 In people with prior MI, β-blockers should be continued for 3 years after the event. B

10.46 Treatment of individuals with HFrEF should include a β-blocker with proven CV outcomes benefit, unless otherwise contraindicated. A

10.47 In people with type 2 diabetes with stable HF, metformin may be continued for glucose lowering if eGFR remains >30 mL/min/1.73 m^2 but should be avoided in unstable or hospitalized individuals with HF. B

Candidates for advanced or invasive cardiac testing include those with *1*) typical or atypical cardiac symptoms and *2*) an abnormal resting ECG.

11. CKD AND RISK MANAGEMENT

CKD

Optimize glucose and BP control and reduce BP variability to reduce the risk or slow the progression of CKD.

Screening

Recommendations

11.1a At least annually, urinary albumin (e.g., spot UACR) and eGFR should be assessed in people

with type 1 diabetes with duration of ≥5 years and in all people with type 2 diabetes regardless of treatment. B

11.1b In people with established DKD, urinary albumin (e.g., spot UACR) and eGFR should be monitored 1–4 times per year depending on the stage of the disease (see Figure 11.1 in the complete 2023 Standards of Care). B

Treatment

Recommendations

11.4a In nonpregnant people with diabetes and hypertension, either an ACE inhibitor or an ARB is recommended for those with moderately increased albuminuria (UACR 30–299 mg/g creatinine) B and is strongly recommended for those with severely increased albuminuria (UACR ≥300 mg/g creatinine) and/or eGFR <60 mL/min/1.73 m^2. A

11.4b Periodically monitor serum creatinine and potassium levels for the development of increased creatinine and hyperkalemia when ACE inhibitors, ARBs, and MRAs are used, or hypokalemia when diuretics are used. B

11.4c An ACE inhibitor or an ARB is not recommended for the primary prevention of CKD in people with diabetes who have normal BP, normal UACR (<30 mg/g creatinine), and normal eGFR. A

11.4d Do not discontinue renin-angiotensin system blockade for increases in serum creatinine (≤30%) in the absence of volume depletion. A

11.5a For people with type 2 diabetes and DKD, use of an SGLT2 inhibitor is recommended to reduce CKD progression and CV events in patients with an eGFR ≥20 mL/min/1.73 m^2 and urinary albumin ≥200 mg/g creatinine. A

11.5b For people with type 2 diabetes and DKD, use of an SGLT2 inhibitor is recommended to reduce CKD progression and CV events in patients with an eGFR ≥20 mL/min/1.73 m^2 and urinary albumin ranging from normal to 200 mg/g creatinine. B

11.5c In people with type 2 diabetes and DKD, consider use of SGLT2 inhibitors (if eGFR is ≥20 mL/min/1.73 m^2), a GLP-1 receptor agonist, or a nonsteroidal MRA (if eGFR is ≥25 mL/min/1.73 m^2) additionally for CV risk reduction. A

11.5d In people with CKD and albuminuria who are at increased risk for CV events or CKD progression, a nonsteroidal MRA shown to be effective in clinical trials is recommended to reduce CKD progression and CV events. A

11.6 In people with CKD who have ≥300 mg/g urinary albumin, a reduction of 30% or greater in mg/g urinary albumin is recommended to slow CKD progression. B

11.7 For people with non–dialysis-dependent stage 3 or higher CKD, dietary protein intake should be aimed to a target level of 0.8 g/kg body weight per day. A For patients on dialysis, higher levels of dietary protein intake should be considered since protein energy wasting is a major problem in some individuals on dialysis. B

11.8 Patients should be referred for evaluation by a nephrologist if they have continuously increasing urinary albumin levels and/or continuously decreasing eGFR and if the eGFR is <30 mL/min/1.73 m^2. A

11.9 Promptly refer to a nephrologist for uncertainty about the etiology of kidney disease, difficult management issues, and rapidly progressing kidney disease. A

Diagnosis, Staging, and Surveillance of DKD

DKD is diagnosed based on the presence and degree of albuminuria and/or reduced eGFR in the absence of symptoms of other primary causes of kidney damage. Two of three specimens of UACR collected within a 3- to 6-month period should be abnormal before considering a patient to have albuminuria. eGFR should be calculated from serum creatinine using a validated formula. The Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) equation is generally preferred. Race should not be included in the formula as race is a social and not a biologic construct. CKD is staged as detailed in Figure 11.1 in the complete 2023 Standards of Care.

