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Screening and Preventive Services for Older Adults

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Abstract

Federal, professional and academic efforts are converging to address the preventive care needs of older Americans. Medicare is placing an increased emphasis on preventive care services for older adults. With the passage of the Affordable Care Act, access to preventive services has been enhanced by reducing out of pocket costs for older adults, and increasing reimbursement to health care providers. In 2010-2011 newly revised guidelines for Screening and Preventive Services have been issued by the United States Preventive Services Task Force (USPSTF) and the Centers for Disease Control and Prevention (CDC). In addition to these guidelines and the landmark changes in Medicare coverage, there are significant new attempts to modify national screening recommendations based on age and expected risk/benefit for older adults. These population-specific guidelines with new emphasis on functional status and multiple risk factor reduction are of increasing importance to an aging population where more conventional disease-focused guidelines are less suitable for maintaining physical function and quality of life. Evidence-based measures of physical performance appropriate for primary care office use are being developed and piloted. As a result of these policies, guidelines and tools, we have the ability to offer older adults more comprehensive, cost-effective screening and preventive measures than in any other previous time.

Keywords

Screening; preventive services; older adults; Affordable Care Act; Medicare; USPSTF; ACOVE; gait speed

When President Lyndon Johnson signed the Medicare program into law in 1965, he personally presented former President Harry Truman and his wife Bess with Medicare Cards number 1 and 2. These distinguished beneficiaries were first among the 19 million Americans eligible at that time for Medicare benefits. At the time of this writing there are 43 million eligible older adults and total enrollment is predicted to exceed 70 million lives by the year 2050. At Medicare's inception, the priority health care needs of older adults were addressed by providing insurance coverage for catastrophic illness, hospital-based treatment, and access to fee-for-service physician services. Historically, Medicare was not designed to deal with coverage for prescription drugs, long term care, and for the purposes of this review, screening and preventive services. It has not been until recently that screening and prevention have been incorporated in to the mission of Medicare.

Rising federal and personal health care expenditures have refocused prevention efforts in the hopes that early detection and treatment of health conditions will minimize more costly

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attempts at advanced disease treatment (1). Complications of chronic disease have emerged as some of the significant drivers of increased health care spending (2), and efforts to prevent or attenuate such complications may prove to be cost-effective, although conclusive evidence is still lacking.

In addition to the dramatic increase in enrollees, increased longevity has led to an imperative to provide preventive services for health issues that specifically emerge in later life. Geriatric syndromes (e.g. dementia, falls and delirium) and other previously uncommon clinical states (e.g., severe osteoporosis, isolated systolic hypertension and incontinence) are now routinely evaluated and managed by contemporary physicians. Overall prognosis, medication and procedure morbidity and patient-specific goals of care inform screening and prevention decisions in unique ways for older adults. Various degrees of frailty complicate routine clinical decision making (3). The development of risk and benefit models for individual strategies of “screening and prevention” for these older cohorts are very active areas of clinical investigation (4). This remainder of this review will summarize the current state of preventive services for older adults including recent changes in Medicare coverage aimed at dramatically improving preventive service selection and utilization for older adults. Next we offer a brief survey of the role of behavioral and lifestyle modification and close with a description of new approaches to screening and prevention for frailty and geriatrics syndromes so prevalent in late life.

Current State of Screening and Prevention in Older Adults

Screening and prevention service provision for older Americans is marked by the following realities as summarized in a recent report from the RAND Corporation (5). There is wide geographic variability in preventive service utilization among Medicare recipients, with both under and overutilization of screening for many specific disease states. This has been well documented in the 2011 Report, “Enhancing Use of Clinical Preventive Services Among Older Adults: Closing the Gap”, emphasizing the substantive geographic and racial discrepancies in utilization of screening and preventive services (6). Vulnerable older adults, (i.e. over age 75 with functional impairment) receive about half of currently recommended preventive care services, with widely varying degrees of guideline adherence among primary care practices. Adherence to national guidelines for screening and prevention for older adults is particularly poor for geriatric syndromes (such as urinary incontinence screening and falls risk assessment), as compared to traditional disease-specific screening (e.g. hypertension) (7).

