What's New in the Standards of Medical Care in Diabetes?

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American Diabetes Association®

Disclosures

- None.

Learning Objectives

By the end of this presentation, participants will be able to:

- Discuss updates and changes in the 2018 Standards of Medical Care in Diabetes
- Identify the classification of diabetes and related diagnostic tests
- Summarize the comprehensive medical evaluation and additional referrals for people with diabetes, including DSME

Evidence Grading System

A	• Clear evidence from well-conducted, generalizable RCTs, that are adequately powered, including: • Evidence from a well-conducted multicenter trial or meta-analysis that incorporated quality ratings in the analysis; • Compelling nonexperimental evidence; • Supportive evidence from well-conducted RCTs that are adequately powered
B	• Supportive evidence from a well-conducted cohort studies
	• Supportive evidence from a well-conducted case-control study
C	• Supportive evidence from poorly controlled or uncontrolled studies
	• Conflicting evidence with the weight of evidence supporting the recommendation
E	• Expert consensus or clinical experience

Classification and Diagnosis of Diabetes

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Classification of Diabetes

1. Type 1 diabetes
   - β-cell destruction
2. Type 2 diabetes
   - Progressive insulin secretory defect
3. Gestational Diabetes Mellitus (GDM)
4. Other specific types of diabetes due to other causes:
   - Monogenic diabetes syndromes
   - Diseases of the exocrine pancreas, e.g., cystic fibrosis
   - Drug- or chemical-induced diabetes

Classification and Diagnosis of Diabetes:
Standards of Medical Care in Diabetes - 2018. *Diabetes Care* 2018; 41 (Suppl. 1): S13-S27

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Criteria for the Diagnosis of Diabetes

Table 2.2—Criteria for the diagnosis of diabetes
FPG ≥126 mg/dL (7.0 mmol/L). Fasting is defined as no caloric intake for at least 8 h.*
OR
2-h PG ≥200 mg/dL (11.1 mmol/L) during OGTT. The test should be performed as described by the WHO, using a glucose load containing the equivalent of 75-g anhydrous glucose dissolved in water.*
OR
A1C ≥6.5% (48 mmol/mol). The test should be performed in a laboratory using a method that is NGSP certified and standardized to the DCCT assay.*
OR
In a patient with classic symptoms of hyperglycemia or hyperglycemic crisis, a random plasma glucose ≥200 mg/dL (11.1 mmol/L).
*In the absence of unequivocal hyperglycemia, results should be confirmed by repeat testing.

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Categories of Increased Risk for Diabetes (Prediabetes)

Table 2.4—Categories of increased risk for diabetes (prediabetes)*
FPG 100 mg/dL (5.6 mmol/L) to 125 mg/dL (6.9 mmol/L) (IFG)
OR
2-h PG during 75-g OGTT 140 mg/dL (7.8 mmol/L) to 199 mg/dL (11.0 mmol/L) (IGT)
OR
A1C 5.7–6.4% (39–47 mmol/mol)
*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.

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A1C: New Recommendations

- To avoid misdiagnosis or missed diagnosis, the A1C test should be performed using a method that is certified by the NGSP and standardized to the Diabetes Control and Complications Trial (DCCT) assay. B
- Marked discordance between measured A1C and plasma glucose levels should raise the possibility of A1C assay interference due to hemoglobin variants (i.e., hemoglobinopathies) and consideration of using an assay without interference or plasma blood glucose criteria to diagnose diabetes. B
- In conditions associated with increased red blood cell turnover, such as sickle cell disease, pregnancy (second and third trimesters), hemodialysis, recent blood loss or transfusion, or erythropoietin therapy, only plasma blood glucose criteria should be used to diagnose diabetes. B

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Type 2 Diabetes

- Screening for type 2 diabetes with an informal assessment of risk factors or validated tools should be considered in asymptomatic adults. B
- Testing for type 2 diabetes in asymptomatic people should be considered in adults of any age who are overweight or obese (BMI ≥25 kg/m^2 or ≥23 kg/m^2 in Asian Americans) and who have 1 or more additional risk factors for diabetes. B
- For all patients, testing should begin at age 45 years. B
- If tests are normal, repeat testing carried out at a minimum of 3-year intervals is reasonable. C

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Type 2 Diabetes

- To test for type 2 diabetes, FPG, 2-h plasma glucose during a 75-g OGTT, and A1C are equally appropriate. B
- In patients with diabetes, identify and treat other CVD risk factors. B
- Testing for type 2 diabetes should be considered in children and adolescents who are overweight or obese (BMI >85th percentile for age and sex, weight for height >85th percentile, or weight >120% of ideal for height) and who have additional risk factors for diabetes. E

