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## Guidelines Abstracted from the American Geriatrics Society Guidelines for Improving the Care of Older Adults with Diabetes Mellitus: 2013 Update

American Geriatrics Society Expert Panel on the Care of Older Adults with Diabetes Mellitus

### OBJECTIVES

- Incorporate high-quality new evidence with significant effect on diabetes mellitus (DM) care that has become available since the 2003 “Guidelines for Improving the Care of the Older Person with Diabetes Mellitus” into a new 2013 Guideline update.
- Improve the care of older people with DM by providing an updated set of evidence-based recommendations individualized to adults with DM aged 65 and older.

Ten years ago, the California Health Care Foundation (CHCF)/American Geriatrics Society (AGS) Panel published some of the first patient-centered clinical guidelines to assist clinicians with the complex and individualized care of older adults with DM.<sup>1</sup> The abstracted set of recommendations presented here provides essential guidance in the care of older adults with DM and is based on the 2013 AGS Guidelines, which have incorporated new evidence available since 2003. The full version of the updated guidelines, *American Geriatrics Society (AGS) Guidelines for Improving the Care of the Older Adult with Diabetes Mellitus: 2013 Update*, is available at [www.GeriatricsCareOnline.org](http://www.GeriatricsCareOnline.org).

### COMPONENTS OF CARE

The components of the 2003 guidelines were aspirin, tobacco cessation, glucose control, blood pressure management, lipids management, eye care, foot care, and DM self-management education and support (DSME/S). Specific geriatric syndromes that have been included and emphasized in the updated 2013 guidelines are depression, polypharmacy, cognitive impairment, urinary incontinence, injurious falls, and persistent pain.

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**Conflict of Interest:** Dr. Chun is on an advisory board related to Patient Centered Medical Home and Alzheimer’s care for Janssen Alzheimer Immunotherapy Research & Development, LLC. Dr. Funnell has served as a member of an Advisory Board for Eli Lilly; Halozyme Therapeutics; Bristol-Meyers Squibb; Hygeia Inc; Boehringer-Ingelheim; Johnson & Johnson, Animas/Lifescan; Intuity Medical; Omada Health; NovoNordisk; Hygia, Inc.; Bayer Diabetes; Amalyn Pharmaceuticals. She is supported in part by the NIH with an R34 grant for peer-based DM self-management education. Dr. Lee holds shares in Mylan Inc. Dr. Linnebur serves as a consultant for the American Geriatrics Society Beers Criteria Expert Panel. She has received a grant from Eli Lilly and Company for a Phase 2 study investigating falls and muscle weakness.

Clinical and functional heterogeneities in older adults with DM that were also addressed in the 2013 guidelines are differences in general health status, age and duration of disease at diagnosis, number of years of treatment, comorbidities and underlying chronic conditions, range of complications, degree of frailty, limits in physical or cognitive function, and differences in life expectancy (time horizon for benefit).

## PATIENT-CENTERED CARE AND INDIVIDUALIZED GOALS

The 2013 guidelines update recommends DM care that is customized and prioritized to the individual person with DM, with attention to quality of life and personal and caregiver choices related to health care. The 2013 guidelines update:

- No longer recommends aspirin for the primary prevention of cardiovascular disease (CVD).
- Renews the emphasis on treating dyslipidemias with statins but not to target levels.
- Continues to support glycemic control recommendations customized to burden of comorbidity, functional status, and life expectancy.
- Presents stronger, more-prescriptive, patient-centered recommendations for lifestyle modification because of increased evidence of its importance for healthy older adults with DM.

## EVIDENCE

The guidelines were updated by reviewing the existing peer-reviewed literature (2002–2012) and guidelines on each DM topic. PubMed was searched for relevant studies published in the peer-reviewed literature from 2002 to 2012. Randomized clinical trials and systematic reviews or meta-analyses were reviewed. When reasonable, the expert panel extrapolated findings to older adults with DM. Evidence tables (available at <http://www.GeriatricsCareOnline.org>) were constructed summarizing new evidence.

