SUCCESSFUL AGING

Healthy Aging

A Women's Issue

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The life expectancy of women currently exceeds that of men by almost seven years, yet women spend approximately twice as many years disabled prior to death as their male counterparts. The diseases that account for death and health care utilization in older women (heart disease, cancer, stroke, fracture, pneumonia, osteoarthritis, cataracts) are also major contributors to disability. This paper reviews the scientific evidence that supports specific recommendations for older women that may prevent or delay these conditions for as long as possible. Risk factors for falls and fractures should be assessed and, where possible, modified. Adequate intakes of calcium, vitamin D, fruits, and vegetables should be encouraged. Weight should be monitored and weight loss discouraged for most women. Screening for B12 deficiency is recommended. Engaging women in a shared decision-making process about the use of hormone replacement therapy for longterm prevention of heart disease and fractures is important, as is regular screening for breast and colo-rectal cancer. Women should be encouraged to engage in enjoyable physical activities, including walking, for 30 minutes daily. These interventions have the potential to delay the onset and improve the course of many chronic conditions that prevail in later life.

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That women live longer than men remains one of the great epidemiologic and medical mysteries; yet, this fact is an ever-present reality in clinical medicine. Despite women's greater longevity, the health picture for older women is characterized by a disproportionate share of certain diseases and greater disability than in older men. In this article we describe the demographic and health characteristics of older American women with a view toward identifying the major public health and clinical challenges in this segment of the population; provide state-of-the-art summaries of the scientific evidence that pertains to the primary or secondary prevention of diseases that selectively afflict women, such as osteoporosis and women's cancers; discuss the use of hormone replacement for older women and the components of adequate counseling; and discuss the scientific evidence and its implications for making reasonable recommendations about nutrition and exercise to prevent the major health problems of older women.

The Demographics of Later Life: It's a Women's World

In 1992, the year of the latest figures on longevity, life expectancy among women of all races reached a record high of 79.1 years.[1] This compares with a life expectancy of 72.3 years for men of all races, also a record high. US women's life expectancy has increased by 31 years during the 20th century compared with a gain of 26 years for men in the United States. Among whites, women's advantage in life expectancy from birth narrowed slightly during the past 20 years, from a peak of 7.6 years in 1970 to the current level of 6.6 years in 1992. This is due to a more rapid decline during the past decade in mortal-

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ABBREVIATIONS USED IN TEXT
CI = confidence interval
RR = relative risk

ity rates among US white men than among other race-gender groups. African-American women have a life expectancy that exceeded that of African-American men by 8.9 years in 1992, which difference has remained relatively stable during the past 20 years. Figure 1 shows the percentage of men and women aged 65 years who survived to age 85 in 1950, 1970, and 1992, derived from US life tables.[1] Nearly half (49.4%) of women who achieved the age of 65 lived to be age 85 compared with less than a third (31.5%) of men aged 65 in 1992. For both sexes, the percentage of 65-year-olds living to age 85 has risen dramatically during the past 42 years.

Greater life expectancy underlies the rapid growth of the nation's older population. In 1990 persons aged 65 and older constituted 12.5% of the US population; by 2050 this group is projected to swell to 22.9% of the population. Similarly, those aged 85 and older constituted only 1.2% of North Americans in 1990, and their representation in 2050 is expected to grow to 5.1%. These segments of the population are disproportionately women; in 1990 there were 2.2 million women aged 65 and older compared with 841,000 men. By 2050 women aged 85 and older are expected to number 10.2 million, a figure approximately double that of men aged 85 and older.[2]

Unfortunately, women's longer life expectancy is accompanied by a greater number of years before death spent disabled. As shown in Table 1, among whites aged 65, remaining life expectancy is 19.3 years for women compared with only 15.5 years for men.[1,3] Women, however, can expect 2.7 of their added years to be spent with a serious limitation in their ability to do daily activities compared with 1.4 years for men.[3] Regardless of race and age, women spend about twice as many years disabled before death as their male counterparts.

Prevalence rates of disability are, in turn, higher among older women for all levels of severity of disability (Figure 2).[4] The 1994 National Health Interview Survey, Phase 1, shows the rates of needing help or supervision in activities of daily living (eating, dressing, bathing, toileting, transferring) to be about 3% among men and women aged 65 to 74, but these rates rise to 22.2% of women aged 85 and older compared with 14.5% of men.[4] The percentage of women needing help or supervision with instrumental activities of daily living (preparing meals, shopping, managing money, using the telephone, doing light housework) more than doubles across each ten-year age category for women, from 6.3% to 15.7% to 40.8% of women aged 65 to 74, 75 to 84, and 85 and older, respectively. In each age group, the rates of disability among women exceed those among men. The need to reside in a nursing home, perhaps the most serious form of loss of independence, is also substantially greater among women than men aged 75 and older, as shown in Figure 3 using data from the 1995 National Nursing Home Survey.[5]

Major Causes of Morbidity and Mortality in Older Women

Heart disease far exceeds any other chronic condition as a cause of death and hospitalization in US women aged 65 and older (Figures 4 and 5).[6–8] The rates of cancer and cerebrovascular disease are the second and third highest of the diseases that account for most deaths and

