REVIEW

CME CREDIT *LEARNING OBJECTIVE:* Readers will consider the patient's frailty status when managing cardiovascular risk factors

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Preventing cardiovascular disease in older adults: One size does not fit all

ABSTRACT

Frailty and cardiovascular disease are highly interconnected and increase in prevalence with age. Identifying frailty allows for a personalized cardiovascular risk prescription and individualized management of hypertension, hyperlipidemia, diabetes, and lifestyle in the aging population.

KEY POINTS

With the aging of the population, individualized prevention strategies must incorporate geriatric syndromes such as frailty.

However, current guidelines and available evidence for cardiovascular disease prevention strategies have not incorporated frailty or make no recommendation at all for those over age 75.

Four-meter gait speed, a simple measure of physical function and a proxy for frailty, can be used clinically to diagnose frailty.

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When assessing and attempting to modify the risk of cardiovascular disease in older patients, physicians should consider incorporating the concept of frailty. The balance of risk and benefit may differ considerably for 2 patients of the same age if one is fit and the other is frail. Because the aging population is a diverse group, a one-size-fits-all approach to cardiovascular disease prevention and risk-factor management is not appropriate.

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Much research remains to be done regarding cardiovascular risk in the frail elderly. In this article, we review the complex interaction between frailty and cardiovascular disease and what the limited data can tell us about how to incorporate frailty into the optimization of high blood pressure, dyslipidemia, and other modifiable risk factors in this vulnerable group (**Table 1**).

A GROWING, DIVERSE GROUP

The number of older adults with multiple cardiovascular risk factors is increasing as life expectancy improves. US residents who are age 65 today can expect to live to an average age of 84 (men) or 87 (women).[1]

However, the range of life expectancy for people reaching these advanced ages is wide, and chronologic age is no longer sufficient to determine a patient's risk profile. Furthermore, the prevalence of cardiovascular disease rises with age, and age itself is the strongest predictor of cardiovascular risk.[2]

TABLE 1

Our recommendations for cardiovascular disease prevention in older adults, considering frailty

Blood pressure	For frail and not-frail patients without limited life expectancy, a goal blood pressure of < 140/90 mm Hg is reasonable with careful attention to risks, including orthostasis, falls, and polypharmacy Treatment may need to be tailored to standing blood pressure
Lipids	For patients over age 75 without cardiovascular disease or frailty and with a life expectancy of at least 2 years, consider a statin for primary prevention, starting at a low dose
Diabetes	Aim for the lowest hemoglobin A_{1c} that does not cause hypoglycemia; relax hemoglobin A_{1c} goals with increasing frailty Use hypoglycemic agents with caution
Aspirin	For patients over age 75 without frailty or cardiovascular disease and no major bleeding risk, but at high risk, consider low-dose aspirin for primary prevention of nonfatal myocardial infarction Carefully consider bleeding risk to ensure that benefit outweighs risk
Exercise and weight	For all older adults, and particularly those with frailty, prescribe: Balance training, such as tai chi, to decrease the risk of falls Stretching at least twice a week Moderate-intensity aerobics such as walking or swimming for 150 minutes per week Resistance training at least twice a week for 20-minute intervals General encouragement of daily activity
Smoking cessation	Smoking cessation remains beneficial at all ages and stages of life All counseling interventions and nicotine replacement are effective
Nutrition	A balanced diet, rich in whole grains, fruits, vegetables, nuts, fish, and lean meats is beneficial at all ages and stages of life
Unique challenges	Inappropriate polypharmacy and complexity of medication regimens increases risk of drug events and falls Multimorbidity requires the balance of multiple medical conditions to create a comprehensive plan Explore goals of care and advance directives in creating a patient-centered prevention plan; engage in shared decision-making

To date, there is no consensus on how to define frailty

Current risk calculators have not been validated in people over age 80,[2] making them inadequate for use in older patients. Age alone cannot identify who will benefit from preventive strategies, except in situations when a dominant disease such as metastatic cancer, end-stage renal disease, end-stage dementia, or end-stage heart failure is expected to lead to mortality within a year. Guidelines for treating common risk factors such as elevated cholesterol[3] in the general population have generally not focused on adults over 75 or recognized their diversity in health status.[4] In order to generate an individualized prescription for cardiovascular disease prevention for older adults, issues such as frailty, cognitive and functional status, disability, and comorbidity must be considered.

