American Geriatrics Society Identifies Five Things That Healthcare Providers and Patients Should Question

AGS Choosing Wisely Workgroup

Given the American Geriatrics Society's (AGS) commitment to improving health care for older adults by, among other means, educating older people and their caregivers about their health and healthcare choices, the AGS was delighted when, in late 2011, the American Board of Internal Medicine Foundation invited the Society to join its "Choosing Wisely®" campaign. Choosing Wisely is designed to engage patients, healthcare professionals, and family caregivers in discussions about the safety and appropriateness of medical tests, medications, and procedures. Ideally, these discussions should examine whether the tests and procedures are evidence-based, whether any risks they pose might overshadow their potential benefits, whether they are redundant, and whether they are truly necessary. In addition to improving the quality of care, the initiative aims to rein in unneeded healthcare spending. According to a 2008 Congressional Budget Office report, as much as 30% of healthcare spending in the United States may be unnecessary. **J Am Geriatr Soc 2013.**

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Thanks to advances in public health and breakthroughs in the medical and surgical sciences, Americans are living far longer than their predecessors just a few generations ago. Adults turning 65 this year can expect to live, on average, another 19 years,[1] but for a significant part of their later years, many older Americans are living with serious health problems. Most have more than one. Data indicate that more than half have three or more chronic diseases and thereby meet the criteria for multimorbidity.[2]

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Treating older adults can be challenging. Because they have age-related anatomical and physiological changes, older adults may respond differently to medications and other interventions than younger individuals. Because older people—particularly those with multiple conditions—are underrepresented in clinical trials, judging the appropriateness of diagnostic and treatment approaches for aging adults can be difficult.[3]

Further complicating care for the more than 50% of older adults with multimorbidity, current clinical practice guidelines tend to focus on the treatment of *individual* disorders and, consequently, may not be applicable to individuals with multiple disorders. According to a seminal 2005 study, following all of the individual clinical guidelines applicable to a hypothetical, 71-year-old woman with chronic obstructive pulmonary disease, type 2 diabetes mellitus, osteoporosis, hypertension, and osteoarthritis would result in her taking a list of medications that would put her at significant risk of multiple drug side effects and drug–drug interactions.[4]

Concerns about inappropriate care for older adults are not limited to the overprescribing of medications. In 2012, Donald M. Berwick, MD, former Administrator of the Centers for Medicare and Medicaid Services (CMS), and Andrew D. Hackbarth, MPhil, highlighted the overuse of surgery and "unwanted intensive care at the end of life for patients who prefer hospice and home care."[5] With the eldest of the United States' 77 million "baby boomers" already 65, addressing inappropriate treatment for older adults is imperative.

Established in 1942, the American Geriatrics Society (AGS) is a nonprofit organization of more than 6,000 health professionals dedicated to improving the health, independence, and quality of life of older people. Enhancing healthcare for *all* older adults—including those with complex and multiple disorders—and working to ensure that their care is appropriate and in keeping with their wishes, is central to the mission of the AGS. To accomplish this mission, the society provides information and leadership to healthcare professionals, policy-makers, and the public and advocates for and implements programs in health care, research, public policy, and professional and public education.

In a recent initiative to improve prescribing for older adults, the AGS updated and expanded the Beers Criteria

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for Potentially Inappropriate Medication Use—one of the most frequently consulted sources of information about safe prescribing for older adults. The society convened a multidisciplinary expert panel that revised, expanded, and enhanced the criteria based on a systematic literature review and evaluation of the evidence base. Renamed the *2012 AGS Beers Criteria for Potentially Inappropriate Medication Use in Older Adults*, it was published in the *Journal of the American Geriatrics Society* (*JAGS*) in early 2012.[3] At the same time, the society's Foundation for Health in Aging (FHA) published a series of easily understood articles for lay people based on the new criteria. The articles explain how older adults and their caregivers can lessen risks of adverse drug events and drug–drug interactions. They are available on the society's public education Web site: www.healthinaging.org.

The AGS launched another major initiative later in 2012, focusing exclusively on improving care for multimorbid older adults, and convened another expert panel to undertake it. In addition to the greater risk of treatment side effects and interactions, older adults with multimorbidity are at greater risk of disability, institutionalization, and death, which makes their care particularly complex.

