The number of aged individuals in the United States is increasing rapidly as the so-called baby boomers advance into their senior years. People aged $\geq 65$ years represented approximately 12% of the US population in 2000, and this proportion is expected to grow to almost 20% by the year 2020.¹
Increasing age is a known risk factor for diabetes, with disease burden in the elderly (>75 years) exceeding 20%. The incidence of diabetes is expected to increase dramatically over the next 50 years, with the largest increases occurring in the oldest age groups. The projected 336% increase in diabetes in the aged population (>75 years) by 2050 will produce an enormous national economic burden and challenge for clinical practice.

Older individuals with diabetes have twice the mortality and suffer from higher rates of functional disability and geriatric syndromes (such as polypharmacy, depression, cognitive impairment, urinary incontinence and injurious falls) than their age-matched counterparts. Care of this clinically and functionally heterogeneous group is often a complex task because many individuals suffer from multiple coexisting illnesses, such as hypertension, hyperlipidemia, coronary heart disease (CHD) and stroke. This complexity of care is confounded by the fact that little has been published regarding the care of this population and many of the current care recommendations are based on data extrapolated from younger populations or on expert opinion.

The American Diabetes Association (ADA) first devoted a section to the care of the older person with diabetes in 2004. In the same year, the American Geriatrics Society (AGS) published its first and only comprehensive guidelines for the treatment of diabetes in this special population. Both organizations advocate for a balanced approach when caring for older individuals with diabetes. Care plans should be individualized for each patient, taking into consideration the mortality benefit of intensive therapy and the quality of life each patient will face with a given therapy. When determining treatment goals, the following should be evaluated: The life expectancy, functional status and cognitive ability of the patient; the availability of a social support system; and patient preferences.

The ADA and AGS advocate for aggressive management using the same standards in place for younger populations who maintain good functional status. Hyperglycemia has also been shown to cause declining mental function in the elderly, which could compromise the individual’s ability to participate in diabetes self-care. However, frail older adults are at high risk for serious hypoglycemia, bradycardia, orthostatic hypotension and myalgia—which could all lead to injurious falls or other adverse health effects. In addition, individuals with lower levels of function (limitations in three or more activities of daily living) have not been shown to benefit from tight glycemic control.

The ADA and AGS guidelines both support aggressive glycemic control (HbA1c ≤7.0%) for aged individuals who are functional, cognitively intact and have significant life expectancy. Individuals in whom a less aggressive treatment (HbA1c ≤8.0%) might be considered are patients with decreased levels of function (impairments in three or more activities of daily living), decreased cognitive impairment, decreased life expectancy (<five years) and those with severe hypoglycemia unawareness.

Unfortunately, no clear definition of “functional” or “decreased cognitive impairment” exists, which creates a challenge for the physician choosing the appropriate goal for an older adult with mild cognitive impairment who requires assistance with bathing, for example.
Overt hyperglycemia should be avoided in all individuals regardless of functional status or life expectancy because of the associated morbidity (polyuria, dehydration, urinary incontinence and hyperglycemic hyperosmolar coma), which can significantly impair quality of life.14,15 Goals of glycemic control need to be made on an individualized basis, factoring in these issues.

Therapy to maintain euglycemia in the aged population typically requires multiple medications. Caution should be taken before starting metformin in this population because of the increased incidence of impaired renal function.14,15 Baseline renal function studies and yearly follow-up levels should be obtained and medication discontinued with serum creatinine of 1.5 mg/dL or greater in men and a level greater than 1.4 mg/dL in women.14,15 Sulfonylureas should be used with discretion and long-acting forms (chlorpropamide and glyburide) should be avoided because of the increased incidence of profound and prolonged hypoglycemia in the aged population.14,15 For individuals requiring insulin therapy, insulin pens should be considered, particularly for patients with compromised manual dexterity or impaired vision.

Regardless of therapy, self-monitoring of blood glucose (SMBG) should be encouraged.14,15 Although studies have yet to demonstrate improved glycemic control with SMBG, its utilization in the elderly is integral to detecting hypoglycemia and, therefore, to improving care and reducing complications.36 Hypoglycemia incidence in patients with hypoglycemia unawareness, a complication more common in the elderly, may only be detected if SMBG is utilized.

Cardiovascular risk reduction
Aged people with diabetes experience twice the mortality as is seen in age-matched controls, with the major killer being macrovascular disease.27 Approximately 80% of people with diabetes will die from cardiovascular disease.28 Tight control of blood pressure, lipids and blood glucose have been proved to decrease negative morbidity and mortality outcomes of aging people with diabetes.21,29 Data also have shown that people with diabetes receive the greatest mortality benefit from treating hypertension first, lipids second and blood glucose third.30 Reducing cardiovascular risk in the older adult is of paramount importance because of the increased risk for cardiovascular disease.15,18 Despite the known benefit of treatment, studies demonstrate that the treatment and control of cardiovascular risk factors in elderly outpatients with diabetes often does not meet the guidelines.20

According to the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure, 20% of individuals age 60-79 are not treated for hypertension.31 Prescribing statins to older patients has been shown to be suboptimal in this population, and adherence to prescribed statins is poor anyway.32 Lastly, an observational study of institutionalized elderly demonstrated that only 42% of residents with diabetes were receiving aspirin therapy.33 Following are some key cardiovascular risk-reduction strategies.

