Preventive geriatrics

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Introduction

Preventive geriatrics is not an oxymoron. It is, however, a challenging area of medicine for many reasons. (1) How can guidelines for prevention take into account the variability seen among older persons? (2) How can preventive geriatrics balance the dichotomy between the treatment of populations and the treatment of the individual? (3) How can clinicians handle the unclear areas or ‘grey zones’ of preventive geriatrics? (4) Does early detection or case finding equate with better outcomes?

To deal with these questions, this chapter presents a model of preventive geriatrics called the \textit{Health Maintenance Clinical Glidepath}, which is primarily for office-based practices. It addresses screening for geriatric specific areas (e.g. cognition, gait and balance) and also screening for common medical illnesses and diseases (e.g. certain cancers, heart disease).

Background

Prevention in medicine has traditionally been divided into primary, secondary and tertiary prevention. Primary prevention is the prevention of disease before it actually starts.

The traditional definition of secondary prevention is the detection of disease at an early stage. This can be detection of asymptomatic disease by screening tests or identification of unreported problems by case finding. The following caution needs to be added to the definition. Detection should only be done if detection is likely to improve outcomes such as mortality, morbidity, function or quality of life. The priority and importance of outcomes need to be made based on patient preference.

Tertiary screening, using a comprehensive geriatric assessment approach, allows for identification and intervention of established health conditions such as cognitive impairment, gait and balance disorders, malnutrition and urinary incontinence. The goal of the intervention would be to prevent or minimize a patient’s functional decline in order to maintain their independent lifestyle, since functional decline and loss of independence are not inevitable consequences of ageing.

The Health Maintenance Clinical Glidepath

The Health Maintenance Clinical Glidepath answers the first two questions above and addresses the limitations of two types of clinical decision-making tools: practice guidelines and evidence-based medicine (EBM). Although practice guidelines and EBM have been important in raising the standards of healthcare in the past decade, their use in preventive geriatrics is limited. Many guidelines do not include older age groups and, if they do, they are no more specific than ‘over 65 years of age’. EBM emphasizes outcomes of populations, whereas clinical practice emphasizes the outcome of the individual. One of the limitations of EBM is the discrepancy between patients in the EBM studies and in clinical practice. For example, many randomized controlled trials of medication interventions for common diseases such as congestive heart failure and osteoporosis exclude patients who are frail, demented or at the end of life.

The older we get, the more unique we become. Chronological age does not equate with physiological or functional age. Guidelines for preventive geriatrics need to take this into account. One approach is to use life expectancy and functional status to help delineate categories of older persons that are more useful than those based on chronological age. Overall health status is a good predictor of life expectancy compared with age alone and functional capacity among older persons has been found to be a predictor of mortality. Four categories can be used to help guide
decisions about preventive measures. Although overlap exists and functional status may fluctuate, Gillick proposed the following: Robust (life expectancy of >5 years and functionally independent); Frail (life expectancy of <5 years and significant functional impairment); Moderately Demented (life expectancy 2–10 years and may or may not be functionally impaired); and End of Life (usually a life expectancy of <2 years).¹

Preventive geriatrics requires making decisions. Healthcare decisions are complex, involving society, healthcare workers and patients. Guidelines for preventive geriatrics need to take into account the following practice principles: (1) patients’ expectations and needs, including quality of life, satisfaction and reassurance; (2) physicians’ need for diagnostic certainty; (3) physicians’ comfort with risk taking and concerns about malpractice; (4) the need for cost-effective medical care; (5) variations in practice patterns, particularly with regard to subspecialty care; and (6) the practical realities of running a practice.²

Healthcare decisions are not black and white. Thus, four levels of recommendation were developed to allow for decisions to be made on a ‘graded’ rather than an ‘all or nothing’ basis and to allow for better patient involvement in decision-making. The four levels are also based, when available, on the strength or weakness of EBM that exists or does not exist. The four levels are ‘Do’, ‘Discuss’, ‘Consider’ and ‘** * * *’. ‘Do’ reflects the strongest recommendation. ‘Discuss’ reflects a recommendation that the physician gives consideration, but does not necessarily need to discuss the decision with the patient. ‘Consider’ reflects a recommendation that a particular evaluation or management measure is not recommended, based on these principles.

