

Comparing Glycemic Control Guidelines in Diabetes Care

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ABSTRACT

Background: Diabetes mellitus (DM) is reaching epidemic proportions nationally and globally. DM complications—such as cardiovascular disease, stroke, renal failure, amputations, diabetic neuropathy, and blindness—exert substantial emotional, physical, and financial tolls on the individual, as well as reduce workforce productivity.

Objective: The goal of this article was to examine guidelines for glycemic control in DM from three national organizations and consider the reasons for their similarities and differences.

Methods: The National Guideline Clearinghouse was initially searched for the list of guidelines related to DM. The most recent, relevant guidelines from three national organizations (the American Diabetes Association [ADA], the American College of Endocrinology [ACE], which is affiliated with the American Association of Clinical Endocrinologists, and the Veterans Health Administration/Department of Defense [VA/DoD]) were selected and then accessed through journals or the organizations' Web sites. The bibliographies of the three guidelines were reviewed, and all studies relevant to the effect of glycemic control on diabetic complications were examined. A search of PubMed was also conducted (January 2000–July 2005) using the search terms *diabetes*, *quality of care*, *VA*, and *US* to assess the effect of the guidelines on clinical practice during the last decade.

Results: Two landmark, randomized controlled studies and several smaller trials in the last decade have highlighted the importance of tight glycemic control in reducing the incidence and progression of DM complications. Health care organizations may serve as liaisons between researchers and providers by developing specific recommendations and performance measures or goals for DM care, based on critical examination of the study results. Three national organizations—the ADA, the ACE, and the VA/DoD—periodically review DM research findings and expert opinions, and formulate clinical practice guidelines. Although all three organizations advocate tight glycemic control to prevent DM complications, they differ slightly in their chosen glycemic targets and their advice about applying these goals to all patient populations with this disease.

Conclusions: All three organizations are taking the initiative to disseminate their guidelines for DM care to providers and patients. Clinicians and health care organizations are strongly encouraged to incorporate these guidelines into daily clinical practice and to assess their impact on patient care through continuous quality-of-care monitoring and provider recognition programs. (*Insulin*. 2006;1:13–21) Copyright © 2006 Excerpta Medica, Inc.

Key words: diabetes mellitus, glycemic control, glycosylated hemoglobin, clinical guidelines.

THE IMPORTANCE OF TIGHT GLYCEMIC CONTROL

Diabetes mellitus (DM) is reaching epidemic proportions nationally and globally. In 2005, 20.8 million people (7% of the population of the United States) were estimated to have DM.¹ In 2003, the prevalence of DM worldwide (for individuals aged 20–79 years) was an estimated 194 million people (5.1% of the global population) and is projected to rise to 333 million (6.3% of the global population) by 2025.² In 2002, DM was the fifth leading cause of death by disease in the United States, and direct and indirect DM-related costs totaled \$132 billion in 2002.³ DM complications—such as cardiovascular disease, stroke, renal failure, amputations, diabetic neuropathy, and blindness—exert substantial emotional, physical, and financial tolls on the individual, as well as reduce workforce productivity.

In the last decade, two landmark, randomized controlled studies and several smaller trials have highlighted the importance of tight glycemic control in preventing and treating the complications of DM. The Diabetes Control and Complications Trial (DCCT) demonstrated that in 1441 patients with type 1 DM who were followed up for a mean of 6.5 years, intensive glycemic control (maintaining a glycosylated hemoglobin [A1C] level of ~7.0% vs 9.0% with conventional treatment) reduced the appearance and progression of retinopathy, neuropathy, and nephropathy.⁴ The Epidemiology of Diabetes Interventions and Complications (EDIC) study followed up the DCCT cohort for another 8 years (15 years total) and showed that, despite a convergence of A1C levels to 8.0%, the original intensive glycemic control group continued to have a lower incidence and progression of retinopathy and nephropathy.^{5,6} In addition, the EDIC study showed that the group originally randomized to tight glycemic control had a lesser incidence of cardiovascular disease compared with the conventional treatment group.⁷ In the United Kingdom Prospective Diabetes Study (UKPDS), a multicenter, randomized controlled trial of 5102 patients with type 2 DM, achieving a median A1C of 7.0% (intensive) versus 7.9% (conventional) reduced the risk of microvascular disease by 25% (95% CI, 7–40; $P = 0.01$).^{8–10}

Results of large, randomized controlled trials such as the DCCT and UKPDS have the potential to revolutionize DM treatment. However, the lessons

learned from these data must be used by practitioners in their daily practice to improve the management and outcomes of individuals with DM. Health care organizations may serve as liaisons between researchers and providers by critically examining the results of these studies and developing specific recommendations and performance measures or goals for DM care.