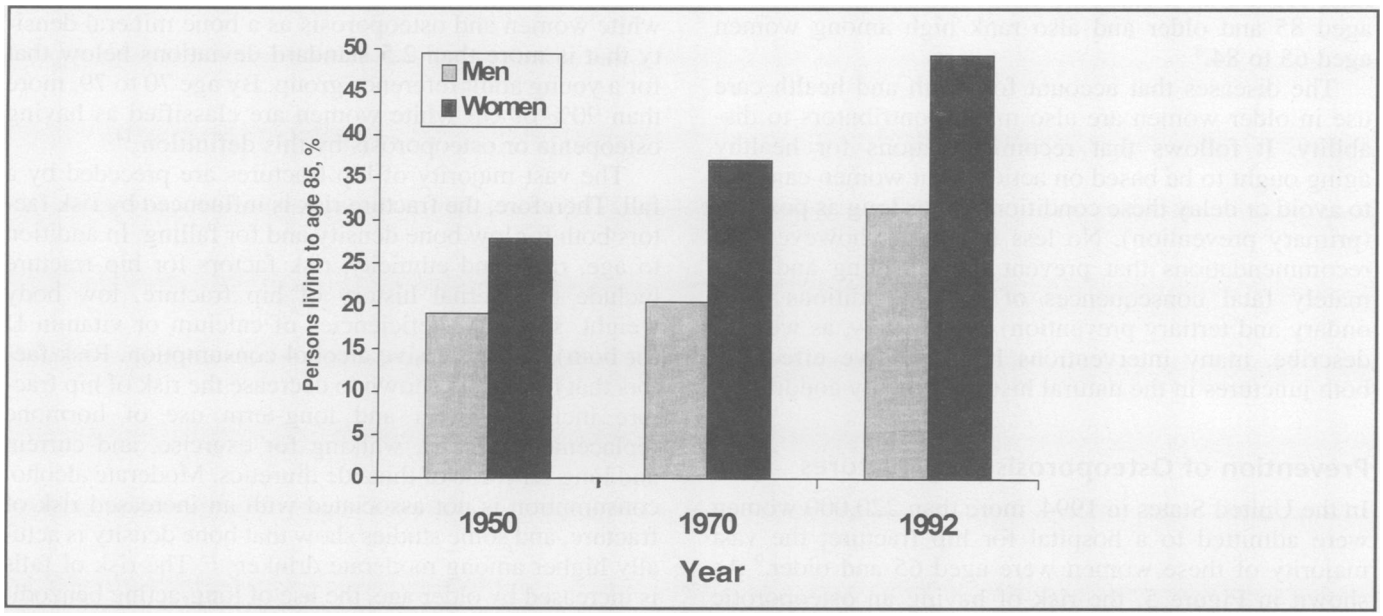

Figure 1.—The graph shows the percentages of 65-year-old men and women who survive to age 85 in the United States in 1950, 1970, and 1992 (from the National Center for Health Statistics).[1]

TABLE 1.—*Life Expectancy and Years of Disabled Life Among Americans Aged 65 and Older*†*

	Age 65		Age 75		Age 85	
	Life Expectancy	Years of Disabled Life	Life Expectancy	Years of Disabled Life	Life Expectancy	Years of Disabled Life
Women						
Black	17.4	2.8	11.4	3.0	6.3	3.2
White	19.3	2.7	12.2	2.8	6.6	3.0
Men						
Black	13.5	1.4	8.9	1.6	5.1	1.7
White	15.5	1.4	9.6	1.6	5.3	1.5

*From the National Center for Health Statistics.[1]
†From Guralnik et al.[2]

hospitalizations in older women. The rates of fracture climb steadily with age and rank second as a cause of hospital admission among women aged 85 and older.[8] Fracture reductions by far outnumber any other surgical procedure performed on women aged 85 and older. Pneumonia and influenza rates rank fourth among the major causes of death for older women. Pneumonia also accounts for a substantial number of hospital admissions, and the rates increase markedly with age.

The major reasons for ambulatory care visits by older women reflect both the precursors of the fatal and acutely disabling diseases noted earlier and several other aged-related conditions that cause substantial disability but are rarely, if ever, fatal. For example, hypertension and diabetes mellitus, two potent cardiovascular risk factors for women, account for more office visits than any other condition in women aged 65 to 79.[8] Osteoarthritis ranks third as a cause of office visits in women aged 65 to 69, fifth among women aged 75 to 79, and sixth among women aged 85 and older.[8] Cataracts rank second as a cause of office visits among women aged 85 and older and also rank high among women aged 65 to 84.[8]

The diseases that account for death and health care use in older women are also major contributors to disability. It follows that recommendations for healthy aging ought to be based on actions that women can take to avoid or delay these conditions for as long as possible (primary prevention). No less important, however, are recommendations that prevent the disabling and ultimately fatal consequences of these conditions (secondary and tertiary prevention). Fortunately, as we will describe, many interventions have positive effects at both junctures in the natural history of many conditions.

Prevention of Osteoporosis and Fractures

In the United States in 1994, more than 220,000 women were admitted to a hospital for hip fracture; the vast majority of these women were aged 65 and older.[9] As shown in Figure 5, the risk of having an osteoporotic fracture rises dramatically with age; women aged 80 and older are at particularly high risk. At the age of 50, a white woman's lifetime risk of fracture is estimated to be about 18% for hip fracture, 16% for spine or forearm fracture, and 40% for any of these three types of fracture.[10] Rates of fracture are lower among African-American women than among Latino or Asian-American women. Hip fractures are associated with a 5% to 20% increased risk of death in older women.[11] About half of women who suffer a hip fracture lose the ability to walk at least temporarily,[12] and between half and a third of older women are discharged from a hospital to a nursing home.[13] Osteoporosis and fracture are more common among women than men. This sex difference is largely attributable to a higher peak bone density in young adult men and to the occurrence of menopause in women that causes an accelerated period of bone loss for as long as several years.