Emergence of contemporary screening and preventive programs

Despite the historical inadequacy of current practices, we are now better positioned to improve the preventive care for older adults than at any previous time in history. Three phenomena are converging to create this opportunity for health care providers.

On January 1, 2011, the first Baby Boomer turned 65. It is estimated that by 2012, about 10,000 Boomers will turn 65 each day. Compared to previous cohorts, this cohort will be better informed about health, more pro-active about their own prerogatives, and highly likely to embrace prevention as a keystone of their future medical care. These individuals will be among the first generations to recognize that longevity per se is a Pyrrhic victory if those additional years gained are characterized by frailty, disability and declining quality of life.

With the implementation in January 2011 of some specific preventive and screening services through the Patient Protection and Affordable Care Act (ACA), US health care providers are now able to offer older adults a robust range of preventive services not previously provided

because of inadequate preventive service reimbursement (8). The years 2010-2011 mark the publication of newer age-specific guidelines for the utilization of screening and preventive services for older adults. The United States Preventive Services Task Force has taken on the formidable task of redesigning many of its existing guidelines to recognize important age-related variables (9). In addition to disease-specific guidelines to promote longevity, a Geriatrics Task Force of the USPSTF is developing specific new guidelines to emphasize evidence-based evaluation of geriatric conditions that affect quality of life, the first of which is an approach to falls prevention (10, 11).

In this review we will discuss recommendations from various national agencies for “conventional” screening and prevention for the young old, beginning at age 65 years, and subsequently outline the state of the art on screening and prevention for older adults as they approach their eighties and beyond.

Screening and Prevention at age 65 years and Beyond

Recommended Clinical Preventive Services

Older adults and providers are faced with a lengthening list of recommended preventive services. Table 1 and Table 2 list many of the screening and preventive measures according to the recommendations of the USPSTF and the CDC, along with some age considerations and Medicare coverage details. There is now an excellent convergence of these recommendations with Medicare coverage as described below. These recommendations are generally disease-specific, substantiated by evidence of a favorable balance of benefits and harms, and most applicable to relatively younger Medicare beneficiaries with a good functional status and life expectancy. Most of these recommendations do not explicitly consider age parameters, functional status or overall prognosis for adults with serious comorbidity or shorter life expectancy, but do give health care providers and patients a reasonable list of preventive services to consider and offer to older adults. All these recommendations are limited by the paucity of effectiveness studies in geriatric populations.

For the primary health care provider, mastering the ever changing and expanding prevention data can be a formidable task. The “2010-2011 Guide to Preventive Services” is a 200 page document (9). Recently the CDC issued a report, “Enhancing the Use of Clinical Preventive Services Among Older Adults-Closing the Gap” (6). This document emphasizes the marked regional and racial/ethnic variances in utilization of screening and preventive services among adults age 65 and older. In an attempt to set priorities to improve utilization of these services, they have proposed a focused list of high priority recommendations. At the core of this report are eight indicators for monitoring the use of clinical preventive services among adults aged 65 and older: two vaccinations (influenza and pneumococcal disease); five screenings for early detection of breast cancer, colorectal cancer, diabetes, lipid disorders, and osteoporosis; and counseling for smoking cessation. Additionally, the report highlights seven other recommended services for older adults (alcohol misuse screening and counseling, prophylactic aspirin use, screening for blood pressure screening, cervical cancer depression, obesity, and consideration of zoster vaccination. (Table 2)

Yearly Medicare Wellness Exams and Preventive Services—In an attempt to increase preventive service utilization and individualize preventive service plans, the ACA now provides for yearly “Wellness” exams with key preventive services at no additional cost to Medicare enrollees. The initial visit, termed the “Welcome to Medicare” exam is a one-time office visit available only during the first 12 months of Medicare enrollment. This visit is designed to provide both the patient and the health care provider with essential baseline data and to begin a collaborative focus on current health status, risk factor identification, medication review, and to target reasonable expectations of the health care system and key

