

Summary of Revisions for the 2009 Clinical Practice Recommendations

Beginning with the 2005 supplement, the Clinical Practice Recommendations contained only the “Standards of Medical Care in Diabetes” and selected other position statements. This change was made to emphasize the importance of the “Standards” as the best source to determine American Diabetes Association (ADA) recommendations. The position statements in the supplement are updated yearly. Position statements not included in the supplement will be updated as necessary and republished when updated. A list of the position statements not included in this supplement appears on p. S98.

Additions to the “Standards of Medical Care in Diabetes”

- A section on bariatric surgery has been added.
- A section on discharge planning has been added to “Diabetes care in the hospital.”

Revisions to the “Standards of Medical Care in Diabetes”

- In the “Testing for type 2 diabetes in children” section, small-for-gestational-age birth weight has been added to the list of conditions associated with insulin resistance.
- Testing should begin at age 10 years or at onset of puberty, if puberty occurs at a younger age, and should be repeated every 3 years. (E)
- In the “Prevention/delay of type 2 diabetes” section, the recommendation has been revised to clarify that one-time counseling is not adequate.
- Patients with impaired glucose tolerance (A) or impaired fasting glucose (E) should be referred to an effective ongoing support program for weight loss of 5–10% of body weight and for increasing physical activity to at least 150 min per week of moderate activity such as walking.

Diabetes care:

- For patients using less frequent insulin injections, noninsulin therapies, or medical nutrition therapy and physical therapy alone, self-monitoring of blood glucose (SMBG) may be useful as a guide to the success of therapy. (E)
- In the “Glucose monitoring” section, continuous glucose monitoring (CGM) has been revised with recommendations.
 - CGM in conjunction with intensive insulin regimens can be a useful tool to lower A1C in selected adults (aged ≥ 25 years) with type 1 diabetes. (A)
 - Although the evidence for A1C lowering is less strong in children, teens, and younger adults, CGM may be helpful in these groups. Success correlates with adherence to ongoing use of the device. (C)
 - CGM may be a supplemental tool to SMBG in those with hypoglycemia unawareness and/or frequent hypoglycemic episodes. (E)
- Table 8, now titled “Correlation of A1C with average glucose,” has been revised to reflect the correlation from the ADAG (A1c-Derived Average Glucose) study.
- The “Glycemic control” section has been extensively revised based on new evidence and includes the following recommendations.
 - Lowering A1C to below or around 7% has been shown to reduce microvascular and neuropathic complications of type 1 and type 2 diabetes. Therefore, for microvascular disease prevention, the A1C goal for non-pregnant adults in general is $< 7\%$. (A)
 - In type 1 and type 2 diabetes, randomized controlled trials of intensive versus standard glycemic control have not shown a significant reduction in cardiovascular disease (CVD)

outcomes during the randomized portion of the trials. Long-term follow-up of the Diabetes Control and Complications Trial (DCCT) and the UK Prospective Diabetes Study (UKPDS) cohorts suggests that treatment to A1C targets below or around 7% in the years soon after the diagnosis of diabetes is associated with long-term reduction in risk of macrovascular disease. Until more evidence becomes available, the general goal of $< 7\%$ appears reasonable for many adults for macrovascular risk reduction. (B)

- Subgroup analyses of clinical trials such as the DCCT and UKPDS and the microvascular evidence from the Action in Diabetes and Vascular Disease: Preterax and Diamicron MR Controlled Evaluation (ADVANCE) trial suggest a small but incremental benefit in microvascular outcomes with A1C values closer to normal. Therefore, for selected individual patients, providers might reasonably suggest even lower A1C goals than the general goal of $< 7\%$, if this can be achieved without significant hypoglycemia or other adverse effects of treatment. Such patients might include those with short duration of diabetes, long life expectancy, and no significant CVD. (B)
- Conversely, less stringent A1C goals than the general goal of $< 7\%$ may be appropriate for patients with a history of severe hypoglycemia, limited life expectancy, advanced micro- or macrovascular complications, and those with longstanding diabetes in whom the general goal is difficult to attain despite diabetes self-management education, appropriate glucose monitoring, and effective doses of multiple glucose-lowering agents including insulin. (C)
- The level of evidence for a medical nutrition therapy recommendation has been changed.
 - Intake of *trans* fat should be minimized. (B)