An expert panel consisting of general internists, family practitioners, geriatricians, clinical pharmacists, health services researchers, and certified DM educators was convened. Potential conflicts of interest were disclosed appropriately. Expert panel members followed the U.S. Preventive Services Task Force scale for rating the evidence. Some of the recommendations are based on clinical experience and the consensus of the expert panel (Table 1).

## VALIDATION

A draft of the guideline was posted on the AGS website for public comment and sent to the following organizations with special interest and expertise in the treatment of DM in older adults for peer review: American Diabetes Association, American Association of Clinical Endocrinologists, American Academy of Family Physicians, American College of Physicians, Society for General Internal Medicine, American College of Clinical Pharmacy, American Society of Consultant Pharmacists, American Association of Nurse Practitioners,

American Academy of Nutrition and Dietetics, American Association of Diabetes Educators, and the American Medical Directors Association.

## THE GUIDELINES

### Guiding Principles for Care of Older Adults with DM

Clinicians should establish specific goals of care or target outcomes for persons with DM in collaboration with patients, families, or caregivers. Such targets should be identified and documented in the medical record for all aspects of care, such as management of hypertension, hyperlipidemia, hyperglycemia, mood disorder if present, and screening and treatment of geriatric syndromes when required.

If the documented goals are not being met, the patient should be evaluated for contributing causes. Efforts should also be made to assess patient and caregiver preferences to keep care simple and inexpensive. If target outcomes are still not being met, specialists may provide valuable assistance.

## RECOMMENDATIONS

### Aspirin

1. If an older adult has DM and known cardiovascular disease, daily aspirin therapy 81 to 325 mg/d is recommended, unless contraindicated or the patient is taking other anticoagulant therapy. (IA)

There is no evidence that a higher dose is more effective than a 75-mg/d dose,<sup>2</sup> and there is insufficient evidence to recommend the use of aspirin for primary CVD prevention for older adults with type 2 DM. For adults aged 80 and older, aspirin should be used with caution.

### Smoking

1. Older adults with DM who smoke should be assessed for readiness to quit and should be offered counseling and pharmacologic interventions to assist with smoking cessation. (IIA)

### Hypertension

#### General Recommendations

1. If an older adult has DM and requires medical therapy for hypertension, then the target blood pressure should be less than 140/90 mmHg if it is tolerated. (IA)

There is potential harm in lowering systolic blood pressure to less than 120 mmHg in older adults with type 2 DM. (1B)

Systolic blood pressure of less than 130 mmHg is not associated with better CVD outcomes than blood pressure control between 130 and 140 mmHg.<sup>3,4</sup>

Recent evidence comparing classes of antihypertensive medications for persons with DM indicates that many, such as diuretics, angiotensin-converting enzyme (ACE) inhibitors, beta-blockers, and calcium channel blockers, have comparable effectiveness in reducing

cardiovascular morbidity and mortality. Angiotensin-receptor blockers (ARBs) may also have cardiovascular and renal benefit for persons with DM.

2. Older adults with DM and hypertension should be offered a therapeutic intervention to lower blood pressure within 3 months if systolic blood pressure is 140 to 160 mmHg or diastolic blood pressure is 90 to 100 mmHg or within 1 month if blood pressure is greater than 160/100 mmHg. (IIIB)

### Medication

3. Older adults with DM who are taking an ACE inhibitor or ARB should have renal function and serum potassium levels monitored after approximately 1 to 2 weeks of initiation of therapy, with each dosage increase, and at least yearly. (IIIA)
4. Older adults with DM who are prescribed a thiazide or loop diuretic should have electrolytes checked after approximately 1 to 2 weeks of initiation of therapy, with each dosage increase, and at least yearly. (IIIA)

## Glycemic Control

### General Recommendations

1. Target goal for glycosylated hemoglobin (HbA1c) in older adults generally should be 7.5% to 8%. HbA1c between 7% and 7.5% may be appropriate if it can be safely achieved in healthy older adults with few comorbidities and good functional status. Higher HbA1c targets (8–9%) are appropriate for older adults with multiple comorbidities, poor health, and limited life expectancy. (1A evidence for HbA1c 7–8%, and IIA for 8–9%)

There is potential harm in lowering HbA1c to less than 6.5% in older adults with type 2 DM. (11A)

There is no evidence that using medications to achieve tight glycemic control in older adults with type 2 DM is beneficial. For adults younger than 65, using medications to achieve HbA1c levels of less than 6.5% is associated with harms, including hypoglycemia and mortality, except for reductions in MI and mortality with metformin.<sup>5</sup> Given the long time frame needed to achieve a reduction in microvascular complications (retinopathy, neuropathy, and nephropathy), glycemic goals should reflect patient goals, health status, and life expectancy.