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Gestational Diabetes Mellitus (GDM)

- Test for undiagnosed diabetes at the 1st prenatal visit in those with risk factors, using standard diagnostic criteria. B
- Test for GDM at 24–28 weeks of gestation in pregnant women not previously known to have diabetes. A
- Test women with GDM for persistent diabetes at 4–12 weeks postpartum, using the OGTT and clinically appropriate nonpregnancy diagnostic criteria. E

Classification and Diagnosis of Diabetes:
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Gestational Diabetes Mellitus

- Women with a history of GDM should have lifelong screening for the development of diabetes or prediabetes at least every 3 years. B
- Women with a history of GDM found to have prediabetes should receive intensive lifestyle interventions or metformin to prevent diabetes. A

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Comprehensive Medical Evaluation and Assessment of Comorbidities

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Patient-Centered Collaborative Care

A patient-centered communication style should be used to optimize health outcomes and quality of life:

- person-centered and strength-based language
- active listening
- elicits patient preferences and beliefs, and
- assesses literacy, numeracy, and potential barriers to care

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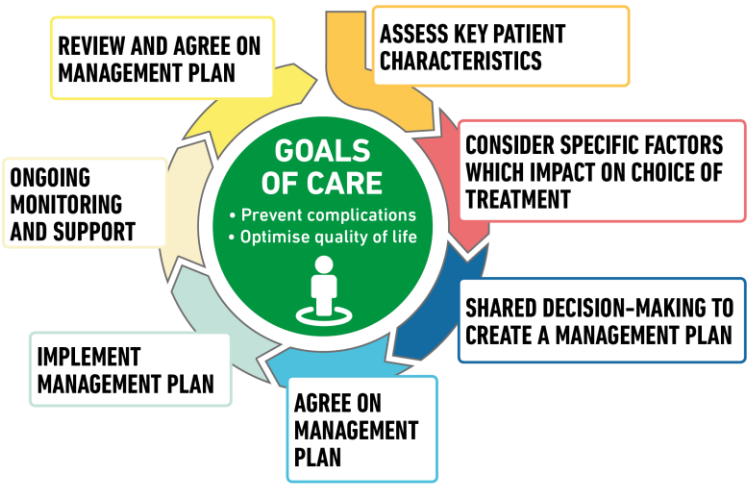
Figure 1 DECISION CYCLE FOR PATIENT-CENTRED GLYCAEMIC MANAGEMENT IN TYPE 2 DIABETES



Components of the Comprehensive Diabetes Evaluation

		INITIAL VISIT	EVERY FOLLOW-UP VISIT	ANNUAL VISIT
PAST MEDICAL AND FAMILY HISTORY	**Diabetes history**			
	▪ Characteristics at onset (e.g., age, symptoms)	✓		
	▪ Review of previous treatment regimens and response	✓		
	▪ Assess frequency/cause/severity of past hospitalizations	✓		
	Family history			
	▪ Family history of diabetes in a first-degree relative	✓		
	▪ Family history of autoimmune disorder	✓		
	Personal history of complications and common comorbidities			
	▪ Macrovascular and microvascular	✓		
	▪ Common comorbidities	✓		
	▪ Presence of hemoglobinopathies or anemias	✓		
	▪ High blood pressure or abnormal lipids	✓		
	▪ Last dental visit	✓		✓
	▪ Last dilated eye exam	✓		✓
	▪ Visits to specialists	✓	✓	✓
	Interval history			
	▪ Changes in medical/family history since last visit		✓	✓

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Components of the Comprehensive Diabetes Evaluation

		INITIAL VISIT	EVERY FOLLOW-UP VISIT	ANNUAL VISIT
SOCIAL HISTORY	▪ Eating patterns and weight history	✓	✓	✓
	▪ Sleep behaviors and physical activity	✓	✓	✓
	▪ Familiarity with carbohydrate counting in type 1 diabetes	✓		
	▪ Tobacco, alcohol, and substance use	✓		
	▪ Identify existing social supports	✓		
	Interval history			
	▪ Changes in social history since last visit		✓	✓
MEDICATIONS AND VACCINATIONS	▪ Medication-taking behavior	✓	✓	✓
	▪ Medication intolerance or side effects	✓	✓	✓
	▪ Complementary and alternative medicine use	✓	✓	✓
	▪ Vaccination history and needs	✓		✓