elements of patient responsibility. In addition to physical exam for disease detection, this exam requires determination of Body Mass Index (BMI), and documentation of visual acuity. Subsequently, all Medicare recipients are eligible for an “Annual Wellness Exam” at which time many of the same elements in the initial exam are repeated. The intent of these serial wellness exams is to foster a collaborative approach to health management, and to establish an updated, individualized, screening schedule and preventive care plan for each patient. The Centers for Medicare and Medicaid Services (CMS) provides on-line patient information at their user-friendly “My Medicare” website (12) available in both English and Spanish. In addition to a downloadable “Preventive Services Checklist”, patients have the option of creating a personal on-line data base that merges national guidelines for screening and prevention with patient-specific adherence and their current prescription drugs from the Medicare Database.

There are some aspects of screening that have not been formally recommended by the USPSTF. There is no recommendation for “Wellness Exams” per se, but many of the covered elements are recommended, e.g., hypertension, age-specific cancer screen for colon and breast. As a result of the paucity of data for some geriatric conditions, a number of screens have received an “insufficient evidence” rating (e.g. dementia screening, auditory screening and tests for visual acuity and glaucoma.)

Immunizations—The U.S. Preventive Services Task Force has recently issued the 2010-2011 “Recommended Schedules for Adult Immunization covering adults age 19 to ≥ 65 years (9, 11). In addition to completing vaccination schedules for specific personal health or environmental risk factors, the immunization recommendations for all older adults include the following:

Influenza. Annual influenza vaccination has been demonstrated to reduce the incidence of influenza syndromes, hospitalization rates, and deaths. Despite efficacy of this immunization, substantial regional variation persists from state to state and by race/ethnicity. The percentage of adults age 65 and older who reported not receiving influenza vaccination in 2009 was 26.8% for White, 38.3% for Black and 38.2% for Hispanics (6).

Pneumococcal (polysaccharide) Vaccine is recommended by the USPSTF once at age 65 years for immunocompetent adults. The ACIP and the CDC recommend a one-time revaccination if the initial vaccinations were given before age 65 and five years have elapsed. Comparable ethnic/racial disparities as described for influenza immunizations exist for pneumococcal vaccine as well.

Herpes Zoster. There are approximately 1 million episodes of herpes zoster (Shingles) annually in the United States. *Postherpetic neuralgia* is a serious complication of Zoster and can be especially debilitating in older adults. A live-attenuated vaccine approved by the FDA in 2006 offers a 51% relative risk reduction in the incidence of zoster and a 67% reduction in the incidence of postherpetic neuralgia (13). Reduction in zoster related morbidity has been more recently confirmed in a community based study of participants age 60 with reductions in zoster incidence, hospitalization and ophthalmic complications (14, 15).

Tetanus. A tetanus booster is recommended every 10 years throughout life; the majority of tetanus cases occur in under-immunized adults over the age 60.

Screening Controversies and New Paradigms

Unlike the relative consensus for immunization recommendations, there is considerable controversy regarding screening for specific disease states in older adults. The benefit of

screening to any individual is highly contingent on estimated remaining life span and the presence of comorbidity. (Figure 1) Complications of screening tests and disease treatment generally increase with patient age, and comprehensive screening is more likely to result in polypharmacy for older adults than for younger patients. In addition to the paucity of data to guide recommendations for adults older than 75 years, there is a glaring lack of data for the effectiveness of various preventive strategies in persons with multiple comorbidities. Finally, with advances in therapeutics, the natural history and prognosis of many chronic diseases is changing rapidly. As age progresses, an emphasis on preservation of functionality and quality of life increasingly take precedence over simple extended biologic longevity.

The combination of evidence-based single disease screening recommendations from the USPSTF, CDC and other bodies and the Preventive Exams funded through Medicare have created an effective platform for screening of the younger Medicare recipient. However, these guidelines become less robust and evidenced-based as individuals age and/or develop declining health status and disabilities (4). Frailty, geriatrics syndromes such as urinary incontinence and cognitive decline cut across multiple chronic disease states, have multiple concurrent interventions, and lack specific chronic disease clinical outcomes that are often necessary to evaluate screening interventions.