Selection of Glucose-Lowering Medications for People With CKD

eGFR should be monitored while taking metformin, which can be used in patients with eGFR ≥30 mL/min/1.73 m^2. Reassess benefits and risks of continuing treatment when eGFR falls to <45 mL/min/1.73 m^2, and do not initiate metformin in patients with an eGFR already at this level. Temporarily discontinue at the time of or

before iodinated contrast imaging procedures in patients with eGFR 30–60 mL/min/1.73 m^2.

See Table 9.2 for general drug-specific factors, including adverse event information, for antihyperglycemic agents.

Nonsteroidal MRAs in CKD

Finerenone can reduce DKD, CV events, and HF hospitalization in people with advanced DKD, but it should be used with caution due to a risk of hyperkalemia. It can be used with SGLT2 inhibitors.

12. RETINOPATHY, NEUROPATHY, AND FOOT CARE

Management of glycemia, BP, and lipids can reduce the risk or slow the progression of microvascular complications of diabetes.

Diabetic Retinopathy

Screening

Recommendations

12.4 People with type 2 diabetes should have an initial dilated and comprehensive eye examination by an ophthalmologist or optometrist at the time of the diabetes diagnosis. **B**

12.5 If there is no evidence of diabetic retinopathy (DR) for one or more annual eye exams and glycemia is well controlled, then screening every 1–2 years may be considered. If any level of DR is present, subsequent dilated retinal examinations should be repeated at least annually by an ophthalmologist or optometrist. If DR is progressing or sight-threatening, then examinations will be required more frequently. **B**

12.6 Programs that use retinal photography (with remote reading or use of a validated assessment tool) to improve access to DR screening can be appropriate screening strategies for DR. Such programs need to provide pathways for timely referral for a comprehensive eye examination when indicated. **B**

Treatment

Recommendations

12.9 Promptly refer individuals with any level of diabetic macular edema, moderate or worse nonproliferative DR (a precursor of proliferative DR), or any proliferative DR to an ophthalmologist who is knowledgeable and experienced in the management of DR. **A**

12.14 The presence of DR is not a contraindication to aspirin therapy for cardioprotection, as aspirin does not increase the risk of retinal hemorrhage. **A**

For more information about treatment of DR, see "12. Retinopathy, Neuropathy, and Foot Care" in the complete 2023 Standards of Care.

Neuropathy

Screening

Recommendations

12.15 All people with diabetes should be assessed for diabetic peripheral neuropathy (DPN) starting at diagnosis of type 2 diabetes and 5 years after the diagnosis of type 1 diabetes and at least annually thereafter. **B**

12.16 Assessment for distal symmetric polyneuropathy should include a careful history and assessment of either temperature or pinprick sensation (small-fiber function) and vibration sensation using a 128-Hz tuning fork (for large-fiber function). All people with diabetes should have annual 10-g monofilament testing to identify feet at risk for ulceration and amputation. **B**

12.17 Symptoms and signs of autonomic neuropathy should be assessed in people with diabetes starting at diagnosis of type 2 diabetes and 5 years after the diagnosis of type 1 diabetes and at least annually thereafter and with evidence of other microvascular complications, particularly kidney disease and DPN. Screening can include asking about orthostatic dizziness, syncope, or dry cracked skin in the extremities. Signs of autonomic neuropathy include orthostatic hypotension, a resting tachycardia, or evidence of peripheral dryness or cracking of skin. **E**

Treatment

Recommendation

12.20 Gabapentinoids, serotonin-norepinephrine reuptake inhibitors, tricyclic antidepressants, and sodium channel blockers are recommended as initial pharmacologic treatments for neuropathic pain in diabetes. **A** Refer to neurologist or pain specialist when pain control is not achieved within the scope of practice of the treating physician. **E**

Foot Care

Recommendations

12.21 Perform a comprehensive foot evaluation at least annually to identify risk factors for ulcers and amputations. **A**

12.22 The examination should include inspection of the skin, assessment of foot deformities, neurological assessment (10-g monofilament testing with at least one other assessment: pinprick, temperature, vibration), and vascular assessment, including pulses in the legs and feet. **B**

12.23 Individuals with evidence of sensory loss or prior ulceration or amputation should have their feet inspected at every visit. **A**

