STANDARDS OF MEDICAL CARE IN DIABETES 2016

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STANDARDS OF CARE

• Funded out Association’s general revenues and does not use industry support.

• Slides correspond with sections within the Standards of Medical Care in Diabetes—2016.

• Reviewed and approved by the Executive Committee of the Association’s Board of Directors.
PROCEESS

• ADA’s Professional Practice Committee (PPC) conducts an annual review & revision.
• Searched Medline for human studies related to each subsection and published since January 1, 2015.
• Recommendations revised per new evidence, for clarity, or to better match text to strength of evidence.

Professional.diabetes.org/SOC
# Clinical Practice Recommendations Evidence Grading System

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong></td>
<td>Clear evidence from adequately-powered, well-conducted, generalizable RCTs, including evidence from a multicenter trial or meta-analysis that incorporated quality ratings in the analysis; Compelling nonexperimental evidence; Supportive evidence from adequately-powered, well-conducted RCTs.</td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>Supportive evidence from a well-conducted cohort studies Supportive evidence from a well-conducted case-control study Supportive evidence from poorly controlled or uncontrolled studies or evidence from observational studies with high potential for bias</td>
</tr>
<tr>
<td><strong>C</strong></td>
<td>Evidence from case series or case reports Conflicting evidence with the weight of evidence supporting the recommendation</td>
</tr>
<tr>
<td><strong>E</strong></td>
<td>Expert consensus or clinical experience</td>
</tr>
</tbody>
</table>
TRENDS IN THE NUMBER AND PROPORTION OF HIGHER AND LOWER LEVEL RECOMMENDATIONS

- Higher level recommendations defined as A or B evidence grades
- Lower level recommendations defined as C or E evidence grades
TERMINOLOGY

• No longer using the term “diabetic.”
• Diabetes does not define people.
• People with diabetes are individuals with diabetes, not “diabetics.”
• “Diabetic” will continue to be used related to complications, e.g., “diabetic retinopathy.”
1. STRATEGIES FOR IMPROVING DIABETES CARE
CARE DELIVERY SYSTEMS

• 33-49% of patients still do not meet targets for A1C, blood pressure, or lipids.
• 14% meet targets for all A1C, BP, lipids, and nonsmoking status.
• Progress in CVD control is slowing.
• Substantial system-level improvements are needed.
• Delivery system is fragmented, lacks clinical information capabilities, duplicates services & is poorly designed.
CHRONIC CARE MODEL

Six Components:
1. Delivery system design
2. Self-management support
3. Decision support
4. Clinical information systems
5. Community resources & policies
6. Health systems

WHEN TREATMENT GOALS AREN’T MET

• Seek evidence-based approaches that improve clinical outcomes and quality of life.

• Recent reviews of quality improvement strategies have not identified one approach that’s more effective than others.

• Translating Research Into Actions for Diabetes (TRIAD) study provided objective data.
HEALTH DISPARITIES

• Lack of health insurance
• Food insecurity (FI)
  • Carefully evaluate hyperglycemia and hypoglycemia and propose solutions
  • Recognize that homelessness, poor literacy, and poor numeracy often occur with food insecurity; appropriate resources should be made available for patients with diabetes.
2. Classification and Diagnosis of Diabetes
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
   • Monogenic diabetes syndromes
   • Diseases of the exocrine pancreas, e.g., cystic fibrosis
   • Drug- or chemical-induced diabetes
CRITERIA FOR THE DIAGNOSIS OF DIABETES

Fasting plasma glucose (FPG) ≥126 mg/dL (7.0 mmol/L)  
OR  
2-h plasma glucose ≥200 mg/dL (11.1 mmol/L) during an OGTT  
OR  
A1C ≥6.5%  
OR  
Random plasma glucose ≥200 mg/dL (11.1 mmol/L)

CRITERIA FOR THE DIAGNOSIS OF PREDIABETES

FPG 100–125 mg/dL
(5.6–6.9 mmol/L): IFG

OR

2-h plasma glucose 140–199 mg/dL
(7.8–11.0 mmol/L): IGT

OR

A1C 5.7–6.4%

* For all three tests, risk is continuous, extending below the lower limit of a range and becoming disproportionately greater at higher ends of the range.