Three national organizations—the American Diabetes Association (ADA), the American College of Endocrinology (ACE), which is affiliated with the American Association of Clinical Endocrinologists (AACE), and the Veterans Health Administration/Department of Defense (VA/DoD)—periodically review DM research findings and expert opinions, and formulate clinical practice guidelines.^{11–13} The current article examines these organizations' guidelines for glycemic control in DM and considers the reasons for their similarities and differences. Although all three organizations advocate tight glycemic control to prevent complications of DM, they differ slightly in their chosen glycemic targets and their advice about applying these goals to all patient populations with DM.

MATERIALS AND METHODS

The National Guideline Clearinghouse (www.guideline.gov) was initially searched for the list of guidelines related to DM. The most recent, relevant guidelines from three national organizations (the ADA; the ACE, which is affiliated with the AACE; and the VA/DoD) were selected and then accessed through journals or the organizations' Web sites. The VA/DoD clinical practice guidelines were available at the VA Web site (www.ogp.med.va.gov/cpg/DM/DMC_cpg/content/ModG/annoG.htm), and the ACE/AACE and the ADA guidelines were published in journals. The published ACE/AACE guidelines were accompanied by transcriptions of oral presentations from the 2001 ACE Diabetes Mellitus Consensus Conference detailing the organization's rationale for choosing its glycemic control targets. The bibliographies of the three guidelines were reviewed, and all studies referenced in the sections of the guidelines describing their recommendations for glycemic control were accessed.

Two PubMed literature searches were conducted (January 2000–July 2005) using the search terms *diabetes, quality of care, and VA*, and then *diabetes, quality of care, and US*. Five epidemiologic DM studies

were selected that describe to what degree health care providers achieve the glycemic control targets recommended in the guidelines.

ASSESSMENT OF GLYCEMIC CONTROL

All three organizations regard A1C testing as the first-line marker for glycemic control (**Table I**). However, they acknowledge that A1C levels do not provide enough information about glucose variability and may

be less accurate under conditions of increased red cell turnover and hemoglobinopathies. All three organizations also support the usefulness of postprandial glucose (PPG) measurements and mention its association with cardiovascular risk, independent of fasting plasma glucose (FPG).¹¹⁻¹³

Each organization states that self-monitoring of blood glucose (SMBG) is necessary to achieve tight glycemic control. The ADA recommends that SMBG be

Table I. Comparing glycemic control guidelines.¹¹⁻¹³

	ADA ¹²	ACE/AACE ¹³	VA/DoD ¹¹
Assessment of glycemic control	A1C = first-line test PPG linked to cardiovascular risk, useful in patients with elevated A1C and normal FPG SMBG: • ≥3 Times a day in patients on multiple insulin injections • Frequency for patients with type 2 DM on oral medications is unclear	A1C = first-line test PPG linked to cardiovascular risk SMBG: • No recommendation about specific frequency • Very important educational tool that allows patients to learn about the effects of nutrition and physical activity on blood glucose	A1C = first-line test PPG linked to cardiovascular risk, useful in patients with elevated A1C and normal FPG SMBG: • No recommendation about specific frequency • Emphasize using data from SMBG to make treatment decisions that improve glycemic control
Targets for glycemic control			
A1C	<ul style="list-style-type: none"> • <7.0% for most patients with DM • Modify goal for patients with limited life expectancies, very young or older patients, and individuals with comorbid conditions • <6.0% for some individuals with DM 	<ul style="list-style-type: none"> • <6.5% for most patients with DM • Modify goal for patients “whose functional state or risk for other adverse treatment effects (such as hypoglycemia unawareness) is thought to outweigh the benefits of optimal glucose control” 	<ul style="list-style-type: none"> • Utilize risk-stratification algorithm: <ul style="list-style-type: none"> — <9.0% for all patients to avoid symptoms of hyperglycemia — <7.0% for patients with very mild or no microvascular complications, no concurrent illness, and reasonable life expectancy
FPG	90–130 mg/dL	<110 mg/dL	<ul style="list-style-type: none"> • Consider other patient factors that increase risk for hypoglycemia and patient preferences • Specific target to be determined jointly by patient and provider
PPG	2-hour PPG <180 mg/dL	2-hour PPG <140 mg/dL	If A1C is above target level and FPG is normal, aim for 1- to 2-hour PPG <180 mg/dL