Table 12.1 is a shortened version of the original Health Maintenance Clinical Glidepath which details the recommendations for each area of prevention and for each category of Robust, Frail, Moderately Demented and End of Life. It will be noted in the following sections whether recommendations are based on organizational guidelines, EBM or expert consensus. All areas of the Glidepath underwent a Delphi process.³

Office visits

Although there is no direct evidence available on how often Robust elderly versus Frail or Moderately Demented elderly need office visits, because other screening procedures need to be done, the minimum frequency should be once per year. ‘Do as needed’ is recommended for elderly at the End of Life because of potential limitations or inability on the part of the patient to get to the office.

Blood pressure (BP) including orthostatic measurements

Performing BP measurements in all groups is recommended at each visit. Although this pertains to screening for hypertension in all four categories, it also pertains to hypotension (and associated symptoms) in the Frail, Moderately Demented and End of Life categories. Recommendations for hypertension screening are based on organizational guidelines. Although most organizations agree on the importance of screening for hypertension, they do not agree on how often. For example, the recommendations of the American College of Physicians (ACP) for BP screening for adults range from every 1–2 years to every 2–5 years for normotensive patients. The Seventh Report of the Joint National Committee for Hypertension (JNC 7) and The United States Preventative Services Task Force (USPSTF)⁴ recommend BP screening for normotensive patients every 1–2 years and yearly for prehypertensive patients.⁵ Note that these organizations do not take into account extreme ages of the elderly (for example, the difference between an 85-year-old and a 65-year-old person). They also set the upper limits of normal fairly low compared with more geriatric-oriented groups. The Assessing Care of Vulnerable Elders (ACOVE) Project recommends screening for systolic hypertension begin at a BP >160 mmHg.

Screening for orthostatic hypotension (OH) is based on evidence that OH is prevalent among older patients (13–30%) and that there is an association between OH and adverse outcomes. JNC 7 recommends screening all patients treated for hypertension for orthostatic hypotension, but the frequency is not specified.

Although no studies have been carried out to show improved outcomes if this screening is done, the cost and risk of the intervention are low enough that postural blood pressure measurements are recommended.

Weight

Weight loss in older patients is associated with increased mortality, morbidity and other unfavourable outcomes (e.g. loss of muscle mass, decreased muscle strength, altered immune function, decreased wound healing). The data on the benefit and outcome of nutrition management are somewhat controversial, but mostly positive. Oral nutritional supplement was shown to improve weight in nursing-home elderly, supplementation was shown to improve weight and reduce falls in frail elderly living in the community and dietary supplementation led to moderate weight gain and improvements in general well-being in homebound elderly.⁶–⁸ A meta-analysis concluded that oral nutritional supplements can improve nutritional status and seem to reduce mortality and complications for undernourished elderly patients in the hospital. Current evidence does not
Table 12.1 The Health Maintenance Clinical Glidepath.