According to the American Diabetes Association (ADA) 2013 recommendations for frail older adults, persons with limited life expectancy or extensive comorbid conditions, and others in whom the risks of intensive glycemic control appear to outweigh the potential benefits, a less-stringent target such as 8.0% is appropriate.<sup>6</sup>

### Monitoring

2. Older adults with DM whose individual targets are not being met should have their HbA1c levels measured at least every 6 months and more frequently as needed or indicated. For older adults with stable HbA1c over several years, measurement every 12 months may be appropriate. (IIIB)

More-frequent monitoring may be appropriate for persons in whom there is a clinical indication to achieve tight glycemic control (e.g., symptomatic individuals with high HbA1c levels).<sup>6</sup>

3. For older adults with DM, a schedule for self-monitoring of blood glucose should be considered, depending on functional and cognitive abilities. The schedule should be based on the goals of care, target HbA1c levels, potential for modifying therapy, and risk of hypoglycemia. (IIB)

The optimal frequency and timing of self-monitoring is not known. Some people do not need to self-monitor and may need to balance self-monitoring with the intensity of therapy, quality of life, and risk of hypoglycemia. Self-monitoring may reduce the risk of serious hypoglycemia in older adults with DM who use insulin or oral antidiabetic agents. The ADA recommends that self-monitoring “should be dictated by the particular needs and goals of the patient,” and frequency should be increased when adding to or modifying therapy.<sup>6</sup>

4. The management plan for older adults with DM with severe or frequent hypoglycemia should be evaluated; the individual should be offered referral to a DM educator, endocrinologist, or diabetologist, and the individual and any caregivers should have more-frequent contacts with the healthcare team (e.g., physicians, certified DM educators, pharmacists, nurse case manager) while therapy is being readjusted. (IIB)

### Medications

5. If an older adult is prescribed an oral antidiabetic agent, metformin, unless contraindicated, is the preferred first-line agent in combination with lifestyle therapy. (IA)

After the use of metformin, glucose-lowering medication therapy should be individualized.<sup>7</sup> Sulfonylureas have been associated with greater risk of hypoglycemia, and the risk increases with age. Glyburide should generally not be prescribed to older adults with type 2 DM because of the high risk of hypoglycemia. Chlorpropamide has a prolonged half-life, particularly in older adults and should be avoided. Expert opinion supports the safety of insulin use in healthy older adults with DM education, careful monitoring, and ongoing cognitive assessment and suggests the elimination of insulin sliding scale in nursing homes.<sup>8</sup>

6. Use estimated glomerular filtration rate (eGFR) rather than serum creatinine levels to guide metformin use. Specifically, do not use metformin in patients with an eGFR of less than 30 mL/min per 1.73 m<sup>2</sup>. For individuals with an eGFR between 30 and 60 mL/min per 1.73 m<sup>2</sup>, check renal function more frequently and use lower dosages. (IIB)

Despite concern about lactic acidosis with metformin, recent data suggest that the risk is low.

## Lipids

### General Recommendations

1. For older adults with DM and dyslipidemia, efforts should be made to correct the lipid abnormalities if feasible after overall health status is considered. (IA)

Evidence supports the use of lipid-lowering agents, particularly statins, in older adults with DM who are younger than 75, but there are no clinical trial data collected over the last 10 years in people aged 80 and older with DM. The beneficial effects of lipid lowering have been seen primarily with 5-hydroxy-3-methylglutarylcoenzyme A reductase inhibitors (statins).