(continued)

Table I. (Continued)

	ADA ¹²	ACE/AACE ¹³	VA/DoD ¹¹
Dissemination of clinical guidelines	<ul style="list-style-type: none"> • Recommends successful interventions (ie, point-of-care availability of guidelines, guideline-based checklists, automated reminders, dedicated DM provider visits, DM registries, care management services) • Collaborates with NCQA on the Diabetes Physician Recognition Program • Provides multimedia education for patients and providers 	<ul style="list-style-type: none"> • Recommends chronic care model approach to redesigning DM care • Recommends making guidelines accessible at the point of care • Recommends making guidelines accessible through multimedia education • Provides educational tools for providers and patients 	<ul style="list-style-type: none"> • Centralized quality-of-care assessment of local VA sites • Centralized distribution of DM tool kits developed by DoD and VA with adaptable educational tools • Electronic medical record contains clinical reminders, medication order sets, chronic disease-management menus

ADA = American Diabetes Association; ACE/AACE = American College of Endocrinology/American Association of Clinical Endocrinologists; VA/DoD = Veterans Health Administration/Department of Defense; A1C = glycosylated hemoglobin; PPG = postprandial glucose; FPG = fasting plasma glucose; SMBG = self-monitoring of blood glucose; DM = diabetes mellitus; NCQA = National Committee for Quality Assurance.

performed ≥ 3 times daily for patients using multiple insulin injections.¹² However, it does not recommend a specific number of tests per day for patients with type 2 DM on oral therapy because there have been no large, prospective, randomized controlled trials addressing the efficacy of SMBG in these patients. The AACE promotes intensive patient self-management skills, and ACE/AACE guidelines refer to SMBG as a “very important educational tool” that allows patients to learn about the effects of nutrition and physical activity on blood glucose.¹⁴ Specific parameters are not given except that patients should do SMBG “consistently to help understand the dynamics of blood glucose changes relative to medication, diet, stress and exercise.”¹⁵ The VA/DoD guidelines do not provide specific parameters for SMBG but state that “regardless of whether the FPG or PPG level is determined, it is not the collection of data, but rather the use of the data to make clinical decisions that leads to improvements in diabetes control.”¹¹ Thus, the VA/DoD emphasizes that SMBG alone does not improve glycemic control. The patient and provider need to review the glucose values, recognize hyper- and hypoglycemia, and attempt to correct them by modifying the patient’s diet, exercise, and medications.

TARGETS FOR GLYCEMIC CONTROL

Guidelines from the ADA, ACE/AACE, and VA/DoD^{11–13} emphasize the importance of tight glycemic control in reducing microvascular complications and cite relevant large, randomized controlled trials. All agree that a target A1C as close to the normal range (<6.0%–7.0%, depending on the A1C assay) is appropriate for some people with type 1 and type 2 DM. They also acknowledge that the risk–benefit ratio of tight glycemic control (aiming for an A1C level <6.0%–7.0%) should be assessed for each individual, and the glycemic target should be modified to maximize the prevention of complications and minimize the risk of hypoglycemia (**Table I**).

Despite the concordance in their general approach, these organizations differ in their specific recommendations. The ADA guidelines advocate a target A1C of <7.0% for most people with DM, based on data from the UKPDS and DCCT.¹² The VA/DoD guidelines recommend an A1C of <7.0% for people with very mild or no microvascular complications, no concurrent illness, and reasonable life expectancy.¹¹ However, ACE/AACE guidelines lower the target to <6.5%, citing evidence from the UKPDS, the DCCT, and a few smaller cohort trials that support a more stringent