<table>
<thead>
<tr>
<th>Item</th>
<th>Robust elderly</th>
<th>Frail Life expectancy &lt;5 years or significant functional impairment</th>
<th>Moderately demented Life expectancy 2–10 years</th>
<th>End of life Life expectancy &lt;2 years and functionally non-independent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Office visits</strong></td>
<td>Do 2 times/year</td>
<td>Do 1–4 times/year</td>
<td>Do 1–4 times/year</td>
<td>Do as needed</td>
</tr>
<tr>
<td>Blood pressure including orthostatics</td>
<td>Do each visit</td>
<td>Do each visit</td>
<td>Do each visit</td>
<td>Do each visit</td>
</tr>
<tr>
<td>Weight</td>
<td>Do each visit. If loss of &gt;5 lb/year perform MNA</td>
<td>Do each visit. If loss of &gt;5 lb/year perform MNA</td>
<td>Do each visit. If loss of &gt;5 lb/year perform MNA</td>
<td>** ****</td>
</tr>
<tr>
<td>Height</td>
<td>Do each visit</td>
<td>Do yearly</td>
<td>** ****</td>
<td>** ****</td>
</tr>
<tr>
<td>Pain assessment</td>
<td>Do each visit</td>
<td>Do each visit</td>
<td>Do each visit</td>
<td>Do each visit</td>
</tr>
<tr>
<td>Medication review including OTCs and herbal medicines</td>
<td>Do each visit</td>
<td>Do each visit</td>
<td>Do each visit</td>
<td>Do each visit</td>
</tr>
<tr>
<td>Lifestyle education (exercise, smoking cessation, alcohol and injury prevention)</td>
<td>Do each visit</td>
<td>Do each visit</td>
<td>Discuss periodically with caregiver</td>
<td>** ****</td>
</tr>
<tr>
<td>Maintain awareness of elder abuse</td>
<td>Do each visit</td>
<td>Do each visit</td>
<td>Do each visit</td>
<td>Do each visit</td>
</tr>
<tr>
<td>Assess ADLs and IADLs</td>
<td>Do yearly</td>
<td>Do yearly</td>
<td>Do each visit</td>
<td>Do each visit</td>
</tr>
<tr>
<td>Visual acuity testing</td>
<td>Consider yearly</td>
<td>Consider yearly</td>
<td>Consider yearly</td>
<td>** ****</td>
</tr>
<tr>
<td>Auditory testing</td>
<td>Consider yearly</td>
<td>Consider yearly</td>
<td>Consider yearly</td>
<td>** ****</td>
</tr>
<tr>
<td>Ask about urinary incontinence</td>
<td>Do yearly</td>
<td>Do yearly</td>
<td>Do yearly</td>
<td>Do yearly</td>
</tr>
<tr>
<td>Males: ask about erectile dysfunction and ADAM screen for hypogonadism</td>
<td>Do yearly</td>
<td>Do yearly</td>
<td>Consider yearly</td>
<td>** ****</td>
</tr>
<tr>
<td>Cognitive screening</td>
<td>Do initially; do if symptomatic</td>
<td>Do initially; do if symptomatic</td>
<td>Do initially</td>
<td>Consider if symptomatic</td>
</tr>
<tr>
<td>Depression screening</td>
<td>Do initially; do if symptomatic</td>
<td>Do initially; do if symptomatic</td>
<td>Do initially; do if symptomatic</td>
<td>Do initially; do if symptomatic</td>
</tr>
<tr>
<td>Screening for gait and balance</td>
<td>Do initially; Do if symptomatic</td>
<td>Do initially; Do if symptomatic</td>
<td>Do initially; Do if symptomatic</td>
<td>Do if symptomatic</td>
</tr>
<tr>
<td>Advance directives</td>
<td>Do yearly and as needed</td>
<td>Do yearly and as needed</td>
<td>Do yearly and as needed</td>
<td>Do yearly and as needed</td>
</tr>
<tr>
<td>Influenza vaccine</td>
<td>Do yearly</td>
<td>Do yearly</td>
<td>Do yearly</td>
<td>Do yearly</td>
</tr>
<tr>
<td>Pneumococcal vaccine</td>
<td>Do once; consider repeat every 6 years for patients with chronic diseases</td>
<td>Do once; consider repeat every 6 years for patients with chronic diseases</td>
<td>Do once; consider repeat every 6 years for patients with chronic diseases</td>
<td>Consider vaccination once</td>
</tr>
<tr>
<td>Tetanus</td>
<td>Do primary series if not vaccinated before and booster every 10 years</td>
<td>Do primary series if not vaccinated before</td>
<td>Do primary series if not vaccinated before</td>
<td>** ****</td>
</tr>
<tr>
<td>Zostavax</td>
<td>Do once</td>
<td>Do once</td>
<td>Do once</td>
<td>Consider</td>
</tr>
<tr>
<td>Breast examination</td>
<td>Do yearly</td>
<td>Do yearly</td>
<td>Do yearly</td>
<td>** ****</td>
</tr>
<tr>
<td>Mammography</td>
<td>Do every 1–2 years up to age 80 years</td>
<td>Consider every 1–2 years up to age 75 years</td>
<td>Consider every 1–2 years up to age 70 years</td>
<td>** ****</td>
</tr>
<tr>
<td>Pap smear</td>
<td>Consider 1–3 pap smears if patient has never had one</td>
<td>** ****</td>
<td>** ****</td>
<td>** ****</td>
</tr>
<tr>
<td>Faecal occult blood test</td>
<td>Do yearly</td>
<td>Consider yearly</td>
<td>Consider yearly</td>
<td>** ****</td>
</tr>
<tr>
<td>Colonoscopy</td>
<td>Consider every 10 years</td>
<td>** ****</td>
<td>** ****</td>
<td>** ****</td>
</tr>
<tr>
<td>PSA</td>
<td>Discuss pros and cons with patient</td>
<td>** ****</td>
<td>** ****</td>
<td>** ****</td>
</tr>
</tbody>
</table>