In response to these historical limitations, the USPSTF commissioned a specific geriatrics task force to develop a process for future guideline development for complex geriatric conditions characterized by multiple causation, a variety of concurrent interventions, and outcomes defined more by quality of life than simply disease incidence and mortality (16). The first of these new guidelines addressing primary care interventions to prevent falling in older adults is now available (10). (Figure 2) describes the analytic framework suggested by the Geriatrics Task Force to evaluate screening for geriatrics-specific conditions. In this schematic it is assumed that for any given geriatrics condition it may be necessary to both screen for multiple risk factors, and implement multiple interventions to significantly improve outcomes such as reduced falls and improved functional status.

Life Style and Behavioral Modification at age 65 and Beyond

Adding Life to Years

The phenomenon of exceptional longevity has been an object of curiosity and wonderment throughout most of human history. Exceptional longevity has historically been so rare that many Heads of State have traditionally sent signed congratulatory letters to citizens on their 100th birthday. One of the most profound demographic shifts on the current century is the bulge in the population of older adults. The fastest growing cohort of older Americans is now those age 85. The United States currently has over 55,000 centenarians. Imagine the strain on the White House paperwork when, as conservatively predicted, the number of centenarians reaches 800,000 by the year 2050 (17).

Population studies of individuals with exceptional longevity suggest the “compression of morbidly hypothesis,” positing that better medical care will result in a delay in the onset of disability that might accompany the increase in life expectancy (18). Ideally we will all live longer with a shortened period of morbidity. What, if any, are the “secrets” of these older adults that have allowed them to reach advanced age with relatively less disability? Yates and colleagues have added to our understanding of the possible modifiable nongenetic determinants of long life (19). They describe a particular cohort in an extension of the Physicians' Health Study, a large-scale prospective study of healthy US physicians. One cohort of healthy male physicians with a mean age of 72 years was followed prospectively for a average of 25 years to ascertain specific determinants and modifiable risk factors

predicting survival to age 90 years. Importantly, the authors found a 54% probability of survival to 90 years in subjects with the absence of 5 key adverse factors (smoking, diabetes, obesity, hypertension and sedentary lifestyle.) In contrast, subjects with all 5 factors present had less than a 5% probability of reaching 90.

The longest-surviving subgroups not only lived longer (10 years longer on average compared with those who died before age 90 years), but also had less comorbidity, as marked by delayed occurrence of cancer and heart disease, evidence that the years they gained were relatively disease and disability free. Additional studies also suggest that adherence to thoughtful medical management with an emphasis on screening, prevention and lifestyle modification can result in life extension and substantive reductions in medical care costs (20, 21, 22, 18). Furthermore, attention to lifestyle modification can improve the quality of life across the spectrum of older adulthood (including current baby boomers as well as the oldest old population.) The risk factors adversely impacting longevity are all potentially modifiable by an increasing health system and personal emphasis on screening and prevention.

Weight Management and Physical Activity

Historically malnutrition, weight loss, and frailty were the chief considerations in terms of weight management in older adults. Now overweight states and obesity are emerging as potentially far more serious health risk factors. The prevalence of obesity and its attendant morbidities is increasing in old persons as in younger cohorts. Approximately 20% of adults age 65 and older are obese, and the prevalence is likely to increase (23, 24). Obesity is being increasingly recognized as a significant determinant in the accelerated onset and progression of cognitive disorders. A biological connection between obesity and muscle loss (sarcopenia) has also been documented (25). In addition, obesity is associated with urinary incontinence in women, and significant psychosocial morbidity including isolation, loneliness and depression. The combination of weight loss and exercise has been reported to be more effective at improving physical function than either intervention alone (26). In older adults with normal body mass index, a variety of exercise regimens have demonstrated overall improvement in physical function, falls reduction, and overall quality of life (27).

Recent Cochrane reviews have documented that progressive resistance training is associated with enhanced physical function, and improved performance in various physical tests suitable for primary care office use (20, 22). Screening can prompt counseling by physicians according to established guidelines from many reputable sources such as those recently released by the CDC outlining specific guidelines for physical exercise for adults age 65 years and older in their 2010 "Physical Activity for Everyone" web site, including excellent self-instruction for seniors and helpful patient counseling advice for health care providers (28). At a minimum, they advise that older adults should spend 5 hours (300 minutes) each week engaged in moderate intensity activity. In addition, muscle strengthening activities on two or more days a week that work in all major muscle groups (legs, hips, back, abdomen, chest, shoulders, and arms) are recommended. When surveyed, older adults state that their health care provider was not the primary source of recommendation for physical activity (29).

