Clinical Review

A Criterion-Based Review of Preventive Health Care in the Elderly

Part 2. A Geriatric Health Maintenance Program

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Although the geriatric population is growing rapidly and using an increasing portion of health care dollars, no consensus exists about the best approach to preventive medicine in this age group. The most comprehensive review to date is the 1989 United States Preventive Services Task Force (USPSTF) recommendations. However, the USPSTF did not specifically address the unique situation of the elderly. Consequently, we have evaluated numerous screening tests and preventive interventions for the elderly by systematically applying the geriatric-specific criteria for preventive services proposed in Part 1 of this article (*J Fam Pract 1992; 34: 205–224*). Tests and interventions were measured against specific screening criteria and put into one of three categories: those that have been proven effective, those that may be effective but about which more research is needed, and those that are not effective. Recommendations were compared with those of the USPSTF. Proof of the efficacy of most screening tests and interventions in the current literature was found to be lacking, pointing to the need for substantial future research in this area.

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Health maintenance programs have been well established for all age groups except for those over 65 years of age. Childhood immunizations and the detection and treatment of hypertension are prototypical examples of the successful prevention of illness and the sequelae of illness, respectively. The lack of a proven geriatric preventive medicine program has major political and economic implications. Numerous authors have pointed out that the elderly, increasing more than twice as fast as the total population, are the fastest growing age group in the United States.[1–3] The population of the "old old" is increasing even faster.[1,4] Because of this population growth and heavy use of health services, it is projected that the elderly will consume a progressively larger portion of the United States health care budget, up to 50% by the year 2040.[1] Whether preventive care can reduce these expenditures, either by early detection of treatable

conditions or by the "compression of morbidity,"[5] remains unclear.

Health problems are highly prevalent among the elderly.[6–11] Eighty percent of them have one or more chronic diseases,[12] and the prevalence of medical problems[8] and functional disability[10,12,13] increases with advancing age. The elderly often do not seek medical attention for their health problems because of cost, fear, or a misconception that health problems are an inevitable part of aging.[10,14,15] As many as 50% of their health problems, half of which are amenable to treatment, are unknown to their personal physician.[10]

Because of the above, multiple reviews and proposals for geriatric screening protocols have been published. To date, however, as discussed in our companion article (*J Fam Pract 1992; 34; 205–224*), no conclusive evidence exists that preventive medicine programs are cost-effective for the elderly.

The 1989 United States Preventive Services Task Force (USPSTF)[16] recommendations were a tremendous step in establishing standard screening guidelines for the American population, including the elderly. The scope of their report was comprehensive. In it, they noted numerous times that convincing evidence for the effectiveness

of various interventions is lacking, a critical point with which we totally agree.

Unfortunately, the USPSTF did not specifically focus on the geriatric age group. This led to three difficulties in interpreting their recommendations for the elderly. First, all persons 65 years and older were for the most part evaluated as a single group. The elderly are not a homogeneous population,[17] however, and there are good reasons to distinguish between the "young old" and the "old old" when advocating preventive health care. Second, several health issues commonly considered important in the care of the elderly were not discussed, such as minimizing polypharmacy, detecting incontinence, or discussing advance directives. Third, the USPSTF did not explicitly address issues unique to the assessment of preventive services in the elderly, such as emphasizing quality rather than quantity of life and assessing the effect of services on caregivers of the elderly. In addition, although the USPSTF used a ranking system to assess the quality of data on which their recommendations were based, their final recommendations were not clearly differentiated by the strength of the supporting evidence in every case. Instead, recommendations were made in a "yes" or "no" format.

We have tried to address these difficulties in this article. We employed the criteria for evaluating preventive services proposed specifically for the elderly by Klinkman et al to develop a geriatric health maintenance program (Table 1). Where possible, we note those areas for which there is evidence that the old old should be considered differently from the young old. We realize that distinguishing between the young old and the old old is difficult and may differ for various conditions. Still, evidence suggests that as the elderly age, they have more health problems and more complications from interventions; this may alter the benefits and risks of some preventive interventions in the old old. Unfortunately, there is a profound dearth of information about the relative benefits of prevention in the old old vs the young old, thus markedly limiting our attempt to further delineate these two groups. It is our hope that as the results of further well-done studies become available, we will be able to enumerate additional areas where the old old should be evaluated differently.

Our protocol applies to a prevention program, not treatment, of identified diseases. Specific symptoms or conditions found in the course of routine or illness care should be appropriately pursued and treated. Screening for presymptomatic conditions, however, has costs as well as benefits. We have included an assessment of these in designing our geriatric health maintenance program.

Our approach to prevention for the elderly should yield three benefits. First, it will help clinicians by more

Table 1. Six Criteria for Evaluating Preventive Services in the Elderly

1. The condition must have a significant effect on health.

2. Acceptable methods of preventive intervention or treatment must be available for the condition.

3. For *primary* preventive services (counseling, chemoprevention, immunizations), the intervention must be effective in preserving health.

4. For *other* preventive services or interventions:
   (a) There must be a period before the individual (or his or her caretaker) is aware of the condition, or of its seriousness or implications, during which it can reliably be detected by providers;
   (b) Tests used to identify the condition must be able to reliably discriminate between cases and non-cases of the condition; *and*
   (c) Preventive services or treatment during this "pre-awareness" period must have greater effectiveness than care or treatment delayed until the individual or caretaker brings it to a provider's attention.

5. For individuals who are cared for by caregivers, the benefit offered by the preventive service must outweigh any negative effects on the quality of life of caregivers.

6. The relative value of the preventive service or intervention must be determined by a comparison of its costs with its expected health benefits.*

*It is understood that at present this criterion cannot be met for the majority of candidate preventive services owing to lack of information. The criterion is included because of the central importance of determining relative values of services at a time in which choices must be made. The inclusion of some form of cost-benefit statement allows the choice to be made on explicit, rather than implicit, grounds. In the absence of information needed for a cost-benefit calculation, incidence, effectiveness, and cost data could be substituted and a rough estimation of the "cost-effectiveness" of the service made. This is the approach used by most reviewers to date. Please see text for a more complete explanation.
From Klinkman MS, Zazove P, Mehr DR, Ruffin MT. A criterion-based review of preventive health care in the elderly. Part 1. Theoretical framework and development of criteria. J Fam Pract 1992; 34:217.

clearly specifying which geriatric screening interventions have been proven effective and which have not. Second, it highlights those areas of geriatric prevention that need more research. Third, it provides an objective standard that clinicians and researchers can use to assess the effectiveness of preventive interventions; this will allow direct comparison of the results of various studies. Ultimately, this approach should help society determine how to best spend our increasingly scarce health care dollars.

Methods

We evaluated the numerous areas of medical care, screening tests, and preventive interventions that have been advocated by various authors and organizations, including the 1989 USPSTF, as appropriate for inclusion in a geriatric prevention program. The potential importance

Table 2. Levels of Quality of Evidence in Support of
Interventions

Level	Source of Evidence
I	Evidence obtained from at least one properly designed randomized controlled trial.
II-1	Evidence obtained from well-designed controlled trials without randomization.
II-2	Evidence obtained from well-designed cohort or case-control analytic studies, preferably from more than one center or research group.
II-3	Evidence obtained from multiple time series with or without the intervention. Dramatic results in uncontrolled experiments (such as the results of the introduction of penicillin treatment in the 1940s) could also be regarded as this type of evidence.
III	Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees.

Adapted from Guide to Clinical Preventive Services: An Assessment of the Effectiveness of 169 Interventions. Report of the US Preventive Services Task Force. Baltimore: Williams & Wilkins, 1989.

of each area has been discussed in other publications and is not reviewed in detail here.

For each area, we completed a thorough literature search including a review of the USPSTF summary for the conditions addressed by the Task Force. The purpose of this search was to obtain the most current data on the conditions evaluated. We evaluated the quality of these data using an approach identical to that listed in the methodology section of the USPSTF report. This involved assigning a level to the quality of evidence for each intervention. These levels are listed in Table 2.

Using this information, we then applied the five applicable Klinkman geriatric criteria (Table 1) for each potential area of intervention (numbers 1, 2, 3, 5, and 6 apply to primary preventive services, and numbers 1, 2, 4, 5, and 6 apply to secondary preventive services). We evaluated the evidence against these criteria to ascertain whether they were met for that area. For an intervention to be endorsed as "clearly effective" in our final recommendations, there had to be level II-2 evidence or better (Table 2) supporting that intervention. In other words, the evidence had to come from a well-designed randomized or nonrandomized controlled trial or a high-quality cohort or case-control study. Likewise, any intervention for which similar quality studies documented ineffectiveness or harm was classified as "ineffective." For any proposed counseling interventions, we required that a controlled trial documenting benefit had been done in order to include it in our protocol.

In many areas clinical evidence was inadequate to definitively classify an intervention as effective or ineffective. Frequently, only expert opinions supported the use

of a service. These potential interventions were assigned to the "unclear effectiveness" category. Whether to include them in a geriatric prevention program has been left to each clinician's discretion.

Upon reviewing the list of items in the unclear effectiveness category, it became evident that the performance of some of the services required significantly less effort than others. Consequently, we divided this category into "low-effort" and "high-effort" subcategories using the following criteria: (1) the amount of time required for the service; (2) the potential for adverse effects from including the particular prevention measure or intervention; (3) the cost of the service; and (4) the difficulty in performing the preventive measure or intervention. For example, the time involved in preventive care must be reasonable and practical if busy providers are to do it. Time-intensive interventions such as filling out and evaluating numerous questionnaires or making home visits may provide much information for research purposes but are not likely to be employed in routine clinical practice. Similar approaches were used for the three other criteria. Further discussion about this category, including how the amount of effort required might play a role in a clinician's decision of whether to advocate the intervention, is in the Summary section.

As a result, our final recommendations provide the clinician with the following four rankings: clearly effective, unclear effectiveness requiring low effort, unclear effectiveness requiring high effort, and clearly ineffective.

In the following section we discuss the various potential interventions. For each area evaluated, we present our findings in three parts: overview, evaluation, and recommendation.

In the overview subsection, we summarize the pertinent findings of our literature search and review for that area. The information cited in this section was included because it addresses one of the criteria of Klinkman et al (Table 1).

The evaluation subsection summarizes whether the information available meets the criteria of Klinkman et al for evaluating preventive services. For situations where all the criteria are not met, we identify which criteria were not met and the reasons why. Additional references are cited here as indicated. Because Klinkman criteria 1 and 2 were met most of the time and criteria 5 and 6 were often not evaluable, these were discussed only where applicable.

Finally, the recommendations subsection summarizes whether that area should be included in a geriatric health maintenance program. For the areas where different recommendations appear appropriate for the old old based on the literature, we have emphasized this.