A1C ≥6.5%

- Performed in a laboratory using a method that is NGSP certified and standardized to the DCCT assay – www.ngsp.org

- POC testing not recommended

- Greater convenience, preanalytical stability, and less day-to-day perturbations than FPG and OGTT

- Consider cost, age, race/ethnicity, anemia, etc.
RECOMMENDATIONS: SCREENING FOR TYPE 2 DIABETES

• Consider testing in asymptomatic adults of any age with BMI $\geq 25$ kg/m\(^2\) or $\geq 23$ kg/m\(^2\) in Asian Americans who have 1 or more add’l dm risk factors. 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
RECOMMENDATIONS: SCREENING FOR TYPE 2 DIABETES (2)

- FPG, 2-h PG after 75-g OGTT, and the A1C are equally appropriate. B
- In patients with diabetes, identify and, if appropriate, treat other CVD risk factors. B
- Consider testing for T2DM in overweight/obese children and adolescents with 2 or more add’l diabetes risk factors. E
RECOMMENDATIONS: PREDIABETES

• Testing should begin at age 45 for all patients, particularly those who are overweight or obese. B
• Consider testing for prediabetes in asymptomatic adults of any age w/ BMI ≥25 kg/m² or ≥23 kg/m² (in Asian Americans) who have 1 or more add’l risk factors for diabetes. B
• If tests are normal, repeat at a minimum of 3-year intervals. C

**RECOMMENDATIONS: PREDIABETES (2)**

- FPG, 2-h PG after 75-g OGTT, and A1C, are equally appropriate for prediabetes testing. B
- In patients with prediabetes, identify and, if appropriate, treat other CVD risk factors. B
- Consider prediabetes testing in overweight/obese children and adolescents with 2 or more add’l diabetes risk factors. E
CRITERIA FOR TESTING FOR T2DM IN CHILDREN & ADOLESCENTS

• Overweight plus any 2:
  • Family history of type 2 diabetes in 1st or 2nd degree relative
  • Race/ethnicity
  • Signs of insulin resistance or conditions associated with insulin resistance
  • Maternal history of diabetes or GDM
• Age of initiation 10 years or at onset of puberty
• Frequency: every 3 years
• Screen with A1C
RECOMMENDATIONS: DETECTION AND DIAGNOSIS OF GDM

• Test for undiagnosed T2DM at the 1st prenatal visit in those with risk factors. B

• Test for GDM at 24–28 weeks of gestation in women not previously known to have diabetes. A

• Screen women with GDM for persistent diabetes at 6–12 weeks postpartum, using the OGGT. E

RECOMMENDATIONS: DETECTION AND DIAGNOSIS OF GDM (2)

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

- Diabetes Self-Management Education (DSME)
- Diabetes Self-Management Support (DSMS)
- Medical Nutrition Therapy (MNT)
- Physical activity education
- Smoking cessation counseling
- Guidance on routine immunizations
- Psychosocial care
RECOMMENDATIONS: DIABETES SELF-MANAGEMENT EDUCATION & SUPPORT

- All people with diabetes should participate in DSME and DSMS both at diagnosis and as needed thereafter. B
- Effective self-management, improved clinical outcomes, health status, and quality-of-life are key outcomes of DSME and DSMS and should be measured and monitored as part of care. C
- DSME/S should be patient-centered, respectful, and responsive to individual patient preferences, needs, and values that should guide clinical decisions. A
Effectiveness of Nutrition Therapy:

- An individualized MNT program is recommended for all people with type 1 and type 2 diabetes. A

- For people with T1DM or those with T2D who are on a flexible insulin program, education on carb counting or estimation. A

- For patients on a fixed insulin program, having a consistent pattern of carbohydrate intake with respect to time and amount can result in improved glycemic control and a reduced risk of hypoglycemia. B

RECOMMENDATIONS: PHYSICAL ACTIVITY

- Children with diabetes/prediabetes: at least 60 min/day physical activity B
- Adults with diabetes: at least 150 min/wk of moderate-intensity aerobic activity over at least 3 days/week with no more than 2 consecutive days without exercise A
- All individuals, including those with diabetes, should reduce sedentary time, particularly by breaking up extended amounts of time (≥90 min) spent sitting. B
- Adults with type 2 diabetes should perform resistance training at least twice weekly A
RECOMMENDATIONS: SMOKING CESSATION

• Advise all patients not to use cigarettes, other tobacco products, or e-cigarettes. A

• Include smoking cessation counseling and other forms of treatment as a routine component of diabetes care. B
RECOMMENDATIONS: PSYCHOSOCIAL CARE

• Routinely screen for depression, diabetes-related distress, anxiety, eating disorders & cognitive impairment. B