goal.^{13,16–21} For example, in the UKPDS, when patients without retinopathy at entry in the lowest tertile of A1C values (<6.2%) were assigned a relative risk (RR) of 1.0, the RR of developing retinopathy rose to 1.4 (95% CI, 1.1–1.8) in the middle tertile (A1C, 6.2%–7.4%).¹⁶ Likewise, the RR of retinopathy progression was 4.1 (95% CI, 3.1–5.6) in the middle tertile (A1C, 6.2%–7.4%) of patients with retinopathy at entry compared with the lowest tertile (A1C, <6.2%).¹⁶ In a prospective population-based study (the European Prospective Investigation of Cancer and Nutrition [EPIC]–Norfolk) of 4662 men (5% with DM), there was a significant positive correlation between A1C level and mortality.¹⁷ The ACE guidelines published in 2002¹³ are supported by expert testimony from the 2001 Consensus Conference that provides details on the rationale for more aggressive glycemic control.^{18–21} It is possible that the ACE committee put greater emphasis on epidemiologic observational studies rather than on studies that examined the effect of treatment on clinical outcomes, such as cardiovascular mortality. The ADA appears to be less stringent in its A1C target because of the lack of treatment studies demonstrating that reducing the A1C level to <6.0% lowers mortality. The results of the pending Action to Control Cardiovascular Risk in Diabetes study may resolve these differences.¹² In addition, the ADA states that treatments which reduced the A1C level to 7.0% were associated with weight gain and severe hypoglycemia, whereas the ACE guidelines do not highlight these side effects.

These organizations also have different targets for FPG and PPG levels. The ADA recommends FPG measurements in the range of 90 to 130 mg/dL and 2-hour PPG test results <180 mg/dL.¹² If premeal glucose values are in the target range and the A1C level is above target, the ADA guidelines advise that focusing on PPG monitoring and reduction may lower the patient's A1C level. The ACE/AACE recommends FPG measurements <110 mg/dL and 2-hour PPG test results <140 mg/dL.¹³ The VA/DoD guidelines do not designate numeric target ranges for FPG and PPG because these are to be determined jointly by the patient and the provider.¹¹ They recommend that PPG levels be assessed in patients with frequent hypoglycemia (defined as blood glucose <70 mg/dL) or in patients who have A1C levels above target (see

Table II) but normal (which is not defined) readings for FPG levels; this recommendation is based on the approach that aiming for 1- to 2-hour PPG measurements of <180 mg/dL may lower the A1C level.¹¹ The VA/DoD suggests this as a possible, but not validated, option to improve glycemic control.

INDIVIDUALIZING GOALS FOR SPECIFIC PATIENT POPULATIONS WITH DIABETES MELLITUS

Although all three organizations advise individualizing goals for specific patient populations with DM,^{11–13} the ACE/AACE guidelines specifically highlight the risk–benefit ratio of glycemic control with these words: “The guidelines may be modified for individual patients whose functional state or risk for other adverse treatment effects (such as hypoglycemia unawareness) is thought to outweigh the benefits of optimal glucose control.”¹³ Despite the results of several interventional studies that showed an association between tight glycemic control and increased risk of hypoglycemia,^{4,8} the panel that establishes ACE/AACE guidelines believes that newer medications—such as insulin analogues and rapid-acting insulin secretagogues—and newer technologies enable the patient to achieve tight glycemic control with a lower risk of hypoglycemia.¹³ These newer technologies are not defined but may include continuous glucose monitoring systems and alternate site glucose meters.

Although not specific as to the type and severity of complications, the ADA acknowledges that no clinical trial data exist to assess the effects of tight glycemic control in patients with advanced DM complications, the elderly (≥ 65 years old) with DM, or young children (<13 years old) with DM.¹² Thus, “less stringent goals may be appropriate for patients with limited life expectancies, in the very young, or older adults, and in individuals with comorbid conditions.”¹² Likewise, patients with DM who experience severe or frequent episodes of hypoglycemia may require modification of the goals of treatment. Based on the findings of some epidemiologic studies^{10,17} that show the risk of DM complications decreases as A1C is lowered without a lower threshold, the ADA guidelines suggest that it may be appropriate to aim for an A1C level of <6.0% in some patients with DM, although these patients are not defined.¹²

Table II. Veterans Health Administration/Department of Defense guidelines: Individualizing determination of target glycosylated hemoglobin (A1C) levels in patients with diabetes mellitus.¹¹

Major Comorbidity* or Physiologic Age	Determination of Target A1C Level		
	Absent or Mild [†]	Moderate [‡]	Advanced [§]
Absent or >15 years of life expectancy	7.0% (<1% above upper normal range)	<8.0% (<2% above upper normal range)	<9.0% (<3% above upper normal range)
Present or 5 to 15 years of life expectancy	<8.0% (<2% above upper normal range)	<8.0% (<2% above upper normal range)	<9.0% (<3% above upper normal range)
Marked [¶] or <5 years of life expectancy	<9.0% (<3% above upper normal range)	<9.0% (<3% above upper normal range)	<9.0% (<3% above upper normal range)