To provide ease of reference, the candidate services

Table 3. Geriatric Health Maintenance Items That Are
Clearly Effective in a Screening Program

Historical
  Smoking

Physical examination
  Blood pressure
  Cancer screening
    Breast, up to the age of 75
    Carotid stenosis, symptomatic persons <80 years old
    Hearing, especially in the old old

Laboratory
  None

Interventions
  Estrogen replacement therapy for all women without uteruses
    (for coronary artery disease prevention)

Vaccinations
  Tetanus
  Influenza

evaluated in the Application of Criteria section are di-
vided into the following general categories: historical
factors, physical examination, laboratory, interventions,
and vaccinations. Within each category, the items re-
viewed are listed in alphabetical order. For those tests or
interventions that could fit under several categories (eg,
cancer screening could be under either physical examina-
tion or laboratory), we chose the one that seemed to fit
best and that allowed easiest localization.

Application of Criteria

Those items that are clearly effective in a geriatric health
maintenance program have been listed in Table 3. Areas
of unclear effectiveness, as well as those areas that have
been shown not to be effective in a prevention program
for this age group, are listed in Table 4. Interventions
that may be more or less appropriate in the old old have
been listed in Table 5.

Historical Factors

ACCIDENTS: BURNS

Overview. Although individuals over 65 years of age
made up only 9% of patients hospitalized for burns in
one study performed in New England,[18] age-specific
population death rates and average hospital days were
considerably higher in the elderly. Scalds and clothing
ignition were particularly common, accounting for as
much as 67% of the burns. If hot water temperature is
reduced to 120°F, scald burns may be less likely.[19] The
USPSTF[16] states that deaths are less likely in houses with

smoke alarms, and that alarms are installed when given
out free. They recommend counseling individuals to in-
stall smoke detectors, refrain from smoking in bed, and
reduce water heater temperatures to 120°F.

Evaluation. Preventive measures undertaken to reduce
accidental burns are of unclear effectiveness. If individu-
als followed the USPSTF recommendations, there would
probably be fewer serious burn injuries and deaths; how-
ever, no controlled studies exist to support the efficacy of
physician counseling in persuading the elderly to adopt
the proposed control measures. Therefore, effectiveness
remains unproven, and criterion 3 is not met.

Recommendation. No definitive recommendation can be
made until further studies investigate the effectiveness of
this intervention. Since the suggested counseling could
be done relatively quickly, cheaply, and without adverse
effects, we classify this as a low-effort intervention.

ACCIDENTS: FALLS

Overview. Falls are common in the elderly[20-22] and are
the leading cause of accidental deaths in this age group.[23]
One prospective study identified yearly falls in 35% of
community elderly over 70 years of age.[24] Several inde-
pendent predictors of falls have been found in the com-
munity, including difficulty in rising from a chair, arthri-
tis, Parkinson's disease, reported sedative use, cognitive
impairment, disability of the lower extremities, balance
and gait abnormalities, and foot problems.[25,26] Environ-
mental hazards are also common.[25] Although simple
tests, such as Tinetti's Balance and Gait Assessment or
the timed "Up and Go Test" are available to screen for
the propensity toward falling,[27,28] these are incompletely
validated. Treatment of existing conditions, environmen-
tal and lifestyle adjustments, and the elimination, if pos-
sible, of sedative drugs may reduce the incidence of
falling, but controlled trials of any of these interventions
in individuals who have a history of falling or whose
medical conditions place them at risk of falling are lack-
ing.[27,28] In a randomized controlled trial, intensive eval-
uation and intervention in a population of very old
individuals who had fallen (mean age 88 years) reduced
subsequent hospitalizations over the next 2 years; how-
ever, additional falls were very common, and the occur-
rence of falls was virtually identical in both the interven-
tion and control groups.[29]

Evaluation. Interventions intended to prevent accidental
falls are of unclear effectiveness. Klinkman criteria 4b and
4c are not met for screening for the propensity to fall,
and criterion 4c is not met for intervening to prevent
future falls.[27,28] Only level III evidence exists at present
to support any specific program for preventing falls.

Table 4. Evaluation of Other Potential Interventions for a Geriatric Health Maintenance Program

Area of Potential Intervention	Unclear Effectiveness			Area of Potential Intervention	Unclear Effectiveness		
	Low-Effort Intervention	High-Effort Intervention	Ineffective Intervention		Low-Effort Intervention	High-Effort Intervention	Ineffective Intervention
Historical							
Accidents				Ovarian		X	
Burns	X			Penis			X
Falls				Prostate		X	
Aged ≥75 y with history of falls	X			Skin		X	
All others		X		Uterus		X	
Motor vehicle	X			Vagina/vulva			X
Alcohol	X			Carotid stenosis			
Constipation	X			Asymptomatic and symptomatic, aged >80 y		X	
Dentition	X			Thyroid palpation		X	
Exercise	X			Vision			
Mobility/ADL/IADLs	X			Visual acuity	X		
Nutrition	X			Glaucoma			X
Podiatry	X						
Polypharmacy	X			**Laboratory**			
Psychosocial				Cholesterol		X	
Dementia				Electrocardiogram			X
Aged <75 y		X		Plasma glucose testing			X
Aged ≥75 y	X			Thyroid function tests		X	
Depression		X		Tuberculosis testing		X	
Urinary incontinence	X			Urinalysis		X	
Physical Examination				**Interventions**			
Cancer				Advance directives	X		
Breast				Aspirin		X	
Aged >75 y		X		Estrogen replacement therapy			
Cervical				Osteoporosis		X	
Has had previous Papanicolaou smear test			X	Coronary artery disease			
Has had minimal previous screening		X		Women with uteruses		X	
Colorectal		X		Vaccinations			
Lung			X	Pneumococcal	X		
Oral		X					

ADL denotes activities of daily living; IADL, instrumental activities of daily living.

Table 5. Preventive Services That Have Improved or Diminished Effectiveness in the Old Old

Preventive Service	Improved Effective	Diminished Effective
Historical		
Accidents		
Falls prevention; particularly with a history of previous falls	X	
Motor vehicle		X
Mobility/ADL/IADL assessment	X	
Nutrition (undernutrition) screening or counseling	X	
Podiatry care	X	
Polypharmacy identification	X	
Dementia screening	X	
Urinary incontinence identification	X	
Physical examination		
Blood pressure		X
Cancer screening		
Breast		X
Cervical		X
Hearing screening	X	
Visual acuity screening	X	
Laboratory		
Cholesterol		X
Interventions		
Advance directives counseling	X	
Vaccinations		
Influenza immunization	X	

ADL denotes activities of daily living; IADL, instrumental activities of daily living.

Recommendation. Further intervention studies to assess the effect of trying to reduce falls are needed. Clinicians can consider following the USPSTF recommendations: simple balance and gait tests, counseling about environmental hazards, encouraging activity, and elimination of sedative drugs. Because the overall elderly population is large and the above intervention would require a significant investment of time, we consider this a high-effort intervention. If evaluation were restricted to the old old with a history of previous falls, however, this would be a low-effort intervention.

ACCIDENTS: MOTOR VEHICLE

Overview. Drivers under 30 years of age account for most motor vehicle–related trauma and death; however, per million miles driven, those over 70 years have more accidents, more hospitalizations resulting from accidents, and more driver and pedestrian accidents resulting in fatalities than middle-aged drivers.[30-32] Visual perceptual abilities, information processing, and psychomotor skills are all believed to be related to driving ability, and these decline with age.[32] Good epidemiologic studies of older drivers are virtually nonexistent. A recent uncontrolled study of dementia clinic patients did suggest an alarm-

ingly high rate of being in or causing accidents among those who drove.[33] Seat belts, which decrease injuries and deaths in motor vehicle accidents among all age groups, are readily available and easy to use.[16] No good studies, however, demonstrate that physician counseling increases seat belt use.[34] Seat belt laws, particularly with enforcement and community interventions, have been effective in increasing seat belt use.[35-39]

Evaluation. Preventive measures intended to reduce injuries from motor vehicle injuries are of unclear effectiveness. Klinkman criterion 6 is probably not met because motor vehicle accidents pale in comparison with other causes of death and disability in the elderly. Even if the prevalence is believed to be high enough to warrant intervention, no level I or II studies demonstrate the effectiveness of counseling patients to use seat belts and not to drive when using substances that might impair driving performance; therefore, criterion 4c is not met.

Recommendation. Further research is needed to determine the effectiveness of physician recommendations. Because the counseling efforts required are not extensive, we classify this as low-effort intervention. Because there are relatively few old old drivers, counseling is probably less effective in this age group. (See also the discussion of dementia in the Psychosocial section below.)

ALCOHOL

Overview. Alcohol use is common, places tremendous demands on the health care system, and has significant social costs to others.[16] Still, exact information on the frequency and extent of its use and abuse by elderly Americans is lacking.[10] Alcohol abuse is underdiagnosed,[40] even though it is claimed to be the third most common mental health disorder among elderly men.[41] Although sophisticated questionnaires are impractical for the busy practitioner, simple screening tests exist to detect alcohol abuse. The CAGE questionnaire[42] is the most popular test used in primary care. The USPSTF noted, however, that doubts exist as to the accuracy of these tests.[16] Even if they are accurate for the elderly, no evidence exists documenting that early detection favorably influences patient outcomes.[41] Clinical findings of alcohol abuse, such as palmar erythema, are not useful since they usually appear only after prolonged abuse. No evidence exists that screening asymptomatic persons to detect and treat alcoholism results in better outcomes than treatment after signs and symptoms become apparent.[16]

Evaluation. Interventions intended to identify alcoholism are of unclear effectiveness. Klinkman criterion 4 is not met; no evidence exists that early detection changes the course of the illness (4c),[41] and the effectiveness of

screening tests is uncertain (4b).[16] This area is a good example of the importance of criterion 5; although no level II-2 evidence or better exists concerning this in the elderly, abundant data have documented the adverse effects of alcoholism on the families and caregivers of afflicted persons.

Recommendation. Further studies are needed to evaluate the effectiveness of simple screening tests in primary care and whether early detection and treatment of alcoholism in the elderly improves health outcomes. This is considered a low-effort intervention.

CONSTIPATION

Overview. Constipation seems to be more common in the elderly,[43,44] although this has not been proven.[45] It has been attributed to reduced or improper oral intake, reduced activity, decreased smooth muscle strength, increased gut transit time, and side effects from drugs.[3,44,46] Constipation is easily detected and treatable; however, it can provoke considerable concern and self-medication, and can cause complications such as arrhythmias and rectal prolapse.[43,45,47] No evidence exists that early diagnosis and treatment prevents problems.

