



# Summary of Evidence-Based Recommendations

Practice recommendations discussed in this program are from the following sources:

## American Diabetes Association

**Source:** American Diabetes Association. Executive Summary: Standards of Medical Care in Diabetes—2009. *Diabetes Care* 2009;32:S2-S12.

**Website:** [http://care.diabetesjournals.org/cgi/content/full/32/Supplement\\_1/S6](http://care.diabetesjournals.org/cgi/content/full/32/Supplement_1/S6)

**Strength of Evidence:** The strength of evidence is indicated following each recommendation. See table below for description of evidence levels.

## Diabetes Education

**Recommendation #1:** Patients should receive diabetes education to national standards when diabetes is diagnosed and as needed thereafter. (B)

## Glycemic Goals

**Recommendation #2:** 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 nonpregnant adults in general is <7%. (A)

**Recommendation #3:** Randomized controlled trials of intensive vs. standard glycemic control have not shown a significant reduction in CVD outcomes during the randomized portion of the trials. Long-term follow-up of DCCT and 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)

**Recommendation #4:** Subgroup analyses of clinical trials such as DCCT and UKPDS and the microvascular evidence from the ADVANCE suggest a small but incremental benefit in microvascular outcomes with A1C values closer to normal. Therefore, for selected 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. (B)

## Hypertension

**Recommendation #5:** Patients with diabetes should be treated to a systolic blood pressure <130 mm Hg (C) and a diastolic <80 mm Hg. (B)

**Recommendation #6:** Multiple drug therapy (two or more agents at maximal doses) is generally required to achieve BP targets. (B)

## Bariatric Surgery

**Recommendation #7:** Bariatric surgery should be considered for adults with BMI  $>35$  kg/m<sup>2</sup> and type 2 diabetes, especially if the diabetes is difficult to control with lifestyle and pharmacologic therapy. (B)

## ACE Inhibitor/ARB Therapy

**Recommendation #8:** Pharmacologic therapy for patients with diabetes and hypertension should include an ACE inhibitor or ARB. If one class is not tolerated, the other should be substituted. If needed to achieve BP targets, a thiazide diuretic should be added to those with an estimated GFR  $>30$  mL/min per 1.73 m<sup>2</sup> and a loop diuretic for those with an estimated GFR  $<30$  mL/min per 1.73 m<sup>2</sup>. (C)

## Lipid Management

**Recommendation #9:** Statin therapy should be added to lifestyle therapy, regardless of baseline lipid levels, for diabetic patients with overt CVD (A) – or without CVD who are over age 40 years and one or more other CVD risk factors. (A)

**Recommendation #10:** In individuals without overt CVD, the primary goal is an LDL cholesterol  $<100$  mg/dL (2.6 mmol/L). (A)

**Recommendation #11:** In individuals with overt CVD, a lower LDL cholesterol goal of  $<70$  mg/dL (1.8 mmol/L), using a high dose of a statin, is an option. (B)

## Smoking Cessation

**Recommendation #12:** Advise all patients not to smoke (A) include smoking cessation counseling and other forms of treatment as a routine component of diabetes care. (B)

## NICE-SUGAR Trial

**Source:** Normoglycemia in Intensive Care Evaluation–Survival Using Glucose Algorithm Regulation. N Engl J Med 2009;360:1283-1297.

**Website:** <http://clinicaltrials.gov/show/NCT00220987>

**Strength of Evidence:** Randomized controlled trial

## Glycemic Control in Critically Ill Patients

**Recommendation #13:** Intensive glucose control was found to increase mortality in ICU patients in the NICE-SUGAR trial. A blood glucose target of 180 mg or less per deciliter resulted in lower mortality than did a target of 81 to 108 mg per deciliter. On that basis, the use of the lower target in critically ill adults is not recommended.

## American Association of Clinical Endocrinologists and American Diabetes Association

**Source:** American Association of Clinical Endocrinologists and American Diabetes Association Consensus Statement on Inpatient Glycemic Control. Diabetes Care 2009;32:1119-1131.

**Website:** <http://care.diabetesjournals.org/content/29/8/1955.full.pdf>

**Strength of Evidence:** Consensus statement

## Glycemic Control in Noncritically Ill Inpatients

**Recommendation #14:** Noninsulin antihyperglycemic agents are not appropriate in most hospitalized patients who require therapy for hyperglycemia.

- For the majority of noncritically ill patients treated with insulin, the premeal BG target should generally be less than 140 mg/dL (less than 7.8 mmol/L) in conjunction with random BG values less than 180 mg/dL (less than 10.0 mmol/L), provided these targets can be safely achieved.
- Scheduled subcutaneous administration of insulin, with basal, nutritional, and correction components, is the preferred method for achieving and maintaining glucose control.
- Insulin therapy should be initiated for treatment of persistent hyperglycemia, starting at a threshold of no greater than 180 mg/dL (10.0 mmol/L).
- Once insulin therapy has been started, a glucose range of 140–180 mg/dL (7.8–10.0 mmol/L) is recommended for the majority of critically ill patients.

## Definitions of the ADA's Level of Evidence

Level of evidence	Description
A	<p>Clear evidence from well-conducted, generalizable, randomized controlled trials that are adequately powered, including:</p> <ul style="list-style-type: none"> <li>• Evidence from a well-conducted multicenter trial</li> <li>• Evidence from a meta-analysis that incorporated quality ratings in the analysis</li> </ul>
	<p>Compelling nonexperimental evidence, i.e., the “all or none” rule developed by the Centre for Evidence-Based Medicine at Oxford</p>
	<p>Supportive evidence from well-conducted randomized controlled trials that are adequately powered, including:</p> <ul style="list-style-type: none"> <li>• Evidence from a well-conducted trial at one or more institutions</li> <li>• Evidence from a meta-analysis that incorporated quality ratings in the analysis</li> </ul>
B	<p>Supportive evidence from well-conducted cohort studies, including:</p> <ul style="list-style-type: none"> <li>• Evidence from a well-conducted prospective cohort study or registry</li> <li>• Evidence from a well-conducted meta-analysis of cohort studies</li> </ul>
	<p>Supportive evidence from a well-conducted case-control study</p>
C	<p>Supportive evidence from poorly controlled or uncontrolled studies, including:</p> <ul style="list-style-type: none"> <li>• Evidence from randomized clinical trials with one or more major or three or more minor methodological flaws that could invalidate the results</li> <li>• Evidence from observational studies with high potential for bias (such as case series with comparison to historical controls)</li> <li>• Evidence from case series or case reports</li> </ul>
	<p>Conflicting evidence with the weight of evidence supporting the recommendation</p>
E	<p>Expert consensus or clinical experience</p>