12.24 Obtain a prior history of ulceration, amputation, Charcot foot, angioplasty or vascular surgery, cigarette smoking, retinopathy, and renal disease and assess current symptoms of neuropathy (pain, burning, numbness) and vascular disease (leg fatigue, claudication). **B**

12.25 Initial screening for PAD should include assessment of lower-extremity pulses, capillary refill time, rubor on dependency, pallor on elevation, and venous filling time. Individuals with a history of leg fatigue, claudication, and rest pain relieved with dependency or decreased or absent pedal pulses should be referred for ankle–brachial index and for further vascular assessment as appropriate. **B**

12.26 A multidisciplinary approach is recommended for individuals with foot ulcers and high-risk feet (e.g., those on dialysis, those with Charcot foot, those with a history of prior ulcers or amputation, those with PAD). **B**

12.27 Refer individuals who smoke and have a history of prior lower-extremity complications, loss of protective sensation, structural abnormalities, or PAD to foot care specialists for ongoing preventive care and lifelong surveillance. **B**

12.28 Provide general preventive foot self-care education to all people with diabetes, including those with loss of protective sensation, on appropriate ways to examine their feet (palpation or visual inspection with an unbreakable mirror) for daily surveillance of early foot problems. **B**

12.29 The use of specialized therapeutic footwear is recommended for people with diabetes at high risk for ulceration, including those with loss of protective sensation, foot deformities, ulcers, callous formation, poor peripheral circulation, or history of amputation. **B**

13. OLDER ADULTS

Recommendations

13.1 Consider the assessment of medical, psychological, functional (self-management abilities), and social domains in older adults to provide a framework to determine targets and therapeutic approaches for diabetes management. **B**

13.2 Screen for geriatric syndromes (i.e., polypharmacy, cognitive impairment, depression, urinary incontinence, falls, persistent pain, and frailty) in older adults, as they may affect diabetes self-management and diminish QoL. **B**

Diabetes in older adults is associated with higher rates of premature death, functional disability, accelerated muscle loss, coexisting illnesses and geriatric syndromes. When assessing older adults with diabetes, it is important to accurately categorize the type of diabetes as well as their complications and treatment-related concerns, such as fear of hypoglycemia.

Neurocognitive Function

Recommendation

13.3 Screening for early detection of mild cognitive impairment or dementia should be performed for adults 65 years of age or older at the initial visit, annually, and as appropriate. **B**

People with diabetes have higher incidences of all-cause dementia, Alzheimer disease, and vascular dementia. Ongoing studies are evaluating whether preventing or delaying diabetes onset may help to maintain cognitive function in older adults. However, studies examining the effects of intensive glycemic and BP control have not demonstrated a reduction in cognitive decline.

Hypoglycemia

Recommendations

13.4 Because older adults with diabetes have a greater risk of hypoglycemia than younger adults, episodes of hypoglycemia should be ascertained and addressed at routine visits. **B**

13.6 For older adults with type 2 diabetes on multiple daily doses of insulin, CGM should be

TABLE 13.1 Framework for Considering Treatment Goals for Glycemia, BP, and Dyslipidemia in Older Adults With Diabetes

Patient Characteristics/ Health Status	Rationale	Reasonable A1C Goal‡	Fasting or Preprandial Glucose	Bedtime Glucose	BP	Lipids
Healthy (few coexisting chronic illnesses, intact cognitive and functional status)	Longer remaining life expectancy	<7.0–7.5% (53–58 mmol/mol)	80–130 mg/dL (4.4–7.2 mmol/L)	80–180 mg/dL (4.4–10.0 mmol/L)	<130/80 mmHg	Statin, unless contraindicated or not tolerated
Complex/ intermediate (multiple coexisting chronic illnesses* or two or more instrumental ADL impairments or mild-to-moderate cognitive impairment)	Intermediate remaining life expectancy, high treatment burden, hypoglycemia vulnerability, fall risk	<8.0% (64 mmol/mol)	90–150 mg/dL (5.0–8.3 mmol/L)	100–180 mg/dL (5.6–10.0 mmol/L)	<130/80 mmHg	Statin, unless contraindicated or not tolerated
Very complex/poor health (LTC or end-stage chronic illnesses** or moderate-to-severe cognitive impairment or two or more ADL impairments)	Limited remaining life expectancy makes benefit uncertain	Avoid reliance on A1C; glucose control decisions should be based on avoiding hypoglycemia and symptomatic hyperglycemia	100–180 mg/dL (5.6–10.0 mmol/L)	110–200 mg/dL (6.1–11.1 mmol/L)	<140/90 mmHg	Consider likelihood of benefit with statin