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Components of the Comprehensive Diabetes Evaluation

		INITIAL VISIT	EVERY FOLLOW-UP VISIT	ANNUAL VISIT
TECHNOLOGY USE	▪ Assess use of health apps, online education, patient portals, etc.	✓		✓
	▪ Glucose monitoring (meter/CGM): results and data use	✓	✓	✓
	▪ Review insulin pump settings	✓	✓	✓
SCREENING	**Psychosocial conditions** ▪ Screen for depression, anxiety, and disordered eating; refer for further assessment or intervention if warranted	✓		✓
	▪ Consider assessment for cognitive impairment*	✓		✓
	Diabetes self-management education and support ▪ History of dietitian/diabetes educator visits	✓	✓	✓
	▪ Screen for barriers to diabetes self-management	✓		✓
	▪ Refer or offer local resources and support as needed	✓	✓	✓
	Hypoglycemia ▪ Timing of episodes, awareness, frequency and causes	✓	✓	✓
	Pregnancy planning ▪ For women with childbearing capacity, review contraceptive needs and preconception planning	✓	✓	✓

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Components of the Comprehensive Diabetes Evaluation

		INITIAL VISIT	EVERY FOLLOW-UP VISIT	ANNUAL VISIT
PHYSICAL EXAMINATION	▪ Height, weight, and BMI; growth/pubertal development in children and adolescents	✓	✓	✓
	▪ Blood pressure determination	✓	✓	✓
	▪ Orthostatic blood pressure measures (when indicated)	✓		
	▪ Fundoscopic examination (refer to eye specialist)	✓		✓
	▪ Thyroid palpation	✓		✓
	▪ Skin examination (e.g., acanthosis nigricans, insulin injection or insertion sites, lipodystrophy)	✓	✓	✓
	▪ Comprehensive foot examination			
	• Visual inspection (e.g., skin integrity, callous formation, foot deformity or ulcer, toenails)	✓	✓	✓
	• Screen for PAD (pedal pulses; refer for ABI if diminished)	✓		✓
	• Determination of temperature, vibration or pinprick sensation, and 10-g monofilament exam	✓		✓

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Components of the Comprehensive Diabetes Evaluation

		INITIAL VISIT	EVERY FOLLOW-UP VISIT	ANNUAL VISIT
LABORATORY EVALUATION	▪ A1C, if the results are not available within the past 3 months	✓	✓	✓
	▪ If not performed/available within the past year			
	• Lipid profile, including total, LDL, and HDL cholesterol and triglycerides[#]	✓		✓^
	• Liver function tests[#]	✓		✓
	• Spot urinary albumin–to–creatinine ratio	✓		✓
	• Serum creatinine and estimated glomerular filtration rate[†]	✓		✓
	• Thyroid-stimulating hormone in patients with type 1 diabetes[#]	✓		✓
	• Vitamin B12 if on metformin (when indicated)	✓		
	• Serum potassium levels in patients on ACE inhibitors, ARBs, or diuretics[†]	✓		✓

[†] May be needed more frequently in patients with known chronic kidney disease or with changes in medications that affect kidney function and serum potassium.
[#] May also need to be checked after initiation or dose changes of medications that affect these laboratory values (i.e., diabetes medications, blood pressure medications, cholesterol medications, or thyroid medications),.
^ In people without dyslipidemia and not on cholesterol-lowering therapy, testing may be less frequent.

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Components of the Comprehensive Diabetes Evaluation

		INITIAL	EVERY FOLLOW-	ANNUAL
ASSESSMENT AND PLAN	**Goal setting**			
	▪ Set A1C/blood glucose target and monitoring frequency	✓	✓	✓
	▪ If hypertension diagnosed, establish blood pressure goal	✓		✓
	▪ Incorporate new members to the care team as needed	✓	✓	✓
	▪ Diabetes education and self-management support needs	✓	✓	✓
	Cardiovascular risk assessment and staging of CKD			
	▪ History of ASCVD	✓	✓	✓
	▪ Presence of ASCVD risk factors (see Table 9.2)	✓	✓	✓
	▪ Staging of CKD (see Table 10.1)[†]	✓	✓	✓
	Therapeutic treatment plan			
	▪ Lifestyle management	✓	✓	✓
	▪ Pharmacologic therapy	✓	✓	✓
	▪ Referrals to specialists (including dietitian and diabetes educator) as needed	✓	✓	✓
	▪ Use of glucose monitoring and insulin delivery devices	✓	✓	✓

[†] May be needed more frequently in patients with known chronic kidney disease or with changes in medications that affect kidney function and serum potassium.