WHAT IS FRAILTY?

Clinicians have recognized frailty for decades, but to date there remains a debate on how to define it.

Clegg et al[5] described frailty as "a state of increased vulnerability to poor resolution of

homeostasis after a stressor event,"[5] a definition generally agreed upon, as frailty predicts both poor health outcomes and death.

Indeed, in a prospective study of 5,317 men and women ranging in age from 65 to 101, those identified as frail at baseline were 6 times more likely to have died 3 years later (mortality rates 18% vs 3%), and the difference persisted at 7 years.[6] After adjusting for comorbidities, those identified as frail were also more likely to fall, develop limitations in mobility or activities of daily living, or be hospitalized.

The two current leading theories of frailty were defined by Fried et al[6] and by Rockwood and Mitnitski.[7]

Fried et al[6] have operationalized frailty as a "physical phenotype," defined as 3 or more of the following:

- Unintentional weight loss of 10 pounds in the past year
- Self-reported exhaustion
- Weakness as measured by grip strength
- Slow walking speed
- Decreased physical activity.[6]

Rockwood and Mitnitski[7] define frailty as an accumulation of health-related deficits over time. They recommend that 30 to 40 possible deficits that cover a variety of health systems be included such as cognition, mood, function, and comorbidity. These are added and divided by the total possible number of variables to generate a score between 0 and 1.[8]

The difficulty in defining frailty has led to varying estimates of its prevalence, ranging from 25% to 50% in adults over 65 who have cardiovascular disease.[9]

CAUSE AND CONSEQUENCE OF CARDIOVASCULAR DISEASE

Studies have highlighted the bidirectional connection between frailty and cardiovascular disease.[10] Frailty may predict cardiovascular disease, while cardiovascular disease is associated with an increased risk of incident frailty.[9,11]

Frail adults with cardiovascular disease have a higher risk of poor outcomes, even after correcting for age, comorbidities, disability, and disease severity. For example, frailty is associated with a twofold higher mortality rate in individuals with cardiovascular disease.[9]

A prospective cohort study[12] of 3,895 middle-aged men and women demonstrated that those with an elevated cardiovascular risk score were at increased risk of frailty over 10 years (odds ratio [OR] 1.35, 95% confidence interval [CI] 1.21–1.51) and incident cardiovascular events (OR 1.36, 95% CI 1.15–1.61). This suggests that modification of cardiovascular risk factors earlier in life may reduce the risk of subsequently becoming frail.

Biologic mechanisms that may explain the connection between frailty and cardiovascular disease include derangements in inflammatory, hematologic, and endocrine pathways. People who are found to be clinically frail are more likely to have insulin resistance and elevated biomarkers such as C-reactive protein, D-dimer, and factor VIII.[13] The inflammatory cytokine interleukin 6 is suggested as a common link between inflammation and thrombosis, perhaps contributing to the connection between cardiovascular disease and frailty. Many of these biomarkers have been linked to the pathophysiologic changes of aging, so-called "inflamm-aging" or immunosenescence, including sarcopenia, osteoporosis, and cardiovascular disease.[14]

Frailty assessment is an important first step in managing risk

ASSESSING FRAILTY IN THE CLINIC

For adults over age 70, frailty assessment is an important first step in managing cardiovascular disease risk.[15] Frailty status will better identify those at risk of adverse outcomes in the short term and those who are most likely to benefit from long-term cardiovascular preventive strategies. Additionally, incorporating frailty assessment into traditional risk factor evaluation may permit appropriate intervention and prevention of a potentially modifiable risk factor.