The strong association of age with fracture risk is partly a function of the loss of bone density with age (Figure 6). The World Health Organization defines osteopenia as a bone mineral density that is between 1 and 2.5 standard deviations lower than that of young US white women and osteoporosis as a bone mineral density that is more than 2.5 standard deviations below that for a young adult reference group. By age 70 to 79, more than 90% of US white women are classified as having osteopenia or osteoporosis by this definition.[14]

The vast majority of hip fractures are preceded by a fall. Therefore, the fracture risk is influenced by risk factors both for low bone density and for falling. In addition to age, race, and ethnicity, risk factors for hip fracture include a maternal history of hip fracture, low body weight, smoking, deficiencies of calcium or vitamin D (or both), and excessive alcohol consumption. Risk factors that have been shown to decrease the risk of hip fracture include current and long-term use of hormone replacement therapy, walking for exercise, and current and long-term use of thiazide diuretics. Moderate alcohol consumption is not associated with an increased risk of fracture, and some studies show that bone density is actually higher among moderate drinkers.[15] The risk of falls is increased by older age, the use of long-acting benzodiazepines, the use of anticonvulsant drugs, lower extremity disability, poor distant depth perception, and an array

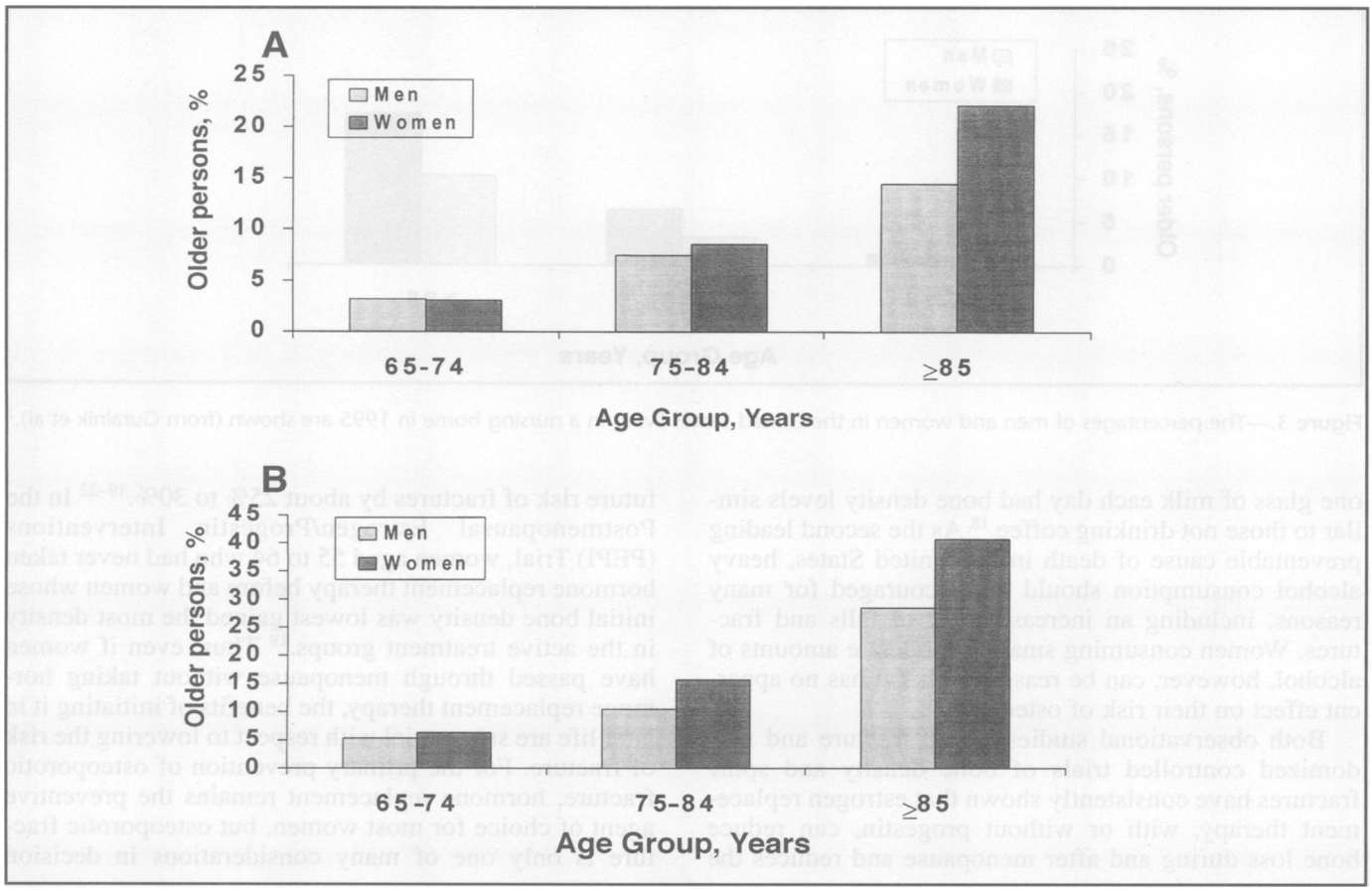

Figure 2.—The prevalence rates of disability in men and women in the United States (1994) are shown, A, in activities of daily living and, B, in instrumental activities of daily living (from the National Center for Health Statistics).[4]

of neurologic problems that cause gait disturbances—stroke, loss of palmomental reflex, and the like.[16]

The prevention of bone loss, falling, and in turn, the fractures that are a major cause of disability and health care use in older women should be regarded as a key component of promoting healthy aging. Worthwhile clinical interventions group well into the following categories: nutrition, physical activity, osteoporosis-preventing therapies, the avoidance of high-risk medications, smoking cessation, and fall prevention.