The panel developed a series of guiding principles for the care of these older adults—principles outlining a management approach that clinicians can follow to provide them with more-appropriate, individualized care. The approach considers a range of issues particular to each person's care. These include not only the limited evidence base, but also interactions between conditions and between treatments, the person's preferences and goals and the varying prognoses associated with these, the probable presence of multifactorial geriatric syndromes in these older adults, and the feasibility of each management decision and its implementation. In addition to outlining this approach to caring for these individuals, the panelists also called for the development of sufficient evidence that can eventually serve as the basis for a guideline to the care of these older people. The panel published two documents—a comprehensive background document and a summary report—in the October 2012 issue of *JAGS*. As it did after the publication of the *2012 AGS Updated Beers Criteria*, the FHA published comprehensive public education materials explaining the unique needs of multimorbid older adults and how following the guiding principles can help improve their care.

Given its commitment to improving health care for older adults by, among other means, educating older people and their caregivers about their health and healthcare choices, the AGS was delighted when, in late 2011, the American Board of Internal Medicine (ABIM) Foundation invited the AGS to join its "Choosing Wisely®" campaign. Choosing Wisely is designed to engage individuals, healthcare professionals, and family caregivers in discussions about the safety and appropriateness of medical tests, medications, and procedures. These discussions should examine whether the tests and procedures are evidence based, whether any risks they pose might overshadow their potential benefits, whether they are redundant, and whether they are truly necessary. In addition to improving the quality of care, the initiative aims to rein in unneeded healthcare spending. According to a 2008 Congressional Budget Office report, as much as 30% of healthcare spending in the United States may be unnecessary.[6]

The ABIM launched the Choosing Wisely campaign in 2011 with an initial group of nine U.S. medical societies. It asked each to identify five medical tests, medications, or procedures that physicians and patients should question. Lists of the tests, medications, and procedures that the nine organizations identified as warranting scrutiny and discussion are now posted on choosingwisely.org, the initiative's Web site. Easily understood versions of this information, which *Consumer Reports* developed for individuals and their family caregivers, has also been posted to the site.

The AGS was among the second wave of medical organizations asked to join the initiative. After a review of the evidence, and careful deliberation among its experts, the AGS identified five commonly prescribed medications and treatments that older adults, healthcare providers, and family caregivers should question and discuss.

The society's list of five things, itemized below, is intended to help facilitate discussions between older adults and their healthcare providers regarding the appropriateness of treatment options. The list is not intended to take the place of healthcare professionals' judgment or substitute for a consultation with a healthcare provider.

METHODS

The ABIM asked each participating organization to identify five tests, medications, or treatments commonly used in their specialty for which there is currently insufficient evidence of safety or appropriateness and that may pose risks for individuals that outweigh potential benefits.

Each organization was allowed to determine how to identify its five things as long as the following criteria were met: Each of the five was within the specialty's purview (each was among tests or procedures the society's members performed), the tests and procedures were frequently used in the specialty or were costly, each recommendation was based on sufficient evidence, and the process for making the decisions was documented and would be made available to the public if requested.

In April 2012, the AGS started work on its list, convening a Choosing Wisely Workgroup headed by Paul Mulhausen, MD, vice-chair of the AGS Clinical Practice and Models of Care Committee. To ensure that potential conflict-of-interest concerns were addressed appropriately, workgroup members disclosed potential conflicts of interest at the beginning of the process. Each workgroup member's potential conflicts of interest are provided at the end of this document.

After conducting preliminary research focused on tests and treatments commonly recommended for older adults, the workgroup surveyed the society's members via its Web site (www.americangeriatrics.org) and weekly e-mail, asking them what tests and procedures should be included in the list. The AGS then expanded the survey to others in the field over the Association of Directors of Geriatrics Academic Programs listserv (http://adgap.americangeriatrics.org), the GeriPal blog (www.geripal.org), and the POGOe Web site (www.pogoe.org). The society

received more than 300 individual responses to the survey. The workgroup reviewed these, identified the tests or treatments most often recommended for inclusion in the list, and then narrowed the number of tests and procedures to 10. Next, workgroup members consulted AGS members with expertise in these areas, discussing current research, clinical experience, and opinions on each. Based on these reviews, and on expert opinions, members of the workgroup ultimately identified the final five things.

The list of the AGS's five things has been posted on the ABIM Web site, www.choosingwisely.org, and linked to the AGS Web sites www.americangeriatrics.org and www.healthinaging.org. As part of this undertaking, the AGS and the FHA have developed and published a series of online professional and public resources about the society's five things.

RESULTS

The AGS List of Five Things Physicians and Patients Should Question (Table 1).

1. Don't recommend percutaneous feeding tubes in patients with advanced dementia; instead, offer oral assisted feeding.

Careful hand feeding of individuals with severe dementia is associated with comfort and functional status that are as good as, or better than, those associated with tube feeding. Older adults with advanced dementia who are handfed run lower risks of aspiration pneumonia and mortality than those with percutaneous feeding tubes. Tube feeding is associated with agitation, greater use of physical and chemical restraints, and worsening pressure ulcers.