• Adults aged ≥65 years with DM should be considered for evaluation of cognitive function, depression screening and treatment. B

• Patients with diabetes and depression should receive a collaborative care approach for depression mgmt. A
3. Glycemic Targets
DIABETES CARE: GLYCEMIC CONTROL

- Two primary techniques available for health providers and patients to assess effectiveness of management plan on glycemic control
  1. Patient self-monitoring of blood glucose (SMBG)
  2. A1C
- CGM or interstitial glucose may be a useful adjunct to SMBG in selected patients.
RECOMMENDATIONS: GLUCOSE MONITORING

• When prescribed as part of a broader educational context, SMBG results may be helpful to guide treatment decisions and/or patient self-management for patients using less frequent insulin injections or noninsulin therapies. E

• When prescribing SMBG, ensure that patients receive ongoing instruction and regular evaluation of SMBG technique and SMBG results, and their ability to use SMBG data to adjust therapy. E
RECOMMENDATIONS: A1C TESTING

• Perform the A1C test at least 2x annually in patients that meet treatment goals (and have stable glycemic control). E

• Perform the A1C test quarterly in patients whose therapy has changed or who are not meeting glycemic goals. E

• Use of point-of-care (POC) testing for A1C provides the opportunity for more timely treatment changes. E
RECOMMENDATIONS:
GLYCEMIC GOALS IN ADULTS

- Lowering A1C to <7% has been shown to reduce microvascular complications and, if implemented soon after the diagnosis of diabetes, is associated with long-term reduction in macrovascular disease. B

- Consider more stringent goals (e.g. <6.5%) for select patients if achievable without significant hypoglycemia or other adverse effects. C

- Consider less stringent goals (e.g. <8%) for patients with a history of severe hypoglycemia, limited life expectancy, or other conditions that make <7% difficult to attain. B
# Approach to the Management of Hyperglycemia

## Patient/Disease Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Low Risk</th>
<th>High Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risks associated with hypoglycemia &amp; other drug adverse effects</td>
<td>low</td>
<td>high</td>
</tr>
<tr>
<td>Disease Duration</td>
<td>long</td>
<td>short</td>
</tr>
<tr>
<td>Life expectancy</td>
<td>absent</td>
<td>Few/mild</td>
</tr>
<tr>
<td>Important comorbidities</td>
<td>absent</td>
<td>Few/mild</td>
</tr>
<tr>
<td>Established vascular complications</td>
<td>absent</td>
<td>Few/mild</td>
</tr>
<tr>
<td>Patient attitude &amp; expected treatment efforts</td>
<td>highly motivated, adherent, excellent self-care capabilities</td>
<td>less motivated, nonadherent, poor self-care capabilities</td>
</tr>
<tr>
<td>Resources &amp; support system</td>
<td>readily available</td>
<td>limited</td>
</tr>
</tbody>
</table>

## Numbers

- A1C: 7%
- Usual target: 6-7%

## References

4. Approaches to Glycemic Treatment
RECOMMENDATIONS: PHARMACOLOGICAL THERAPY FOR TYPE 1 DIABETES

• Most people with T1DM should be treated with multiple dose insulin (MDI) injections (3–4 injections/day of basal & prandial insulin) or continuous subcutaneous insulin infusion (CSII).

• Individuals who have been successfully using CSII should have continued access after they turn 65 years old.
RECOMMENDATIONS: PHARMACOLOGICAL THERAPY FOR TYPE 1 DIABETES (2)

• Consider educating individuals with T1DM on matching prandial insulin dose to carbohydrate intake, premeal blood glucose, and anticipated activity. E

• Most individuals with T1DM should use insulin analogs to reduce hypoglycemia risk. A
RECOMMENDATIONS:
PHARMACOLOGICAL THERAPY FOR T2DM

- Metformin, if not contraindicated and if tolerated, is the preferred initial pharmacological agent for T2DM. A

- In patients with newly dx’d T2DM and markedly symptomatic and/or elevated blood glucose levels or A1C, consider insulin therapy (with or without additional agents). E
**RECOMMENDATIONS: PHARMACOLOGICAL THERAPY FOR T2DM (2)**

- If noninsulin monotherapy at maximal tolerated dose does not achieve or maintain the A1C target over 3 months, add a second oral agent, a GLP-1 receptor agonist, or insulin. **A**
- Use a patient-centered approach to treatment. **E**
- Don’t delay insulin initiation in patients not achieving glycemic goals. **B**
5. Cardiovascular Disease and Risk Management
CARDIOVASCULAR DISEASE

- CVD is the leading cause of morbidity & mortality for those with diabetes.
- Largest contributor to direct/indirect costs
- Common conditions coexisting with type 2 diabetes (e.g., hypertension, dyslipidemia) are clear risk factors for ASCVD.
- Diabetes itself confers independent risk
- Control individual cardiovascular risk factors to prevent/slow CVD in people with diabetes.
- Systematically assess all patients with diabetes for cardiovascular risk factors.

