

limitations.^{9,10} Current guidelines endorse a graduated or stepwise introduction of physical activity to improve safety and adherence and construction of an individualized activity plan.

High quality evidence demonstrates that smoking cessation significantly reduces the risk for coronary heart disease, various cancers, and chronic obstructive pulmonary disease.¹¹ Alcohol use in the elderly may negatively impact function and cognition as well as general health.⁵ Healthy or frail, older adults need to be counseled to reduce or cease alcohol intake and tobacco use.

Vaccinations represent an extremely powerful advance for the health and well-being of older adults. Tetanus, influenza, pneumococcus, and herpes zoster are all significant causes of morbidity and, in some cases, mortality of both healthy and frail elderly. Use of vaccinations in older persons to prevent or attenuate disease from each pathogen is endorsed by the USPSTF, ACOVE, and the Advisory Committee on Immunization Practices (ACIP).⁵

USPSTF guidelines “strongly recommend” that clinicians discuss aspirin chemoprevention in adults who are at increased risk for cardiovascular disease (5-year risk of $\geq 3\%$).⁴ However, the risks of gastrointestinal bleeding with low-dose aspirin in older adults are well documented and should be evaluated prior to initiating aspirin therapy.¹²

Mr. G and Mr. H both deserve an offer of most of the primary preventive measures described here. Each would benefit from an individualized exercise program, although Mr. G would need to start at a much lower level of monitored activity accounting for his multiple comorbidities and limitations in mobility. Aspirin chemoprevention requires more thought. Barring a contraindication, Mr. G deserves a daily aspirin due to his existing heart disease and a very high, short-term risk of cardiovascular events. Mr. H, on the other hand, will want to weigh the benefits and risks of daily aspirin given his lack of a history of coronary artery disease and more moderate cardiovascular risk.

Secondary Prevention

Secondary prevention focuses on early detection and treatment of asymptomatic disease. These measures present more complex decision-making challenges for patients and their providers. While modern medicine offers many measures to remove or repair disease, consideration must be given to the potential harms associated with the test or treatment and to the likelihood that the frail older adult will survive long enough to experience a real benefit.

Colorectal, breast, and cervical cancer screening may reduce cancer-specific mortality in older adults.^{1,13} A variety of levels of evidence support screening for colorectal cancer with different methods, including annual fecal occult blood testing and endoscopic examination. However, flexible sigmoidoscopy and, in particular, colonoscopy carry increased risk of perforation and bleeding in the elderly.¹⁴ Current recommendations from the USPSTF suggest offering colorectal cancer screening to individuals who have at least 5 years to live.¹⁵ Prospective controlled trials of screening mammography for breast cancer enrolling women up to age 74 demonstrate a reduction in breast cancer mortality

Health and the Aging Brain

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For years researchers have known that a healthy diet and exercise play a role in the prevention of heart disease and cancer. Over the last decade an accumulating body of evidence has shown that cardiovascular risk factors in midlife also affect the risk of dementia in late life.¹⁻³ It should follow that a healthy diet and exercise, behaviors that may prevent or delay heart disease, may prevent or delay the onset of dementia as well. Recently, animal studies, clinical trials, and imaging studies have added insights into the possibility of preventing or delaying the onset of dementia.

Diet has been shown in several studies to have an effect on the risk of Alzheimer's disease (AD). A diet that has a high caloric intake⁴ or is high in fats⁵ increases the risk, while diets rich in antioxidants⁶⁻⁸ and omega-3 fatty acids have been shown to be beneficial. For instance, several cohort studies have found that regular fish consumption can decrease the risk of AD.⁸⁻¹³ Individual supplemental nutrients have been studied, but most researchers agree that dietary sources of nutrients are preferred. In support of this notion, an investigation of whole diet concluded that individuals who adhere more closely to a Mediterranean style diet have a reduced risk of disease.¹⁴ Conversely, obesity has been linked to an increased risk of AD in several studies.¹⁵⁻¹⁷