This table represents a consensus framework for considering treatment goals for glycemia, BP, and dyslipidemia in older adults with diabetes. The patient characteristic categories are general concepts. Not every patient will clearly fall into a particular category. Consideration of patient and caregiver preferences is an important aspect of treatment individualization. Additionally, a patient's health status and preferences may change over time. ‡A lower A1C goal may be set for an individual if achievable without recurrent or severe hypoglycemia or undue treatment burden. *Coexisting chronic illnesses are conditions serious enough to require medications or lifestyle management and may include arthritis, cancer, HF, depression, emphysema, falls, hypertension, incontinence, stage 3 or worse CKD, MI, and stroke. "Multiple" means at least three, but many patients may have five or more. **The presence of a single end-stage chronic illness, such as stage 3–4 HF or oxygen-dependent lung disease, CKD requiring dialysis, or uncontrolled metastatic cancer, may cause significant symptoms or impairment of functional status and significantly reduce life expectancy. ADL, activities of daily living. Adapted from Kirkman MS, Briscoe VJ, Clark N, et al. Diabetes Care 2012;35:2650–2664.

considered to improve glycemic outcomes and decrease glucose variability. **B**

Older adults are at higher risk of hypoglycemia for many reasons and should be routinely queried about hypoglycemia and hypoglycemia unawareness. Glycemic targets and pharmacologic treatments may need to be adjusted to minimize hypoglycemia.

Treatment Goals

Providers caring for older adults with diabetes must take clinical, cognitive, and functional differences into consideration when setting and prioritizing treatment goals. Table 13.1 provides a treatment goal framework for older patients.

Lifestyle Management

Recommendations

13.13 Optimal nutrition and protein intake is recommended for older adults; regular exercise, including aerobic activity, weight-bearing exercise, and/or resistance training, should be encouraged in all older adults who can safely engage in such activities. **B**

13.14 For older adults with type 2 diabetes, overweight/obesity, and capacity to safely exercise, an intensive lifestyle intervention focused on dietary changes, physical activity, and modest weight loss (e.g., 5–7%) should be considered for its benefits on QoL, mobility and physical functioning, and cardiometabolic risk factor control. **A**

Pharmacologic Therapy

Recommendations

13.15 In older adults with type 2 diabetes at increased risk of hypoglycemia, medication classes with low risk of hypoglycemia are preferred. **B**

13.16 Overtreatment of diabetes is common in older adults and should be avoided. **B**

13.17 Deintensification of treatment goals is recommended to reduce the risk of hypoglycemia if it can be achieved within the individualized A1C target. **B**

13.18 Simplification of complex treatment plans (especially insulin) is recommended to reduce the risk of hypoglycemia and polypharmacy and decrease the burden of the disease if it can be achieved within the individualized A1C target. **B**

13.19 Consider costs of care and insurance coverage rules when developing treatment plans in order to reduce risk of cost-related barriers to adherence. **B**

Older adults require individualized diabetes pharmacotherapy and glycemic targets. See Figure 9.3 for general recommendations regarding person- and drug-specific factors to consider when selecting glucose-lowering agents. Providers should consider the cost and complexity of treatment to reduce barriers to adherence.

Metformin is the first-line agent for older adults with type 2 diabetes, although it can cause problematic gastrointestinal side effects and vitamin B12 deficiency. Thiazolidinediones and longer-acting sulfonylureas should be avoided. Dipeptidyl peptidase 4 inhibitors are well tolerated. GLP-1 receptor agonists and SGLT2 inhibitors have CV and renal benefits that extend to older adults, although class-specific side effects may limit their use. Multiple daily insulin therapy may be too complex for many older patients. Simplification of the insulin plan to match an individual's self-management abilities has been shown to reduce hypoglycemia and disease-related distress without worsening glycemic outcomes. Figure 13.1 in the complete 2023 Standards of Care provides an approach to insulin plan simplification.