Gait speed is a quick, easy, inexpensive, and sensitive way to assess frailty status, with excellent inter-rater and test-retest reliability, even in those with cognitive impairment.[16] Slow gait speed predicts limitations in mobility, limitations in activities of daily living, and death.[8,17]

In a prospective study[18] of 1,567 men and women, mean age 74, slow gait speed was the strongest predictor of subsequent cardiovascular events.[18]

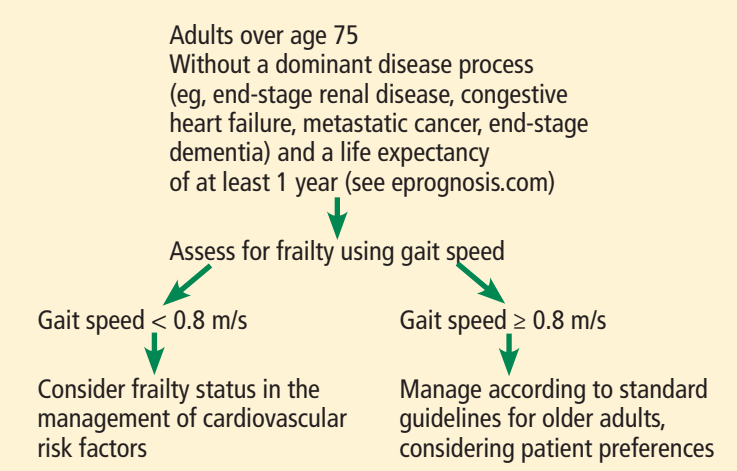

Figure 1. A framework to incorporate gait speed into the management of cardiovascular risk factors.

In 1 study, slow gait was the strongest predictor of cardiovascular events

Gait speed is usually measured over a distance of 4 meters (13.1 feet),[17] and the patient is asked to walk comfortably in an unobstructed, marked area. An assistive walking device can be used if needed. If possible, this is repeated once after a brief recovery period, and the average is recorded.

Gait speed less than 0.8 meters per second (taking > 5 seconds to walk 4 meters) is the suggested cutoff for identifying those at risk of adverse health outcomes.[17] Every 0.1 meter-per-second improvement in gait speed is associated with a 10% decrease in risk of death at 1 year.[9] Repeat measures are useful to track improvement over time. **Figure 1** shows how to incorporate gait speed into cardiovascular management decisions about disease prevention.

The FRAIL scale[19,20] is a simple, validated questionnaire that combines the Fried and Rockwood concepts of frailty and can be given over the phone or to patients in a waiting room. One point is given for each of the following, and people who have 3 or more are considered frail:

- **F**atigue
- **R**esistance (inability to climb 1 flight of stairs)
- **A**mbulation (inability to walk 1 block)
- **I**llnesses (having more than 5)
- **L**oss of more than 5% of body weight.

Other measures of physical function such as grip strength (using a dynamometer), the Timed Up and Go test (assessing the ability to get up from a chair and walk a short distance), and Short Physical Performance Battery (assessing balance, chair stands, and walking speed) can be used to screen for frailty, but are more time-intensive than gait speed alone, and so are not always practical to use in a busy clinic.[21]

MANAGEMENT OF RISK FACTORS

Management of cardiovascular risk factors is best individualized as outlined below.

LOWERING HIGH BLOOD PRESSURE

The incidence of ischemic heart disease and stroke increases with age across all levels of elevated systolic and diastolic blood pressure.[22] Hypertension is also associated with increased risk of cognitive decline. However, a J-shaped relationship has been observed in older adults, with increased cardiovascular events for both low and elevated blood pressure, although the clinical relevance remains controversial.[23]

Odden et al[24] performed an observational study and found that high blood pressure was associated with an increased mortality rate in older adults with normal gait speed, while in those with slow gait speed, high blood pressure neither harmed nor helped. Those who could not walk 6 meters appeared to benefit from higher blood pressure.

HYVET (the Hypertension in the Very Elderly Trial),[25] a randomized controlled trial in 3,845 community-dwelling people age 80 or older with sustained systolic blood pressure higher than 160 mm Hg, found a significant reduction in rates of stroke and all-cause mortality (relative risk [RR] 0.76, $P = .007$) in the treatment arm using indapamide with perindopril if necessary to reach a target blood pressure of 150/80 mm Hg.