The area of nutrition and healthy aging will be considered comprehensively later. With respect to the prevention of osteoporosis and fracture, the rates of postmenopausal bone loss can be slowed by adequate intakes of calcium and the avoidance of vitamin D deficiency. According to the new August 1997 Institute of Medicine report, the recommended calcium intake for older women is 1,200 mg per day (the equivalent of 4 glasses of milk).[62] Many older women consume too little calcium to sustain their physiologic requirements. The average calcium consumption among American women is about 600 mg per day. It is important to encourage older women to assess their dietary intake of calcium and to either increase their dietary intake to reach the recommended targets for calcium intake or to increase their intake through dietary supplements such as those provided in some over-the-counter antacid medications. Vitamin D is necessary for calcium absorption. It is available in fortified milk and produced naturally in the body by getting 15 to 20 minutes of exposure to sunlight per day. For older adults who are homebound or in an institution or who have low intakes of milk, a multivitamin providing 400 IUs of vitamin D (600 IUs for people over 70) can be recommended to meet this requirement.

Weight loss during adulthood is a major risk factor for hip fracture. In a recent prospective study of nearly 10,000 older white women, the rate of hip fracture was 15 per 1,000 women-years among women who had lost 10% or more of their body weight since the age of 25 compared with 6.3 per 1,000 women-years among women whose weight remained stable; even lower rates of hip fracture occurred among women who gained weight.[17] Thus, the other major nutritional intervention that can contribute to reducing fracture risk is weight monitoring and avoiding weight loss. Although some studies have shown that high levels of caffeine consumption are associated with lower bone density and a higher risk of fracture, a recent study showed that even among heavy coffee drinkers, women who drank at least

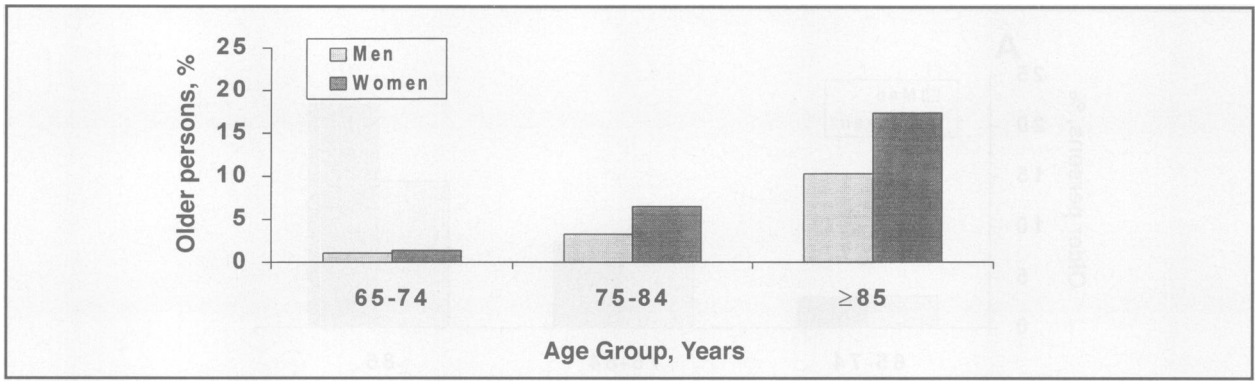

Figure 3.—The percentages of men and women in the United States living in a nursing home in 1995 are shown (from Guralnik et al).[5]

one glass of milk each day had bone density levels similar to those not drinking coffee.[18] As the second leading preventable cause of death in the United States, heavy alcohol consumption should be discouraged for many reasons, including an increased risk of falls and fractures. Women consuming small to moderate amounts of alcohol, however, can be reassured that it has no apparent effect on their risk of osteoporosis.

Both observational studies of hip fracture and randomized controlled trials of bone density and spine fractures have consistently shown that estrogen replacement therapy, with or without progestin, can reduce bone loss during and after menopause and reduces the future risk of fractures by about 25% to 30%.[19–22] In the Postmenopausal Estrogen/Progestin Interventions (PEPI) Trial, women aged 55 to 64 who had never taken hormone replacement therapy before and women whose initial bone density was lowest gained the most density in the active treatment groups.[19] Thus, even if women have passed through menopause without taking hormone replacement therapy, the benefits of initiating it in later life are substantial with respect to lowering the risk of fracture. For the primary prevention of osteoporotic fracture, hormone replacement remains the preventive agent of choice for most women, but osteoporotic fracture is only one of many considerations in decision