Treatment in Skilled Nursing Facilities and Nursing Homes

Recommendations

13.20 Consider diabetes education for the staff of long-term care (LTC) and rehabilitation facilities to improve the management of older adults with diabetes. **E**

13.21 People with diabetes residing in LTC facilities need careful assessment to establish individualized glycemic goals and to make appropriate choices of glucose-lowering agents based on their clinical and functional status. **E**

13.22 Consider use of CGM to assess risk for hypoglycemia in older adults treated with sulfonylureas or insulin. **E**

Older adults in LTC may have irregular and unpredictable meal consumption, undernutrition, anorexia, or impaired swallowing. Meals tailored to patients' culture, preferences, and personal goals may increase QoL, satisfaction with meals, and nutrition status. It may be helpful to give insulin after meals to ensure that the dose is appropriate for the amount of carbohydrate consumed in the meal.

End-of-Life Care

Recommendations

13.23 When palliative care is needed in older adults with diabetes, HCPs should initiate conversations regarding the goals and intensity of care. Strict glucose and BP control are not necessary **E**, and simplification of regimens can be considered. Similarly, the intensity of lipid management can be relaxed, and withdrawal of lipid-lowering therapy may be appropriate. **A**

13.24 Overall comfort, prevention of distressing symptoms, and preservation of QoL and dignity are primary goals for diabetes management at the end of life. **C**

14. CHILDREN AND ADOLESCENTS

The management of diabetes in children and adolescents cannot simply be derived from care routinely provided to adults with diabetes. The epidemiology, pathophysiology, developmental considerations, and response to therapy in pediatric-onset diabetes are different from adult diabetes.

See "14. Children and Adolescents" in the complete 2023 Standards of Care for specific recommendations regarding the comprehensive treatment of type 1 and type 2 diabetes in children and adolescents. The ADA position statements "Type 1 Diabetes in Children and Adolescents" and "Evaluation and Management of

Youth-Onset Type 2 Diabetes" provide additional information.

Type 1 Diabetes

A multidisciplinary team of specialists trained in pediatric diabetes management and sensitive to the challenges of children and adolescents with type 1 diabetes and their families, as well as the unique aspects of pediatric diabetes management, should provide care for this population.

Type 2 Diabetes

Evidence suggests that type 2 diabetes in youth is different not only from type 1 diabetes, but also from type 2 diabetes in adults, with a more rapid, progressive decline in β-cell function and accelerated development of diabetes complications.

Management

Treatment of youth-onset type 2 diabetes should include lifestyle management, diabetes self-management education, and pharmacologic treatment. Self-management in pediatric diabetes involves both the youth and their adult caregivers. Current pharmacologic treatment options for youth-onset type 2 diabetes are limited to three classes of drugs: insulin, metformin, and, in those ≥10 years of age with no contraindications, GLP-1 receptor agonists indicated for use in youth. As comorbidities may already be present at the time of diagnosis, screening and treatment of risk factors are recommended. Consideration of the sociocultural context and efforts to personalize diabetes management are of critical importance to minimize barriers to care, enhance adherence, and maximize response to treatment.

Glycemic Targets

Recommendations

14.63 A reasonable A1C target for most children and adolescents with type 2 diabetes is <7% (53 mmol/mol). More stringent A1C targets (such as <6.5% [48 mmol/mol]) may be appropriate for selected individuals if they can be achieved without significant hypoglycemia or other adverse effects of treatment. Appropriate individuals might include those with short duration of diabetes and lesser degrees of β-cell dysfunction and individuals treated with lifestyle or metformin only who achieve significant weight improvement. **E**

14.64 Less stringent A1C goals (such as 7.5% [58 mmol/mol]) may be appropriate if there is an increased risk of hypoglycemia. **E**

Pharmacologic Management

Recommendations

14.66 Initiate pharmacologic therapy, in addition to behavioral counseling for healthful nutrition and physical activity changes, at diagnosis of type 2 diabetes. **A**

14.74 Use of medications not approved by the FDA for youth with type 2 diabetes is not recommended outside of research trials. **B**

In the complete 2023 Standards of Care, see recommendations 14.67–14.73 for guidance on the pharmacologic management of type 2 diabetes in youth and Tables 14.*1A* and 14.*1B* for screening and treatment recommendations for type 1 and type 2 diabetes in youth.

Transition From Pediatric to Adult Care

Recommendation

14.111 Pediatric diabetes care teams should begin to prepare youth for transition to adult health care in early adolescence and, at the latest, at least 1 year before the transition. **E**

To prevent a lapse in care, coordination between the pediatric and adult care teams is recommended. See the ADA position statement, "Diabetes Care for Emerging Adults: Recommendations for Transition from Pediatric to Adult Diabetes Care Systems" for a more comprehensive discussion.

