Cardiovascular Screening and Primary Prevention in Older Adults

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KEYWORDS

• Cardiovascular disease • Prevention • Elderly • Aging • Statins • Hypertension • Diabetes • Screening

KEY POINTS

- Older adults carry the highest burden of cardiovascular disease (CVD) and have the greatest potential to benefit from primary prevention strategies.
- Lifestyle strategies, including smoking cessation, physical activity, and healthy diet, are encouraged at all ages, functional levels, and cognitive stages.
- Robust older adults should be screened for CVD and have risk factors treated similar to younger adults, with attention to the increased risk for adverse effects.
- Older adults with limited life expectancy are unlikely to benefit from aggressive preventive strategies.
- Shared decision making is essential to ensure that the approach to screening and prevention is well-aligned with each patient's goals and preferences.

Although prevention of disease is a fundamental principle underlying modern medicine, evidence on appropriate preventive screening and treatment is limited for older adults. Consider the following patients scheduled to see their primary care physicians for their annual visits:

Mr K is a widowed 82-year-old living independently in the community with hypertension, hyperlipidemia, diabetes, and arthritis. He takes aspirin 81 mg, hydrochlorothiazide 25 mg, and simvastatin 40 mg daily, with ibuprofen 400 mg as needed for pain. Since his wife died a year ago he increasingly eats frozen dinners or take out, although his daughter encourages him to "eat healthy." He is a retired construction worker and

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spends his days doing small projects in his community. He walks his dog daily for 15 minutes and has had no falls. He smokes half a pack of cigarettes daily (down from 2 packs a day) and drinks 3 beers on the weekend. Physical examination reveals a regular heart rate of 72, blood pressure (BP) 151/78 mm Hg sitting and 153/80 mm Hg standing, and a normal gait while walking to the examination room. Laboratory data include a hemoglobin A1c (HbA1c) level of 7.2% and low-density lipoprotein (LDL)-cholesterol of 110 mg/dL.

Mr L is an 83-year-old with hypertension, hyperlipidemia, diabetes, and arthritis who recently moved to a memory unit because of gradually worsening dementia. Daily medications are aspirin 81 mg, donepezil 5 mg, lisinopril 10 mg, metformin 1000 mg, simvastatin 40 mg, and a multivitamin, with ibuprofen 400 mg as needed for pain. He has had increasing difficulty dressing himself, and requires cueing for bathing (Fast stage 6b, moderately severe dementia). He is a retired plumber and smoked half a pack of cigarettes daily until 2 years ago. He does not drink alcohol and until admission to the memory unit enjoyed going for long walks in the evenings. He has fallen once in the past month and 3 times in the past year, without significant injury. His heart rate is 64 and regular, BP 123/68 mm Hg sitting and 118/64 mm Hg standing. His gait is slow and cautious. The HbA1c is 6.2% and LDL-cholesterol is 110 mg/dL.

These 2 individuals have similar cardiovascular risk profiles, but Mr K is a robust older adult whereas Mr L has substantive functional and cognitive impairments. Considering their age alone, each has a life expectancy of approximately 7 years (US census data). Mr K, however, is independent without a life-limiting chronic disease and has an excellent prospect of living at least 7 more years, whereas Mr L has moderately severe dementia now requiring nursing home–level care with a life expectancy of only approximately 2 years.[1]

In this article, we review screening tests and prevention strategies that may be considered for primary prevention of cardiovascular disease (CVD) in older adults, with a focus on those $\geq$75 years of age, accounting for age, functional status, and medical conditions.

EPIDEMIOLOGY OF CARDIOVASCULAR DISEASE AND AGING

With improvements in medicine and technology, life expectancy has increased substantially over the past century. The age group 65 to 74 years is experiencing rapid growth, while the proportional rate of rise is greatest in the subgroup older than 85.[2] The incidence and prevalence of most CVDs, including ischemic heart disease, heart failure, valve disease, rhythm disorders, and stroke, rise progressively with age, and CVD remains the leading cause of death in those older than 75 years.[3] Although globally the rate of acute myocardial infarctions has decreased since 1990, the prevalence of ischemic heart disease has increased as the population has aged.[4] In the United States, according to National Health and Nutrition Examination Survey (NHANES) data from 2011 to 2014, 92.1 million adults have at least 1 type of CVD, equivalent to 1 in 3 Americans.[3] In men and women older than 80 years, the prevalence of CVD approaches 85%.[3] The patients described in the vignettes are fairly typical of those seen in daily practice: surviving into advanced age with multiple comorbidities and taking multiple medications. However, although the oldest patients carry most of the CVD burden, such patients have been markedly underrepresented in most CVD prevention trials that provide the principal evidence for CVD prevention guidelines.[5]

Some challenges to implementing CVD prevention strategies for older adults include difficulty in estimating life expectancy and clinicians' discomfort with