(continued overleaf)
support routine supplementation for older people at home or for well-nourished older persons in any setting.\(^9\)

Since screening for weight loss is very low cost and low risk and the benefits of intervention are mostly positive, it should be done for patients in all categories except End of Life. Outpatient screening of unintentional weight loss of 10% or greater in 1 year is indicative of significant malnutrition. Utilizing a validated screening tool, such as the Mini-Nutritional Assessment (MNA), can identify patients who are malnourished or at risk for malnutrition.\(^9\)

### Height

Since measuring height is a low-cost screening intervention and as bone loss occurs height may decrease, it may be an effective and economical method to identify early osteoporosis of the spine for Robust and Frail elderly. One study showed a significant association with historical height loss of 1.5 cm and vertebral fractures.\(^11\)

### Pain

Pain should now be considered the fifth vital sign and should be assessed at every visit for patients in all categories. Use of Likert scales (e.g. 1–10) or pictorial scale (e.g. facial expressions) can be useful to quantify pain. Even patients with dementia can be evaluated for pain, using such tools as the CNA Pain Assessment Tool (CPAT) and the Pain Assessment in Advanced Dementia Scale (PAINAD-G).\(^12,13\)

### Medication review including over-the-counter (OTC) and herbal medicines

The risk of adverse drug events, poor compliance and drug–drug interactions, and even the risk of hospitalization, are most associated with number of drugs, while underlying comorbidities and to some extent age contribute to this risk.\(^14,15\) Patients should maintain an up-to-date medication list including OTC and herbal preparations, to bring in at each office visit or hospitalization. Medication reviews should be performed for patients in all four categories at each office visit, to assess for duplication, drug–drug or drug–disease interactions, adherence, affordability and side effects.

### Lifestyle education

Recommendations about areas of lifestyle education in general apply mainly to the Robust and Frail elderly,
Both the USPSTF and A more thorough assess-
tion of access to firearms and driving with depressed and
mild cognitive impairment should include screening tools such as the CAGE
questionnaire, MAST or AUDIT. Of these three, the CAGE
screening questionnaire has the best sensitivity and specificity for
alcohol dependence. Alcohol abuse can initially be screened for by asking
what quantity a patient consumes on a regular basis. Men who consume more than four drinks per day and women who consume more than two drinks per day are at risk of alcohol-related problems. A more thorough assessment should include screening tools such as the CAGE questionnaire, MAST or AUDIT. Of these three, the CAGE questionnaire has the best sensitivity and specificity for diagnosing alcohol dependence. Both the USPSTF and the American Geriatrics Society (AGS) recommend that primary care providers screen their older patients for alcohol misuse.

Areas of education for injury prevention include the use of car seat belts, alcohol-related risks in relation to driving, home environmental hazards to reduce falls and the restriction of access to firearms and driving with depressed and cognitively impaired patients.