Evaluation. Preventive measures intended to identify constipation are of unclear effectiveness. Criterion 4c is failed because no level I or II evidence exists documenting that early detection of constipation has greater effectiveness than treatment delayed until the individual informs a provider.

Recommendation. Further research is needed on whether early treatment of constipation would improve health outcomes. Because of the low cost, ease, and safety of screening, this is considered a low-effort intervention.

DENTITION

Overview. Although the number has decreased over the past three decades,[48] 40% of elderly persons are edentulous.[49] Many have suboptimal or no dentures,[7] and a high rate of periodontal disease exists.[49,50] Poor dentition can contribute to nutritional deficiencies[51] and decrease the enjoyment of life. Dental examinations detect caries and periodontal disease before teeth are lost, and elderly persons receiving regular dental care are four times as likely to maintain the integrity of their teeth and avoid periodontal disease.[48,50] No prospective data exist regarding the benefits of preventive dentistry in the elderly. For persons aged 50 years and over, a preventive oral hygiene program does prevent the progression of periodontal disease and caries compared with age-matched controls. The benefit was the same as for younger age groups, suggesting no decrease in effectiveness with age.[52] The optimal frequency for regular dental

visits, however, is unknown.[53] Poor dentition may result in an overall decline of health, morale, and self-esteem, which can give rise to depression and social withdrawal.[54] Preventive dentistry might avert such problems, but this has not been specifically investigated.

Evaluation. Interventions to maintain or restore dentition are of unclear effectiveness. For primary prevention, no level I or II evidence exists to support criterion 3. For secondary prevention, this area is equivocal for criterion 4c (and thus for criterion 6). Abundant anecdotal evidence does exist that regular dental care improves the oral health of the elderly, and the study above[52] (which lumped together all persons aged 50 years and older) suggests that regular dental care does prevent the progression of dental disease in the elderly. This has not clearly been documented, however, for those over 65 years of age. There is some suggestion that criterion 5 may be supported.[54] If subsequent studies demonstrate that preventive dental care in the elderly is more effective than intervention after the individual or caretaker is aware of a problem, this intervention should be included in a geriatric health maintenance program.

Recommendation. Further studies are clearly needed to investigate the effectiveness of preventive dental care in the elderly.[55] This intervention is considered a low-effort one.

EXERCISE

Overview. The prevalence of a sedentary lifestyle (defined as physical activity less than three times a week) is estimated to be 55% for all ages and 62% for ages 55 years and older.[56] In addition, 80% to 94% of Americans fail to exercise at a level sufficient to obtain cardiorespiratory benefit.[57,58] Many medical conditions associated with physical inactivity contribute significantly to morbidity and mortality. Increasing physical activity seems to reduce the incidence of coronary heart disease,[59–63] hypertension,[64] non-insulin–dependent diabetes mellitus,[65–67] colon cancer,[68] and depression and anxiety.[69] Its benefit in preventing osteoporosis in postmenopausal women is less clear.[16] Exercise programs may improve physical well-being, cognition, and self-image in geriatric patients; decrease cholesterol levels; result in a more positive approach to life; and potentially have positive effects on caregivers.[70–73] No data exist, however, showing that physicians can influence the elderly (or any age group, for that matter) to significantly alter and maintain their level of physical activity. Compliance may be a significant problem in the elderly; some elderly believe strenuous exercise is not effective in avoiding heart attacks.[74] Moreover, no data exist to support the benefits of physical activity in elderly persons who have spent many years

living a sedentary lifestyle; in fact, physical activity could conceivably increase the risk for adverse outcomes, such as falls with fractures.

Evaluation. Interventions intended to increase physical exercise are of unclear effectiveness. Criterion 3 is not met because no level II-2 or better evidence exists that physician counseling produces a consistent alteration in patients' level of physical activity. If criterion 3 were met, then criterion 6 would need to be evaluated. In 20-year-olds, sedentary lifestyles increase medical costs and decrease life expectancy,[75] but no comparable data exist for the elderly.

Recommendation. Although increased physical activity is a reasonably acceptable intervention, the USPSTF[16] and the Surgeon General's Workshop[76] recommendations to counsel patients to exercise are not clearly supported by current data. Until evidence is available that physician counseling effectively promotes continued exercise, no definitive recommendation can be made. Furthermore, studies are needed that investigate the benefits and risks of increasing physical activity in those with long-term sedentary lifestyles. This is a low-effort intervention because it requires little time from the provider and poses little risk to elderly patients, with the possible exception of those with prolonged sedentary lifestyles.

MOBILITY, ACTIVITIES OF DAILY LIVING, AND INSTRUMENTAL ACTIVITIES OF DAILY LIVING

Overview. Around 20% of the elderly have some limitation of activities of daily living (ADL), mobility, or instrumental activities of daily living (IADL), with limitations increasing sharply with age.[77] Adverse effects of these limitations may include immobilization, hip fractures, and depression, as well as increased need for caretaker assistance. Furthermore, decreased ability to perform ADL or IADL is a good marker for risk of institutionalization or death in community-dwelling elderly.[78,79] A wide variety of screening instruments exist to assess mobility and ADL, and IADL capabilities.[80,81] Specific treatment can ameliorate the condition of only certain ADL and IADL deficits, however, and we are unaware of any study showing that intervention improves overall health outcomes.

Evaluation. Measures to improve mobility and performance of ADL and IADL are of unclear effectiveness. Criterion 4c is not met because there is no level I or II evidence that treating impaired mobility or ADL or IADL dependency improves health outcome. Possibly criterion 2 is unmet as well, because it is unclear whether effective treatment exists for many types of ADL and IADL deficiencies. Future studies investigating this area need to focus on those deficits that are correctable. It

should be noted that criterion 5 probably is met because improving ADL and IADL deficits should decrease caretaker burdens.

Recommendation. The USPSTF did not evaluate this category. No definitive recommendation can be made until studies are performed that evaluate whether remediation of deficiencies in ability to perform ADL improves health outcomes. This is considered a low-effort intervention because short, accurate screening instruments are available. The increased incidence of disability with age[77] suggests improved effectiveness from screening the old old.

NUTRITION

Overview. It is unclear whether malnutrition is prevalent in the elderly; some cite a 50% prevalence,[82] with an increase with age,[51,83] whereas others believe it is uncommon.[10] Where it does exist, reasons include poor dentition, decreased number of taste buds, decreased mobility, living alone, and food costs.[4,84] Diet plays a role in many diseases, including hypertension, coronary artery disease, cancer, dental disease, and osteoporosis,[4] and has been correlated with poor health status.[85] Preventive programs for nutrition can be divided into two categories: (1) counseling about general nutrition, such as fat and sodium intake, and (2) screening for over- or undernutrition. No level I or II evidence exists for the elderly for either of these preventive measures. In particular, although reducing sodium intake is effective in reducing blood pressure in hypertensive patients and low fat diets are effective in combating coronary artery disease in patients aged 18 to 59 years,[16] no studies have shown benefits for either of these in asymptomatic elderly patients. Furthermore, programs to improve nutritional status may adversely affect quality of life and place a significant burden on caretakers.

Evaluation. Dietary interventions are of unclear effectiveness. All the evidence for nutrition screening in the elderly can be categorized as level III. The effectiveness of intervention in asymptomatic elderly persons has not clearly been established (thus, criterion 3 for primary prevention and criterion 4c for secondary prevention are not met), and the effects of a treatment program on caregivers is unclear (criterion 5). Furthermore, because the incidence of malnutrition may not be significant in the American community-dwelling elderly,[10] the costs of mass screening may outweigh the benefits (failing to meet criterion 6).

Recommendation. For the elderly, we disagree with the USPSTF recommendations to routinely discuss general nutrition with patients. Research is needed to investigate the unknowns listed above. For now, in the absence of

firm data, clinicians who wish to provide dietary interventions should consider concentrating on overnutrition in the young old and on undernutrition in the old old. This is considered a low-effort intervention.

PODIATRY

Overview. Thirty-five percent of the elderly have foot problems.[86] Although 77% of the old old had difficulty cutting their toenails, more than half did not receive podiatric care.[87] Physical examination can detect many foot problems that are unmentioned by patients.[87] These may contribute to discomfort, diminished ambulation, decreased quality of life, and even amputation.[88] Many are treatable,[88,89] but no evidence exists that early treatment makes a difference.[10] A British study revealed that approximately 20% of elderly persons not seeing a podiatrist received help at home with footcare from caregivers.[87]

Evaluation. Interventions to improve foot care are of unclear effectiveness. There is no level I or II evidence that treatment in patients who do not complain of a podiatric problem improves health (thus, it does not meet criterion 4c). No data have been gathered in the United States regarding criterion 5. A British study,[87] however, suggests that podiatric problems may be a significant burden for caregivers.

Recommendation. This intervention was not reviewed by the USPSTF. More research is needed. Clinicians who decide to include this area should consider doing so only for the old old because of the increased prevalence of foot problems in this age group.[87] It is considered a low-effort intervention.

POLYPHARMACY

Overview. Seventy-five percent of elderly persons take at least one medication.[90,91] The number of drugs taken increases with age; those 85 years and older take 50% more drugs than the younger elderly.[92] It is generally feasible to determine how many drugs a patient takes by asking (except in patients with cognitive impairment). Because of the increased number and severity of medical conditions and age-associated declines in both renal and hepatic function, the elderly are potentially more vulnerable to medication-related side effects.[13,93,94] Affordability of medication and the inability to remember dosage schedules are also problems.

Evaluation. Preventive measures intended to reduce or prevent polypharmacy are of unclear effectiveness. Interventions may reduce costs and risks to patients and save time and costs for caretakers of dependent elderly. However, although many authorities believe polypharmacy is a major geriatric problem and that interventions to re-

duce it are effective and indicated,[93,94] we are aware of no level I or II studies documenting the benefits of such interventions. Therefore, criterion 4c is not met.

Recommendation. This area was not addressed by the USPSTF. Well-designed studies evaluating the effectiveness of minimizing polypharmacy are needed. If clinicians wish to intervene, targeting the old old would be logical because of their documented increased drug use[92] and potential increased susceptibility to side effects. Intervention to reduce polypharmacy is a low-effort intervention.

PSYCHOSOCIAL: DEMENTIA

Overview. Although dementia is relatively infrequent in those younger than 75 years, a recent community survey found rates of 19% in those 75 to 84 years and 47% in those 85 years and older.[95] Of the screened population, 84% with moderate to severe cognitive impairment had Alzheimer's disease. Individuals with Alzheimer's disease are at increased risk of falls and fractures,[96] and may be at increased risk of being in or causing automobile accidents.[31,97] The automobile data need to be interpreted with caution, as one study did not have a control group and the other used an outdated definition of *senility*, which included many disorders not usually related to cognitive impairment. Fourteen percent of dementias seen in an ambulatory university setting were partially reversible in the short term, and the general condition of 23% of the patients improved with treatment of coexisting conditions.[98] Providing care for dementia patients may be demanding and time-consuming, and caregivers frequently suffer significant psychological distress.[99] Some authorities believe that early identification of cognitive impairment may aid families and individuals in obtaining additional support and in making long-term financial, residential, and terminal care plans.[16,100,101] Several screening tests for cognitive impairment are available, of which the Mini-Mental State Examination[102] seems to be the most popular.