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Referrals for Initial Care Management

• Eye care professional for annual dilated eye exam
• Family planning for women of reproductive age
• Registered dietitian for MNT
• DSMES
• Dentist for comprehensive dental and periodontal examination
• Mental health professional, if indicated

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Anxiety Disorders: When to Refer

- Screening in people exhibiting anxiety or worries B:
  - diabetes complications
  - insulin injections or infusion
  - taking medications, and/or
  - hypoglycemia

  that interfere with self-management behaviors
- And those who express:
  - Fear
  - dread, or
  - irrational thoughts
- And/or show anxiety symptoms such as:
  - avoidance behaviors
  - excessive repetitive behaviors, or
  - social withdrawal.

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Referral for Psychosocial Care

Table 4.2—Situations that warrant referral of a person with diabetes to a mental health provider for evaluation and treatment

- If self-care remains impaired in a person with DD after tailored diabetes education
- If a person has a positive screen on a validated screening tool for depressive symptoms
- In the presence of symptoms or suspicions of disordered eating behavior, an eating disorder, or disrupted patterns of eating
- If intentional omission of insulin or oral medication to cause weight loss is identified
- If a person has a positive screen for anxiety or fear of hypoglycemia
- If a serious mental illness is suspected
- In youth and families with behavioral self-care difficulties, repeated hospitalizations for diabetic ketoacidosis, or significant distress
- If a person screens positive for cognitive impairment
- Declining or impaired ability to perform diabetes self-care behaviors
- Before undergoing bariatric or metabolic surgery and after surgery if assessment reveals an ongoing need for adjustment support

Lifestyle Management:
Standards of Medical Care in Diabetes - 2018. Diabetes Care 2018; 41 (Suppl. 1): S38-S50

Lifestyle Management

Outline

The Foundation of Hyperglycemic Management

Lifestyle
- Medical Nutrition Therapy
- Physical activity

Medications

Metabolic Surgery

DSMES Delivery

Four critical time points for DSMES delivery:

1. At diagnosis
2. Annually for assessment of education, nutrition, and emotional needs
3. When new complicating factors (health conditions, physical limitations, emotional factors, or basic living needs) arise that influence self-management; and
4. When transitions in care occur

Lifestyle Management:
Standards of Medical Care in Diabetes - 2018. Diabetes Care 2018; 41 (Suppl. 1): S38-S50

Nutrition: Recommendations

Table 4.1—MNT recommendations

Topic	Recommendations	Evidence rating
Effectiveness of nutrition therapy	• An individualized MNT program, preferably provided by a registered dietitian, is recommended for all people with type 1 or type 2 diabetes or gestational diabetes mellitus.	A
	• A simple and effective approach to glycemia and weight management emphasizing portion control and healthy food choices may be considered for those with type 2 diabetes who are not taking insulin, who have limited health literacy or numeracy, or who are older and prone to hypoglycemia.	B
	• Because diabetes nutrition therapy can result in cost savings **B** and improved outcomes (e.g., A1C reduction) **A**, MNT should be adequately reimbursed by insurance and other payers. **E**	B, A, E
Energy balance	• Weight loss (>5%) achievable by the combination of reduction of calorie intake and lifestyle modification benefits overweight or obese adults with type 2 diabetes and also those with prediabetes. Intervention programs to facilitate weight loss are recommended.	A
Eating patterns and macronutrient distribution	• There is no single ideal dietary distribution of calories among carbohydrates, fats, and proteins for people with diabetes; therefore, macronutrient distribution should be individualized while keeping total calorie and metabolic goals in mind.	E
	• A variety of eating patterns are acceptable for the management of type 2 diabetes and prediabetes.	B

Lifestyle Management:
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Goals of Nutrition Therapy

1. To promote and support healthful eating patterns, emphasizing a variety of nutrient-dense foods in appropriate portion sizes, to improve overall health and to:
   - Achieve and maintain body weight goals
   - Attain individualized glycemic, blood pressure, and lipid goals
   - Delay or prevent the complications of diabetes
2. To address individual nutrition needs based on personal & cultural preferences, health literacy & numeracy, access to healthful foods, willingness and ability to make behavioral changes, & barriers to change

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Goals of Nutrition Therapy

3. To maintain the pleasure of eating by providing non-judgmental messages about food choices
4. To provide an individual with diabetes the practical tools for developing healthful eating patterns rather than focusing on individual macronutrients, micronutrients, or single foods

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Physical Activity

- 150 min of moderate-to-vigorous intensity aerobic activity/week with no more than 2 consecutive days without activity.
- Shorter durations (min.75 min/week) of vigorous-intensity or interval training may be sufficient for younger and more physically fit individuals.
- Adults should do 2-3 sessions/week of resistance exercise on nonconsecutive days.
- Interrupt sitting every 30 min for blood glucose benefits, particularly in adults with type 2 diabetes.
- Flexibility training and balance training are recommended 2–3 times/week for older adults with diabetes.