15. MANAGEMENT OF DIABETES IN PREGNANCY

Diabetes confers significantly greater maternal and fetal risk largely related to the degree of hyperglycemia but also related to chronic complications and comorbidities of diabetes. In general, specific risks of diabetes in pregnancy include spontaneous abortion, fetal anomalies, preeclampsia, fetal demise, macrosomia, neonatal hypoglycemia, hyperbilirubinemia, and neonatal respiratory distress syndrome, among others. In addition, diabetes in pregnancy may increase the risk of obesity, hypertension, and type 2 diabetes in offspring later in life.

Preconception Counseling and Care

Recommendations

15.1 Starting at puberty and continuing in all people with diabetes and reproductive potential,

preconception counseling should be incorporated into routine diabetes care. A

15.2 Family planning should be discussed, and effective contraception (with consideration of long-acting, reversible contraception) should be prescribed and used until an individual's treatment plan and A1C are optimized for pregnancy. A

15.3 Preconception counseling should address the importance of achieving glucose levels as close to normal as is safely possible, ideally A1C <6.5% (48 mmol/mol), to reduce the risk of congenital anomalies, preeclampsia, macrosomia, preterm birth, and other complications. A

15.5 In addition to focused attention on achieving glycemic targets A, standard preconception care should be augmented with extra focus on nutrition, diabetes education, and screening for diabetes comorbidities and complications. B

15.6 Individuals with preexisting type 1 or type 2 diabetes who are planning a pregnancy or who have become pregnant should be counseled on the risk of development and/or progression of DR. Dilated eye examinations should occur ideally before pregnancy or in the first trimester, and then pregnant individuals should be monitored every trimester and for 1 year postpartum as indicated by the degree of retinopathy and as recommended by the eye care HCP. B

The preconception care of people with diabetes is detailed in Table 15.1 in the complete 2023 Standards of Care.

Management of GDM

Recommendations

15.14 Lifestyle behavior change is an essential component of management of GDM and may suffice as treatment for many individuals. Insulin should be added if needed to achieve glycemic targets. A

15.15 Insulin is the preferred medication for treating hyperglycemia in GDM. Metformin and glyburide should not be used as first-line agents, as both cross the placenta to the fetus. A Other oral and noninsulin injectable glucose-lowering medications lack long-term safety data.

15.17 Telehealth visits for pregnant people with GDM improve outcomes compared with standard in-person care. A

Pregnancy and Drug Considerations

Recommendations

15.21 In pregnant individuals with diabetes and chronic hypertension, a BP threshold of 140/90 mmHg for initiation or titration of therapy is associated with better pregnancy outcomes than reserving treatment for severe hypertension, with no increase in risk of small-for-gestational-age birth weight. A There are limited data on the optimal lower limit, but therapy should be lessened for BP <90/60 mmHg. E A BP target of 110–135/85 mmHg is suggested in the interest of reducing the risk for accelerated maternal hypertension. A

15.22 Potentially harmful medications in pregnancy (i.e., ACE inhibitors, ARBs, statins) should be stopped prior to conception and avoided in sexually active individuals of childbearing potential who are not using reliable contraception. B

Postpartum Care

Recommendations

15.23 Insulin resistance decreases dramatically immediately postpartum, and insulin requirements need to be evaluated and adjusted as they are often roughly half the prepregnancy requirements for the initial few days postpartum. C

15.24 A contraceptive plan should be discussed and implemented with all people with diabetes of reproductive potential. A

15.25 Screen individuals with a recent history of GDM at 4–12 weeks postpartum, using the 75-g OGTT and clinically appropriate nonpregnancy diagnostic criteria. B

15.26 Individuals with overweight/obesity and a history of GDM found to have prediabetes should receive intensive lifestyle interventions and/or metformin to prevent diabetes. A

15.27 Breastfeeding is recommended to reduce the risk of maternal type 2 diabetes and should be considered when choosing whether to breastfeed or formula feed. B

15.28 Individuals with a history of GDM should have lifelong screening for the development of type 2 diabetes or prediabetes every 1–3 years. B

15.30 Postpartum care should include psychosocial assessment and support for self-care. E

16. DIABETES CARE IN THE HOSPITAL

Among hospitalized individuals, hyperglycemia, hypoglycemia, and glucose variability are associated with adverse outcomes, including death. Therefore, careful management of people with diabetes during hospitalization has direct and immediate benefits. When caring for hospitalized people with diabetes, consult with a specialized diabetes or glucose management team when possible.