Evaluation. Efforts to identify dementia are of unclear effectiveness. Criterion 4b is equivocal because, although the Mini-Mental State Examination has fair to good sensitivity and specificity in hospital patients, its general applicability is unclear.[103] Other instruments have similar or worse problems.[104] Furthermore, criterion 4c and 5 are not met because (1) no evidence exists that detecting dementia in the presymptomatic phase has a significant impact on illness outcome; and (2) the theory that family members and society may benefit from early detection of dementia by enabling future planning, support, and identification of individuals at risk for motor vehicle accidents is supported only by level III evidence.

Recommendation. The USPSTF suggested that physicians inquire periodically about the functional status of elderly patients at home but recommended they not screen for dementia. We believe no definitive recommendation can be made on the basis of existing evidence. Nonetheless, because of the potential risks to society of demented persons driving, clinicians may want to consider screening all persons over 75 years for dementia with a simple validated test.[80,100] If restricted to this group, we classify dementia screening as a low-effort intervention. In the young old, however, because of its much lower frequency, dementia screening is a high-effort intervention. Subsequent studies should assess more adequately the true magnitude of the risk of the demented driver to society and the potential benefit or harm of early detection to families.

PSYCHOSOCIAL: DEPRESSION

Overview. Depression occurs in 10% to 13% of the elderly[10,105,106] owing to various causes, including decreased sensory input, isolation, recent bereavement, loss of friends and family members, recent significant personal losses, worry about loss of income-producing ability, and feelings of hopelessness and despair. Complications of depression include increased morbidity and suicide.[10,107,108] Treatment is readily available and relatively effective,[109] but may be costly if long-term. Screening questionnaires exist but are not specific for the elderly, and many are time-consuming or, if short, less accurate. No evidence exists that treatment in the pre-awareness phase leads to a superior outcome.[16]

Evaluation. Preventive measures to identify depression are of unclear effectiveness. Level I or II evidence for criteria 4b and 4c is lacking. Furthermore, the reliability and reproducibility of making a definitive diagnosis of depression is poor, and there is no evidence that intervention is more effective if done early in the course of the disease.[16]

Recommendation. The USPSTF recommended that screening for depression is not warranted at this time. Clinicians should, however, be aware of the increased prevalence of depression in the elderly. Because of lack of definitive evidence, we classify this intervention as having unproven effectiveness and consider it a high-effort intervention because of the time commitment required.

SMOKING

Overview. Smoking is common in the elderly; 17.9% of elderly men and 16.8% of elderly women smoke.[110] Smoking causes numerous medical problems,[16] is probably the single leading cause of death in this country,[16] and is easily detected while taking the patient's history. Cessation of smoking decreases morbidity from coronary artery disease,[111,112] improves cerebral perfusion,[113] and reduces the risk of lung cancer.[114] Cardiovascular benefits of smoking cessation show no diminution of the beneficial effect with increasing age.[115] Ninety percent of smokers wish to quit,[116] and patients are more likely to stop when their physician recommends that they do so[117]; however, only 6% of patients who quit have continued to refrain from tobacco 1 year later.[16] The most effective smoking cessation techniques or programs involve multiple modalities, use both physicians and nonphysicians, are individualized, and occur on multiple occasions.[118]

Evaluation. Smoking clearly meets all the criteria with level I or II evidence, including criterion 6.[119] Despite the low long-term quitting rate following physician counseling alone, smoking is such a serious health risk that even a small positive impact has enormous beneficial health effects for the population.[119] Unfortunately, physicians often fail to emphasize smoking cessation to geriatric patients who smoke.

Recommendation. We agree with the USPSTF recommendation to recommend cessation of smoking. At each health maintenance visit, physicians should strongly encourage patients who smoke to stop, regardless of the patient's age, unless that person's life expectancy is under 2 years.

URINARY INCONTINENCE

Overview. Loss of bladder control is very common, affecting approximately 20% of community-dwelling and 40% of institutionalized elderly.[13,120,121] The prevalence and severity of loss of bladder control increase with age.[122] The problem is grossly underreported, with estimates that only 50% of cases are acknowledged by the patient or recognized by the physician.[122] Its sequelae can be significant for both patients and their families, including dependence, depression, loss of self-confidence, social withdrawal and isolation, physiological and functional decline, and possible institutionalization.[123] Urinary incontinence and its underlying causes are detectable by taking a careful history, by physical examination, and, as needed, by tests.[124] Treatment is often effective, usually well tolerated, frequently minimizes the resulting psychological and physical damage, and can preserve the patient's quality of life.[123] No level I or II evidence exists, however, supporting the premise that screening for patients with urinary incontinence improves health more than waiting until they notify a provider about it.

Evaluation. Efforts to identify urinary incontinence are of unclear effectiveness. Although criterion 5 is met,[123] the evidence for criterion 4 is only level III. In view of the high prevalence of urinary incontinence, the fact that it

increases with age, and the ready availability of treatment, it would appear that if future studies did meet criterion 4, this intervention would be cost-effective (especially for the old old), thus meeting criterion 6.

Recommendation. This area was not discussed by the USPSTF. It is considered a low-effort intervention. If clinicians wish to include it in their geriatric health maintenance program, it is more likely to be effective for the old old.

Physical Examination

BLOOD PRESSURE

Overview. Hypertension increases with age and is associated with increased morbidity and mortality; the prevalence in those aged 65 to 74 years is estimated at 64%, and is higher in blacks.[7,125,126] It can be cheaply, easily, and accurately detected by a sphygmomanometer. Treatment in the elderly reduces cardiovascular mortality, including death from strokes.[126-128] The Hypertension Detection and Follow-up Program found a reduction in *overall* mortality for individuals who started the program at age 60 to 69 years.[125] The Systolic Hypertension in Elderly Persons (SHEP) study demonstrated that treatment of systolic hypertension reduced the incidence of total stroke and major cardiovascular events.[129] Controversy remains over whether there should be different screening guidelines for the old old. The SHEP study showed a significant reduction in stroke in those who were treated,[129] but did not specify whether there was an overall improved mortality for this age group, or whether they had a different incidence of side effects. The European Working Party for High Blood Pressure in the Elderly study did not find a beneficial effect of treating hypertension in those over 80 years of age.[130] A Finnish study, which found mortality in a community to be inversely related to blood pressure in those aged 85 years and older, also suggests this age group should be treated less aggressively[131]; however, substantial design deficiencies exist in this study, and and its generalizability is questionable.

Evaluation. Blood pressure screening is effective. The evidence clearly supports screening the elderly for hypertension, especially the young old (criteria 4,[129] and 6[125–129]). Although criterion 5 has not been specifically addressed, decreasing the prevalence of stroke should reduce the demands of caretakers who would otherwise care for these persons.

Recommendation. We agree with the recommendation of the USPSTF to screen all persons for hypertension. More information is needed about treating hypertension in the

old old. Until this is available, the Finnish study[131] and the European Working Party results[130] suggest the need for caution in treating those older than 80 years.

CANCER SCREENING: BREAST

In 1986, nearly 90% of all deaths from cancer occurred in the elderly.[132]

Overview. An estimated 44,000 women will have died from breast cancer in 1991,[132] and incidence and mortality rate rise progressively from age 65 to 85 years.[133] Early detection regimens for breast cancer consist of breast self-examination, clinical examination of the breast, and mammography. Monthly self-examination has a sensitivity of 25% and an uncertain specificity,[134,135] whereas clinical breast examination alone has a 45% sensitivity.[134] The sensitivity of mammography depends on the size of the lesion, the patient's age, and the extent of follow-up care. Its specificity approximates 95%.[136,137] The more frequently referenced studies on the effectiveness of clinical breast examination or mammography do not include women 65 years of age and older.[138–141] Randomized clinical trials that did include women 65 years of age and older demonstrate improved breast cancer outcomes by early detection with single-view mammography yearly[142] or every 2 years.[143,144] Nevertheless, only half of women aged 40 years and older had a physician breast examination, and only 20% aged 50 years and older had a mammogram within the previous year.[145,146] Although 80% of women obtain mammograms in response to physician referral,[147] only 37% of physicians adhere to mammography screening guidelines.[148] Thus, many women are not screened, and the percentage of those screened decreases with age. Clinical breast examination and mammography are readily acceptable and noninvasive, and are becoming reasonably priced.

Evaluation. Breast cancer screening is effective in women up to age 75 years. Effectiveness is unclear in women older than 75 years. For women aged 65 to 74 years, criterion 4 is clearly met; the combination of yearly clinical examinations and mammograms has proved effective in detecting early asymptomatic stages of the disease with subsequent excellent prognosis from early treatment through level 1 data.[142–144,149] There are, however, no data to support clinical breast examinations and mammograms beyond 75 years of age. The USPSTF hypothesizes that the incidence of breast cancer will be relatively low among women aged 75 years and older with previous normal screening, thus limiting the effectiveness of further screening.[16] Therefore, criteria 4b and 4c are unclear for women 75 years of age and older.

Mathematical modeling of breast cancer screening for women between the ages of 40 and 75 years has suggested small increases in life expectancy at relatively high costs[149]; however, the information is inadequate to assess criterion 6 in the elderly.

Recommendation. We agree with the USPSTF recommendations that all women should receive an annual clinical breast examination and mammography until the age of 75 years. If no pathology has been found by then, clinicians may consider concluding mammographic screening. For women over 75 years who have never had a mammogram, the data are less clear as to effectiveness, and further research is needed before definitive recommendations can be made about instituting this high-effort service.