* Major comorbidity includes, but is not limited to, any or several of the following conditions: cardiovascular disease, chronic obstructive pulmonary disease, chronic liver disease, stroke, and malignancy.
[†] Mild microvascular disease is defined by early background retinopathy and/or microalbuminuria and/or mild neuropathy.
[‡] Moderate microvascular disease is defined by preproliferative (without severe hemorrhage, intraretinal microvascular anomalies [IRMA], or venous bleeding) retinopathy or persistent, fixed proteinuria (macroalbuminuria) and/or demonstrable peripheral neuropathy (sensory loss).
[§] Advanced microvascular disease is defined by severe nonproliferative (with severe hemorrhage, IRMA, or venous bleeding) or proliferative retinopathy and/or renal insufficiency (serum creatinine level >2.0 mg/dL) and/or insensate extremities or autonomic neuropathy (eg, gastroparesis, impaired sweating, or orthostatic hypotension).
^{||} Moderate degree of major comorbid condition.
[¶] Severe degree or end-stage major comorbid condition.

Expanding on the concept of individualizing goals, the VA/DoD guidelines provide a risk-stratification algorithm for determining the individual patient's target A1C level (**Table II**).¹¹ (The VA/DoD guidelines designate an A1C level of 9.0% as the upper limit of the desirable range for all patients because it is associated with clinical symptoms, such as blurry visions and polyuria.¹¹) This approach takes into account that the future risk of the incidence and progression of microvascular complications depends on the individual's level of glycemic control and the duration of exposure to hyperglycemia, both of which are reflected in the current stage of microvascular complications. A person's life expectancy and the presence of any comorbid illnesses also affect the potential benefit from tight glycemic control and the risk of hypoglycemia. At one end of the spectrum, a target A1C level of <7.0% is suggested for patients with mild or no microvascular complications and a reasonable life expectancy. At the other end, patients with shortened life expectancy (<5 years, possibly secondary to severe comorbid conditions) and/or

severe microvascular complications may have a goal A1C of <9.0%.¹¹

The VA/DoD guidelines also suggest careful consideration of patient factors and preferences in determining glycemic targets.¹¹ A1C targets may be lowered if patients wish to become pregnant or are pregnant, have a supportive psychosocial environment, and are able to perform SMBG testing and modify their lifestyles. A1C targets may be raised in patients with current alcohol or substance abuse problems or other factors that increase the potential harm caused by hypoglycemia.²²

EFFORTS TO ACHIEVE WIDESPREAD IMPLEMENTATION OF CLINICAL PRACTICE GUIDELINES

In the 1990s, data from >4000 patients who reported a diagnosis of DM in two national population-based cross-sectional surveys—the Third US National Health and Nutrition Examination Survey and the Behavioral Risk Factors Surveillance System (BRFSS)—revealed that health care systems fell short of the glycemic

control targets designated by the ADA and ACE/AACE.²³ Among adults aged 18 to 75 years, 28.8% had obtained an A1C test in the previous year; the median A1C level was 7.5% for those who were tested. A total of 42.9% of those who were tested had A1C levels <7.0%; 18.0% had A1C levels >9.5%.²³ A more recent retrospective cohort study of 1765 patients with type 1 and type 2 DM treated at 30 US academic medical centers showed that 34.0% were at A1C goal levels of <7.0%; 40.4% of those above goal levels had their medication regimens adjusted at their most recent clinic visit.²⁴

In 2005, ACE/AACE held a conference to discuss ways to achieve widespread implementation of the 2001 ACE/AACE guidelines for DM care.¹⁴ They commended the work of health care organizations that have adopted the chronic care model and have streamlined the model components (including the implementation of clinical information systems, decision support, self-management support, and delivery system design) to improve clinical outcomes. ACE/AACE also has encouraged widespread dissemination of their guidelines by making them “accessible at the point of care (ie, in examination rooms, on patient charts, on office computers, and on personal digital assistants [PDAs])” and through various educational media (including DM-related programs, Web-based programs, teleconferences, medical journals, and organization Web sites).¹⁴ ACE/AACE continues to provide educational symposia and publications for health care providers, as well as educational materials for patients (eg, the “Patients First” intensive DM self-management brochure).¹⁵