2. Pharmacological therapy with a statin is recommended in addition to medical nutrition therapy and increased physical activity unless contraindicated or not tolerated. (1B)

The evidence for reduction of CVD endpoints with drugs other than statins is limited in all age groups,<sup>9</sup> and the evidence does not support combination therapy with a statin and niacin or fenofibrate, which is generally not recommended.

Medical nutrition therapy, supplemented Mediterranean diet, enhanced physical activity, and weight loss have also been shown to play a role in improving cardiovascular risk profiles in older adults with DM.

Optimal low-density lipoprotein cholesterol (LDL-C) targets have not been established. Expert opinion supports the selection of specific LDL-C levels as prompts for specific actions.

It is recommended that goals for high-density lipoprotein cholesterol (HDL-C) and triglycerides be consistent with ADA recommendations of HDL-C greater than 40 mg/dL in men, HDL-C greater than 50 mg/dL in women, and triglycerides less than 150 mg/dL. Expert consensus suggests that persons with low-risk lipid values (LDL-C <100 mg/dL; HDL-C >50 mg/dL, triglycerides <150 mg/dL) on an initial assessment may have lipids checked every 2 years; in most persons with DM, measurement of a fasting lipid profile is recommended at least annually and more frequently if targets are not being met.<sup>6</sup>

### Monitoring

3. Older adults with DM who are newly prescribed a statin should have alanine aminotransferase level measured before treatment with the new medication begins and as clinically indicated thereafter. (IIIB)

There is no clinical trial evidence supporting the monitoring of liver enzymes.

## Eye Care

1. Older adults with new-onset DM should have an initial screening dilated-eye examination with funduscopy performed by an eye care specialist. (IB)
2. Older adults with DM and who are at high risk of eye disease (symptoms of eye disease present; evidence of retinopathy, glaucoma, or cataracts on an initial

dilated-eye examination or subsequent examinations during the prior 2 years; HbA1c  $\geq$  8.0%; type 1 DM; or blood pressure  $\geq$  140/90 mmHg) on the prior examination should have a screening dilated-eye examination performed by an eye care specialist with funduscopy training at least annually. Persons at lower risk or after one or more normal eye examinations may have a dilated-eye examination at least every 2 years. (IIB)

Decision analytical models suggest that screening for diabetic retinopathy is cost-effective, although annual screening in persons at low risk of retinopathy is not more cost-effective than less-frequent screening intervals.<sup>10</sup> Less-frequent examinations, every 2 to 3 years, may be cost-effective after one or more normal eye examinations in low-risk individuals.<sup>11</sup>

### Foot Care

1. Older adults with DM should have a careful foot examination at least annually to check skin integrity and to determine whether there is loss of sensation or decreased perfusion and more frequently if there is evidence of any of these findings. (IIIA)

Quality of evidence is Level II for more-frequent examinations for persons at high risk of foot problems and Level III for routine annual screening, based on recommendations from the ADA.<sup>6</sup>

### Nephropathy Screening

1. A test for the presence of albuminuria should be performed in individuals at diagnosis of type 2 DM. After the initial screening and in the absence of previously demonstrated macro- or microalbuminuria, a test for the presence of microalbuminuria should be performed annually. (IIIA)

There is little evidence supporting annual microalbuminuria screening. This is especially so in older adults with limited life expectancy. If an individual is taking an ACE inhibitor or ARB, there is no need for screening.

### DM Self-Management Education and Support

1. Persons with DM and, if appropriate, family members and caregivers should receive DSME/S with reassessment and reinforcement periodically as needed. (IA)

Recommended DSME/S is described in the National Standards for Diabetes Self-Management and Support.<sup>12</sup>

2. The monitoring technique of older adults with DM who self-monitor blood glucose levels should be routinely reviewed. (IIIB)

3. Older adults with DM and normal cognition and functional status should perform at least 150 minutes per week of moderate-intensity aerobic physical activity. (1A) Unless there are contraindications, older adults with DM should be advised to perform aerobic and resistance exercises to the best of their ability under the direction of their healthcare provider. (IA)