Frailty was not assessed during the trial; however, in a reanalysis, the results did not change in those identified as frail using a Rockwood frailty index (a count of health-related deficits accumulated over the lifespan).[26]

SPRINT (the Systolic Blood Pressure Intervention Trial)[27] randomized participants age 50 and older with systolic blood pressure of 130 to 180 mm Hg and at increased risk of cardiovascular disease to intensive treatment (goal systolic blood pressure ≤ 120 mm Hg) or standard treatment (goal systolic blood pres-

sure ≤ 140 mm Hg). In a prespecified subgroup of 2,636 participants over age 75 (mean age 80), hazard ratios and 95% confidence intervals for adverse outcomes with intensive treatment were:

- Major cardiovascular events: HR 0.66, 95% CI 0.51–0.85
- Death: HR 0.67, 95% CI 0.49–0.91.

Over 3 years of treatment this translated into a number needed to treat of 27 to prevent 1 cardiovascular event and 41 to prevent 1 death.

Within this subgroup, the benefit was similar regardless of level of frailty (measured both by a Rockwood frailty index and by gait speed).

However, the incidence of serious adverse treatment effects such as hypotension, orthostasis, electrolyte abnormalities, and acute kidney injury was higher with intensive treatment in the frail group. Although the difference was not statistically significant, it is cause for caution. Further, the exclusion criteria (history of diabetes, heart failure, dementia, stroke, weight loss of > 10%, nursing home residence) make it difficult to generalize the SPRINT findings to the general aging population.[27]

Tinetti et al[28] performed an observational study using a nationally representative sample of older adults. They found that receiving any antihypertensive therapy was associated with an increased risk of falls with serious adverse outcomes. The risks of adverse events related to antihypertensive therapy increased with age.

Recommendations on hypertension

Managing hypertension in frail patients at risk of cardiovascular disease requires balancing the benefits vs the risks of treatment, such as polypharmacy, falls, and orthostatic hypotension.

The Eighth Joint National Committee suggests a blood pressure goal of less than 150/90 mm Hg for all adults over age 60, and less than 140/90 mm Hg for those with a history of cardiovascular disease or diabetes.[29]

The American College of Cardiology/American Heart Association (ACC/AHA) guidelines on hypertension, recently released, recommend a new blood pressure target of <120/<80 as normal, with 120–129/<80 considered elevated, 130–139/80–89 stage 1 hypertension, and ≥140/≥90 as stage 2 hypertension.[30] An important caveat to these guidelines is the recommendation to measure blood pressure accurately and with accurate technique, which is often not possible in many busy clinics. These guidelines are intended to apply to older adults as well, with a note that those with multiple morbidities and limited life expectancy will benefit from a shared decision that incorporates patient preferences and clinical judgment. Little guidance is given on how to incorporate frailty, although note is made that older adults who reside in assisted living facilities and nursing homes have not been represented in randomized controlled trials.[30]

American Diabetes Association guidelines on hypertension in patients with diabetes recommend considering functional status, frailty, and life expectancy to decide on a blood pressure goal of either 140/90 mm Hg (if fit) or 150/90 mm Hg (if frail). They do not specify how to diagnose frailty.[31]

Canadian guidelines say that in those with advanced frailty (ie, entirely dependent for personal care and activities of daily living) and short life expectancy (months), it is reasonable to liberalize the systolic blood pressure goal to 160 to 190 mm Hg.[32]

Our recommendations. In both frail and nonfrail individuals without a limited life expectancy, it is reasonable to aim for a blood pressure of at least less than 140/90 mm Hg. For those at increased risk of cardiovascular disease and able to tolerate treatment, careful lowering to 130/80 mm Hg may be considered, with close attention to side effects.

A goal blood pressure < 140/90 mm Hg is reasonable, with attention to risks

Treatment should start with the lowest possible dose, be titrated slowly, and may need to be tailored to standing blood pressure to avoid orthostatic hypotension.

Home blood pressure measurements may be beneficial in monitoring treatment.

MANAGING LIPIDS

For those over age 75, data on efficacy of statins are mixed due to the small number of older adults enrolled in randomized controlled trials of these drugs. To our knowledge, no statin trial has examined the role of frailty.