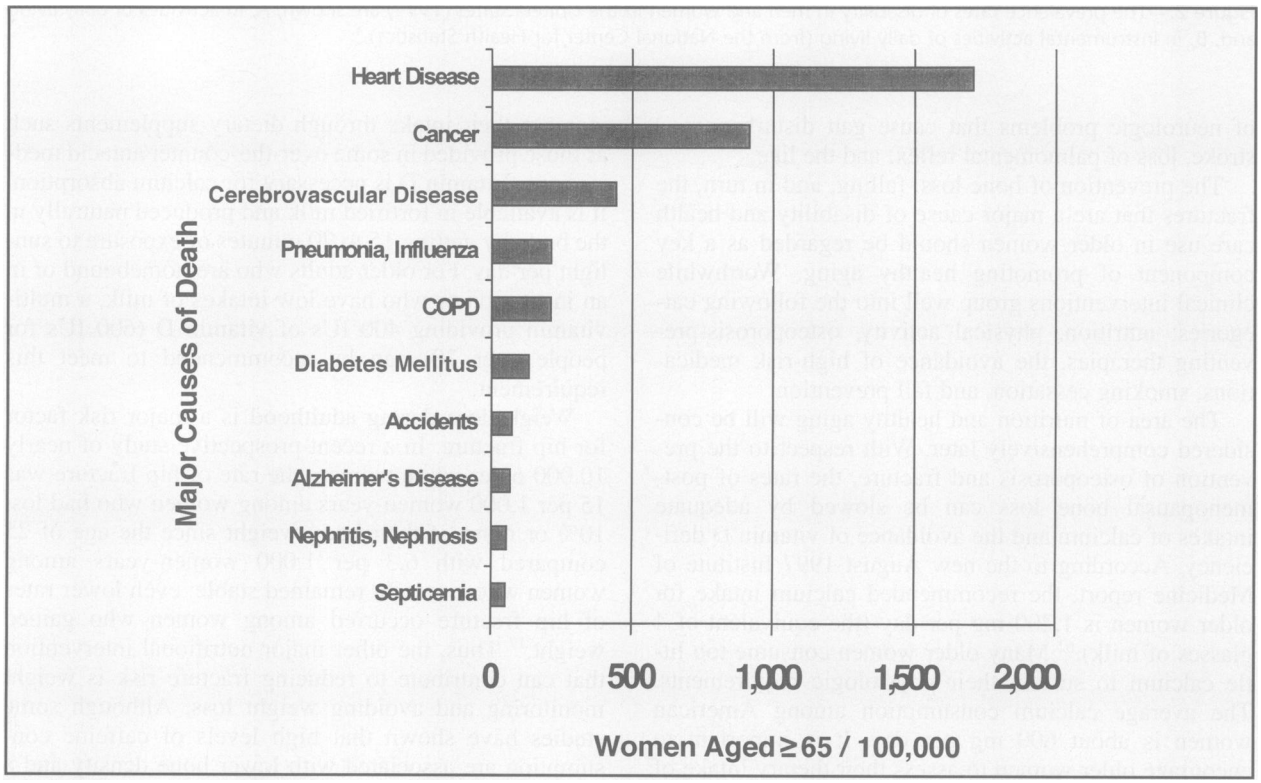

Figure 4.—The rates of the major causes of death per 100,000 in women aged 65 and older in the United States (1995) are shown (from Anderson et al).[6] COPD = chronic obstructive pulmonary disease.

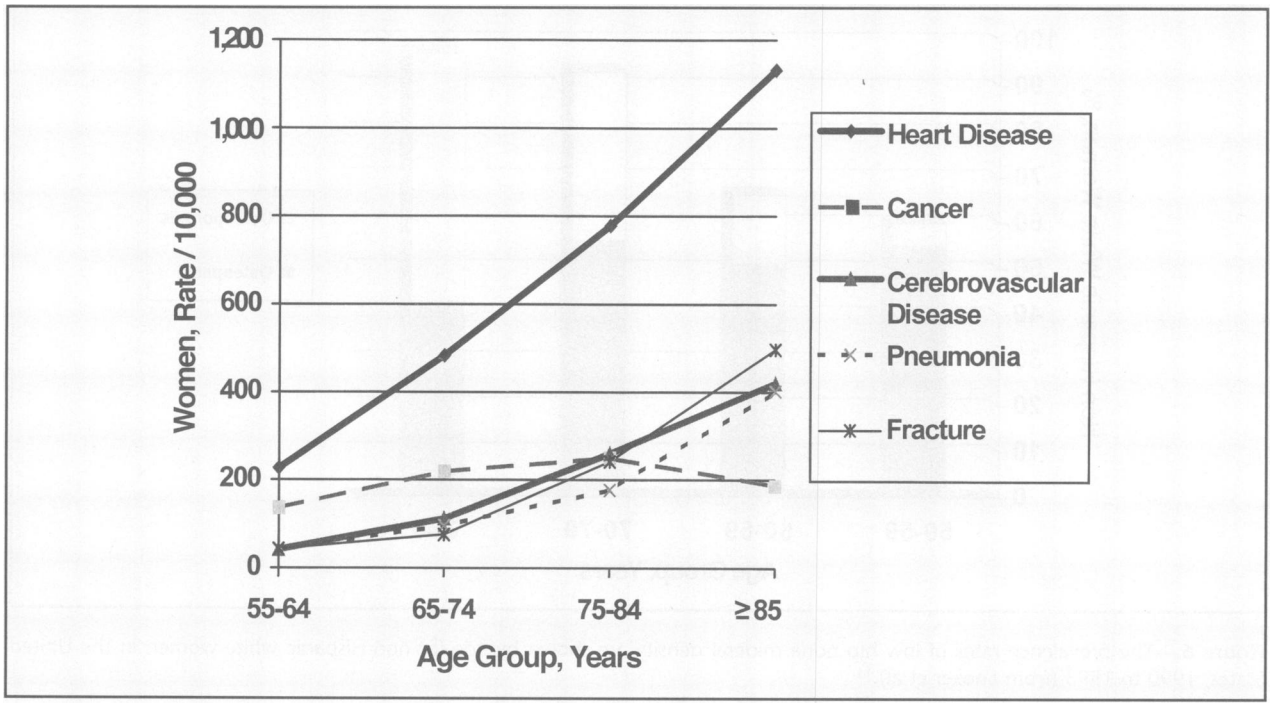

Figure 5.—The rates of hospital discharge for major diagnoses in women aged 55 and older in the United States (1991) are shown (from Cohen and Van Nostrand).[7]

making about long-term hormone therapy. This issue is discussed in detail in the next section. New drugs, such as alendronate sodium (and other bisphosphonates), are now available as alternatives for the prevention of fracture. Strong evidence exists that alendronate use increases bone density by about the same amount as hormone replacement therapy and reduces fracture risk, including hip fracture risk in women with vertebral fracture treated for three years.[23] Data are not yet available regarding the long-term risks and benefits of alendronate therapy for prevention or treatment. Thus, such agents should be used with caution beyond three years and the emerging scientific data on this and other new agents watched carefully for changes in the balance of risks and benefits.