Screening and Prevention for the very Old

Over the past 20 years, a very important contribution to enhanced quality of care for vulnerable older adults has come from the Assessing the Care of Vulnerable Elders (ACOVE) Project developed by researchers at RAND Health and collaborators. Beginning in 1988 these researchers developed quality indicators specifically applicable to adults age 75 and older living in community settings. The initial set of quality indicators has gone

through several iterative revisions after further analysis and review by physician consensus groups and were published as ACOVE-2 (30). This set of quality indicators is focused on common age associated health problems including the geriatric syndromes, end of life care, and continuity of care considerations, and are used extensively in the evaluation of health systems.

An important further use of these data sets and indicators has been to develop survey instruments applicable to clinical practice. The most widely known of these tools is the survey instrument known as VES-13. This survey can be completed by persons over age 65 or their proxy. One of the key findings from this survey is that about two thirds of community dwelling elders age 75 years or greater fell into a score qualifying them as “vulnerable elders”. A subset of 5 questions from the VES-13 has been developed to assess functional status among vulnerable elders. (31). An abbreviated version, the Short Functional Status Survey can be used for serial changes in functional status (32).

More recently, there have been a series of pilot studies incorporating accurate case-finding regarding functional state of older adults into models of practice change. These pilot studies attempt to assist primary care physicians to incorporate screening, clinical verification, and interventions aimed at enhancing functional state in elders in the context of real-life busy practices. These studies introduced a practice redesign model based on ACOVE-2 (screening, efficient collection of clinical data, medical record prompts, patient education and empowerment materials, and physician decision support and education.) These interventions have proven to be applicable in a wide variety of primary care practices nationally (33, 34, 35, 36). Preliminary results suggest that screening and treatment for typical geriatric syndromes including falls, urinary incontinence and dementia is feasible and improves the care that community-based primary physicians provide for their older patients.

Additional Tools Available for Screening for Frailty in Older Adults

There are a variety of physical performance tests currently available for assessing functional states in older adults, many of them derived from the Short Physical Performance Test (37). Many of these performance tests can be utilized in a primary care office setting without extensive equipment or time expenditures. Most of these tests focus in one way or another on observation of characteristics of ambulation in older adults. Patients are instructed to walk a short distance at their own pace; distance and time are recorded over a distance of about 15 feet. It has been observed that gait speed (also known as walking speed) bears a strong correlation with over-all function and well being. Studenski and colleagues recently performed an analysis on 9 cohort studies evaluating a standard measure of gait speed and correlating scores with survival among community-dwelling older adults age 65 years and older. In their studies gait speed was positively correlated with survival, and increased across the full range of gait speed. Gait speed as accurate at estimation of survival as other indicators such as chronic illness, smoking history, body mass index, and hospitalization (38).

Figure 3 presents a schematic outlining the relative emphasis on specific screening and preventive services according to the health status of adults (rather than chronological age). The vertical axis represents the health status distribution of the 65 years of age and older population at any given time and the horizontal bars demonstrating the variable importance of specific measures. The entire field of screening and preventive services is rapidly maturing just as the older population increases. Overall screening for the average 65 year old is not appreciably different than for a 50 year old cohort. However, for older adults, there are increasingly informed recommendations for disease-specific screening, and improved office-based tools to screen for cognitive decline, physical frailty, and the geriatric syndromes so

damaging to quality of life. Despite these advances, almost all screening and prevention services remain relatively underutilized by health care workers caring for older adults. With improved knowledge and increased Medicare emphasis, opportunities abound to take existing off-the-shelf inexpensive tools and correct these deficiencies.