Hypertension
Hypertension is a common co-existing condition with diabetes in the aged population. Antihypertensive treatment has been shown to reduce coronary artery events by 23%, strokes by 30%, cardiovascular deaths by 18% and total deaths by 13% among the elderly, with the greatest benefit seen in those older than 70 years of age.34 With only two to four years of treatment needed to realize a mortality benefit, control of this cardiovascular risk factor is appropriate in nearly all people of advanced age.30

Although most agree that hypertension should be treated in the aged person with diabetes, debate exists on the level of control that should be targeted. The AGS recommends treatment targets of <140/80 mmHg; the ADA does not provide any specific guidelines for aged adults.15,17 Although some may advocate for less aggressive hypertension treatment in the elderly because of the increased risk of adverse effects (falls, hypotension and syncope, for example), recent evidence suggests that intensive blood pressure control has added benefit in the elderly population.35

Regardless of treatment targets, blood pressure should be lowered gradually to avoid complications.14,15,17 Similar to guidelines for younger populations, angiotensin-converting enzyme inhibitors and angiotensin II receptor blockers should be strongly considered on the basis of their renal protective effects.17 Baseline renal function studies and electrolytes should be performed as well as follow-up labs one to two weeks after starting the medication regimen and after any dosage increase.14,15

Lipids
The role of statins as a secondary prevention tool for cardiovascular disease in patients with diabetes is well established with their use as a primary prevention strategy increasing in high-risk populations.17 Currently, the ADA recommends statin use to obtain lipid goals (low-density lipoprotein <100 or <70 for those with one or more CHD risk factors, high-density lipoprotein >40 in men and >50 in women, and triglycerides <150) for all patients with overt CHD and for patients without CHD who are over the age of 40 and have one or more other CHD risk factors.17 Although the ADA does not provide specific guidelines for treatment of lipids in the aged population, the AGS has suggested that treatment goals for younger patients with diabetes should be applied to the elderly.15 This is likely due to the fact that only two to four years of lipid control is needed before a mortality benefit is realized.
Aspirin
Data have shown that daily low-dose aspirin (100 mg) reduces cardiovascular deaths in at-risk patients by 44%,15 Current ADA and AGS guidelines recommend aspirin use when not contraindicated.15,17 Although some concern may exist in administration of aspirin to the frail aged patient because of the risk of bleeding, research has demonstrated that the risk of a major bleed in elderly nursing home residents on aspirin therapy is very low.37 Because of the significant cardiovascular benefit, the low cost and the minimal risk of side effects, aspirin should be utilized for primary prevention in virtually all aged individuals with diabetes.15

Screening
Microalbumin is an early screening tool for cardiovascular disease and also renal failure, for which elderly people with diabetes are at increased risk.38 Because microalbuminuria is an independent risk factor for cardiovascular disease, yearly microalbumin should be performed in all aged people with diabetes to screen for nephropathy and to help assess cardiac risk.15,17

Geriatric syndromes
Such geriatric syndromes as polypharmacy, depression, cognitive impairment, urinary incontinence and injurious falls are more common among aged individuals with diabetes, and account for increased morbidity and decreased quality of life in this population.8-12 Because of this, the AGS recommends target history-taking covering each of the geriatric syndromes on a regular basis.15

Polypharmacy is common in all patients with diabetes, but is an even bigger issue among the aged population.15 Inherent to appropriate treatment guidelines, older adults being treated for diabetes and hypertension will be placed on numerous different classes of medication without even considering any other medical problems, leading to increased potential for drug-drug and drug-disease interactions.

Polypharmacy alone has been shown to contribute to or exacerbate other geriatric syndromes, including falls, depression, urinary incontinence and cognitive impairment.14 Patients should be encouraged to carry an updated medication list for review by not only their primary care physicians, but all other consultants as well.14 Reviewing medication lists alone can improve patient care by decreasing inappropriate prescribing.39

Older persons with diabetes are significantly more likely to suffer from depression, which may impede diabetes self-management and has been shown to compromise health outcomes if unrecognized.40 Physicians should screen for depression during the initial evaluation of the patient and after any unexplained decline in clinical status.14,15

Cognitive impairment is more prevalent in the aged person with diabetes than the general elderly population.9 Because hyperglycemia has been shown to cause declining mental function, glycemic control should be evaluated in any person with diabetes presenting with cognitive decline.14,15 Physicians also must be aware of an individual’s cognitive function and available support systems when prescribing treatments, as individuals with impaired cognition may have difficulty participating in diabetes self-care.14

Urinary tract dysfunction, including urinary incontinence, is prevalent, particularly among elderly women with diabetes.10 Risk factors specific to this subpopulation include polyuria due to hyperglycemia, fecal impaction due to autonomic insufficiency, overflow secondary to neurogenic bladder or autonomic insufficiency, urinary tract infection and candida vaginitis.14

Many older women assume that urinary incontinence is a natural part of aging and will not offer this as a “problem” without being specifically asked about it. Although commonly undetected by healthcare providers, urinary incontinence should be among the regular screening priorities, as it may be associated with social isolation, depression, falls and fractures.14,15

Injurious falls are more prevalent among the older patients who have diabetes than among their aged-matched nondiabetic counterparts.15 Like urinary incontinence, falls often go undetected by clinicians.14 Polypharmacy, peripheral neuropathy, hypoglycemia and declining functional status all contribute to the incidence of falls in this population.15 Although no trials specific to the aged person with diabetes have investigated this issue, exercise programs aimed at strengthening and balance—as well as elimination of any unnecessary medications, especially psychotropics—have been shown to reduce falls in the general elderly population.41

Final notes
Aged persons with diabetes present a unique challenge to osteopathic physicians because of their clinical and functional heterogeneity. Care should focus on treatments that will provide realized benefit during the patient’s lifespan and minimize any side effects. Physicians should frequently reassess their patient and the treatment goals for them to optimize care. As osteopathic physicians, we have been trained to address the complexity of this population and their disease. Using our holistic, patient-centered approach, we should lead the way in providing excellent evidence-based care for this fast-growing population.
References