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Smoking Cessation

- Advise all patients not to use cigarettes and other tobacco products A or e-cigarettes. E
- Include smoking cessation counseling and other forms of treatment as a routine component of diabetes care. B

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Diabetes Distress

- Very common and distinct from other psychological disorders
- Negative psychological reactions related to emotional burdens of managing a demanding chronic disease
- Recommendation:
  - Routinely monitor people with diabetes for diabetes distress, particularly when treatment targets are not met and/or at the onset of diabetes complications. B

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Glycemic Targets

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Assessment of Glycemic Control

- Two primary techniques are available for health providers and patients to assess the effectiveness of a management plan on glycemic control:
  1. Patient self-monitoring of blood glucose (SMBG)
  2. A1C
- Continuous glucose monitoring (CGM) also has an important role in assessing the efficacy and safety of treatment in subgroups of patients with T1DM and in selected patients with T2DM.
  - Data indicate similar A1C and safety with the use of CGM compared with SMBG.

Glycemic Targets:
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Summary of Glycemic Recommendations

Table 6.2—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. 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. †Postprandial glucose may be targeted if A1C goals are not met despite reaching preprandial glucose goals. Postprandial glucose measurements should be made 1–2 h after the beginning of the meal, generally peak levels in patients with diabetes.

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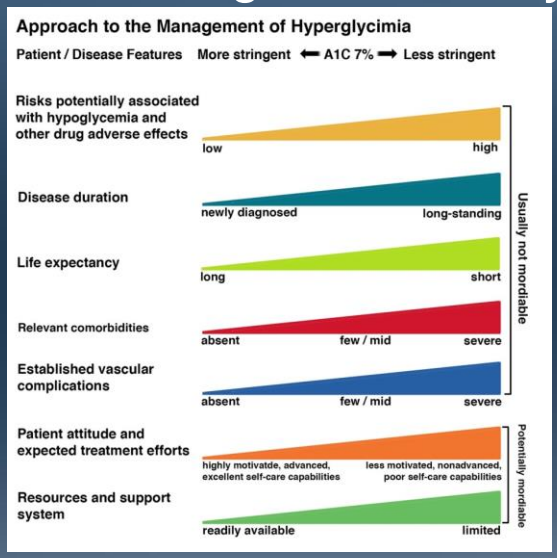
Approach to the Management of Hyperglycemia



American Diabetes Association. 8. Pharmacologic approaches to glycemic treatment: Standards of Medical Care in Diabetes. *Diabetes Care* 2018; 41 (Suppl. 1): S73-S85

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Microvascular Complications and Foot Care

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CKD Stages and Corresponding Focus of Kidney-Related Care

Table 10.1—CKD stages and corresponding focus of kidney-related care

	CKD stage†		Focus of kidney-related care			
Stage	eGFR (mL/min/1.73 m^2)	Evidence of kidney damage*	Diagnose cause of kidney injury	Evaluate and treat risk factors for CKD progression**	Evaluate and treat CKD complications***	Prepare for renal replacement therapy
No clinical evidence of CKD	≥60	—				
1	≥90	+	√	√		
2	60–89	+	√	√		
3	30–59	+/−	√	√	√	
4	15–29	+/−		√	√	√
5	<15	+/−			√	√

†CKD stages 1 and 2 are defined by evidence of kidney damage (+), while CKD stages 3–5 are defined by reduced eGFR with or without evidence of kidney damage (+/−). *Kidney damage is most often manifest as albuminuria (UACR ≥30 mg/g Cr) but can also include glomerular hematuria, other abnormalities of the urinary sediment, radiographic abnormalities, and other presentations. **Risk factors for CKD progression include elevated blood pressure, glycemia, and albuminuria. ***See **Table 10.2**.