Conclusion

An unprecedented convergence of new evidence-based preventive guidelines and modifications to the Medicare preventive benefits has taken place over the past year. There has never been a greater opportunity for health care providers to apply a long overdue emphasis on screening and prevention for both the “young old” and the “older old”. At the same time, the Medicare program is highly vulnerable to benefit reductions as part of tighter fiscal control of the Federal budget. Thus, any of us interested in enhancing screening and prevention strategies for our older patients have both the opportunity and perhaps the mandate to do what we can to apply these clinical strategies in our clinical practices while also being advocates for preservation of these cost-effective preventive strategies recently introduced into the American health delivery system.

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References

1. Maciosek MV, Coffield AB, Edwards NM, et al. Priorities Among Effective Clinical Preventive Services: Results of a Systematic Review and Analysis. *American Journal of Preventive Medicine*. 2006; 31(1):52–61. [PubMed: 16777543]
2. Hoffman C, Rice D, Sung HY. Persons with chronic conditions: their prevalence and costs. *JAMA*. 1996; 276(18):1473–1479. [PubMed: 8903258]
3. Xue QL, Bandeen-Roche K, Varadhan R, Zhou J, Fried LP. Initial manifestations of frailty criteria and the development of frailty phenotype in the Women's Health and Aging Study II. *J Gerontol A Biol Sci Med Sci*. 2008 Sep; 63(9):984–90. [PubMed: 18840805]
4. Clarfield AM. Screening in frail older people: An ounce of prevention or a pound of trouble? *J Am Geriatr Soc*. 2010; 58(10):2016–21. [PubMed: 20929471]
5. [Accessed May 11, 2011] <http://www.rand.org/health/projects>
6. Centers for Disease Control and Prevention, Administration on Aging, Agency for Healthcare Research and Quality and Centers for Medicare and Medicaid Services. *Enhancing Use of Clinical Preventive Services Among Older Adults*. Washington, DC: AARP; 2011.
7. Wenger HS, Solomon DH, Roth CP, et al. The Quality of Medical Care Provided to Vulnerable Community-Dwelling Patients. *Annals of Internal Medicine*. 2003; 139(9):740–747. [PubMed: 14597458]
8. Koh HK, Sebelius KG. Promoting prevention through the Affordable Care Act. *N Engl J Med*. 2010 Sep 30; 363(14):1296–9. [PubMed: 20879876]
9. U.S. Preventive Services Task Force. [accessed May 12, 2011] <http://www.USPreventiveServicesTaskForce.org>
10. Michael YL, Whitlock EP, Lin JS, Fu R, O'Connor E, Gold R. Primary Care-Relevant Interventions to Prevent Falling in Older Adults: A systematic evidence review for the USPSTF. *Ann Intern Med*. 2010; 153:815–825.
11. Tinetti ME. Making prevention recommendations relevant for an aging population. *American College of Physicians Comment on: Ann Intern Med*. 2010 Dec 21; 153(12):809–14.
12. My Medicare. [Accessed May 12, 2011] <https://www.MyMedicare.gov>