CANCER SCREENING: CERVIX

Overview. The incidence of cervical cancer is greatest in those 50 years and older.[133] Older women are more likely to have advanced disease, thus having a worse prognosis.[150] Papanicolaou smear tests are acceptable to physicians and patients, minimally invasive, inexpensive, and effective in screening for cervical cancer.[145,151–156] The 80% decreased cervical cancer mortality rate from the 1950s to the present is thought to be due to the widespread use of Papanicolaou smears.[152,153] Still, one of three women do not receive Papanicolaou smear tests as recommended.[146,157–159] In the elderly, half of those over 65 years of age never received a Papanicolaou smear test, and three of four received the smear test only episodically.[160,161] However, although some believe that regular Papanicolaou smear tests are cost-effective in elderly women who have had no previous regular Papanicolaou tests,[162] others disagree.[163] For elderly women who have had previous unremarkable Papanicolaou smears, the incidence of cervical cancer is very low.[164]

Evaluation. Cervical cancer screening is of unclear effectiveness for women over the age of 65 years with minimal previous screening. For women 65 years and older with previous screening, additional screening is not effective. Women with previous regular Papanicolaou smear tests fail criterion 1, thus limiting the usefulness of continued screening.[164] Implications for the cohort of women 65 years of age and older who have had minimal previous screening are less clear. Although criteria 4a, 4b, and 4c are met with level II data or better for younger populations,[151–156] no similar data exist for the elderly.

Recommendation. We agree with the USPSTF recommendation not to screen women 65 years of age and older who have had previous normal Papanicolaou smear tests. No definitive recommendation can be made for

women in this age group who previously had minimal screening for cancer. This is considered a high-effort intervention, especially for the old old. All women with previous abnormal Papanicolaou smear tests or cervical carcinoma should have received a period of intensive evaluation and follow-up care as appropriate for the specific abnormality found. Because of their risk of recurrence, even if treated appropriately, these women need to continue receiving Papanicolaou smear tests every 2 to 3 years for the rest of their lives.

CANCER SCREENING: COLORECTAL

Overview. An estimated 61,000 people will have died from colorectal cancer in 1991,[132] with the mortality rate increasing significantly for each 5-year interval after age 60 years.[133] Screening regimens consist of digital rectal examinations, fecal occult blood testing, and sigmoidoscopy. Digital rectal examinations detect only 10% or less of colorectal cancers.[165] Fecal occult blood tests are not very accurate; in asymptomatic people over aged 50 years, the positive predictive value is only 5% to 10% for carcinoma and 30% for adenomas.[166–168] The sensitivity of sigmoidoscopy for detecting colorectal cancers is directly related to the length of the colorectal mucosa examined: 25% with the rigid sigmoidoscope and 60% sensitivity with the 65-cm flexible sigmoidoscope.[169,170] As the USPSTF notes, no clear-cut evidence exists that early detection of colorectal cancer reduces subsequent morbidity and mortality.[16]

Evaluation. Screening for colorectal cancer is of unclear effectiveness. Colorectal cancer does have an asymptomatic period, but providers are currently unable to reliably detect the disease or discriminate between cases and noncases. In addition, although data supporting the effectiveness of intervention during the "pre-awareness period" (criterion 4c) are based primarily on randomized trials, cohort studies, or case-control studies,[171–175] all are of limited quality owing to flaws in the study designs or methods used. It is generally accepted that routine use of these screening procedures has not decreased morbidity or mortality from colorectal cancer.[16] The USPSTF rated the quality of evidence as level III.[16] Although preventive services for colorectal cancer have been theorized to increase life expectancy by 30.2 days with annual occult blood testing and by 42.6 days with annual occult blood testing and 60-cm flexible sigmoidoscopy every 3 years,[176] these calculations were based on the limited-quality data mentioned above. Although not specifically studied in the elderly, the documented immense cost of screening for colorectal cancer for all ages[177] implies that the relative value of preventive services for colorectal cancer does not meet criterion 6.

Recommendation. The USPSTF recommendation to offer screening for colorectal cancer to persons 50 years of age and older is not fully supported by the evidence. Until its efficacy is proven, routine colorectal screening recommendations cannot be made. This is considered a high-effort intervention because of the cost and potential adverse effects of the screening tests.

CANCER SCREENING: LUNG

Overview. About 142,000 deaths from lung cancer were predicted for 1991,[132] with the highest incidence[178] and mortality[132] among the elderly. Early detection regimens include chest radiographs, sputum cytology, or some combination of both. Several studies, including level I and II studies, have evaluated the efficacy of these procedures,[179-185] and none reported reduced mortality from lung cancer with screening. Moreover, these tests have a relatively high false-positive rate.[186]

Evaluation. Lung cancer screening is not effective. Criteria 4b and 4c are unmet because providers are unable to reliably detect presymptomatic disease, to reliably discriminate between cases and noncases, or to alter the outcome by treatment.[179-186] Given the poor reliability of the available tests for lung cancer,[147] criterion 6 is not met.

Recommendation. We agree with the USPSTF recommendation that screening for lung cancer should not be done in this age group.

CANCER SCREENING: ORAL CAVITY

Overview. The incidence and mortality rates for oral cancers are highest in the elderly[133]; over half the cases and the majority of deaths occur in this age group.[187] Persons using tobacco products or excessive alcohol or both are at increased risk.[187-189] Screening procedures include cytological scrapings or oral rinses, oral inspection, and oral palpation. Cytological scrapings and oral rinses are ineffective, even in high-risk populations.[189-192] Although some argue for screening high-risk populations with oral inspection and palpation,[193-195] no level I or II data are available on the sensitivity and specificity of visual inspection and palpation of the oral cavity. Moreover, exhaustive inspection and palpation of the oral cavity are not simple to perform by the average physician.

Evaluation. Examining the oral cavity as a preventive measure is of unclear effectiveness. No evidence exists on which to evaluate the reliability of oral inspection and palpation in detecting cases and discriminating between cases and noncases. Also, no data exist on which to evaluate the effectiveness of intervention during this asymptomatic period. Therefore, preventive interventions for oral cancer do not meet criterion 4.

Recommendation. We agree with the USPSTF recommendation that primary care physicians should not screen patients for this, but disagree with their recommendation to consider screening high-risk elderly persons. No level I or II evidence exists supporting reduced morbidity and mortality in the elderly from early detection with current screening techniques, even among high-risk individuals. More data are needed about this intervention, which we classify as high effort. Users of tobacco products, however, should be advised to cease using tobacco products (see Smoking).

CANCER SCREENING: OVARY

Overview. Ovarian cancer was predicted to be the fifth leading cause of cancer death in women in 1991, with an estimated 12,500 deaths.[132] The highest incidence and mortality rate was predicted to be among women aged 55 years and older.[132] More than two thirds of ovarian cancer patients are initially diagnosed with advanced disease and have a 5-year survival rate of 15% to 20%.[132] The overall 5-year survival rate increased significantly between 1960 and 1985 but remains low at 38%.[132] Stage I ovarian cancer has a cure rate as high as 90%,[196,197] and produces no symptoms. Early detection procedures for ovarian cancer include bimanual pelvic examination, Papanicolaou smear, cytologic evaluation of peritoneal lavage, serum tumor markers, and ultrasound imaging. Neither the pelvic examination[198] nor the Papanicolaou smear test[199,200] is reliable for screening for this disease. Cytologic examination of peritoneal fluid has poor sensitivity and is impractical.[198,201] Serum levels of CA-125 have been reported to be elevated in 80% of ovarian cancer patients,[202] but many questions need to be answered before testing for CA-125 level can be recommended as a screening test. Abdominal ultrasound imaging has a low yield in asymptomatic women and generates many false-positive studies,[201-204] although preliminary evidence suggests that transvaginal ultrasound may improve the performance of this screening approach.[205,206] There is a need for a well-designed clinical trial.

Evaluation. Screening for ovarian cancer is of unclear effectiveness. Ovarian cancer has an symptomatic period, but the pelvic examination and Papanicolaou smear are unreliable for early detection[198-200] (criterion 4b is not met). The data on ultrasound and serum tumor markers indicate poor reliability in detecting cases and discriminating between cases and noncases. In addition, no evidence exists on which to evaluate these procedures for efficacy. Therefore, 4c is not met.

Recommendation. The USPSTF recommends not screening for ovarian cancer. Until further data are available,

especially in view of preliminary evidence using transvaginal ultrasound,[205,206] we believe no definitive recommendation can currently be made. This represents a high-effort intervention.

CANCER SCREENING: PENIS

Overview. Penile cancer is rare in the United States. The incidence is from 0.1 to 9.2 per 100,000 men, with the highest incidence in men 85 years and older. Death is uncommon, with 3.1 deaths per 100,000 men.[133] No screening procedures are discussed in the medical literature because the extremely low incidence rates in this country make any screening effort unnecessary.

Evaluation. Screening for penile cancer is not effective because the prevalence is so low (fails to meet criterion 1) that it does not have a significant effect on the health of elderly men.

Recommendation. The USPSTF did not review a preventive service for penile cancer. We recommend that no screening be done for penile cancer.

CANCER SCREENING: PROSTATE

Overview. This is the most frequent cancer occurring among men aged 70 years and older.[133] Despite advances in therapy, mortality from prostate cancer has not changed over the last 30 years.[132] Only 61% of men are initially diagnosed with localized disease; the remainder have distant metastasis or local extracapsular spread,[207] and a significantly worse prognosis. Screening regimens include annual digital rectal examinations, transrectal ultrasonography, and serum tumor markers. Digital examinations have limited sensitivity. Several studies document that cancer often occurs in the nonpalpable areas of the prostate[208,209]; the sensitivity of palpation ranges from 55% to 69%, and its specificity from 26% to 96%.[210–213] The limited data available about transrectal ultrasound suggest a positive predictive value of only 3% to 31%[212,213] because many benign diseases give false-positive results.[214] Prostatic acid phosphatase has poor sensitivity[215] and prostatic-specific antigen has poor specificity.[215,216] Recent evaluations of single use and combined use of the various screening procedures show evidence of better efficacy in identifying cases and discriminating them from controls[213,217]; however, there is no evidence that early detection improves the morbidity or mortality rate. Prostate cancer has a good prognosis; only 1 in 380 men who are diagnosed with the disease die from it.[211] Thus, screening may subject men to unnecessary morbidity and mortality, given the procedures necessary as a result of false-positive screening test results.

Evaluation. Screening for prostate cancer is of unclear effectiveness. The currently available tests cannot reliably discriminate between cases and noncases.[208–217] Thus, criteria 4a and 4b are not met. Likewise, criterion 4c is also not met because no evidence exists documenting that intervention during the asymptomatic phase has greater effectiveness than delayed detection.

Recommendation. No recommendations can be made whether to perform screening tests for prostatic cancer. Further studies are needed to clarify the various screening tests available. This is considered a high-effort intervention.