The PROSPER trial (Prospective Study of Pravastatin in the Elderly at Risk)[33] randomized 5,804 patients ages 70 to 82 to receive

either pravastatin or placebo. Overall, the incidence of a composite end point of major cardiovascular events was 15% lower with active treatment (P = .014). However, the mean age was 75, which does little to address the paucity of evidence for those over age 75; follow-up time was only 3 years, and subgroup analysis did not show benefit in those who did not have a history of cardiovascular disease or in women.

The JUPITER trial (Justification for the Use of Statins in Prevention: an Intervention Trial Evaluating Rosuvastatin)[34] randomized 5,695 people over age 70 without cardiovascular disease to receive either rosuvastatin or placebo. Exploratory analysis showed a significant 39% reduction in all-cause mortality and major cardiovascular events with active treatment (HR 0.61, 95% CI 0.46–0.82). Over 5 years of treatment, this translates to a number needed to treat of 19 to prevent 1 major cardiovascular event and 29 to prevent 1 cardiovascular death.

The benefit of statins for primary prevention in these trials began to be apparent 2 years after treatment was initiated.

The Women's Health Initiative,[35] an observational study, found no difference in incident frailty in women older than 65 taking statins for 3 years compared with those who did not take statins

Odden et al[36] found that although statin use is generally well tolerated, the risks of statin-associated functional and cognitive decline may outweigh the benefits in those older than 75. The ongoing Statin in Reducing Events in the Elderly (STAREE) trial may shed light on this issue.

Aim for the lowest hemoglobin A_{1c} that does not cause hypoglycemia; relax goals with increasing frailty

Recommendations on lipid management

The ACC/AHA,[3] in their 2013 guidelines, do not recommend routine statin treatment for primary prevention in those over age 75, given a lack of evidence from randomized controlled trials. For secondary prevention, ie, for those who have a history of atherosclerotic cardiovascular disease, they recommend moderate-intensity statin therapy in this age group.

Our recommendations. For patients over age 75 without cardiovascular disease or frailty and with a life expectancy of at least 2 years, consider offering a statin for primary prevention of cardiovascular disease as part of shared decision-making.

In those with known cardiovascular disease, it is reasonable to continue statin therapy except in situations where the life expectancy is less than 6 months.[37]

Although moderate- or high-intensity statin therapy is recommended in current guidelines, for many older adults it is prudent to consider the lowest tolerable dose to improve adherence, with close monitoring for side effects such as myalgia and weakness.

TYPE 2 DIABETES

Evidence suggests that tight glycemic control in type 2 diabetes is harmful for adults ages 55 to 79 and does not provide clear benefits for cardiovascular risk reduction, and controlling hemoglobin A_{1c} to less than 6.0% is associated with increased mortality in older adults.[38]

The American Diabetes Association[31] and the **American Geriatrics Society**[39] recommend hemoglobin A_{1c} goals of:

- 7.5% or less for older adults with 3 or more coexisting chronic illnesses requiring medical intervention (eg, arthritis, hypertension, and heart failure) and with intact cognition and function
- 8.0% or less for those identified as frail, or with multiple chronic illnesses or moderate cognitive or functional impairment
- 8.5% or 9.0% or less for those with very complex comorbidities, in long-term care, or with end-stage chronic illnesses (eg, end-stage heart failure), or with moderate to severe cognitive or functional limitation.

These guidelines do not endorse a specific frailty assessment, although the references allude to the Fried phenotype criteria, which include gait speed. An update from the American Diabetes Association provides a patient-centered approach to tailoring treatment regimens, taking into consideration the risk of hypoglycemia for each class of drugs, side effects, and cost.[40]

Our recommendations. Hyperglycemia remains a risk factor for cardiovascular disease in older adults and increases the risk of many geriatric conditions including delirium, dementia, frailty, and functional decline. The goal in in-

dividualizing hemoglobin A_{1c} goals should be to avoid both hyper- and hypoglycemia.

Sulfonylureas and insulins should be used with caution, as they have the highest associated incidence of hypoglycemia of the diabetes medications.