13. Oxman MN, Levin MJ, Johnson GR, et al. Shingles Prevention Study Group. A vaccine to prevent herpes zoster and postherpetic neuralgia in older adults. *N Engl J Med*. 2005; 352:2271–2284. [PubMed: 15930418]
14. Tseng HF, Smith N, Harpaz R, Bialek SR, Sy LS, Jacobsen SJ. Herpes zoster vaccine in older adults and the risk of subsequent herpes zoster disease. *JAMA: The Journal of the American Medical Association*. 2011 January 12; 305(2):160–6. [PubMed: 21224457]
15. Fried R. Zoster vaccine in older adults. *J Am Geriatr Soc*. 2010; 58(9):1799–800. [PubMed: 20863342]
16. Leipzig RM, Whitlock EP, Wolff TA, Barton MB, Michael YL, Harris R, et al. Reconsidering the approach to prevention recommendations for older Adults. *Annals of Internal Medicine*. 2010 December 20; 153(12):809–814. [PubMed: 21173415]
17. US Bureau of the Census. 1999. Centenarians in the United States. Washington, DC: US Dept of Commerce, Economics and Statistics Administration; 1990. p. 23-199.
18. Fries JF. Aging, natural death, and the compression of morbidity. *N Engl J Med*. 1980; 303(3): 130–135. [PubMed: 7383070]
19. Yates LB, Djousse L, Kurth T, Buring JE, Gaziano JM. Exceptional longevity in men: Modifiable factors associated with survival and function to age 90 years. *Arch Intern Med*. 2008 February 11; 168(3):284–90. [PubMed: 18268169]
20. Liu CJ, Latham NK. Progressive resistance strength training for improving physical function in older adults. *Cochrane Database Syst Rev*. 2009; (3):CD002759. [PubMed: 19588334]
21. Rose D, Hernandez D. The role of exercise in fall prevention for older adults. *Clin Geriatr Med*. 2010; 26:607–631. [PubMed: 20934613]
22. Mangione KK, Miller AH, Naughton IV. Cochrane review: Improving physical function and performance with progressive resistance strength training in older adults. *Physical Therapy*. 2010 December 01; 90(12):1711–5. [PubMed: 21123213]
23. Arterburn, De; Crane, PK.; Sullivan, SD. The coming epidemic of obesity in elderly Americans. *J Am Geriatr Soc*. 2004; 52:1907–12. [PubMed: 15507070]
24. Li F, Fisher KJ, Harmer P. Prevalence of overweight and obesity in older U.S. adults: estimates from the 2003 Behavioral Risk Factor Surveillance System survey. *J Am Geriatr Soc*. 2005; 53:737–9. [PubMed: 15817035]
25. Roubenoff R. Sarcopenic obesity: the confluence of two epidemics. *Obes Res*. 2004; 12:887–8. [PubMed: 15229325]
26. Villareal DT, Chode S, Parimi N, Sinacore D, Hilton T, Armamento-Villareal R, Napoli N, Qualls C, Shah D. Weight loss, exercise, or both and physical function in obese older adults. *N Engl J Med*. 2011; 364:1218–29. [PubMed: 21449785]
27. Ko FCY. The clinical care of frail, older adults. *Clin Geriatr Med*. 2011; 27:89–100. [PubMed: 21093725]
28. [Accessed May 12, 2011] www.cdc.gov/physicalactivity/everyone.guidelines/older adults.html
29. Schonberg MA, Leveille SG, Marcantonio ER. Preventive Health Care among Older Women: Missed Opportunities and Poor Targeting. *The American Journal of Medicine*. November; 2008 121(11):974–981. [PubMed: 18954844]
30. Reuben DB, Roth C, Kamberg C, et al. Restructuring primary care practices to manage geriatric syndromes: The ACOVE-2 intervention. *J Am Geriatr Soc*. 2003; 51:1787–1793. [PubMed: 14687359]
31. Min L, Yoon W, Mariano J, Wenger N, Elliott M, Kamberg C, Saliba D. The vulnerable elders-13 survey predicts 5-year functional decline and mortality outcomes in older ambulatory care patients. *J Am Geriatr Soc*. 2009; 57:2070–2076. [PubMed: 19793154]
32. Min L, Wenger N, Reuben D, Saliba D. A short functional survey is responsive to changes in functional status in vulnerable older people. *J Am Geriatr Soc*. 2008; 56:1932–1936. [PubMed: 18775036]
33. Reuben D, Roth C, Frank J, Hirsch S, Katz D, McCreath H, Younger J, Murawski M, Edgerly E, Maher J, Maslow K, Wenger N. Assessing care of vulnerable elders-Alzheimer's disease: A pilot study of a practice redesign intervention to improve the quality of dementia care. *J Am Geriatr Soc*. 2010; 58:324–329. [PubMed: 20374405]