CANCER SCREENING: SKIN

Overview. Although the incidence and mortality rate of malignant melanoma increase with age, the mortality rate remains relatively low at 1.5 per 100,000.[133] Nonmelanoma skin cancers are 30-fold more common[132,218] and rarely cause death, but contribute significantly to morbidity.[219] Early detection reduces morbidity from nonmelanoma skin cancer and mortality from melanoma.[218] Screening procedures are self-examination and physician examination. No data exist on the accuracy of self-examination, and data on the efficacy of early detection of melanoma are primarily from descriptive studies (level III quality of data)[220–223]; moreover, patients detecting suspicious lesions frequently delay seeking medical attention.[224] Physician examination of the skin involves the issues of how much skin to examine and who should perform the examination. Those performing a complete skin examination are 6.4 times more likely to detect melanomas than those doing partial examinations.[225] The sensitivity and specificity of the examination vary widely, depending on the skill of the physician, ranging from 33% to 98% for sensitivity and 45% to 95% for specificity.[226–228]

Evaluation. Screening measures for skin cancer are of unclear effectiveness. For all skin cancers, criterion 4 is not clearly met: providers are unable to reliably detect cases and discriminate between cases and noncases (criterion 4b), and no evidence exists that intervention during the asymptomatic phase results in better outcomes than delayed intervention (criterion 4c).

Recommendation. The USPSTF recommends against routine complete skin examination. This may be true, but more research is needed—especially in people at high risk (family or personal history of skin cancer, dysplastic nevi, congenital nevi, or increased sunlight exposure)—before definitive recommendations can be made about eliminating this high-effort intervention.

CANCER SCREENING: UTERUS

Overview. Cancer of the uterine fundus is relatively common; the peak incidence is in women 60 to 74 years of age, and the peak mortality is in those 85 years and older.[133] Early detection procedures are bimanual pelvic examination, Papanicolaou smear, endocervical aspiration, and endometrial sampling. The first three are not useful or reliable screening tools for this disease.[229,230] Endometrial sampling can detect occult endometrial cancer and is readily accepted by physicians and patients, but is moderately expensive, invasive, and of undetermined accuracy.[229–231] In addition, early detection in asymptomatic women has not been shown to affect the outcome.[230]

Evaluation. Screening for uterine cancer is of unclear effectiveness. Criteria 4b and 4c are not met because it has not been shown that providers can discriminate between cases and noncases, and no evidence exists that detection during the asymptomatic period improves the outcome. Furthermore, even if level I or II studies document the effectiveness of detecting asymptomatic uterine cancer, it is possible that criterion 6 would not be met because endometrial screening is currently expensive and invasive.

Recommendation. This area was not reviewed by the USPSTF. The evidence regarding screening for uterine cancer is unclear and prevents making definitive recommendations about implementing this high-effort intervention.

CANCER SCREENING: VAGINA AND VULVA

Overview. An estimated 4900 new cases of vaginal and vulvar cancer were detected and 1100 deaths occurred in 1990,[132] with the highest mortality rate in women between the ages of 50 and 70 years.[232] Vaginal cancer screening consists of visual inspection and vaginal wall Papanicolaou smears; however, no data exist to support the effectiveness of these techniques. Vulvar cancer screening entails visual inspection and biopsy of suspicious lesions. All screening procedures are significantly restricted by the low prevalence and incidence rates of these cancers.

Evaluation. Screening for vulvar and vaginal cancers is not effective. The incidence of vulvar and vaginal cancers is low, which limits the impact of screening on the health of elderly women (fails to meet criterion 1) and the cost-effectiveness of any possible intervention (fails to meet criterion 6).

Recommendation. These were not addressed by the USPSTF. We recommend not screening for these cancers.

CAROTID ARTERY STENOSIS

Overview. Cerebrovascular disease is the third leading cause of death in the United States, accounting for $5 billion in health care costs[16] and causing much morbidity. Auscultation for carotid artery bruits and Doppler ultrasonography are noninvasive, acceptable, and relatively inexpensive procedures that can detect people at high risk for cerebrovascular accidents.[41] A recent study[233] documented the effectiveness of carotid endarterectomy in symptomatic patients with high-grade stenosis; the elderly benefited equally. Patients aged 80 years and older, however, were specifically excluded from this study. Likewise, no evidence exists that similar treatment of asymptomatic patients is more effective than waiting until they have symptoms.[16] Furthermore, as the extensive USPSTF review documents, some studies have demonstrated a significant risk to carotid endarterectomies in the elderly.[16]

Evaluation. Screening for carotid artery stenosis is effective for symptomatic young old persons. Its effectiveness, however, for those symptomatic persons aged 80 years and older is unclear. For symptomatic young old, level I evidence supports treatment of patients with high-grade stenosis who are operated on by highly qualified surgeons (thus meeting criterion 4c).[233] However, as the authors themselves stated, it is not clear that the same results would occur in patients with less severe lesions, in other hospitals, or in the old old. For asymptomatic persons, criterion 4 is not met because of the lack of evidence that presymptomatic treatment is more beneficial, and criterion 6 is not met because serious questions exist as to whether the potential benefits of carotid endarterectomy in asymptomatic persons outweigh its complications, particularly in the old old.[16] Any further evaluative studies should include the tremendous cost to society of carotid endarterectomies, and whether the old old respond similarly to the young old.

Recommendation. Where high quality surgical services are available, symptomatic patients under 80 years of age should be evaluated for high-grade stenoses with ultrasound and, if indicated, with angiography. No definitive recommendation can be made for asymptomatic patients or symptomatic patients 80 years old and older, however, pending the results of well-done studies on these persons. Evaluation of asymptomatic patients is considered a high-effort intervention.

HEARING

Overview. Hearing loss increases with age and occurs in 23% of those 65 to 74 years old, 33% of those 75 to 84 years old, and 48% of those older than 84 years.[16] It may reduce communication ability and cause isolation, de-

pression, and other psychosocial problems,[16] as well as functional handicaps,[105] although 20% of the elderly with hearing loss have few problems from it.[234] Questionnaires are available for detecting hearing loss in the elderly,[235,236] but these are either lengthy or of undetermined effectiveness. Pure tone audiometry with the Welch Allyn audioscope (Welch Allyn, Skaneateles Falls, NY) is easily performed, 94% sensitive, and 72% specific.[237] Using an overall hearing loss prevalence in the elderly of 34%, we calculate a positive predictive value of 0.63 for this test. Treatment with assistive devices[238] and hearing aids is often effective, and new digital aids should prove especially attractive in the future.[239] Giving hearing aids to hearing-impaired elderly individuals identified by screening does result in a better quality of life in these patients as compared with those who were not treated.[240]

Evaluation. Screening for hearing loss is effective. All criteria are met. Criterion 4[237,240] is clearly met. Considering the high prevalence of hearing loss, relative ease of screening, and noninvasiveness of the test, criterion 6 is most likely also met. There is little information regarding criterion 5. It would appear that treatment of hearing loss would reduce the frustration of caregivers in communicating with these persons.[241]

Recommendation. We agree with the USPSTF recommendation to periodically screen all elderly persons. Inexpensive methods of screening should be considered, with confirmation of abnormals by more definitive audiological examinations. Because hearing loss increases with age, the benefit of screening the old old is expected to be especially high.

THYROID PALPATION

Overview. People who have been exposed to neck irradiation when young are more likely to develop thyroid cancer. The prognosis is good (5-year survival rate of 90% in those treated),[16] but no studies document that treating asymptomatic persons gives better results than treating symptomatic patients. Furthermore, screening is not reproducible owing to the great interpersonal variability in examining thyroids.[16]

Evaluation. Thyroid palpation as a screening test is of unclear effectiveness. There is no reliable screening test for thyroid cancer (thus, criterion 4b is not met). Even if there were, 4c is not met because no evidence indicates that early detection reduces morbidity.

Recommendation. The USPSTF suggested that periodic thyroid palpation be performed only if indicated clinically, not routinely. Although this appears reasonable, the evidence does not support a definitive recommendation.

VISION: ACUITY SCREENING

Overview. According to data from the National Center for Health Statistics, 26% of those 65 to 74 years of age who did not wear corrective lenses had a visual acuity of 20/50 or less.[242] Impaired visual acuity has been linked to falls and hip fractures,[243,244] isolation, and an overall diminished quality of life. No prospective study, however, has documented that screening asymptomatic elderly persons for poor visual acuity reduces morbidity or improves health or ability to perform ADL or IADL as opposed to examining only those with symptoms.[16]

Evaluation. Visual acuity screening is of unclear effectiveness. Criterion 4c is not met in that no level I or II evidence exists that screening asymptomatic persons improves a patient's quality of life, prevents complications, or prevents affected persons from endangering others.

Recommendation. The USPSTF, while recognizing the lack of prospective studies, suggested that visual acuity screening may be appropriate in the elderly. Although this may be true, we believe that a firm recommendation cannot be made until studies document the effectiveness of this intervention. This is a low-effort intervention. The old old would be expected to benefit more because they are more vulnerable to problems, such as falls.

VISION: GLAUCOMA

Overview. Glaucoma is the second leading cause of blindness in the United States, and its prevalence increases with age.[16] Screening procedures include tonometry, ophthalmoscopy, and perimetry. The first two are fraught with poor positive and negative predictive values,[245] particularly in the primary care setting, and perimetry is impractical as a screening test. Furthermore, early treatment of open-angle glaucoma, though widely believed effective, has never been adequately demonstrated to retard visual loss.[16] In fact, Eddy et al[245] calculated that earlier diagnosis with tonometry does not make a substantial difference in patient outcome.

Evaluation. Glaucoma screening is not effective, especially for primary care physicians. Criterion 4 is not met; screening fails to meet criterion 4b because reliable screening tests are not available, and fails to meet 4c because evidence suggests that early treatment does not improve patient outcome.[245]

Recommendation. The USPSTF states that screening for glaucoma by an eye care specialist may be prudent in the elderly. The current evidence, however, does not support this recommendation.[245]

Laboratory

Patients with specific diseases such as diabetes should have the appropriate laboratory tests performed when indicated. In general, however, routine screening laboratory tests, including those for institutionalized elderly patients,[246] are not recommended. The following are evaluations of specific tests and procedures:

CHOLESTEROL

Overview. In the general population, serum cholesterol is a risk factor for coronary artery disease, the leading cause of death in the United States.[247] Two large-scale randomized primary prevention trials (level I evidence) demonstrated that lowering cholesterol in very hypercholesterolemic middle-aged men lowers cardiovascular, though not overall, mortality.[248,249] Total cholesterol levels are less predictive of coronary disease in the elderly than LDL or HDL levels, and total cholesterol levels above 6.2 mmol/L (240 mg/dL) are present in 32% of men and 52% of women between the ages of 65 and 74 years.[250] No clinical trials have assessed the benefits and risks of lowering cholesterol levels in this age group.[251] A recently reported computer simulation suggests that treatment of those with established coronary artery disease with lovastatin, a cholesterol-lowering agent, is significantly more cost-effective than primary prevention in the elderly.[252]

Evaluation. Serum cholesterol screening is of unclear effectiveness. Criterion 4c is not met.[247] Some believe screening would be of benefit because of the high incidence of coronary artery disease.[250] Without the results of controlled studies in elderly populations, however, the risks from this approach are unknown. The World Health Organization trial,[253] which demonstrated an increased overall mortality rate in the clofibrate treatment group, reminds us that interventions to lower cholesterol have the potential of being harmful. Furthermore, even if one believes intervention to be effective, the high prevalence of hypercholesterolemia in the asymptomatic elderly requiring measurement of lipoprotein fractions to distinguish those truly at risk would create an enormous burden on the health care system. Thus, criterion 6 is probably not met.