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Summary of Revisions

- The new “Bariatric surgery” section contains the following recommendations.
 - Bariatric surgery should be considered for adults with BMI ≥ 35 kg/m² and type 2 diabetes, especially if the diabetes is difficult to control with lifestyle and pharmacologic therapy. (B)
 - Patients with type 2 diabetes who have undergone bariatric surgery need life-long lifestyle support and medical monitoring. (E)
 - Although small trials have shown glycemic benefit of bariatric surgery in patients with type 2 diabetes and BMI 30–35 kg/m², there is currently insufficient evidence to generally recommend surgery in patients with BMI < 35 kg/m² outside of a research protocol. (E)
 - The long-term benefits, cost-effectiveness, and risks of bariatric surgery in individuals with type 2 diabetes should be studied in well-designed randomized controlled trials with optimal medical and lifestyle therapy as the comparator. (E)
- The recommendation for pneumococcal vaccination has been revised.
 - Administer pneumococcal polysaccharide vaccine to all diabetic patients ≥ 2 years of age. A one-time revaccination is recommended for individuals > 64 years of age previously immunized when they were < 65 years of age if the vaccine was administered > 5 years ago. Other indications for repeat vaccination include nephrotic syndrome, chronic renal disease, and other immunocompromised states, such as after transplantation. (C)

Prevention and Management of Diabetes Complications:

- Glomerular filtration rate (GFR) cut points for use of thiazide or loop diuretics have been revised.
- Pharmacologic therapy for patients with diabetes and hypertension should be with a regimen that includes either an ACE inhibitor or an angiotensin receptor blocker. If one class is not tolerated, the other should be substituted. If needed to achieve blood pressure targets, a thiazide diuretic should be added to those with an estimated GFR (see below) ≥ 30 ml/min per 1.73 m² and a loop di-

uretic for those with an estimated GFR < 30 ml/min per 1.73 m². (C)

- Several dyslipidemia recommendations have been revised.
 - If drug-treated patients do not reach the above targets on maximal tolerated statin therapy, a reduction in LDL cholesterol of ~ 30 –40% from baseline is an alternative therapeutic goal. (A)
 - If targets are not reached on maximally tolerated doses of statins, combination therapy using statins and other lipid-lowering agents may be considered to achieve lipid targets but have not been evaluated in outcome studies for either CVD outcomes or safety. (E)
- Several antiplatelet agent recommendations have been revised and/or the level of evidence has been changed.
 - Use aspirin therapy (75–162 mg/day) as a primary prevention strategy in those with type 1 or type 2 diabetes at increased cardiovascular risk, including those who are > 40 years of age or who have additional risk factors (family history of CVD, hypertension, smoking, dyslipidemia, or albuminuria). (C)
 - For patients with CVD and documented ASA (acetylsalicylic acid, aspirin) allergy, clopidogrel (75 mg/day) should be used. (B)
 - Combination therapy with aspirin (75–162 mg/day) and clopidogrel (75 mg/day) is reasonable for up to a year after an acute coronary syndrome. (B)
- Coronary heart disease treatment recommendations have been revised and/or the level of evidence has been changed.
 - In patients with known CVD, ACE inhibitor (C), aspirin (A), and statin therapy (A) (if not contraindicated) should be used to reduce the risk of cardiovascular events.
 - In patients > 40 years of age with another cardiovascular risk factor (hypertension, family history, dyslipidemia, microalbuminuria, cardiac autonomic neuropathy, or smoking), aspirin and statin therapy (if not contraindicated) should be used to reduce the risk of cardiovascular events. (B)
 - In patients with congestive heart fail-

ure (CHF), thiazolidinedione use is contraindicated. (C)

- Metformin may be used in patients with stable CHF if renal function is normal. It should be avoided in unstable or hospitalized patients with CHF. (C)
- The recommendation in the “Retinopathy screening and treatment” section has been revised.
 - Adults and children aged 10 years or older with type 1 diabetes should have an initial dilated and comprehensive eye examination by an ophthalmologist or optometrist within 5 years after the onset of diabetes. (B)
- One recommendation in the “Neuropathy screening and treatment” section has been moved to the “Foot care” section, and one has been revised.
 - Screening for signs and symptoms of cardiovascular autonomic neuropathy should be instituted at diagnosis of type 2 diabetes and 5 years after the diagnosis of type 1 diabetes. Special testing is rarely needed and may not affect management or outcomes. (E)
- The “Foot care” section has been extensively revised, including the recommendations.
 - For all patients with diabetes, perform an annual comprehensive foot examination to identify risk factors predictive of ulcers and amputations. The foot examination should include inspection, assessment of foot pulses, and testing for loss of protective sensation (10-g monofilament plus testing any one of: vibration using 128-Hz tuning fork, pinprick sensation, ankle reflexes, or vibration perception threshold). (B)