Similar to ACE/AACE, the ADA links suboptimal DM care to fragmentation of health care delivery systems and calls for innovative, evidence-based, patient-centered care.²⁵ The ADA guidelines advocate effective interventions, including provider education, DM self-management education, guideline-based checklists, “point-of-care” availability of guidelines, automated reminders, dedicated DM provider visits, DM registries, care management services, and specialty consultation.²⁵ The ADA has initiated a number of programs that support adherence to the guidelines. In collaboration with the National Committee for Quality Assurance, the ADA developed the Diabetes Physician Recognition Program (DPRP), which awards recognition to physicians who can show that they excel in DM

care. The DPRP operationalizes the ADA’s Standards of Care for Diabetes. The ADA also offers various learning opportunities for patients and providers, including organizing large and small symposia, offering Web-based education, and the development and dissemination of various publications.

In the last 5 years, the VA has taken a leadership role in optimizing DM care. The Translating Research into Action for Diabetes study conducted surveys and analyzed medical records to assess DM quality-of-care measures in 1285 patients in 5 VA systems and 6920 patients in 8 commercial managed care organizations; adjustments were made for patient demographic and health characteristics.²⁶ Results of this study showed that a greater percentage of patients met glycemic targets in the VA system compared with commercial managed care organizations, with respect to performance of annual A1C testing (93% vs 83%, respectively; $P = 0.005$) and achievement of A1C levels <8.5% (83% vs 65%, respectively; $P = 0.009$).²⁶ In the BRFSS study, more patients receiving care at the VA reported ever attending a DM education class and receiving at least one A1C test within the past year, compared with patients receiving care in other health care systems.²⁷

A major reason why the VA has been successful in implementing the VA/DoD guidelines is due to its centralized structure and advanced uniform electronic medical record system.^{26,28} The VA has made its guidelines for DM care operational through the development of performance measures. Medical center directors and regional directors are held accountable for these measures. The VA Office of Quality and Performance tracks these performance measures relating to the care of people with DM by sending external reviewers to all VA facilities; these reviewers conduct surveys on medical charts and provide feedback to national, regional, and local leaders.^{26,28} The education offices of the DoD and the VA have created educational diabetes tool kits for providers and patients, which include the VA/DoD guidelines, pocket cards, and posters.

In addition, all VA sites utilize the Computerized Patient Record System (CPRS), an electronic medical record that makes patient data easily accessible to providers.^{26,28} When a health care provider examines a patient’s record in CPRS, computerized clinical reminders highlight performance measures that need

attention (ie, A1C >9.0% or not done) and suggest interventions (eg, “quick orders” for laboratory values, antihypertensive medications).^{26,28} Other CPRS features that facilitate efficient care for people with DM include guideline-based chronic disease management menus and medication order sets.

DISCUSSION AND CONCLUSIONS

The highest level of clinical evidence demonstrates that tight glycemic control reduces microvascular complications in patients with DM. Based on the findings of recent studies (including the DCCT/EDIC study), there is growing evidence which suggests that tight glycemic control can also ameliorate macrovascular complications in people with type 2 DM. To help providers and health care systems apply the knowledge gained through the latest studies on DM management to patient care, three national organizations—the ADA, the ACE/AACE, and the VA/DoD—have developed evidence-based guidelines. All three groups recommend achieving an A1C level of at least <7.0% for some people with type 1 and type 2 DM, although ACE/AACE lowers the goal A1C level even further. The ACE guideline of an A1C level <6.5% is specifically based on an increased RR for retinopathy in the 6% to 7% range (UKPDS¹⁶) and nonspecifically based on continuous risk for mortality with increasing A1C levels (EPIC¹⁷). The three organizations agree that the glycemic goal should be modified for patients in whom the risk of an adverse event exceeds the benefit of tight glycemic control in reducing DM complications. Of special note, the VA/DoD has demonstrated a comprehensive approach to assessing the risk–benefit ratio of intensive glycemic control for the individual patient.

All three organizations are taking the initiative to disseminate their guidelines for DM care to providers and patients, recognizing that widespread implementation of evidence-based guidelines requires more than the distribution of lengthy documents to providers and patients. Clinicians and health care organizations are strongly encouraged to incorporate these guidelines into daily clinical practice and to assess their impact on patient care through continuous quality-of-care monitoring and provider recognition programs.

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