Weight-bearing exercise is important for preserving health in many target systems including bone. Increasing physical activity reduces bone loss, the incidence of falls, and fracture risk in later life. Recommendations regarding physical activity are discussed in detail later.

Smoking is the leading preventable cause of death and disability in older adults. Reducing the risk of fractures is one of many reasons for advising older adults who smoke to quit. Unfortunately, for many older smokers, physician advice is not an adequate motivator for long-term behavioral change. State-of-the-art smoking cessation programs are based on behavioral change techniques that include tailored approaches to meeting individual needs, personalized feedback and support, and long-term reinforcement and follow-up. Clinicians should identify such programs in their health care environment or the community and strongly encourage older smokers to contact them.

Clinical interventions to reduce the risk of falling in later life can importantly alter fracture risk at a time when all women enter their years of greatest vulnerability to fracture by virtue of their diminishing bone density. A review of the prescription medications being taken by older people with a view toward reevaluating the need for sedative and hypnotic medications and polypharmacy is highly recommended. Other fall prevention strategies with proven effectiveness include gait training by a physical therapist for older people with gait problems or trouble transferring, balance and strength training as a component of a supervised (at least initially) exercise program, and home safety evaluations to remove environmental hazards and install safety devices such as grab bars and hand rails.[24,25]

The role of bone density screening for older women in fracture prevention guidelines is currently controversial. A bone density measurement contains information about future fracture risk that cannot be obtained from assessing the risk factors noted earlier. A recent meta-analysis of 11 separate studies showed that the risk of osteoporotic fracture was 2.6 times higher among women with bone density one standard deviation below their age-adjusted mean compared with women with higher bone density.[26] Despite strong evidence that bone density is associated with future fracture risk, there are no studies examining the value of bone density screening in reducing the future risk of fracture. Proponents of bone density screening argue that only by measuring

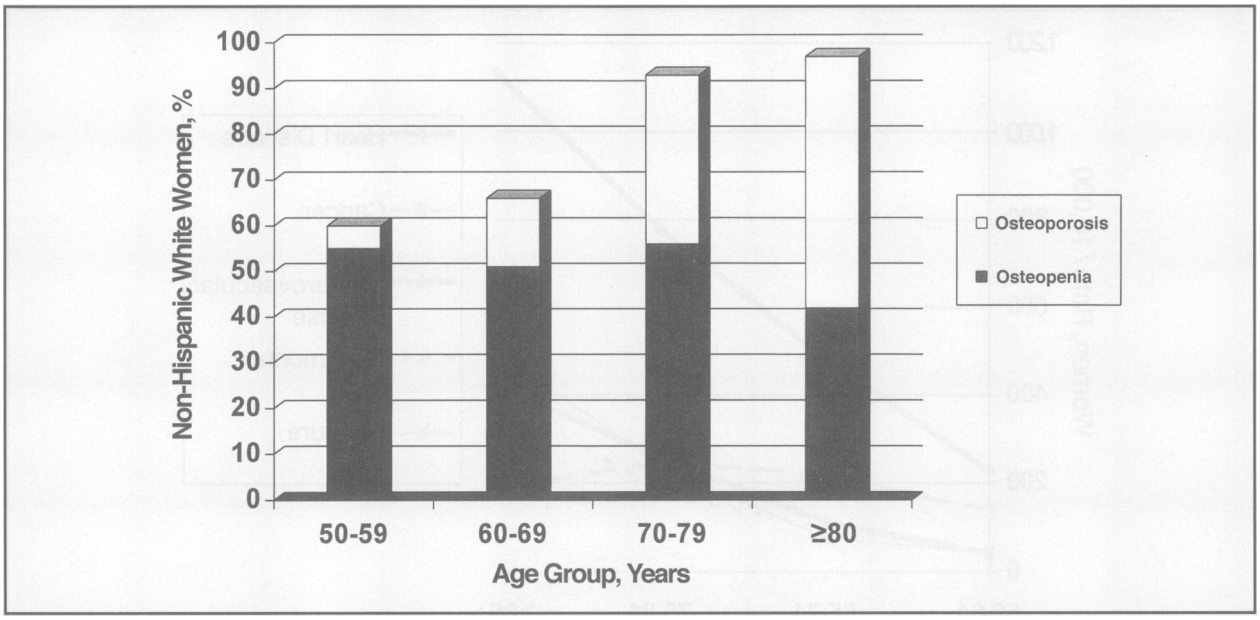

Figure 6.—The prevalence rates of low hip bone mineral density are shown by age for non-Hispanic white women in the United States, 1990 to 1993 (from Looker et al).[14]

bone density can preventive and therapeutic interventions be targeted to the women at highest risk, that the effectiveness of therapy can only be monitored if a pretreatment measurement of bone density is known, and that no other method is available currently for identifying women with high fracture risk due to osteopenia.[27] Opponents of widespread bone density screening argue that the evidence base is lacking for screening programs, that hormone replacement therapy can be recommended for preventing fractures and heart disease without knowing a patient's bone density, and that virtually all women aged 80 and older will be found to be osteopenic or osteoporotic (see Figure 6). An interesting development is that some preventive and therapeutic agents including estrogen replacement may increase bone density to a greater extent in women with low bone mass.[19] Thus, there appear to be situations when bone density testing can be useful both to women and their physicians. Such a situation is when a woman's decision about hormone replacement or other preventive therapies would be importantly influenced by knowing her bone density. The assessment of women with several nonmodifiable risk factors for fracture might also benefit from a knowledge of bone density because those women with high fracture risk and low bone density have the highest rates of hip fractures.[17]

Hormone Replacement Therapy Counseling for Older Women

In March 1996 the US Preventive Services Task Force published the following recommendation about hormone replacement therapy counseling[28(p829)]:

> Counseling all perimenopausal and postmenopausal women about the potential benefits and risks of hormone prophylaxis is recommended. There is insufficient evidence to recommend for or against hormone therapy for all postmenopausal women. Women should participate fully in the decision-making process, and individual decisions should be based on patient risk factors for disease, clear understanding of the probable benefits and risks of hormone therapy, and patient preferences.