American Diabetes Association Standards of Medical Care in Diabetes. Cardiovascular disease and risk management. Diabetes Care 2016; 39 (Suppl. 1): S60-S71
RECOMMENDATIONS: HYPERTENSION/ BLOOD PRESSURE CONTROL

Systolic Targets:

• People with diabetes and hypertension should be treated to a systolic blood pressure goal of <140 mmHg. A

• Lower systolic targets, such as <130 mmHg, may be appropriate for certain individuals, such as younger patients, if it can be achieved without undue treatment burden. C
**RECOMMENDATIONS: HYPERTENSION/BLOOD PRESSURE CONTROL (2)**

**Diastolic Targets:**

- Patients with diabetes should be treated to a diastolic blood pressure \(<90 \text{ mmHg}. A\)

- Lower diastolic targets, such as \(<80 \text{ mmHg}, may be appropriate for certain individuals, such as younger patients, if it can be achieved without undue treatment burden. B**
## Recommendations for Statin Treatment in People with Diabetes

<table>
<thead>
<tr>
<th>Age</th>
<th>Risk Factors</th>
<th>Statin Intensity*</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;40 years</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>ASCVD risk factor(s)**</td>
<td>Moderate or high</td>
</tr>
<tr>
<td></td>
<td>ASCVD</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>Moderate</td>
</tr>
<tr>
<td>40–75 years</td>
<td>ASCVD risk factors</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>ACS &amp; LDL &gt;50 who can’t tolerate high dose statin</td>
<td>Moderate +</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>ezetimibe</td>
</tr>
<tr>
<td></td>
<td>ASCVD risk factors</td>
<td>Moderate</td>
</tr>
<tr>
<td>&gt;75 years</td>
<td>ASCVD</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>ezetimibe</td>
</tr>
</tbody>
</table>

* In addition to lifestyle therapy. ** ASCVD risk factors include LDL cholesterol ≥100 mg/dL (2.6 mmol/L), high blood pressure, smoking, overweight and obesity, and family history of premature ASCVD.

American Diabetes Association Standards of Medical Care in Diabetes. Cardiovascular disease and risk management. Diabetes Care 2016; 39 (Suppl. 1): S60-S71
RECOMMENDATIONS: ANTIPLATELET AGENTS

Consider aspirin therapy (75–162 mg/day) C

• As a primary prevention strategy in those with type 1 or type 2 diabetes at increased cardiovascular risk (10-year risk >10%)

• Includes most men or women with diabetes age ≥50 years who have at least one additional major risk factor, including:
  • Family history of premature ASCVD
  • Hypertension
  • Smoking
  • Dyslipidemia
  • Albuminuria

American Diabetes Association Standards of Medical Care in Diabetes. Cardiovascular disease and risk management. Diabetes Care 2016; 39 (Suppl. 1): S60-S71
RECOMMENDATIONS: CORONARY HEART DISEASE

Screening

• In asymptomatic patients, routine screening for CAD isn’t recommended & doesn’t improve outcomes provided ASCVD risk factors are treated. A

• Consider investigations for CAD with:
  • Atypical cardiac symptoms (e.g. unexplained dyspnea, chest discomfort)
  • Signs or symptoms of associated vascular disease incl. carotid bruits, transient ischemic attack, stroke, claudication or PAD
  • EKG abnormalities (e.g. Q waves) E
6. Microvascular Complications and Foot Care
RECOMMENDATIONS: DIABETIC KIDNEY DISEASE

Treatment

• Optimize glucose control to reduce risk or slow progression of diabetic kidney disease. A

• Optimize blood pressure control (<140/90 mmHg) to reduce risk or slow progression of diabetic kidney disease. A
## MANAGEMENT OF CKD IN DIABETES