Individuals with advanced dementia frequently develop eating and swallowing difficulties that lead to poor oral intake, weight loss, and aspiration. Approximately one-third of nursing home residents with advanced dementia have feeding tubes.[7] Feeding tube use is intended to prevent serious adverse outcomes such as aspiration pneumonia, malnutrition and its consequences, functional decline, and death. It is also intended to improve comfort. Nevertheless, tube feeding *cannot* be expected to prevent aspiration of oral secretions or to reduce risk of regurgitation, and no published studies have suggested that feeding tube insertion can reduce the risk of aspiration pneumonia.[8] A nonrandomized study found that orally fed individuals with oropharyngeal dysphagia had significantly *fewer* major aspiration events than those fed by tube.[9] Regarding undernutrition, no data suggest that providing additional nutrients through a feeding tube improves meaningful clinical outcomes.[8,10] A Cochrane systematic review noted that the use of feeding tubes in individuals with advanced dementia is not associated with better nutritional status, lower risk of pressure ulcers, or longer survival[11] than hand feeding. Another comprehensive review found no evidence to suggest that tube feeding can improve pressure ulcer outcomes, reduce infections, enhance functional status, or increase comfort,[8] and a propensity analysis found that tube feeding was significantly associated with worse pressure ulcer outcomes.[12]

The adverse, burdensome effects of tube feeding are significant. Aspiration pneumonia is the most common adverse event.[13] Others include tube occlusion, leaking, and local infection.[8] Furthermore, individuals may need to be physically or chemically restrained[14] to keep them from pulling the feeding tube out of place.

Conservative hand feeding approaches begin with appropriately positioning the individuals, with the upright position preferred[15] when possible. Other factors that appear to improve outcomes with hand feeding include nursing home staff education; ad lib diets; medication adjustments;[16] and use of finger foods, preferred foods,[17] and foods with strong flavors.[18] Specific feeding[15] techniques—such as offering frequent reminders to swallow multiple times per bolus,[17] reducing bolus size to smaller than one teaspoon,[18] encouraging gentle coughs after each swallow,[18] using facilitating techniques such as stroking the cheeks and neck,[19] placing food and fluid well into the mouth,[19] and optimizing the eating environment—all seem reasonable as well, although an evidence base for these strategies has not been well established.

There are significant opportunities to improve decision-making on behalf of individuals with advanced dementia and feeding difficulties. In a study of relatives of residents with dementia who died in nursing homes and had a feeding tube, 13.7% reported that there was no prior discussion about feeding tube insertion. In cases in which such discussions occurred, 41.6% of relatives reported that the discussion lasted fewer than 15 minutes, and 12.6% reported feeling pressured by the physician to insert the tube. Tellingly, family members with loved ones who died with a feeding tube were less likely to report that their relatives received excellent end-of-life care than family members of those who did not die with the tubes.[20]

Approaches to address this issue have been developed and tested. A randomized controlled trial found that a decision aid for surrogates deciding among feeding options for nursing home residents with advanced dementia improved the quality of decision-making. This intervention showed evidence of sustained benefit over time.[21]

2. Don't use antipsychotics as first choice to treat behavioral and psychological symptoms of dementia.

Older adults with dementia are frequently aggressive, resistant to care, and exhibit other disruptive and challenging behaviors. Although antipsychotics are often prescribed in such cases, these medications provide limited benefits and can increase risks of serious harm, including stroke and premature death. Use of these drugs should be limited in this population.

The recommendation to avoid using antipsychotics as first-choice treatments for behavioral and psychological symptoms of dementia is based on evidence from randomized controlled trials and on expert opinion.[2,22,23] Findings have shown that these medications are not generally effective for these individuals.

In a 42-site, double-blind, placebo-controlled trial, 421 outpatients with Alzheimer's disease and psychosis, aggression, or agitation were randomly prescribed one of three atypical antipsychotic medications (olanzapine, quetiapine, risperidone) or placebo and followed for as long