34. Wenger NS, Roth CP, Shekelle PG, Young RT, Solomon DH, Kamberg CJ, et al. A practice-based intervention to improve primary care for falls, urinary incontinence, and dementia. *Journal of the American Geriatrics Society* [Internet]. 2009; 57(3):547.
35. Wenger N, Roth C, Hall W, Ganz D, Snow V, Byrkit J, Dzielak E, Gullen D, Loepofe T, Sahler C, Snooks Q, Beckman R, Adams J, Rosen M, Reuben D. Practice redesign to improve care for falls and urinary incontinence. *Arch Intern Med*. 2010; 170(19):1765–1772. [PubMed: 20975026]
36. Ganz DA, Fung CH, Sinsky CA, Wu S, Reuben DB. Key elements of high-quality primary care for vulnerable elders. *Journal of General Internal Medicine* [Internet]. 2008; 23(12):2018.
37. Guralnik J, Simonsick E, Ferrucci L, Glynn R, Berkman L, Blazer D, Scherr P, Wallace R. A short physical performance battery assessing lower extremity function: Association with self-reported disability and prediction of mortality and nursing home admission. *Journal of Gerontology: Medical Sciences*. 1994; 49(2):M85–M94.
38. Studenski S, Perera S, Patel K, Rosano C, Faulkner K, Inzitari M, Brach J, Chandler J, Cawthon P, BarrettConnor E, Nevit M, Visser M, Kritchevsky S, Badinelli S, Harris T, Newman A, Cauley J, Ferrucci L, Guralnik J. Gait speed and survival in older adults. *JAMA*. 2011; 305(1):50–58. [PubMed: 21205966]
39. Rich JS, Black WC. When should we stop screening? *Eff Clin Pract*. 2000; 3:78–84. [PubMed: 10915327]

Figure 1. Days of Life Lost by Stopping Screening at Various Ages (39)

Figure 2. Example of the Ideal Analytic Framework for Geriatric Topics (10)

*Risk factors include increasing age, baseline functional impairment and limitations, incontinence, polypharmacy, medical risk, or sensory and cognitive deficits.

Figure 3. Relative Emphasis of Screening and Preventive Services According to Functional State of Older Adults

Table 1
Selected Screening and Preventive Services For Medicare Enrollees by USPSTF Rating, CDC Recommendation and Medicare Benefit

Service	USPSTF Rating	Age Considerations	CDC	Medicare Benefit
Medicare Preventive Exams:				
Initial preventive physical exam (IPPE)	NR	Available only within first year post Medicare B		Co-pay waived
Annual wellness visit (AWV)	NR	Annual - no age restriction		Co-pay waived
Immunizations:				
Influenza	B	No age restriction	Y	Y
Pneumococcal	B	No age restriction	Y	Y
Hepatitis B	A	No age restriction		Y
Herpes Zoster	NR	No age restriction	Y	Y
Cardiovascular screening:				
Abdominal aorta ultrasound	B	Ever-smoking males		Y
Hypertension	A	No age restriction	Y	Y
Carotid artery imaging	D	No age restriction		Y
Cancer screening:				
Colon	A	Annually to at least age 65	Y	Y
	C	Recommend against age 76-84, with exceptions		Y
	D	Recommend against ≥ 85 years		Y
Breast	B	Every 2 years age 55-74	Y	NR
	I	Insufficient evidence for ≥ 75 years		
Prostate	D	Insufficient evidence for ≥ 75 years		
Bone mass	B	Annual for at least 2 years after Part B eligible	Y	Y
Diabetes	B	No	Y	Y
Dementia	I	NR - insufficient evidence		Y
Hearing	I	NR - insufficient evidence		
Visual Activity	I	NR - insufficient evidence		
Glaucoma	I	NR - insufficient evidence		

USPSTF = United States Preventive Services Task Force

CDC = Centers for Disease Control

USPSTF Ratings:

A = recommended service

B = recommended service

C = USPSTF recommends against routine use of this service

D = USPSTF discourages use of this service

I = insufficient evidence for recommendation

Y = yes

N = no

NR = no recommendation

Table 2
CDC Clinical Preventive Services for Older Adults

Key Indicators	Other Recommended Services
Immunization:	Alcohol Misuse
Influenza	Aspirin Rx
Pneumococcal	Blood Pressure
Screening:	Cervical Cancer Screening
Breast Cancer	Depression
Colorectal Cancer	Obesity
Diabetes	Zoster Vaccination
Lipid Disorders	
Osteoporosis	
Counseling	
Smoking Cessation	

CDC = Centers for Disease Control

Reference (6)