Recommendation. Although cholesterol screening is a popular topic today and is promoted by many, it has not been proven efficacious in the elderly. Because of the enormous costs involved, cholesterol screening is a high-effort intervention, and we disagree with the USPSTF recommendation that periodic screening may be prudent in this age group. Though still unproven, intervention in those with established disease may be more promising.[252]

There is little evidence to support screening those aged 75 years and older, and we feel screening is inappropriate in those who already have a poor quality of life or a life expectancy of under 3 years.

ELECTROCARDIOGRAM

Overview. Electrocardiograms (ECGs) are easy to perform, readily available, reproducible, and acceptable to physicians and patients. They are, however, of limited prognostic value. The annual probability that an asymptomatic person will have angina, myocardial infarction, or sudden death is low,[254] and the resting ECG has poor correlation with existing coronary artery disease and is a poor predictor of future events.[16] Early detection of coronary artery disease in asymptomatic people by a resting ECG resulted in no change in outcome.[255] ECGs obtained as a baseline to help with future clinical decision making have little impact on emergency department decision making.[256,257]

Evaluation. Screening electrocardiograms are not effective because ECGs have low specificity and poorly predict future cardiac events; thus this intervention fails to meet criteria 4a and 4b with level II-2 data or better.[254–257]

Recommendation. The USPSTF recommendation did not specifically address the elderly. It did state for all adults that it may be clinically prudent to obtain resting ECGs on patients with two or more cardiac risk factors. We disagree and recommend that ECGs not be done routinely in asymptomatic elderly patients, regardless of their cardiac risk, because of the test's poor specificity.

PLASMA GLUCOSE TESTING

Overview. Diabetes is the seventh leading cause of death in the United States and the leading cause of blindness.[16] It is common in the elderly, and the prevalence increases with age because of decreased glucose tolerance.[3,258] Glucose levels are easy to determine, readily available, and reproducible. Nonetheless, it can be difficult to establish the diagnosis of diabetes, and no evidence exists that early detection and treatment of diabetes mellitus in adults reduces subsequent morbidity and mortality.[16] The USPSTF concluded that there was fair evidence *not* to screen for diabetes in asymptomatic, low-risk adults.

Evaluation. Plasma glucose screening tests are not effective. Criterion 4b is unmet because no effective screening test exists. Moreover, criterion 4c is unmet because no level I or II evidence exists that early detection in asymptomatic persons improves outcome. We are unaware of any good evidence regarding screening the elderly at high risk.

Recommendation. We agree with the USPSTF recommendation not to routinely screen for diabetes unless

indicated by the patient's history and physical findings. The USPSTF stated that screening may be appropriate in those at high risk. Whether to screen asymptomatic elderly persons at high risk (positive family history, morbid obesity, history of gestational diabetes) is unclear.

THYROID FUNCTION TESTS

Overview. Hypothyroidism is more common in the elderly and often has an atypical presentation. It appears to be detected accurately with a TSH (thyroid-stimulating hormone) blood test, although this is still debated.[16] Treatment is effective and readily available. No evidence exists, however, that treating asymptomatic people results in a better outcome than waiting until they develop symptoms.[16]

Evaluation. Screening tests for hypothyroidism are of unclear effectiveness. Criterion 4c is not met because treating asymptomatic persons has not been shown to make a difference in outcome.

Recommendation. The USPSTF recommended that it may be clinically prudent to routinely perform thyroid testing on elderly women. We believe no definitive recommendation can currently be made because of lack of level I or II evidence, and we consider it a high-effort intervention because the cost to society of screening all elderly persons would be immense. Physicians should be aware, however, of the increased frequency and atypical presentation of hypothyroidism in the elderly.

TUBERCULIN SKIN TEST

Overview. Tuberculosis is increasing in prevalence, and the death rate is higher in the elderly; still, the incidence and prevalence in the general elderly population remains low.[16] It can be screened for simply and cheaply using skin tests. Chemoprophylactic treatment of asymptomatic persons reduces morbidity in treated elderly nursing home patients with few complications.[259] However, treatment of symptomatic patients is also very effective; most people with a positive tuberculin test do not develop turberculosis,[260] and some evidence suggests that risks of isoniazid prophylaxis increase with age.[261]

Evaluation. Screening for tuberculosis is of unclear effectiveness. Criterion 4c is not met because the evidence is inadequate that treatment of asymptomatic elderly persons improves health outcomes. The low incidence in ambulatory elderly persons suggests that even if criterion 4c were supported by evidence, criterion 6 would not be.

Recommendation. The USPSTF recommended that tuberculin skin tests should not be routinely performed on the community-dwelling elderly. There is inadequate evidence to make a definitive recommendation. It may be

indicated for high-risk groups, but the evidence for this is not clear either. Further studies are needed, particularly on high-risk groups such as Hispanics and persons being admitted to nursing homes. It is considered a high-effort intervention.

URINALYSIS

Overview. Elderly patients, especially women, have an increased incidence of urinary tract infections due to various causes.[16] This may increase with age.[16,262] Urinary infections are easily detected by cultures and by the presence of leukocytes or nitrates on a dipstick. No good evidence exists, however, that treatment of asymptomatic bacteriuria makes a difference,[16] and adverse reactions may occur to any antibiotics given.[262]

Evaluation. Screening urinalysis is of unclear effectiveness. Criterion 4c is not met because there is no evidence that treatment of asymptomatic persons improves subsequent outcome.[16]

Recommendation. The USPSTF states that it may be clinically prudent to perform routine dipstick urinalyses in persons over 60 years of age. Whether this is true cannot be stated until studies document the effectiveness of this approach. It is considered a high-effort intervention because the cost of obtaining urinalyses on all elderly patients would be large, and the potential of drug-related side effects during treatment of asymptomatic bacteriuria is also a concern.

Interventions

ADVANCE DIRECTIVES

Overview. Living wills, durable powers of attorney, and other forms of explicit value-based declarations are used to consent to or refuse various life-sustaining medical interventions.[263] Recent data suggest that most physicians are aware of living wills but only half initiate discussions with patients about them.[264] Advance directives can be inexpensive and have universal ethical recognition. They improve communication and trust, allow for easier and more confident treatment decisions, and promote patient autonomy.[265,266] They may also facilitate physicians' and caregivers' management of patients during critical events by decreasing unwanted critical care. Whether they are cost-effective or improve patients' quality of life is unclear. Furthermore, the percentage of patients who complete them after the recommendation of their physicians is unknown.

Evaluation. Advance directives as a preventive measure are of unclear effectiveness. Although the preponderance of expert opinion supports the routine use of advance

directives,[266] criterion 3 is not met because (1) no data exist that patients comply with a physician's suggestion to develop advance directives, and (2) there is a lack of evidence that completing advance directives preserves the quality of life. Criterion 5 seems to be met since advance directives should decrease the burden of caregivers, but no level I or level II data are available to confirm this. Criterion 6 has not been adequately evaluated at the present time.

Recommendation. The USPSTF did not address this intervention, and more research is needed. No recommendation can be definitively made until the effectiveness of physicians recommending advance directives is clearly documented. It would appear, however, that the old old would be more likely to benefit from advance directives. This is considered a low-effort intervention.

ASPIRIN

Overview. Cardiovascular diseases are a major cause of morbidity and mortality.[16] A recent study suggested that low-dose aspirin reduces this mortality,[267] but a similar British study did not[268]; both studies showed a trend, although not statistically significant, to a higher rate of hemorrhagic strokes in patients taking aspirin. Although it is cheap and easily taken, the long-term effects of regular aspirin, including the potential for gastrointestinal bleeding, were not evaluated.

Evaluation. Prescribing aspirin as a preventive health intervention is of unclear effectiveness. This intervention does not meet criterion 3, both because it is unclear whether early treatment prevents problems and because the benefits of treatment may not outweigh the risks. This may be particularly true in the elderly, who are more susceptible to medication side effects.

Recommendation. The USPSTF did not specifically address the elderly. Their recommendation for all adult men was to routinely prescribe low doses of aspirin for those who have risk factors for myocardial infarction and no contraindications. We believe the evidence does not support extending this recommendation to those aged 65 years and older. Data evaluating the effectiveness and long-term effects of routine aspirin ingestion in the elderly are needed. It is considered a high-effort intervention because of the potential risks of aspirin treatment.

ESTROGEN REPLACEMENT THERAPY: OSTEOPOROSIS

Overview. Osteoporosis affects 15 to 20 million Americans and accounts for 1.3 million fractures yearly.[269] The prevalence rises in women dramatically after menopause.[270] Estrogen deficiency contributes to bone loss.[271] There is level I and II evidence that estrogen replacement

therapy (ERT) may reduce the rate of bone loss in postmenopausal women,[272-281] and level II evidence that ERT reduces bone fractures.[272,273,275,282-286] Estrogen is easily taken, inexpensive, and reliable in content. It is most effective for preventing osteoporosis if started during the perimenopausal period and continued for 10 to 15 years.[287] There is little evidence to support instituting ERT in the elderly (who are all 15 to 30 years beyond menopause) to prevent osteoporosis, and little evidence as to whether or when to stop it if someone is already taking it. The potential benefits of ERT must be compared with the potential adverse effects of uterine and breast cancer.[288]

Evaluation. The effectiveness of ERT for the prevention of osteoporosis is unclear. Both the appropriate regimen and benefits of routine ERT for osteoporosis in the elderly are unclear; therefore, estrogen therapy fails to meet criterion 3.

Recommendation. We disagree with the USPSTF recommendation that ERT should be considered in all women who are at an increased risk for osteoporosis. Until evidence is available that ERT in the elderly reduces the sequelae of osteoporosis and does not have an impact on their health through increased breast or uterine cancers, no definitive recommendation can be made about instituting this high-effort service for osteoporosis in this age group.