Exercise has been shown to offer protection against or assistance in controlling vascular risk factors, such as cardiovascular disease, diabetes, and hypertension. Moreover, exercise enhances synaptic plasticity and is neuroprotective.¹⁸ Observational studies in humans have shown reduced risk of AD in those who engage in regular physical exercise.¹⁹⁻²¹ Furthermore, a recent report demonstrated cross-sectionally that cardiorespiratory fitness was associated with a reduced level of brain atrophy.²² There are few data from clinical trials available as yet, but several that are underway aim to understand more fully the relationships between exercise, mild cognitive impairment, and dementia.

Cognitive stimulation has also been shown to reduce the risk of cognitive decline. Education is well-established as a protective factor against dementia.²³ Occupations that require more complex cognitive processes are also somewhat protective.^{24,25} Finally, in later life, those who engage in cognitively stimulating activities or social activities are less likely to suffer cognitive decline or dementia.^{23,26} Few clinical trials have confirmed these associations, although one trial, the ACTIVE study,²⁷ sought to study the effects of

among screened versus unscreened women.^{16,17} Guidelines are vague on breast cancer screening for older women, but the American Geriatric Society (AGS) recommends offering screening every 1 to 2 years for women with a life expectancy of at least 4 years.¹⁸ Most recommendations now indicate that cervical cancer screening with Pap smears may be discontinued for women who have had at least 3 normal Pap smears over the preceding 10 years and are older than 65 years. Screening may also be stopped among those who have had a hysterectomy for a benign indication.^{19,20} Those with persistent or reemerging risk factors, including no prior screening, should continue to be offered screening.

Several modifiable targets exist for patients at risk for vascular disease. Hypertension treatment trials in older adults have consistently demonstrated significantly decreased all-cause mortality, cardiovascular events, stroke, and chronic kidney disease.²¹ Recognized authorities in the field recommend periodic testing of blood pressure with intervals ranging from 1 to 2 years.²² Concern has been raised in the past about the risks of aggressive treatment of hypertension in older adults, including hypotension, falls, and death.²³ The benefits of treatment, however, are likely to outweigh risks provided that care is taken to avoid complications. Due to a higher overall annual risk of coronary heart disease, older adults stand to benefit from lipid reduction if life expectancy warrants. Lipid lowering therapy clearly benefits older adults at high risk of coronary events. The benefit of primary prevention for low-risk older adults remains unclear.²⁴ Screening for abdominal aortic aneurysm with a one-time abdominal ultrasound examination has been shown to decrease aneurysm-related deaths and all-cause mortality in men with a history of smoking.²⁵

The prevalence of osteoporosis in the elderly is high and increases the risk of fractures of the spine and extremities. The USPSTF recommends that all women aged 65 and older (and those over 60 with risk factors) undergo screening routinely with bone densitometry.²⁶ Questions remain about how frequently and for how long women should be screened. The USPSTF also recently recommended individualized assessments in older men to gauge risk factors for osteoporosis, including for those over age 70.²⁷

Both men might be considered candidates for identification and treatment of blood pressure problems. Likewise, identification of osteoporosis and fracture risk is also key to both their continued function and independence. Many would argue that lipid lowering would continue to be a key measure for Mr. G given prior events, but little evidence informs the exact time-to-benefit and when to stop lipid lowering therapy. While Mr. G would clearly not be a candidate for colorectal cancer screening, Mr. H, depending on preference, may well qualify.

Tertiary Prevention

Tertiary prevention identifies established conditions to prevent further morbidity or functional decline. Practitioners seeing older adults must be prepared to screen for a range of nonspecific symptoms or conditions that can either signify a lurking disease or herald a decline in health. The so-called "geriatric syndromes"

cognitive interventions in older adults over time. The study had 4 arms: memory training, reasoning training, processing speed training, and a control group. Participants in the treatment group showed less functional and cognitive decline at a 5-year follow-up evaluation than those in the control group. As far as which cognitively stimulating activity is best, it is reasonable to consider that the activity that is most enjoyable is the one more likely to be consistently practiced, whether that is reading, book clubs, Sudoku, crossword puzzles, or some other activity.