ASPIRIN

For secondary prevention in older adults with a history of cardiovascular disease, pooled trials have consistently demonstrated a long-term benefit for aspirin use that exceeds bleeding risks, although age and frailty status were not considered.[41]

Aspirin for primary prevention?

The evidence for aspirin for primary prevention in older adults is mixed. Meta-analysis suggests a modest decrease in risk of nonfatal myocardial infarction but no appreciable effects on nonfatal stroke and cardiovascular death.[42]

The Japanese Primary Prevention Project,[43] a randomized trial of low-dose aspirin for primary prevention of cardiovascular disease in adults ages 60 to 85, showed no reduction in major cardiovascular events. However, the event rate was lower than expected, the crossover rates were high, the incidence of hemorrhagic strokes was higher than in Western studies, and the trial may have been underpowered to detect the benefits of aspirin.

The US Preventive Services Task Force[44] in 2016 noted that among individuals with a 10-year cardiovascular disease risk of 10% or higher based on the ACC/AHA pooled cohort equation,[3] the greatest benefit of aspirin was in those ages 50 to 59. In this age group, 225 nonfatal myocardial infarctions and 84 nonfatal strokes were prevented per 10,000 men treated, with a net gain of 333 life-years. Similar findings were noted in women.

However, in those ages 60 to 69, the risks of harm begin to rise and the benefit of starting daily aspirin necessitates individualized clinical decision-making, with particular attention to bleeding risk and life expectancy.[44]

In those age 70 and older, data on benefit and harm are mixed. The bleeding risk of aspirin increases with age, predominantly due to gastrointestinal bleeding.[44]

The ongoing Aspirin in Reducing Events in Elderly trial will add to the evidence.

Aspirin recommendations for primary prevention

The American Geriatrics Society Beers Criteria do not routinely recommend aspirin use for primary prevention in those over age 80, even in those with diabetes.[45]

Our recommendations. In adults over age 75 who are not frail but are identified as being at moderate to high risk of cardiovascular disease using either the ACC/AHA calculator or any other risk estimator, and without a limited life expectancy, we believe it is reasonable to consider low-dose aspirin (75–100 mg daily) for primary prevention. However, there must be careful consideration particularly for those at risk of major bleeding. One approach to consider would be the addition of a proton pump inhibitor along with aspirin, though this requires further study.[46]

For those who have been on aspirin for primary prevention and are now older than age 80 without an adverse bleeding event, it is reasonable to stop aspirin, although risks and benefits of discontinuing aspirin should be discussed with the patient as part of shared decision-making.

In frail individuals the risks of aspirin therapy likely outweigh any benefit for primary prevention, and aspirin cannot be routinely recommended.

Physical activity is the only intervention known to improve frailty

EXERCISE AND WEIGHT MANAGEMENT

A low body mass index is often associated with frailty, and weight loss may be a marker of underlying illness, which increases the risk of poor outcomes. However, those with an elevated body mass index and increased adiposity are in fact more likely to be frail (using the Fried physical phenotype definition) than those with a low body mass index,[47] due in part to unrecognized sarcopenic obesity, ie, replacement of lean muscle with fat.

Physical activity is currently the only intervention known to improve frailty.[5]

Physical activity and a balanced diet are just as important in older adults, including those with reduced functional ability and multiple comorbid conditions, as in younger individuals.

A trial in frail long-term care residents (mean age 87) found that high-intensity resistance training improved muscle strength and mobility.[48] The addition of a nutritional supplement with or without exercise did not affect frailty status. In community-dwelling older adults, physical activity has also been shown to improve sarcopenia and reduce falls and hip fractures.[49]

Progressive resistance training has been shown to improve strength and gait speed even in those with dementia.[50]

Tai chi has shown promising results in reducing falls and improving balance and function in both community-dwelling older adults and those in assisted living.[51,52]

Exercise recommendations

The US Department of Health and Human Services[53] issued physical activity guidelines in 2008 with specific recommendations for older adults that include flexibility and balance training, which have been shown to reduce falls, in addition to aerobic activities and strength training.