Table 1. AGS Choosing Wisely—Five Things Physicians and Patients Should Question

Recommendation	Rationale	Citations
Don't recommend percutaneous feeding tubes in patients with advanced dementia; instead offer oral assisted feeding.	Careful hand feeding for patients with severe dementia is at least as good as tube feeding for the outcomes of death, aspiration pneumonia, functional status, and patient comfort. Food is the preferred nutrient. Tube feeding is associated with agitation, increased use of physical and chemical restraints, and worsening pressure ulcers.	Finucane TE, Christmas C, Travis K. Tube feeding in patients with advanced dementia: A review of the evidence. JAMA 1999;282:1365–1370. Gabriel SE, Normand ST. Getting the methods right—the foundation of patient-centered outcomes research. N Engl J Med 2012;367: 787–790. Teno JM, Feng Z, Mitchell SL et al. Do financial incentives of introducing case mix reimbursement increase feeding tube use in nursing home residents? J Am Geriatr Soc 2008;56:887–890. Teno JM, Mitchell SL, Kuo SK et al. Decision-making and outcomes of feeding tube insertion: A five-state study. J Am Geriatr Soc 2011;59: 881–886. Palecek EJ, Teno JM, Casarett DJ et al. Comfort feeding only: A proposal to bring clarity to decision-making regarding difficulty with eating for persons with advanced dementia. J Am Geriatr Soc 2010;58:580–584. Hanson LC, Carey TS, Caprio AJ et al. Improving decision-making for feeding options in advanced dementia: A randomized, controlled trial. J Am Geriatr Soc 2011;59:2009–2016.
Don't use antipsychotics as first choice to treat behavioral and psychological symptoms of dementia.	People with dementia often exhibit aggression, resistance to care and other challenging or disruptive behaviors. In such instances, antipsychotic medicines are often prescribed, but they provide limited benefit and can cause serious harm, including stroke and premature death. Use of these drugs should be limited to cases where non-pharmacologic measures have failed and patients pose an imminent threat to themselves or others. Identifying and addressing causes of behavior change can make drug treatment unnecessary.	The American Geriatrics Society 2012 Beers Criteria Update Expert Panel. American Geriatrics Society Updated Beers Criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc 2012;60:616–631. National Institute for Health and Clinical Excellence and Social Care Institute for Excellence. National Collaborating Centre for Mental Health. Clinical guidelines #42: Dementia: Supporting people with dementia and their careers in health and social care [on-line] London. November 2006: Amended March 2011. Available at www.nice.org.uk/CG042 Accessed October 16, 2012. Maher A, Maglione M, Bagley S et al. Efficacy and comparative effectiveness of atypical antipsychotic medications for off-label uses in adults: A systematic review and meta-analysis. JAMA 2011;306:1359–1369. Schneider LS, Tariot PN, Dagerman K et al. CATIE-AD Study Group. Effectiveness of atypical antipsychotic drugs in patients with Alzheimer's disease. N Engl J Med 2006;355:1525–1538.

(Continued)

Table 1. (Contd.)