Maintain awareness of elder abuse

Physicians and other healthcare professionals should maintain awareness at all times for patients in all categories. A review of elder abuse screening and assessment instruments have shown that older adults were unlikely to report episodes of elder mistreatment and identification of 70% or more of elder mistreatment comes from third-party observers. Healthcare providers should consider referral to a social service agency for evaluation of mistreatment if elderly patients present with unexplained contusions, burns, bite marks, genital or rectal trauma, pressure ulcers and a BMI of less than 17.5%.

The term ‘awareness’ is used because no particular standardized evaluation tool for elder abuse has been shown to be better than others.

Assess ADLs and IADLs

Prevention of functional decline is one of the hallmarks of geriatric care. Loss of function among older persons is associated with long-term care placement, morbidity and mortality. Thus, although there is no direct evidence on how often to screen older patients in each of the four categories for functional change, given the importance of this health parameter it is recommended for patients in all categories at the intervals as noted in Table 12.1.

Two commonly used measurements of function are Activities of Daily Living (ADLs) (bathing, dressing, toileting, transferring, continence, feeding) and Instrumental Activities of Daily Living (IADLs) (telephone, shopping, food preparation, housekeeping, transportation in the community, taking medications, handling finances).

Visual acuity and auditory testing

Although both of these are an accepted part of the comprehensive geriatric assessment (CGA), the level of recommendation for testing these areas is ‘consider’ for patients in all categories. Based on a review of vision screening studies, direct evidence of vision screening in asymptomatic older adults in primary care settings found no effect in improving visual acuity or other clinical outcomes. The USPSTF concluded that evidence is insufficient to determine whether screening older adults for visual impairment improves functional outcomes. However, due to improved treatment of various chronic eye diseases, the National Eye Institute, the American Optometric Association and the American Academy of Ophthalmology do recommend routine comprehensive eye examinations in asymptomatic patients performed by optometrists or ophthalmologists every 1–2 years.

Likewise, although there is evidence that decreased hearing is common and associated with negative outcomes, there is a lack of EBM that screening will improve outcomes. However, use of hearing aids or surgical intervention has a positive effect on quality of life. The ACOVE authors suggest an annual hearing screening by either questionnaire or hand-held audiometry.
Ask about urinary incontinence
The level of recommendation here is the highest for all categories because urinary incontinence is common among women and may occur in men, is easy to screen for (usually one to two questions) and multiple effective treatments are available.

Males: screen for erectile dysfunction (ED) and hypogonadism
It is recommended that this be done for males in robust and frail categories, but should only be considered in males with moderate (not severe) dementia. ED is common, with multiple treatments available.

Male hypogonadism is also common and is associated with muscle weakness and osteoporosis. The ADAM (Androgen Deficiency in Aging Males) screen for hypogonadism has high sensitivity and adequate specificity (see Chapter 111 for details.)

Cognitive screening
Screening for cognitive impairment is part of a CGA and should be done at initial visits for patients in all categories, except for those at End of Life, where it should be considered. The Mini-Mental State examination is a commonly used screening tool, but may have limited utility if the cut-off score is set too high. For elderly with high education levels, the Saint Louis University Mental Status (SLUMS) examination, along with other screening tests, may be used.

Depression screening
Depression screening should be carried out at initial visits for patients in all categories. A systematic review concluded that screening for depression can improve outcomes, particularly when screening is coupled with system changes that help ensure adequate treatment and follow-up. Screening for depression is part of a CGA. There is no strong evidence for one particular screening instrument for depression. The Geriatric Depression Scale (GDS) may be one of the easiest to administer. However, the GDS does not maintain its validity for patients with dementia and the Cornell scale (a 19-item clinician-administered instrument) is recommended.

Screening for gait and balance
The evidence to screen for gait and balance problems at initial visits in all categories except at End of Life is based on the fact that falls are associated with decreased function, increased nursing home admission and increased morbidity and mortality in populations similar to patients in these categories. One of the best ‘screeners’ for gait and balance problems is to ask patients if they have fallen. The ‘Get Up and Go Test’ may quantify functional mobility in addition to testing balance and may also be useful in following clinical change over time.