This statement outlines the challenges and dilemmas surrounding hormone replacement therapy counseling. Whether or not to use it is one of the most complex and possibly far-reaching health care decisions of older women, and decision -making for hormone replacement therapy can serve as a focal point for discussing the major issues related to preventing chronic disease. The fact that hormone replacement therapy is of interest to older women is evidenced by the increasing rate of its initiation from 1994 to 1997 and the overall prevalence of its use among postmenopausal women at Group Health Cooperative of Puget Sound, Seattle, Washington (Figures 7-A and 7-B). Among women in their late 70s, the prevalence of hormone use was 20%, though its use is higher in the western United States than in other regions of the country.

Risks and Benefits of Hormone Replacement Therapy

The risks and benefits of hormone replacement therapy are summarized in Table 2. The evidence from randomized trials relating to its use to decrease the risks of osteoporosis and fractures has been discussed in the previous section. Meta-analysis of the results of 17 observational studies of the association between current hor-

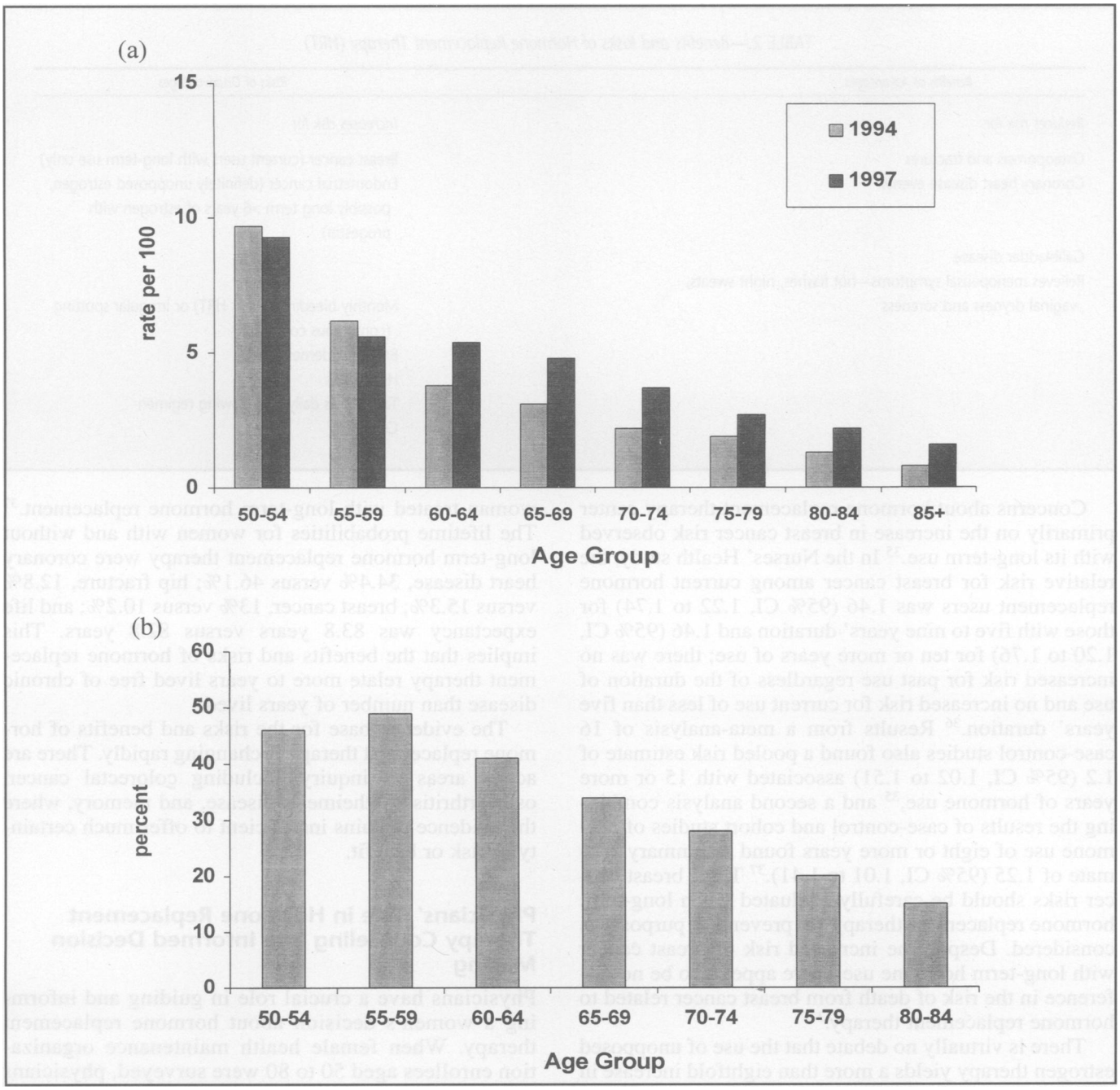

Figure 7.—The rates of hormone replacement therapy (HRT) use at the Group Health Cooperative of Puget Sound, Seattle, Washington, are shown: A, the rates of the initiation of HRT use in 1993–1994, and B, the prevalence rates of HRT use in 1996–1997.