Recommendation	Rationale	Citations
Avoid using medications to achieve hemoglobin A1c <7.5% in most adults age 65 and older; moderate control is generally better.	There is no evidence that using medications to achieve tight glycemic control in older adults with type 2 diabetes is beneficial. Among non-older adults, except for long-term reductions in myocardial infarction and mortality with metformin, using medications to achieve glycated hemoglobin levels less than 7% is associated with harms, including higher mortality rates. Tight control has been consistently shown to produce higher rates of hypoglycemia in older adults. Given the long time frame to achieve theorized microvascular benefits of tight control, glycemic targets should reflect patient goals, health status, and life expectancy. Reasonable glycemic targets would be 7.0–7.5% in healthy older adults with long life expectancy, 7.5–8.0% in those with moderate comorbidity and a life expectancy <10 years, and 8.0–9.0% in those with multiple morbidities and shorter life expectancy.	The Action to Control Cardiovascular Risk in Diabetes Study Group. Effects of intensive glucose lowering in type 2 diabetes. N Eng J Med 2008;258:2545–2559. The Action to Control Cardiovascular Risk in Diabetes Study Group. Long-term effects of intensive glucose lowering on cardiovascular outcomes. N Eng J Med 2011;364:818–828.Duckworth W, Abraira C, Moritz T et al. Glucose control and vascular complications in veterans with type 2 diabetes. N Eng J Med 2009;360:129–139. ADVANCE Collaborative Group. Intensive blood glucose control and vascular outcomes in patients with type 2 diabetes. N Engl J Med 2008;358: 2560–2572. UK Prospective Diabetes Study (UKPDS) Group. Effect of intensive blood-glucose control with metformin on complications in overweight patients with type 2 diabetes (UKPDS 34). Lancet 1998;352:854–865. Montori VM, Fernández-Balsells M. Glycemic control in type 2 diabetes: Time for an evidence-based about-face? Ann Intern Med 2009;150:803–808. Erratum in: Ann Intern Med 2009;151:144. Finucane TE. "Tight control" in geriatrics: The emperor wears a thong. J Am Geriatr Soc 2012;60:1571–1575. Kirkman MS, Briscoe VJ, Clark N et al. Diabetes in older adults: A consensus report. J Am Geriatr Soc 2012;60:2342–2356.
Don't use benzodiazepines or other sedative–hypnotics in older adults as first choice for insomnia, agitation, or delirium.	Large-scale studies consistently show that the risk of motor vehicle accidents, falls and hip fractures leading to hospitalization and death can more than double in older adults taking benzodiazepines and other sedative-hypnotics. Older patients, their caregivers, and their providers should recognize these potential harms when considering treatment strategies for insomnia, agitation, or delirium. Use of benzodiazepines should be reserved for alcohol withdrawal symptoms/delirium tremens or severe generalized anxiety disorder unresponsive to other therapies.	Finkle WD, Der JS, Greenland S et al. Risk of fractures requiring hospitalization after an initial prescription of zolpidem, alprazolam, lorazepam or diazepam in older adults. J Am Geriatr Soc 2011;59:1883–1890. Allain H, Bentue-Ferrer D, Polard E et al. Postural instability and consequent falls and hip fractures associated with use of hypnotics in the elderly: A comparative review. Drugs Aging 2005;22:749–765. The American Geriatrics Society 2012 Beers Criteria Update Expert Panel. American Geriatrics Society Updated Beers Criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc 2012;60:616–631.
Don't use antimicrobials to treat bacteriuria in older adults unless specific urinary tract symptoms are present.	Cohort studies have found no adverse outcomes for older men or women associated with asymptomatic bacteriuria. Antimicrobial treatment studies for asymptomatic bacteriuria in older adults demonstrate no benefits and show increased adverse antimicrobial effects. Consensus criteria has been developed to characterize the specific clinical symptoms that, when associated with bacteriuria, define urinary tract infection. Screening for and treatment of asymptomatic bacteriuria is recommended before urologic procedures for which mucosal bleeding is anticipated.	Nordenstam GR, Brandberg CA, Odén AS et al. Bacteriuria and mortality in an elderly population. N Engl J Med 1986;314:1152–1156. Nicolle LE, Mayhew WJ, Bryan L. Prospective randomized comparison of therapy and no therapy for asymptomatic bacteriuria in institutionalized elderly women. Am J Med 1987;83:27–33. Juthani-Mehta M. Asymptomatic bacteriuria and urinary tract infection in older adults. Clin Geriatr Med 2007;23:585–594. Nicolle LE, Bradley S, Colgan R et al.; Infectious Diseases Society of America; American Society of Nephrology; American Geriatric Society. Infectious Diseases Society of America Guidelines for the diagnosis and treatment of asymptomatic bacteriuria in adults. Clin Infect Dis 2005;40:643–665.

as 36 weeks. There were *no differences* between these groups with regard to improvement on the Clinical Global Impression of Change scale or time to discontinuation of treatment. The adverse effects accompanying the medications offset any benefits of treatment for psychosis, aggression, or agitation.[22]

Given this and other studies that have come to similar conclusions, experts have been investigating alternatives for managing aggression, resistance to care, and other challenging behaviors in individuals with dementia. The AGS 2012 Beers Criteria Update Expert Panel[2] and the National Institute for Health and Clinical Excellence and Social Care Institute for Excellence have concluded that behaviors associated with dementia should be managed using nonpharmacological means in most circumstances.[23]

Identifying and addressing causes of such behaviors may obviate drug treatment directed at these behaviors. Use of antipsychotic drugs should be limited to cases in which nonpharmacological measures have failed and "there is severe distress or an immediate risk of harm to the person with dementia or others." When these medications are used in these cases, it is important to assess and plan for expected effects.[24]

3. Avoid using medications to achieve hemoglobin A1c <7.5% in most adults age 65 and older; moderate control is generally better.

Although older adults make up a large and growing group of individuals with diabetes mellitus, trials of glycemic control have generally focused on middle-aged adults with the disease.[24] In 2012, 26.9% of United States residents age 65 and older had diabetes mellitus.[25] The prevalence of diabetes mellitus in Americans age 65 and older increased 62% from 1994 to 2004,[26] and studies suggest that the largest increases in the population with diabetes mellitus will continue to be in older adults.[27,28] Despite this, a recent Cochrane systematic review found that only four of 20 trials included subjects with a mean age of 65 and older and that only two of these four studies enrolled more than 100 participants.[29]

With sparse evidence for appropriate glycemic targets for older adults, the glycosylated hemoglobin (HbA1c) target of less than 7.0% for middle-aged adults has become the default target for older people in many settings, yet this target is inappropriate for older adults because they risk greater harm with intensive control than do younger adults and because the potential benefits of intensive control are less likely in older adults than among younger ones.