Diabetes Care in Specific Populations:

- Blood pressure treatment recommendations for children with type 1 diabetes have been modified.
- Treatment of high-normal blood pressure (systolic or diastolic blood pressure consistently between the 90–95th percentile for age, sex, and height) should include dietary intervention and exercise aimed at weight control and increased physical activity, if appropriate. If target blood pressure is not reached with 6–12 months of lifestyle intervention,

- pharmacologic treatment should be initiated (E).
- Pharmacologic treatment of high blood pressure (systolic or diastolic blood pressure consistently above the 95th percentile for age, sex, and height or consistently >130/80 mmHg for adolescents) should be initiated along with lifestyle intervention as soon as the diagnosis is confirmed. (E)
 - The goal of treatment is a blood pressure consistently <130/80 or below the 90th percentile for age, sex, and height, whichever is lower. (E)
 - Recommendations on celiac disease screening in children with type 1 diabetes have been revised.
 - Patients with type 1 diabetes should be screened for celiac disease by measuring tissue transglutaminase or anti-endomysial antibodies, with documentation of normal serum IgA levels, soon after the diagnosis of diabetes. (E)
 - Testing should be repeated if growth failure, failure to gain weight, weight loss, or gastroenterologic symptoms occur. (E)
 - Consideration should be given to periodic re-screening of asymptomatic individuals. (E)
 - The recommendation on preconception care has been revised.
 - Starting at puberty, preconception counseling should be incorporated in the routine diabetes clinic visit for all women of child-bearing potential. (C)

Diabetes care in specific settings:

- The “Diabetes care in the hospital” section has been significantly revised, and recommendations for glucose goals have been revised.
 - Critically ill surgical patients’ blood glucose levels should be kept as close

to 110 mg/dl (6.1 mmol/l) as possible, and generally <140 mg/dl (7.8 mmol/l). (A) These patients require an intravenous insulin protocol that has demonstrated efficacy and safety in achieving the desired glucose range without increasing risk for severe hypoglycemia. (E)

- Critically ill nonsurgical patients’ glycemic targets are less well defined. Intravenous insulin infusion protocols targeting blood glucose levels <110–140 mg/dl have been shown to reduce morbidity and mortality in some but not all studies. Intravenous insulin infusion protocols that effectively and safely keep blood glucose <140 mg/dl are recommended. (C)
- The “Diabetes care in the school and day care setting” section has been revised, including the recommendations.
 - An individualized Diabetes Medical Management Plan (DMMP) should be developed by the parent/guardian and the student’s personal diabetes health care team with input from the parent/guardian. (E)
 - All school staff members who have responsibility for a student with diabetes should receive training that provides a basic understanding of diabetes and a student’s needs. (E)
 - While the school nurse is the coordinator and primary provider of diabetes care, a small number of school personnel should be trained in routine and emergency diabetes procedures (including monitoring of blood glucose levels and administration of insulin and glucagon) and in the appropriate response to high and low blood glucose levels and should perform these diabetes care tasks when the school nurse is not available to do so. These school personnel need not be health care professionals. (E)
 - As specified in the DMMP and as developmentally appropriate, the stu-

dent with diabetes should have immediate access to diabetes supplies at all times and should be permitted to self-manage his or her diabetes in the classroom or anywhere the student may be in conjunction with a school activity. Such self-management should include blood glucose monitoring and responding to blood glucose levels with needed food and medication. (E)

- The “Hypoglycemia and employment/licensure” section has been renamed “Diabetes and employment” and contains new recommendations.
 - When questions arise about the medical fitness of a person with diabetes for a particular job, a health care professional with expertise in treating diabetes should perform an individualized assessment; input from the treating physician should always be included. (E)
 - Proper safety assessments for employment should include review of blood glucose test results, history of severe hypoglycemia, presence of hypoglycemia unawareness, and presence of diabetes-related complications but should not include urine glucose or A1C/eAG (estimated average glucose) tests or be based on a general assessment of level of control. (E)

Other revisions to the 2009 Clinical Practice Recommendations

- The “Diabetes in the School and Day Care Setting” position statement has been significantly revised.
- The position statement previously titled “Hypoglycemia and Employment/Licensure” has been renamed “Diabetes and Employment.” It has been extensively revised and expanded, in part to provide additional guidance to health care providers dealing with patients’ employment issues.