Advance directives
Although the evidence is not strong that advance directives make a difference in outcomes (e.g. one study showed that systematic implementation of a programme to increase use of advance directives reduced the utilization of healthcare services without affecting satisfaction or mortality), there are ways to increase discussions and completions of advance directives. Clinicians should take care to assure that underlying depression does not underlie patient preferences or decisions.

Advance directives are especially important for patients in the Frail, Moderately Demented and End of Life categories.

Influenza vaccine
This should be done yearly for patients in all categories. More than 90% of the deaths attributed to pneumonia and influenza during epidemics occurred among persons aged 65 years and older. Influenza vaccination in the elderly has been shown to reduce hospitalization rates, to be cost-effective and to reduce influenza-associated mortality. In the nursing home, although vaccination is only 40% effective in preventing clinical illness, it is more effective in preventing pneumonia, hospitalization and death. Vaccinating more than 80% of nursing home residents has been shown to prevent influenza outbreaks.

Pneumococcal vaccine
The recommendations about pneumococcal vaccine are based on some evidence and based on probable life expectancy in various categories. Although pneumococcal vaccination increases antibody levels in older adults to a lesser extent than younger adults and levels decrease more rapidly in the elderly, vaccination has been shown to be effective in reducing the incidence of pneumococcal bacteraemia in older, high-risk patients who have good antibody response to the vaccine.

Most organizations recommend one dose of the 23-valent pneumococcal vaccine to be given for all adults over age 65 years. Older patients who received the earlier 14-valent vaccine should be revaccinated with the 23-valent vaccine if they fall into any of those two groups. If patients have had the 23-valent vaccination before age 65 years, the recommendations for revaccination are controversial. The ACP
reports that there are currently insufficient data on repeated revaccination every 6 years in healthy elderly and most other organizations do not provide specific recommendations for revaccination. However, since older patients with chronic diseases may occasionally be ‘Robust’ for other reasons, clinicians should ‘consider repeating’ every 6 years.

**Tetanus**

Recommendations regarding adult tetanus/diphtheria vaccination do not vary for older persons from those for younger adults. Over half of the cases of tetanus occur in persons aged 60 years or older. All adults should complete a primary series of tetanus/diphtheria toxoid (Td). If an individual had an incomplete series or an uncertain history, it is recommended that the entire primary series be given. Primary series for adults consists of 0.5 ml of Td intramuscularly as the initial dose and at 2 and 6 months later. Booster doses need to be given every 10 years.\(^5\)\(^3\)\(^4\)

**Zostavax**

Reactivation of latent varicella zoster virus results in a localized eruption known as herpes zoster (shingles). Its incidence increases with age, occurring in up to half of individuals age 85 years or older. Postherpetic neuralgia is a potentially devastating complication, occurring in more than 40% of individuals older than 60 years.\(^3\)\(^5\) In 2006, the FDA approved the use of Zostavax in patients age 60 years or older for prevention of recurrent herpes zoster infection. The Advisory Committee on Immunization Practices (ACIP) recommends a one-time dose of Zostavax for immunocompetent adults age 60 years or older regardless of known prior herpes zoster infection.

**Breast cancer screening**

There is no evidence for or against the clinician recommending self-examination or the clinician doing the clinical breast examination. Breast self-examination may allow women to detect lesions or breast cancers not seen on mammography or those that develop in between mammography or clinical breast examinations. Clinicians performing breast examinations may find lesions or breast cancers not detected on mammography. Breast examinations should be performed yearly in all categories except for those in the end of life category. Mammography is the mainstay of breast cancer screening. Research has shown mammography to be effective up to age 80 years.\(^3\)\(^6\) There is lack of agreement among organizations regarding screening with mammography. The American Cancer Society (ACS) recommends yearly mammography in older adults provided that a woman is in good health. There are few studies that describe women’s decision-making to stop mammography. It appears that some women and their health providers, recognizing that the expected benefit of early detection declines with remaining life expectancy, consciously decide to discontinue screening following a serious health event.\(^3\)\(^7\) The USPSTF recommends biennial screening mammography for women up to age 74 years.