Microvascular Complications and Foot Care:
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Diabetic Retinopathy

Screening:

- Initial dilated and comprehensive eye exam by an ophthalmologist or optometrist:
  - Adults with type 1 diabetes, within 5 years of diabetes onset. B
  - Patients with type 2 diabetes at the time of diabetes diagnosis. B

Microvascular Complications and Foot Care:
Standards of Medical Care in Diabetes - 2018. Diabetes Care 2018; 41 (Suppl. 1): S105-S118

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Neuropathy: Recommendations

Treatment:

- Optimize glucose control to prevent or delay the development of neuropathy in patients with T1DM A and to slow the progression in patients with T2DM. B
- Assess and treat patients to reduce pain related to DPN B and symptoms of autonomic neuropathy and to improve quality of life. E
- Either pregabalin or duloxetine are recommended as initial pharmacologic treatments for neuropathic pain in diabetes. A

Microvascular Complications and Foot Care:
Standards of Medical Care in Diabetes - 2018. Diabetes Care 2018; 41 (Suppl. 1): S105-S118

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Older Adults

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Older Adults

Pharmacologic Therapy:

- In older adults at increased risk of hypoglycemia, medication classes with low risk of hypoglycemia are preferred. B
- Overtreatment of diabetes is common in older adults and should be avoided. B
- Deintensification (or simplification) of complex regimens is recommended to reduce the risk of hypoglycemia, if it can be achieved within the individualized A1C target. B

Older Adults:
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Framework for Considering Treatment Goals in Older Adults with Diabetes

Table 11.1—Framework for considering treatment goals for glycemia, blood pressure, and dyslipidemia in older adults with diabetes (2)

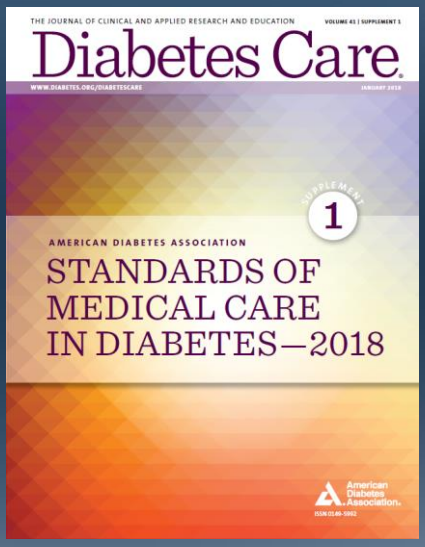
Patient characteristics/health status	Rationale	Reasonable A1C goal‡	Fasting or preprandial glucose	Bedtime glucose	Blood pressure	Lipids
Healthy (few coexisting chronic illnesses, intact cognitive and functional status)	Longer remaining life expectancy	<7.5% (58 mmol/mol)	90–130 mg/dL (5.0–7.2 mmol/L)	90–150 mg/dL (5.0–8.3 mmol/L)	<140/90 mmHg	Statin unless contraindicated or not tolerated
Complex/intermediate (multiple coexisting chronic illnesses* or 2+ 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)	<140/90 mmHg	Statin unless contraindicated or not tolerated
Very complex/poor health (LTC or end-stage chronic illnesses** or moderate-to-severe cognitive impairment or 2+ ADL dependencies)	Limited remaining life expectancy makes benefit uncertain	<8.5%† (69 mmol/mol)	100–180 mg/dL (5.6–10.0 mmol/L)	110–200 mg/dL (6.1–11.1 mmol/L)	<150/90 mmHg	Consider likelihood of benefit with statin (secondary prevention more so than primary)

This represents a consensus framework for considering treatment goals for glycemia, blood pressure, 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. ADL, activities of daily living. ‡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, congestive heart failure, depression, emphysema, falls, hypertension, incontinence, stage 3 or worse chronic kidney disease, myocardial infarction, and stroke. By "multiple," we mean at least three, but many patients may have five or more (47). **The presence of a single end-stage chronic illness, such as stage 3–4 congestive heart failure or oxygen-dependent lung disease, chronic kidney disease requiring dialysis, or uncontrolled metastatic cancer, may cause significant symptoms or impairment of functional status and significantly reduce life expectancy. †A1C of 8.5% (69 mmol/mol) equates to an estimated average glucose of ~200 mg/dL (11.1 mmol/L). Looser A1C targets above 8.5% (69 mmol/mol) are not recommended as they may expose patients to more frequent higher glucose values and the acute risks from glycosuria, dehydration, hyperglycemic hyperosmolar syndrome, and poor wound healing.

Older Adults:
Standards of Medical Care in Diabetes - 2018. Diabetes Care 2018; 41 (Suppl. 1): S119-S125

Helpful Resources

2018 Standards of Care - Resources



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