Our recommendations. For all older adults, particularly those who are frail, we recommend a regimen of general daily activity, balance training such as tai chi, moderate-intensity aerobics such as cycling, resistance training such as using light weights, and stretching. Sessions lasting as little as 10 minutes are beneficial.

Gait speed can be monitored in the clinic to assess improvement in function over time.

If a statin will be the 20th pill, it may be less beneficial than if it is the fifth pill

SMOKING CESSATION

Although rates of smoking are decreasing, smoking remains one of the most important cardiovascular risk factors. Smoking has been associated with increased risk of frailty and significantly increased risk of death compared with never smoking.[54] Smoking cessation is beneficial even for those who quit later in life.

The US Department of Health and Human Services in 2008 released an update on tobacco use and dependence,[55] with specific attention to the benefit of smoking cessation for older adults.

All counseling interventions have been shown to be effective in older adults, as has nicotine replacement. Newer medications such as varenicline should be used with caution, as the risk of side effects is higher in older patients.

NUTRITION

Samieri et al,[56] in an observational study of 10,670 nurses, found that those adhering to Mediterranean-style diets during midlife had 46% increased odds of healthy aging.

The PREDIMED study (Primary Prevention of Cardiovascular Disease With a Mediterranean Diet)[57] in adults ages 55 to 80 showed the Mediterranean diet supplemented with olive oil and nuts reduced the incidence of major cardiovascular disease.

Leon-Munoz et al.[58] A prospective study of 1,815 community-dwelling older adults followed for 3.5 years in Spain demonstrated that adhering to a Mediterranean diet was associated with a lower incidence of frailty ($P = .002$) and a lower risk of slow gait speed (OR 0.53, 95% CI 0.35–0.79). Interestingly, this study also found a protective association between fish and fruit consumption and frailty.

Our recommendations. A well-balanced, diverse diet rich in whole grains, fruits, vegetables, nuts, fish, and healthy fats (polyunsaturated fatty acids), with a moderate amount of lean meats, is recommended to prevent heart disease. However, poor dental health may limit the ability of older individuals to adhere to such diets, and modifications may be needed. Additionally, age-related changes in taste and smell may contribute to poor nutrition and unintended weight loss.[59] Involving a nutritionist and social worker in the patient care team should be considered especially as poor nutrition may be a sign of cognitive impairment, functional decline, and frailty.

SPECIAL CONSIDERATIONS

Special considerations when managing cardiovascular risk in the older adult include polypharmacy, multimorbidity, quality of life, and the patient's personal preferences.

Polypharmacy, defined as taking more than 5 medications, is associated with an increased risk of adverse drug events, falls, fractures, decreased adherence, and "prescribing cascade"— prescribing more drugs to treat side effects of the first drug (eg, adding hypertensive medications to treat hypertension induced by

nonsteroidal anti-inflammatory drugs).[60] This is particularly important when considering adding additional medications. If a statin will be the 20th pill, it may be less beneficial and more likely to lead to additional adverse effects than if it is the fifth medication.

Patient preferences are critically important, particularly when adding or removing medications. Interventions should include a detailed medication review for appropriate prescribing and deprescribing, referral to a pharmacist, and engaging the patient's support system.

Multimorbidity. Many older individuals have multiple chronic illnesses. The interaction of multiple conditions must be considered in creating a comprehensive plan, including prognosis, patient preference, available evidence, treatment interactions, and risks and benefits.

Quality of life. Outlook on life and choices made regarding prolongation vs quality of life may be different for the older patient than the younger patient.

Personal preferences. Although interventions such as high-intensity statins for a robust 85-year-old may be appropriate, the individual can choose to forgo any treatment. It is important to explore the patient's goals of care and advanced directives as part of shared decision-making when building a patient-centered prevention plan.[61]

ONE SIZE DOES NOT FIT ALL

The heterogeneity of aging rules out a one-size-fits-all recommendation for cardiovascular disease prevention and management of cardiovascular risk factors in older adults.

There is significant overlap between cardiovascular risk status and frailty.

Incorporating frailty into the creation of a cardiovascular risk prescription can aid in the development of an individualized care plan for the prevention of cardiovascular disease in the aging population.

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