Older adults with DM should also receive structured lifestyle counseling based on the Diabetes Prevention Program strategies and should be urged to engage in physical activity at least 3 days per week.<sup>13</sup>

4. Older adults with DM should be evaluated regularly for diet and nutritional status and, if appropriate, should be offered referral for culturally appropriate medical nutrition therapy and counseled on the content of their diet (e.g., intake of high-cholesterol foods and appropriate intake of carbohydrates) and on the potential benefits of weight reduction. (IA)

Meal planning should be based on a personalized plan developed collaboratively between the individual and a registered dietitian as part of medical nutrition therapy counseling. The meal plan should incorporate personal preferences and cultural and religious practices and accommodate other chronic and acute conditions, living situation, and any activity of daily living or other impairments. Weight reduction should be done under medical supervision but may not be an appropriate goal in all cases.

5. Older adults with DM who are prescribed a new medication and any caregiver should receive education about the purpose of the drug, how to take it, and the common side effects and important adverse reactions, with reassessment and reinforcement as needed. (IA)

6. Older adults with DM and any caregiver should receive education about risk factors for foot ulcers and amputation. Physical ability to provide proper foot care should be evaluated, with reassessment and reinforcement periodically as needed. (IB)

## Depression

1. Older adults with DM are at greater risk of major depression and should be screened for depression during the initial evaluation period (first 3 months) and if there is any unexplained decline in clinical status. (IIB)

On initial presentation of an older adult with DM, a healthcare professional should assess the individual for symptoms of depression using a standardized short screener,<sup>14</sup> such as the Geriatric Depression Scale, Patient Health Questionnaire (PHQ-9), or other available instruments.<sup>15</sup> Expert opinion suggests screening for depression when there is new-onset cognitive decline.

Psychosocial problems other than depression, such as attitudes about DM, quality of life, DM-related distress, and lack of financial resources, are also important for older adults with type 2 DM.

2. Older adults with DM who present with new-onset or a recurrence of depression should be treated or referred within 2 weeks of presentation, or sooner if they are a danger to themselves, unless there is documentation that the patient has improved. (IIB)

There is evidence from carefully conducted meta-analyses of RCTs that pharmacological and psychological treatment of older adults (aged  $\geq 55$ ) is effective in reducing depressive



symptoms.<sup>16–18</sup> The quality and strength of evidence is IA for undertaking clinical intervention but IIIB for the timing of referral or treatment. For individuals who show evidence of substance abuse or dependence, initiation of therapy for depression may wait until the individual is in a drug- or alcohol-free state.

3. Older adults who have received therapy for depression should be evaluated for improvement in target symptoms within 6 weeks of the initiation of therapy. (IIIB)

There is new evidence that collaborative programs, in which primary care clinicians work closely with mental health specialists, are significantly more effective than typical primary care treatment.<sup>19,20</sup>

### Polypharmacy

1. Older adults with DM should be advised to maintain an updated medication list for review by the clinician. (IIA)

In the outpatient setting, it is recommended that a comprehensive medication review be performed annually. The availability of an updated medication list that includes over-the-counter drugs, vitamins, and herbal supplements allows healthcare providers to evaluate the need for current medications, the potential for drug–drug and drug–disease interactions, and ways to enhance medication adherence. It is also recommended that individuals receive medication reconciliation upon discharge from the hospital.

2. The medication list of an older adult with DM who presents with depression, falls, cognitive impairment, or urinary incontinence should be reviewed. (IIA)

Epidemiological evidence shows that medications may contribute to or exacerbate geriatric syndromes alone or through drug–drug or drug–disease interactions. Medication use, particularly those with a sedating effect, is often cited as a risk factor for falls.<sup>21–23</sup> The AGS Beers Criteria provide clinicians with information on potentially inappropriate medications in older adults.<sup>8</sup>

### Cognitive Impairment

1. Clinicians should assess older adults with DM for cognitive impairment using a standardized screening instrument during the initial evaluation period and with any significant decline in clinical status. Increased difficulty with self-care should be considered a change in clinical status. (IIIA)

Systematic review and meta-analyses of up to 15 studies found that dementia was more likely in persons with DM and suggested that DM was associated with faster cognitive decline in older adults.<sup>24–26</sup>

Simple tools are available to clinicians ([http://www.hospitalmedicine.org/geriresource/toolbox/mental\\_status\\_page.htm](http://www.hospitalmedicine.org/geriresource/toolbox/mental_status_page.htm)). The Montreal Cognitive Assessment tool is available in several languages and is easily accessible for clinical and education purposes (<http://www.mocatest.org/>).