**Cervical cancer screening**

The low levels of recommendation for Robust (‘consider’) and ‘Don’t Do’ for the other categories are based on lack of evidence and organizational recommendations. The ACP and the USPSTF recommend no further Papanicolaou (pap) smears for women over age 65 years who have had previous regular screening with consistently normal results. The AGS position statement says that regular pap smear screening at 1–3 year intervals until at least the age of 70 years seems reasonable. Beyond that age, there is little evidence for or against screening women who have been regularly screened in previous years. An older woman of any age who has never had a pap smear may be screened with at least two negative pap smears 1 year apart. The ACS and AGS both recommend that women 70 years and older who have tested positive for HPV DNA should continue screening at the discretion of their healthcare provider.

**Colon cancer screening**

Regular screening or testing is one of the most effective means of preventing colorectal cancer. This is because most polyps or growths can be found and removed before they have the chance to turn into cancer. The clinician’s choice of screening procedure for colon cancer depends on extrinsic factors (e.g. transportation, availability of a gastroenterologist, the patient’s willingness to do one procedure over the other and the patient’s health status). It is recommended that clinicians consider ordering screening colonoscopies for their robust patients based on current guidelines and based on the number of years it takes for polyps to turn into cancer. Primary care physicians may choose to limit screening in frail individuals or patients with dementia.

The recommendations on the type and frequency of screening procedures vary among different organizations. The USPSTF supports the use of either screening colonoscopy every 10 years, annual screening with a sensitive faecal occult-blood testing (FOBT) or flexible sigmoidoscopy every 5 years with a mid-interval sensitive FBOT. The recommended age of screening is from 50 to 75 years. The ACS lists the following options for colon cancer screening: flexible sigmoidoscopy every 5 years, colonoscopy every 10 years, double-contrast barium enema
every 5 years, virtual colonoscopy (CTC) every 5 years or annual three-sample FBOT. Colonoscopy is a more thorough examination and is the preferred option for screening. Virtual colonoscopy (CTC) is the newest type of screening and should be reserved for patients who cannot undergo a colonoscopy. The ACS does not list an upper age limit on screening.

Prostate cancer screening

The biggest controversy in prostate screening is that some prostate cancers grow slowly and would never cause any problems. Because of an elevated PSA, men may be diagnosed and treated for prostate cancer with either surgery or radiation for lesions that would not cause symptoms or lead to their death. These treatments have side effects that can seriously affect a man’s quality of life. No major scientific or medical organization, including the ACS, American Urologic Association (AUA), USPSTF, American Academy of Family Physicians and the American college of Preventive Medicine, support routine testing for prostate cancer at this time. The National Comprehensive Cancer Network (NCCN) guidelines focus on men at an increased risk for developing prostate cancer due especially to family history and race. These organizations emphasize the need for healthcare professionals to discuss, with the male patients, the possible benefits, side effects and questions about early prostate cancer detection. Therefore men, at least 50 years old or younger if at higher risk, can make informed decisions taking into account their own situations.

Osteoporosis

The recommendation to screen at least once for patients in all categories except End of Life is based on studies that show inadequate rates of diagnosis and treatment. However, there is lack of evidence to show that mass screening of all elderly women and men will be cost-effective or improve outcomes related to osteoporosis.

Dual-energy X-ray absorptiometry (DXA) is the current gold standard test for diagnosing osteoporosis in people without a known osteoporotic fracture. It is, however, an imperfect test, diagnosing osteoporosis in less than half of people who progress to have an osteoporotic fracture. Other screening methods have been evaluated to improve the diagnostic accuracy of osteoporosis. These include the WHO fracture risk algorithm (FRAX), which computes the 10 year probability of fractures in men and women from clinical risk fractures: age, gender, previous fracture, femoral neck BMD, body mass index, prior corticosteroid use, history of rheumatoid arthritis, parental history of hip fracture and current smoking and alcohol use. The osteoporosis self-assessment screening tool (OST) and calcaneal ultrasound are also both being evaluated in men and women to determine their potential role in better diagnosis of osteoporosis. The USPSTF recommends osteoporosis screening using DXA for routine screening of women at age 65 years and for women at age 60 years with risk factors for osteoporosis. The frequency of screening and the age at which to stop screening are not known. In addition to women, the ACP recommends periodic assessment of men for risk factors for osteoporosis (low body weight, physical inactivity, chronic glucocorticoid use, previous fragility fracture and hypogonadism) and DXA scanning for men at increased risk and who are candidates for drug treatment.