Hospital Care Delivery Standards

Recommendations

16.1 Perform an A1C test on all people with diabetes or hyperglycemia (blood glucose >140 mg/dL [7.8 mmol/L]) admitted to the hospital if not performed in the prior 3 months. **B**

16.2 Insulin should be administered using validated written or computerized protocols that allow for predefined adjustments in the insulin dosage based on glycemic fluctuations. **B**

High-quality hospital care for diabetes requires standards for care delivery, which are best implemented using structured order sets, and quality improvement strategies for process improvement.

Glycemic Targets in Hospitalized Adults

Recommendations

16.4 Insulin therapy should be initiated for the treatment of persistent hyperglycemia starting at a threshold ≥180 mg/dL (10.0 mmol/L) (checked on two occasions). Once insulin therapy is started, a target glucose range of 140–180 mg/dL (7.8–10.0 mmol/L) is recommended for most critically ill and noncritically ill patients. **A**

16.5 More stringent goals, such as 110–140 mg/dL (6.1–7.8 mmol/L) or 100–180 mg/dL (5.6–10.0 mmol/L), may be appropriate for selected patients and are acceptable if they can be achieved without significant hypoglycemia. **C**

Hyperglycemia in hospitalized patients is defined as blood glucose levels >140 mg/dL (7.8 mmol/L). Hypoglycemia in hospitalized patients is classified the same as in any setting (Table 6.4).

BGM

In hospitalized individuals with diabetes who are eating, point-of-care (POC) glucose monitoring should be performed before meals; in those not eating, glucose monitoring is advised every 4–6 hours. Although CGM has theoretical advantages over POC glucose monitoring in detecting and reducing the incidence of hypoglycemia, it has not been approved by the FDA for inpatient use.

Glucose-Lowering Treatment in Hospitalized Patients

Recommendations

16.6 Basal insulin or a basal plus bolus correction insulin regimen is the preferred treatment for noncritically ill hospitalized patients with poor oral intake or those who are taking nothing by mouth. **A**

16.7 An insulin regimen with basal, prandial, and correction components is the preferred treatment for most noncritically ill hospitalized patients with adequate nutritional intake. **A**

16.8 Use of a correction or supplemental insulin without basal insulin (often referred to as a sliding scale) in the inpatient setting is discouraged. **A**

Insulin Therapy

In the critical care setting, continuous intravenous insulin infusion is the most effective method for achieving glycemic targets. When discontinuing intravenous insulin, a transition protocol is associated with less morbidity and lower costs of care.

In the noncritical care setting, insulin is the preferred treatment for hyperglycemia. However, in certain circumstances, it may be appropriate to continue home therapies, including oral glucose-lowering medications. The safety and efficacy of noninsulin glucose-lowering therapies in the hospital setting is an area of active research. (See "16. Diabetes Care in the Hospital" in the complete 2023 Standards of Care for details.) If oral medications are held in the hospital but will be reinstated after discharge, there should be a protocol for guiding resumption of home medications 1–2 days prior to discharge.

An insulin schedule with basal and correction components is necessary for all hospitalized individuals with type 1 diabetes, even when taking nothing by mouth, with the addition of prandial insulin when eating.

Hypoglycemia

Recommendations

16.9 A hypoglycemia management protocol should be adopted and implemented by each hospital or hospital system. A plan for preventing and treating hypoglycemia should be established for each individual. Episodes of hypoglycemia in the hospital should be documented in the medical record and tracked for quality improvement/quality assessment. **E**

16.10 Treatment regimens should be reviewed and changed as necessary to prevent further hypoglycemia when a blood glucose value of <70 mg/dL (3.9 mmol/L) is documented. **C**

People with or without diabetes may experience hypoglycemia in the hospital setting. While hypoglycemia is associated with increased mortality, in many cases, it is a marker of an underlying disease rather than the cause of fatality.

Insulin is one of the most common drugs causing adverse events in hospitalized patients, and errors in insulin dosing and/or administration occur relatively frequently.

MNT in the Hospital

The goals of MNT in the hospital are to provide adequate calories to meet metabolic demands, optimize glycemic outcomes, address personal food preferences, and facilitate the creation of a discharge plan.