The benefits of glycemic control were studied in four large randomized trials: the UK Prospective Diabetes Study (UKPDS); the Action to Control Cardiovascular Risk in Diabetes (ACCORD) trial; the Action in Diabetes and Vascular Disease: Preterax and Diamicron Modified Release Controlled Evaluation (ADVANCE) trial; and the Veterans Affairs Diabetes Trial. Results from UKPDS have suggested that, in newly diagnosed middle-aged adults with diabetes mellitus (mean age 53), more-intensive glycemic control decreases the incidence of vascular complications. More-intensive glycemic control (HbA1c 7.0% (vs) 7.9%) with metformin[30] led to decreases in myocardial infarction and all-cause mortality at 10 years. More-intensive control with sulfonylureas or insulin led to decreases in myocardial infarction at 16 years and all-cause mortality at 19 years.[31] Contemporaneous glycemic control does not explain these "legacy effects" of prior intensive control. The magnitude of benefit was greater for metformin, with hazard ratios of 0.6 to 0.7 for intensive glycemic control, compared with hazard ratios of 0.8 to 0.9 for sulfonylureas and insulin.[31]

Older adults are less likely to realize the benefits of intensive control than younger individuals for a number of reasons. First, older adults with diabetes mellitus are less likely to be newly diagnosed,[28] and individuals with established diabetes mellitus are less likely to benefit from more-intensive control.[32] Second, it takes 10 to 19 years before the benefits of more-intensive glycemic control are seen, and many older adults with diabetes mellitus have numerous comorbidities that may result in limited life expectancy. Consequently, it is unlikely that these older adults will survive to benefit from the decrease in vascular complications that intensive glycemic control can afford.[33]

The industry-sponsored ADVANCE trial focused on older adults (mean age 66) with established diabetes mellitus. At 5 years, the study found that intensive control (HbA1c 6.5% (vs) 7.3%) with the sulfonylurea gliclazide led to decreases in macroalbuminuria (2.9% (vs) 4.1%), but there were no differences in rates of myocardial infarction, major cardiovascular events, retinopathy, neuropathy, or all-cause mortality.[34] In observational studies, macroalbuminuria has been associated with accelerated decline in renal function (1.7 mL/min estimated glomerular filtration rate loss per year),[35] and this suggests that, for most people, it would take longer than 10 years for macroalbuminuria to lead to end-stage renal disease. For many older adults with diabetes mellitus, who have limited life expectancy, then, it is unlikely that they would survive to benefit from the lower rates of end-stage renal disease.

The two other large trials of glycemic control also found no improvement in outcomes with intensive glycemic control. In the ACCORD trial (mean age 62), intensive glycemic control (HbA1c 6.5% (vs) 7.5%) resulted in no difference in the primary outcome of nonfatal myocardial infarction, nonfatal stroke, or cardiovascular mortality.[36] (Mortality is discussed below.) In the Veterans Affairs Diabetes Trial (mean age 60), intensive glycemic control (HbA1c 6.9% (vs) 8.1%) resulted in lower rates of progression of nephropathy but with no differences in major cardiovascular outcomes or all-cause mortality.[37]

Taken together, these trials suggest that the benefits of more-intensive glycemic control are greatest for individuals with newly diagnosed disease, with the greatest benefit associated with the use of metformin. Although decreases in surrogate outcomes such as albuminuria occur within 5 years, it takes 10 to 19 years for decreases in clinical outcomes, such as mortality, to be seen.

The four large randomized trials have revealed two major potential harms of more-intensive glycemic control: hypoglycemia and greater mortality. Nearly all studies of glycemic control suggest that more-intensive control leads to more hypoglycemia and more-severe hypoglycemia. In ADVANCE, for example, severe hypoglycemia (defined as hypoglycemia requiring the help of another person) was noted in 2.7% of the intensive control group, compared

with 1.5% of the standard control group, contributing to more hospitalizations in the former. In ACCORD, the prevalence of hypoglycemia requiring medical assistance was 10.5% in the intensive control group and 3.5% in the standard control group.

Observational studies suggest that older adults may be at particularly high risk of hypoglycemia. Age, polypharmacy, and hospitalization have been implicated in the risk of hypoglycemia,[38] and polypharmacy and hospitalization are more prevalent in older than younger adults. Thus, the risk of hypoglycemia with intensive glycemic control in older adults is likely to be higher than the risk of hypoglycemia with intensive glycemic control in middle-aged adults.

In addition, there is evidence suggesting that more-intensive glycemic control leads to greater all-cause mortality. In 2008, ACCORD was terminated early because of unexpected greater all-cause mortality in the intensive control group (5.0%, (vs) 4.0% in standard control, $P = .04$). The underlying cause of the greater mortality in the intensive control group is unclear.[39] Combined with the results of the University Group Diabetes Program—which showed greater mortality with the sulfonylurea tolbutamide[40]—the ACCORD mortality results suggest there may be mortality risks associated with more-intensive glycemic control or with the use of certain classes of diabetes medicines.