<table>
<thead>
<tr>
<th>GFR</th>
<th>Recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td>All patients</td>
<td>Yearly measurement of creatinine, urinary albumin excretion, potassium</td>
</tr>
<tr>
<td>45-60</td>
<td>Referral to a nephrologist if possibility for nondiabetic kidney disease exists</td>
</tr>
<tr>
<td></td>
<td>Consider dose adjustment of medications</td>
</tr>
<tr>
<td></td>
<td>Monitor eGFR every 6 months</td>
</tr>
<tr>
<td></td>
<td>Monitor electrolytes, bicarbonate, hemoglobin, calcium, phosphorus, parathyroid hormone at least yearly</td>
</tr>
<tr>
<td></td>
<td>Assure vitamin D sufficiency</td>
</tr>
<tr>
<td></td>
<td>Consider bone density testing</td>
</tr>
<tr>
<td></td>
<td>Referral for dietary counselling</td>
</tr>
</tbody>
</table>

American Diabetes Association Standards of Medical Care in Diabetes. Microvascular complications and foot care. Diabetes Care 2016; 39 (Suppl. 1): S72-S80
### Management of CKD in Diabetes (2)

<table>
<thead>
<tr>
<th>GFR</th>
<th>Recommended</th>
</tr>
</thead>
</table>
| 30-44 | Monitor eGFR every 3 months  
|       | Monitor electrolytes, bicarbonate, calcium, phosphorus, parathyroid hormone, hemoglobin, albumin weight every 3–6 months  
|       | Consider need for dose adjustment of medications |
| <30   | Referral to a nephrologist |

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American Diabetes Association Standards of Medical Care in Diabetes. Microvascular complications and foot care. Diabetes Care 2016; 39 (Suppl. 1): S72-S80
RECOMMENDATIONS: DIABETIC RETINOPATHY

• To reduce the risk or slow the progression of retinopathy
  • Optimize glycemic control A
  • Optimize blood pressure control A

American Diabetes Association Standards of Medical Care in Diabetes. Microvascular complications and foot care. Diabetes Care 2016; 39 (Suppl. 1): S72-S80
RECOMMENDATIONS: DIABETIC RETINOPATHY (2)

Screening:

• Initial dilated and comprehensive eye examination 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
RECOMMENDATIONS: DIABETIC RETINOPTHATHY (3)

Screening (2):

• If no evidence of retinopathy for one or more eye exam, exams every 2 years may be considered. B

• If diabetic retinopathy if present subsequent examinations for type 1 and type 2 diabetic patients should be repeated annually by an ophthalmologist or optometrist. B

• If retinopathy is progressing or sight-threatening, more frequent exams required. B
RECOMMENDATIONS: NEUROPATHY

Early recognition & management is important because:
1. DN is a diagnosis of exclusion.
3. Up to 50% of DPN may be asymptomatic.
4. Recognition & treatment may improve symptoms, reduce sequelae, and improve quality-of-life.
RECOMMENDATIONS: NEUROPATHY (2)

Screening:

• Assess all patients for DPN at dx for T2DM, 5 years after dx for T1DM, and at least annually thereafter. B

• Assessment should include history & 10g monofilament testing, and at least one of the following: pinprick, temperature, and vibration sensation. B

• Symptoms of autonomic neuropathy should be assessed in patients with microvascular & neuropathic complications. E
RECOMMENDATIONS: NEUROPATHY (3)

Treatment:

• Optimize glucose control to prevent or delay the development of neuropathy in patients with T1DM A & to slow progression in patients with T2DM. B

• Assess & treat patients to reduce pain related to DPN B and symptoms of autonomic neuropathy and to improve quality of life. E
RECOMMENDATIONS: FOOT CARE

• Perform a comprehensive foot evaluation annually to identify risk factors for ulcers & amputations. B

• History should contain prior hx of ulceration, amputation, Charcot foot, angioplasty or vascular surgery, cigarette smoking, retinopathy & renal disease; and should assess current symptoms of neuropathy and vascular disease. B
RECOMMENDATIONS: FOOT CARE (2)

- Exam should include inspection of the skin, assessment of foot deformities, neurologic assessment & vascular assessment including pulses in the legs and feet. B

- Patients with history of ulcers or amputations, foot deformities, insensate feet & PAD are at increased risk for ulcers and amputations and should have their feet examined at every visit. C
TRENDS IN THE PROPORTION OF HIGHER LEVEL RECOMMENDATIONS BY CATEGORY

Proportion of Recommendations Each Year

Year

Glycemia
CVD
Nutrition & Behavior
Pediatrics/Obstetrics

Grant R W, and Kirkman M S Dia Care 2015;38:6-8
THANK YOU