Cholesterol screening

The reason for a low-level recommendation (i.e. ‘consider’) and a targeted approach (only for the robust and frail with additional risk factors) for cholesterol screening is because there is limited evidence about primary prevention of coronary heart disease using drugs in older populations. However, there are recommendations by organizations for secondary prevention of coronary heart disease in the elderly. The USPSTF does recommend screening individuals age 65 years or older with coronary risk factors because studies have shown a reduction in coronary events on treating patient’s with statins compared with placebo. The National Cholesterol Educational Program reaffirms the position that older persons, who are at higher risk and in otherwise good health, are candidates for cholesterol-lowering therapy. The decision to treat should also be based on coexisting disease, social and economic considerations and functional age. There is no upper limit for age of screening and treatment for lipid disorders in the elderly. The recommendations for the frequency of screening are not known.

Thyroid-stimulating hormone (TSH)

TSH screening of all older adults is not currently recommended by the USPSTF on the basis of lack of data. It does recommend screening of symptomatic patients. The ACP suggests office screening of women older than 50 years may be indicated. However, the evidence for treating subclinical thyroid dysfunction is inconclusive. The American Thyroid Association issued guidelines which recommend measuring TSH level starting at age 35 years and every 5 years thereafter. Hypothyroidism may not be associated with adverse outcomes in the oldest individuals when detected by screening alone. A prospective study involving individuals aged 85 years or older did not show an association of elevated TSH levels with reduction in cognitive function, mood or performance of ADLs. Higher TSH
levels were associated with lower all-cause and cardiovascular mortality. Many geriatricians advocate screening high-risk populations such as nursing home populations, frail elderly and patients with dementia. The sensitive TSH assay is probably the screening test of choice.

**Fasting blood glucose**

This recommendation is based on organizational recommendations only. Although the USPSTF recommends against routine screening for diabetes in asymptomatic individuals, it does endorse screening for patients with a blood pressure of 135/80 or greater. The American Diabetes Association has recommended fasting plasma glucose measurement every 3 years in adults with one or more of a long list of risk factors. It also recommended yearly fasting glucose measurements in patients with pre-diabetes (fasting blood sugar between 100 and 125 mg dl$^{-1}$ or 2 h postprandial blood sugar between 140 and 199 mg dl$^{-1}$).

**Sleep apnea**

Because of the low cost of screening (in the form of asking about symptoms of sleep apnea during the routine history and physical or to use a screening questionnaire tool such as the Epworth Sleepiness Scale and the potential to miss this diagnosis among older patients, it is recommended for robust and frail elderly. Two studies have shown some benefit of treatment of sleep apnea in patients with heart failure and stroke.

**Abdominal aortic aneurysm**

Performing a one-time screening for abdominal aortic aneurysm with abdominal ultrasound has been shown to reduce mortality in men. However, no benefit was shown for similar screening in women. The USPSTF and the AHA currently recommend screening in men aged 65–75 years who have ever smoked. They do not recommend screening in women. There is no recommendation for screening men who have never smoked except in individuals who had a first-degree relative who underwent an abdominal aneurysm repair.

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**Key points**

- Health promotion and preventive medicine are key to good outcomes
- Older persons with different levels of function require different approaches
- Vaccinations remain important in older people

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**References**

30. Molloy DW, Guyatt GH, Russo R et al. Systematic implementation of an advance directive program in nursing homes: a randomized controlled trial. JAMA 2000;283:1437–44.