Taken together, diet, exercise, and cognitive stimulation are promising targets for interventions to prevent or delay the onset of disease. Because the data to support these conclusions are still under active investigation, definitive recommendations cannot be made. However, it is doubtful that improving one's diet, becoming more physically fit, and engaging in socially and cognitively stimulating activities are risky prescriptions. They are much more likely to improve quality of life than not.

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can affect any older adult but more often will signal a change in status of a frail elder.

Impairment in activities of daily living is associated with an increased risk of falls, depression, institutionalization, and death in the affected elder.²⁸ Collecting a functional history, including the basic and instrumental activities of daily living, allows the clinician to focus on key problems and potential threats to that person's independence and safety. Likewise, the high prevalence of cognitive and mood disorders among older adults justifies early identification to preserve function and address safety, behavioral, and caregiver issues. Recent reviews highlight the effectiveness of several dementia screening tools for dementia and depression.^{29,30} Providers should also regularly inquire about the occurrence of recent falls in older patients. For patients who report falling, basic assessment should include review of circumstances of the fall(s), measure of orthostatic vital signs, visual acuity testing, cognitive evaluation, gait and balance assessment, and review of medications.³¹ Indeed, the average older adult in the US takes 3-5 prescription medications. Use of multiple medications increases the risk for drug-drug interactions and associated adverse drug events. Evidence-based recommendations on medication management, evaluated by ACOVE authors, include maintaining an up-to-date list and assessing for benefit, interactions, adherence, and affordability. Medications commonly associated with adverse events deserve special attention, including warfarin, NSAIDs, antihypertensives, insulin/hypoglycemics, and psychotropics.³²

Other screening measures supported as ACOVE quality indicators include questionnaires about hearing loss and audiometry, regular ophthalmologic exams, serial weights and inquiry about appetite for nutritional status, and questions about urinary incontinence with targeted history and physical examination to identify specific causes. Clinicians should also ask about driving and firearms (particularly among demented patients and their caregivers), watch for signs of elder abuse or neglect, and inquire about home safety including adequate fire prevention and detection measures.

As noted above, Mr. G easily qualifies as a vulnerable elder. His visit(s) would ideally include assessments of function, cognition, mood, and balance. In addition, his medications need careful review and concerns addressed about his personal safety in living alone. While a busy practitioner working alone may, in theory, be capable of performing these assessments, he or she may benefit from asking other members of the team to perform specific tasks (e.g., Functional Assessment, Mini-Mental State Exam, and others). If problems or concerns persist, referral to a clinic specializing in geriatric care may be warranted. Mr. H presents a different challenge. He appears vigorously healthy, yet he remains at risk for many of the same late life challenges. In his case, a brief written survey that inquires about any concerns about mobility, mood, memory, and medications may be most efficient. In addition, the well elder should fill out a home safety checklist.

The heterogeneity of health and ability among older adults has resulted in differences in their life expectancy and expectations for their lives. In determining appropriate screening and prevention

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measures for this population, providers should consider the benefits and risks of the measure itself and the well-being and preferences of the individual patient. For the frail patient with limited life expectancy, certain measures that require a longer time-to-benefit period or entail more significant risk, like cancer screening, may not be appropriate. On the other hand, inquiries that enhance safety and prevent functional decline, like assessments of gait and balance or medications, may greatly benefit this patient. For the well elder, screening and prevention includes issues relevant to younger adult patients (e.g. cancer screening) as well as brief screens for other common late life problems. Indeed, one size (or form) does not fit all for older adults in the 21st century. **NCMJ**