ESTROGEN REPLACEMENT THERAPY: CORONARY ARTERY DISEASE

Overview. The risk of coronary artery disease rises after menopause.[270] Estrogen replacement therapy protects postmenopausal women from cardiovascular disease.[281,289,290] Daily estrogen therapy in women aged 65 to 74 years with an intact uterus is predicted to save 302 lives per 100,000 women annually.[288] This cardiovascular benefit, however, may be offset by the concomitant use of progesterone to reduce endometrial cancer.[290] Furthermore, the use of unopposed long-term estrogen also increases the risk of endometrial cancer tenfold and breast cancer twofold.[288]

Evaluation. Estrogen replacement therapy is effective for women who have had hysterectomies; its effectiveness for women with intact uteruses has not been established. The use of unopposed estrogen in women with hysterectomies significantly reduces their morbidity and mortality from cardiovascular disease without increasing the impact of adverse outcomes from ERT; therefore, criterion 3 is met.

Recommendation. The USPSTF did not specifically address this topic. The evidence supports recommending giving ERT routinely to all elderly women with hyster-

ectomies. For those who have not had a hysterectomy, however, no recommendations can be made. The exact regimen of estrogen or progesterone or both for these women is currently unclear and needs to be defined by well-designed studies.

Vaccinations

INFLUENZA VACCINE

Overview. Eighty to 90% of all influenza deaths occur in the elderly,[16] and they suffer increased morbidity from the disease as compared with younger persons.[260] The vaccine's efficacy varies depending on the accuracy of predicting which strain will be prevalent in the coming year. It is widely available and relatively well tolerated. Most studies support the effectiveness of the vaccine, although some disagreement remains,[16] in part because evidence exists that the elderly respond immunologically to the vaccine less than younger persons.[291]

Evaluation. Influenza vaccines are an effective preventive measure. Although some questions have been raised about vaccine efficacy in the elderly, and the effectiveness of the vaccine is subject to selection error (thus sometimes failing to meet criteria 3 and 6), the preponderance of level I and II evidence supports its effectiveness in reducing the significant adverse health impact on the elderly of the influenza virus. There are no data on criterion 5, but because the vaccine is well tolerated, preventing influenza infections should reduce the demand for caregivers to care for ill elderly persons.

Recommendation. We agree with the USPSTF recommendation that all patients aged 65 years and older be given influenza vaccines every year during the fall. Despite questions about immunogenicity, because morbidity and mortality is higher in the old old, intervention may be more effective in this age group.

PNEUMOCOCCAL VACCINE

Overview. Pneumonia is a leading cause of death in the elderly. The vaccine is inexpensive and easy to administer, and side effects are relatively rare, especially when given once (as is currently recommended). Although most believe it effective in preventing pneumococcal bacteremia in the elderly,[16,292] substantial evidence conflicts as to its effectiveness.[260,293]

Evaluation. Pneumococcal vaccine as a preventive measure is of unclear effectiveness. There is still enough controversy, as the USPSTF notes, that it does not meet criterion 3.[16,260,293] If criterion 3 is met, criterion 6 will most likely also be satisfied since the vaccine is relatively cheap, safe, and easy to administer. Reasoning similar to that used in the influenza section above suggests that

criterion 5 is also met, although this has likewise not been definitively evaluated.

Recommendation. The evidence seems to support the USPSTF recommendation to give this vaccine once to all persons over the age of 65 years. There is enough controversy about its efficacy, however, that concrete recommendations cannot be made. Further research is needed as to the effectiveness of pneumococcal vaccinations and the cost-benefit ratio to society. It is considered a low-effort intervention.

TETANUS VACCINE

Overview. Tetanus has a high fatality rate. Although its prevalence has been significantly reduced since the advent of the tetanus immunization, most current cases occur in the elderly, many of whom have low antibody titers.[16] The vaccine is relatively safe, easy to administer, widely available, and effective.

Evaluation. Tetanus vaccines are an effective intervention. All the criteria are clearly met, as delineated by the USPSTF.[16]

Recommendation. We agree with the USPSTF recommendation to give a tetanus or diphtheria tetanus vaccine to all patients every 10 years, or at any time they break the integrity of their skin and it has been over 5 years since their last vaccination.

Frequency of Visits

No clear evidence exists supporting any particular frequency of visits for elderly persons. This is a fertile area for additional research. Because the number of medical problems and the incidence of functional disability increase with age, some feel that increasing the frequency of visits with age would allow providers to detect correctable problems as well as reduce morbidity. In the old old, perhaps two or three health maintenance visits per year would be ideal. On the other hand, increasing the frequency of visits may not be cost-effective for all elderly persons, but rather only for a specific subset of them. One such group may be the physiologic old old. Another may be those who have certain risk factors that have not yet been determined. Regardless, additional visits at any age may be indicated for specific problems, depending on the physical and functional status of the patient.

It should be reemphasized that the items in our preventive medicine program are not intended as part of a history and physical examination. To emphasize the preventive aspects of these visits, we call them geriatric health maintenance program visits. Depending on the individual clinician's preference, these visits may be either

appended to other visits, as time permits, or conducted separately. All visits by elderly persons provide an opportunity for addressing health maintenance issues.

Discussion and Summary

Those areas that have clear-cut evidence for inclusion in any geriatric health maintenance program have been enumerated in Table 3. If other measures are later shown to meet the criteria for preventive services in the elderly, they should be added. We want to reemphasize that these recommendations apply only to a preventive medicine program, not to the evaluation and treatment of specific diseases or symptoms. In a busy physician's office, much of the program can be performed by ancillary personnel, especially if the office is organized to do so. Nurse practitioners or physician's assistants should be able to perform the entire program by themselves.

All the other areas evaluated have been listed in Table 4. The "unclear effectiveness" columns indicate those interventions that do not meet the criteria but for which some evidence of benefit exists, or at least evidence of harm is lacking. As discussed earlier, these measures are further subdivided into low-effort and high-effort interventions. Routine inclusion of all of the interventions considered to be of unclear effectiveness would greatly increase the time or cost involved in screening. To maximize the use of scarce resources, research is particularly needed in these areas of geriatric prevention to determine their effectiveness and whether some should only be used in the young old or the old old.

We believe that even though the evidence is currently unclear for all the items in this group, the two subgroups—low-effort and high-effort—should be considered differently. The low-effort interventions are, as a group, comparatively cheap, safe, easy to implement, and not as time-consuming. Consequently, we recommend that until more information is available on the effectiveness of intervention in these areas, if clinicians wish to include items from Table 4 in their prevention protocol, they should first consider those in the low-effort group. The high-effort interventions have more potential adverse consequences, are more costly, harder to implement, or more time-consuming. Therefore, we recommend that clinicians carefully consider the consequences of recommending any of these interventions pending documentation of their effectiveness.

Two examples demonstrate this rationale: inquiring about and recommending seat belt use compared with screening for colon cancer. Encouraging seat belt use is an intervention that requires little effort. Although of unclear effectiveness, making such a recommendation requires minimal time, and is safe, cheap, and easily accomplished. Compare this to screening for colon cancer using a flexible sigmoidoscope or stool guaiacs; both interventions are of unclear effectiveness and considered to require much effort. They are more costly, harder to accomplish, more time-consuming, and more likely to cause complications in the elderly (sigmoidoscopies directly and stool guaiacs by follow-up on false-positive results). Thus, although both interventions (recommendation to use seat belts and screening for colon cancer) are of unclear effectiveness, the actual implementation of each one clearly carries a different import.

The last column of Table 4 contains those interventions for which evidence exists for exclusion from a geriatric prevention program. We recommend that clinicians not use these unless subsequent research indicates otherwise.

Because of our concern for distinguishing the old old from the young old, Table 5 contains a list of interventions that may have improved or diminished effectiveness in the old old. Factors that led us to list a potential preventive measure in this table include an increased prevalence of the particular condition in the old old and an increased susceptibility of the old old to side effects from the screening test used. It should be emphasized that this list does *not* differentiate between low-effort and high-effort interventions.

Our geriatric health maintenance program is probably more notable for what it does not include than for what it does. We found that for most proposed preventive interventions, the data were not adequate to make firm recommendations. Consequently, most of the interventions were classified in the unclear effectiveness category. Only eight were clearly effective preventive interventions for the elderly, and seven were clearly ineffective. Our recommendations vary from those of others, and there will undoubtedly be disagreement with our analysis. We find ourselves in substantial agreement with the USPSTF but do note some important differences.

First, we required explicit evidence of effectiveness, particularly in counseling, before including it in our program. The USPSTF took a liberal view of counseling interventions and were open about this approach. In situations where strong studies did not exist documenting the effectiveness of an area of prevention or intervention, the USPSTF relied on expert opinion to make their recommendations. We took a different approach. If the evidence for an area of prevention or intervention was not supported by well-designed (level I or II) studies, we noted this and clearly identified it as such by placing it into the unclear effectiveness category. We believe no definitive recommendations can be made for these inter-

ventions because clinical evidence of their value is uncertain. Instead, until additional research findings clearly support or refute the effectiveness of an intervention, the specifics of a clinical situation should dictate whether the intervention is appropriate.

A second difference between our approach and that of the USPSTF is that we rarely identified specific high-risk groups for particular interventions. Instead, we took a more global approach, and our recommendations for each area of prevention or intervention apply to the entire elderly population. As noted, we have identified some preventive services as being more or less appropriate for the old old.

As a result of these differences, some of our conclusions vary from those of the USPSTF. A good example is our recommendations concerning estrogen replacement therapy. The USPSTF recommendations, which considered all adult women, discussed only osteoporosis and mentioned that estrogen replacement therapy may reduce osteoporosis. For elderly women, however, the situation is less clear. They are usually many years past menopause, and no evidence exists supporting the institution of ERT in this population. On the other hand, there is evidence supporting the benefits of ERT for prevention of coronary artery disease, especially in women who have undergone hysterectomy. The USPSTF did not address this topic. Similarly, by focusing on the unique differences of the old old, we took a somewhat more favorable approach to screening for dementia than the USPSTF. Though effectiveness is not clear, some evidence does exist suggesting that there may be risks to society if people with Alzheimer's disease drive. We believe that screening persons 75 years or older for dementia may be beneficial, and suggest that further research is needed to determine if this is the case.

We do not claim that our program is the final word in screening for the elderly, but we do propose it as a model to be tested and changed as research in this area continues to evolve. Two things make our program unique: (1) we consistently apply a set of screening criteria designed for the elderly; and (2) we distinguish between the needs of the young old and the old old. Failure to do this may be one of the primary reasons for the disparate conclusions of previous recommendations. In an era of cost restraints, with emphasis on eliminating unproductive health care interventions and on probable future health care rationing, screening needs to be carefully targeted and critically evaluated. This is particularly true for the elderly because of their extensive and currently growing use of health care resources. A uniform recommendation for all those over 65 will in many cases not be appropriate. We hope that continued investigation of preventive programs based on principles of

screening designed specifically for the elderly will help resolve the great uncertainty regarding the most appropriate screening for this age group, including whether the old old and the young old should be approached differently.

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