In summary, the evidence base suggests that older adults are more likely than middle-aged adults to be harmed by intensive glycemic control and less likely to benefit from it. Reviewing this evidence base, several expert panels have come to the conclusion that glycemic targets for older adults should be individualized.[32,41,42]

For older adults with newly diagnosed disease, little comorbidity, long life expectancy, and few established vascular complications, intensive control to HbA1c of 7.0% to 7.5% is reasonable, but few individuals age 65 and older meet those criteria. Studies suggest that 59% of older adults with diabetes mellitus developed it before age 65[35] and therefore are not "newly diagnosed."[43] Moreover, 57% of Americans age 65 and older with diabetes mellitus have serious comorbidities or geriatric syndromes, such as heart failure or falls.[44] Thus, for the majority of adults age 65 and older with diabetes mellitus of long-standing duration, comorbidity burden, and limited life expectancy, less-intensive glycemic control (avoiding using medicines to achieve HbA1c <7.5%) is most appropriate. In light of this, the following is recommended.

For healthy older adults with few comorbidities and life expectancy greater than 10 years with newly diagnosed diabetes mellitus, a reasonable HbA1c target would be 7.0% to 7.5%.

For older adults with moderate comorbidities and life expectancy between 5 and 10 years, a reasonable HbA1c target would be 7.5% to 8.0%.

For older adults with multiple comorbidities, functional or cognitive impairments, and life expectancy less than 5 years (including the vast majority of nursing home residents), a reasonable HbA1c target would be 8.0% to 9.0%.

Because the evidence for benefit is strongest for metformin, and the risk of hypoglycemia is lower with this medication, it should be the drug of choice for glycemic control unless contraindicated.

4. Don't use benzodiazepines or other sedative-hypnotics in older adults as first choice for insomnia, agitation, or delirium.

Insomnia, agitation, and delirium are common in older adults, and Americans frequently use these medications to treat these conditions,[45–47] but extensive evidence suggests that benzodiazepines and other sedative–hypnotic medications (including the newer "Z-compounds"—zolpidem, eszopiclone, and zaleplon) more than double the risk of falls and hip fractures leading to hospitalization and death in older adults. Given the risks, these medications should be used sparingly in older adults.

Short-term randomized trials and long-term epidemiological studies provide evidence of the risks these medications pose. One study found that Swedish women who used hypnotics and sedatives daily from 1984 to 1997 had nearly double the risk of injurious falls leading to hospitalization and death (relative risk = 1.83, 95% confidence interval (CI) = 1.10, 3.06).[48] In a study of community-dwelling adults age 65 and older, benzodiazepines and zolpidem significantly increased the risks of nonvertebral fracture and hip fracture.[49] After adjusting for confounders, the risk ratio for hip fractures after initiating zolpidem compared with the risk before administration of the medication was 3.11 (95% CI = 1.96, 4.91). This risk was similar to that of diazepam, suggesting that zolpidem is not a safer alternative.

In older adults, benzodiazepines have also been implicated in diminished cognition, delirium, and motor vehicle crashes. A recent meta-analysis of randomized, controlled, short-term trials (most of these lasting 5 to 28 nights) enrolling older adults suggested that memory problems, disorientation, confusion, and other adverse cognitive effects are more common with benzodiazepines and newer Z-compounds than placebo (odds ratio (OR) = 4.78, 95% CI = 1.47, 15.5).[50] A case–control study of surgical patients (mean age 73 $\pm$ 8) found that postoperative exposure to benzodiazepines was also strongly associated with development of delirium (OR = 3.0, 95% CI = 1.3, 6.8).[51] Finally, a meta-analysis of cohort studies found that the risk of motor vehicle crashes was higher (OR = 1.60, 95% CI = 1.29, 1.97) in adults taking benzodiazepines.[52]

The recently revised *2012 American Geriatrics Society Updated Beers Criteria for Potentially Inappropriate Medication Use in Older Adults* notes that older adults should avoid benzodiazepines because they increase not only risks of falls, fractures, motor vehicle crashes, and delirium, but also risks of cognitive impairment. The criteria further note that nonbenzodiazepine hypnotics should not be prescribed for chronic use because of evidence of similar adverse events and limited effectiveness in improving sleep latency and duration.[2]

Another compelling reason for refraining from using these medications as the first choices is that there are effective nonpharmacological alternatives. Studies have found that cognitive behavioral therapy (CBT) can alleviate chronic insomnia.[53] In one randomized, double-blind, placebo-controlled trial enrolling 46 older adults with chronic primary insomnia, for example, CBT was more effective—immediately and over the long term—than zopiclone.[54]

Given these findings, benzodiazepines and the newer Z-compounds should be used sparingly in older adults and only after other behavioral interventions have been tried and failed.