Self-Management in the Hospital

Diabetes self-management in the hospital may be appropriate for specific individuals who wish to continue to perform self-care while acutely ill.

Standards for Special Situations

See "16. DIABETES CARE IN THE HOSPITAL" in the complete 2023 Standards of Care for guidance on enteral/parenteral feedings, glucocorticoid therapy, perioperative care, and DKA and hyperosmolar hyperglycemic state.

Transition From the Hospital to the Ambulatory Setting

Recommendation

16.11 A structured discharge plan should be tailored to the individual with diabetes. **B**

Discharge planning should begin at admission and be updated as individual needs change. See "16. Diabetes Care in the Hospital" in the complete 2023 Standards of Care for a discussion of appropriate discharge planning.

Preventing Admissions and Readmissions

People with diabetes are nearly twice as likely as those without diabetes to be readmitted after hospitalization. Strategies to reduce readmissions include targeting ketosis-prone type 1 diabetes, treating individuals with admission A1C >9% (75 mmol/mol) with insulin, and implementing a transitional care model.

17. DIABETES ADVOCACY

For a list of ADA advocacy position statements, including "Diabetes and Driving" and "Diabetes and Employment," see "17. Diabetes Advocacy" in the complete 2023 Standards of Care.

ACKNOWLEDGMENTS

This abridged version of the *Standards of Care in Diabetes—2023* was created by the ADA's Primary Care Advisory Group (PCAG), with special thanks to PCAG chair Hope Feldman, CRNP, FNP-BC, of Philadelphia, PA; ADA lead Nuha Ali ElSayed, MD, MMSc; Rozalina G. McCoy, MD, MS, of Rochester, MN; Joy Moverley, DHSc, MPH, PA-C, of Vallejo, CA; Sean M. Oser, MD, MPH, of Aurora, CO; Alissa R. Segal, PharmD, CDCES, CDTC, FCCP, of Boston, MA; and Jennifer Trujillo, PharmD, FCCP, BCPS, CDCES, BC-ADM, of Aurora, CO. Christopher W. Jones, MD, of Murray, UT; Scott J. Pilla, MD, MHS, of Baltimore, MD; and Nay Linn Aung, MD, BC-ADM, of Utica, NY, also contributed abridged chapters. ADA staff support was provided by Caitlin Krekel, MSPH, RD, Sarah Bradley, and Raveendhara R. Bannuru, MD, PhD, FAGE.

The complete *Standards of Care in Diabetes—2023* was developed by the ADA's Professional Practice Committee: Nuha Ali ElSayed, MD, MMSc (Chair), Grazia Aleppo, MD, Vanita R. Aroda, MD, Raveendhara R. Bannuru, MD, PhD, FAGE (Chief Methodologist), Florence M. Brown, MD, Dennis Bruemmer, MD, PhD, Billy S. Collins, DHSc, PA-C, Marisa E. Hilliard, PhD, Diana Isaacs, PharmD, BCPS, BCACP, CDCES, BC-ADM, FADCES, FCCP, Eric L. Johnson, MD, Scott Kahan, MD, MPH, Kamlesh Khunti, MD, PhD, FRCP, FRCGP, FMedSci, Jose Leon, MD, MPH, Sarah K. Lyons, MD, Mary Lou Perry, MS, RDN, CDCES, Priya Prahalad, MD, PhD, Richard E. Pratley, MD, Jane Jeffrie Seley, DNP, MPH, MSN, BSN, RN, GNP, BC-ADM, CDCES, CDTC, FADCES, FAAN, Robert C. Stanton, MD, and Robert A. Gabbay, MD, PhD. American College of Cardiology—Designated Representatives (Section 10) include Sandeep R. Das, MD, MPH, FACC, and Mikhail Kosiborod, MD, FACC, FAHA. Designated subject matter experts are Kenneth Cusi, MD, FACP, FACE, Christopher H. Gibbons, MD, MMSc, John M. Giurini, DPM, Lisa Murdock, Jennifer K. Sun, MD, MPH, Crystal C. Woodward, Deborah Young-Hyman, PhD, FTOS, and Fel SBM, CDCES. ADA staff are Raveendhara R. Bannuru, MD, PhD, FAGE, Nuha Ali ElSayed, MD, MMSc, Robert A. Gabbay, MD, PhD, Malaika I. Hill, MA, and Laura S. Mitchell.