2. If there is evidence of cognitive impairment in an older adult with DM and delirium has been excluded as a cause, then an initial evaluation designed to

identify reversible conditions that may cause or exacerbate cognitive impairment should be performed within the first 3 months after diagnosis and with any significant change in clinical status. (III A)

The American Academy of Neurology guidelines recommend screening older adults with evidence of cognitive impairment for depression, B<sub>12</sub> deficiency, and hypothyroidism; structural neuroimaging to identify lesions is also recommended for those recently diagnosed.<sup>27</sup> If the cognitive impairment is due to delirium, urgent assessment for etiology and management is indicated.

### Urinary Incontinence

1. Older adults with DM should be evaluated for symptoms of urinary incontinence during annual screening. (III A)

Individuals commonly do not report urinary incontinence, and healthcare providers often do not detect it, but its effects may be profound, and it may be associated with social isolation, depression, falls, and fractures.<sup>28,29</sup> Although the evidence supporting this recommendation is Level III (expert opinion), because of the profound negative effect of underdiagnosis and undertreatment of this condition on quality of life, it is given an importance rating of A.

2. If there is evidence of urinary incontinence in the evaluation of an older adult with DM, then an evaluation designed to identify treatable causes of urinary incontinence should be pursued. (III B)

### Injurious Falls

1. Older adults with DM should be asked about falls every 12 months or more frequently if needed. (III B)

2. If an older adult presents with evidence of falls, the clinician should document a basic falls evaluation, including an assessment of injuries and examination of potentially reversible causes of the falls (e.g., medications, environmental factors). (III B)

Falls are frequently unreported and undetected and may be associated with reversible factors. Common risk factors for falls include balance disorders, functional impairment, visual deficits, cognitive impairment, and certain types of medications.<sup>30,31</sup> Components common in multifactorial interventions include medication review and management, exercise, assessments of instrumental activities of daily living, orthostatic blood pressure measurement, vision assessment, gait and balance evaluation, cognitive evaluation, and assessment of environmental hazards. Quality indicators for falls and mobility problems in vulnerable older adults are available,<sup>32</sup> and the AGS Guideline for the Prevention of Falls in Older Persons (2010) also provides detailed recommendations on effective interventions to reduce falls (<http://www.americangeriatrics.org/falls>).

### Pain

1. Older adults with DM should be assessed during the initial evaluation period for evidence of persistent pain. (III A)

Neuropathic pain may occur in as many as 50% of individuals with DM, but it is often underreported and undertreated in this population. Pharmacological and non-pharmacological treatments are available and should be individualized based on cost, patient preferences, goals of treatment, potential drug–drug interactions, comorbidities, and common side effects.<sup>32,33</sup>

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**Table 1**

## Designations of Quality and Strength of Evidence

<b>Evidence</b>	<b>Description</b>
Quality	
Level I	Evidence from at least one properly randomized controlled trial
Level II	Evidence from at least one well-designed clinical trial without randomization, from cohort or case-controlled analytical studies, from multiple time-series studies, or from dramatic results in uncontrolled experiments
Level III	Evidence from respected authorities based on clinical experience, descriptive studies, or reports of expert committees
Strength	
A	Good evidence to support the use of a recommendation; clinicians “should do this all the time”
B	Moderate evidence to support the use of a recommendation; clinicians “should do this most of the time”
C	Poor evidence to support or to reject the use of a recommendation; clinicians “may or may not follow the recommendation”
D	Moderate evidence against the use of a recommendation; clinicians “should not do this”
E	Good evidence against the use of a recommendation; clinicians “should not do this”