5. Don't use antimicrobials to treat bacteriuria in older adults unless specific urinary tract symptoms are present.

Cohort studies have found no adverse outcomes for older men or women who have asymptomatic bacteriuria (ASB) and do not receive antimicrobial treatments for this, and antimicrobial treatment of ASB may result in *adverse* antimicrobial effects.

ASB is a common occurrence in older adults and its prevalence increases with age. In community populations of women age 65 to 90, the prevalence of ASB ranges from 6% to 16%. Prevalence is highest in women age 90 and older, in whom it ranges from 22% to 43%. In community populations of men age 65 and older, prevalence of ASB ranges from 5% to 21%, and the highest prevalence is also in those age 90 and older. In institutionalized elderly adults, 25% to 50% of women and 15% to 35% of men have ASB.[55]

The clinical importance of ASB has been controversial since the widespread use of the quantitative urine culture first provided a reliable means of identification in the 1950s.[56] Antimicrobial therapy for ASB has no short- or long-term benefits—in men or women—for mortality, genitourinary symptoms (including incontinence), or risk of subsequent symptomatic episodes, and antimicrobial therapy for ASB has been associated with such negative outcomes as adverse drug reactions and re-infection with more-resistant organisms.[57,58] In community-living populations, individuals with bacteriuria are at greater risk of symptomatic infection—but *this is not attributable to bacteriuria*.[59,60]

Identifying cases of symptomatic urinary tract infection (UTI) in frail or cognitively impaired elderly adults is often challenging. Multiple comorbid illnesses may present with symptoms similar to those of UTI, and the acute worsening of a preexisting problem is a common reason to suspect UTI.[55,61] The Society of Healthcare Epidemiology of America has published proposed criteria for the initiation of antibiotics for symptomatic UTI[62] and surveillance definitions for UTI in nursing home populations.[63,64] These criteria take into account the low probability of a UTI in elderly adults without indwelling catheters if local symptoms are not present, as well as the need for microbiological confirmation of the diagnosis.

Older adults with ASB who undergo traumatic genitourinary procedures associated with mucosal bleeding have a high rate of postprocedural bacteremia and sepsis, and clinical evidence supports the effectiveness of antimicrobial treatment in preventing these complications in men undergoing transurethral resection of the prostate. There is little information relevant to other interventions, but screening for and treatment of asymptomatic bacteriuria is recommended before urological procedures for which mucosal bleeding is anticipated.[65]

CONCLUSION

With the eldest of the nation's 77 million baby boomers already 65 and the youngest reaching that milestone in 2019, older adults will make up a growing share of the nation's population for the next 4 decades. Now roughly 40 million, the number of U.S. residents age 65 and older will reach an estimated 78.9 million in 2050.[66]

Currently, 80% of adults age 65 and older have at least one chronic health condition,[67] and roughly half have three or more. In light of this, it is likely that the number of older adults undergoing tests and treatments for healthcare problems will increase significantly over time, yet the evidence base supporting the use of many common tests and treatments for older adults is inadequate, in part because older adults are significantly underrepresented in clinical trials. Filling gaps in the evidence base is essential, but given the prevalence of multimorbidity in older adults, this will be a complex and time-consuming undertaking. In the meantime, it is particularly important that individuals and their healthcare providers follow the suggestion of the ABIM and discuss what is, and is not, known about the potential benefits and risks of common tests and treatments. This way, these patients can truly choose *wisely*.

PANEL MEMBERS AND AFFILIATIONS

Paul Mulhausen, MD, vice-chair of the society's Clinical Practice and Models of Care Committee headed the society's Choosing Wisely Workgroup. Workgroup members included Audrey Chun, MD; Ariel Green, MD, MPH; Arthur Hayward, MD; Sei Lee, MD, MCR; Bruce Leff, MD, AGSF; Matthew McNabney, MD; Pushpendra Sharma, MD, CMD; and Caroline Vitale, MD, AGSF. In addition, the society sought guidance from an advisory group composed of Rosanne Leipzig, MD; Sharon Levine, MD; and David Reuben, MD, and consulted with this group throughout the process. Additional content experts who were consulted on specific recommendations included Nicki Brandt, PharmD, CGP, BCPP; Thomas Finucane, MD; Sunny Linnebur, PharmD, FCCP, BCPS, CGP; Carol M. Mangione, MD, MSPH; Gerardo Moreno, MD; James Pacala, MD, MS, AGSF; Debra Saliba, MD, MPH, AGSF; and Joseph Shega, MD.

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