mone replacement therapy and coronary heart disease in women yields an overall relative risk (RR) of 0.50 (95% confidence interval [CI], 0.45 to 0.59).[29] This association persists for estrogen replacement with or without progestin[30] and may be stronger with a longer duration of use.[31] Furthermore, hormone replacement therapy may reduce the risk of reinfarction (RR, 0.64; 95% CI, 0.32 to 1.30) and death (RR, 0.50; 95% CI, 0.25 to 1.00) among women who survive a first myocardial infarction.[32] And the twofold increase in the incidence of coronary heart disease risk seen in women with a surgical menopause (bilateral oophorectomy) is eliminated among women who use hormone replacement.[33] Past use, however, does not appear to be associated with a decreased coronary heart disease risk, regardless of the duration of use.[29,31] Despite the consistency of the evidence from these observational studies, there is lingering concern that a prevention bias may account for the strength of this association because women who use hormone replacement are generally healthier and more likely to participate in screening examinations than those who do not use it.[29,34]

TABLE 2.—*Benefits and Risks of Hormone Replacement Therapy (HRT)*

Benefits or Advantages	*Risks or Disadvantages*
Reduces risk for	*Increases risk for*
Osteoporosis and fractures	Breast cancer (current users with long-term use only)
Coronary heart disease events	Endometrial cancer (definitely unopposed estrogen, possibly long term >6 years of estrogen with progestin)
Gallbladder disease	
Relieves menopausal symptoms—hot flashes, night sweats, vaginal dryness and soreness	Monthly bleeding (cyclic HRT) or irregular spotting (continuous combined)
	Breast tenderness
	Headaches
	Taking pills daily, or following regimen
	Cost

Concerns about hormone replacement therapy center primarily on the increase in breast cancer risk observed with its long-term use.[35] In the Nurses' Health study, the relative risk for breast cancer among current hormone replacement users was 1.46 (95% CI, 1.22 to 1.74) for those with five to nine years' duration and 1.46 (95% CI, 1.20 to 1.76) for ten or more years of use; there was no increased risk for past use regardless of the duration of use and no increased risk for current use of less than five years' duration.[36] Results from a meta-analysis of 16 case-control studies also found a pooled risk estimate of 1.2 (95% CI, 1.02 to 1.51) associated with 15 or more years of hormone use,[35] and a second analysis combining the results of case-control and cohort studies of hormone use of eight or more years found a summary estimate of 1.25 (95% CI, 1.01 to 1.41).[37] Thus, breast cancer risks should be carefully evaluated when long-term hormone replacement therapy for prevention purposes is considered. Despite the increased risk of breast cancer with long-term hormone use, there appears to be no difference in the risk of death from breast cancer related to hormone replacement therapy.[37]

There is virtually no debate that the use of unopposed estrogen therapy yields a more than eightfold increase in endometrial cancer risk for women with a uterus[37] and that under almost all circumstances, women with a uterus should not use unopposed estrogen. A recent large case-control study showed an elevated risk of endometrial cancer among women using estrogen with progestin for more than six years.[38] If confirmed in future studies, this finding suggests that adding progestin to estrogen use does not permanently eliminate the risk of estrogen-induced cancer in long-term hormone replacement users.

Grady modeled the risks for endometrial cancer, breast cancer, coronary heart disease, and fracture associated with hormone replacement therapy to yield the lifetime probabilities of these diseases developing and the net change in life expectancy for a 50-year-old white woman treated with long-term hormone replacement.[37] The lifetime probabilities for women with and without long-term hormone replacement therapy were coronary heart disease, 34.4% versus 46.1%; hip fracture, 12.8% versus 15.3%; breast cancer, 13% versus 10.2%; and life expectancy was 83.8 years versus 82.8 years. This implies that the benefits and risks of hormone replacement therapy relate more to years lived free of chronic disease than number of years lived.

The evidence base for the risks and benefits of hormone replacement therapy is changing rapidly. There are active areas of inquiry, including colorectal cancer, osteoarthritis, Alzheimer's disease, and memory, where the evidence remains insufficient to offer much certainty of risk or benefit.

Physicians' Role in Hormone Replacement Therapy Counseling and Informed Decision Making

Physicians have a crucial role in guiding and informing a women's decision about hormone replacement therapy. When female health maintenance organization enrollees aged 50 to 80 were surveyed, physicians were cited as a primary source of information among 83.4% of current hormone users, 66.1% of past users, but only 30.6% of never users. Only 46.6% of never users had ever discussed hormone replacement therapy with their physician.[39] Similarly, 71.8% of current hormone replacement users reported that the amount of information from their provider about the benefits of hormone replacement therapy was about right, compared with only 47.4% of past users and 31.3% of never users.[40] The proportion of women who reported receiving no information about the risks and benefits of hormone replacement therapy increased from about 24% for women aged 50 to 59, to 53% in women aged 70 to 80 (Newton KM, LaCroix AZ, Keenan N, Anderson L, The influence of providers on women's

TABLE 3.—*Characteristics of Adequate Hormone Replacement Therapy (HRT) Counseling*

The woman will:
• Have an opportunity to ask questions and share her beliefs, expectations, and concerns about HRT
• Obtain answers to her questions in terms she can understand
• Have an opportunity to express her preferences
• Receive information or advice that helps her make a decision
• Leave the encounter with a clear plan of action

decision-making regarding hormone replacement therapy, January 1997).

Thus, it appears that older women would benefit from initiatives to assist them in making a shared, informed decision about whether or not to use hormone replacement. At a hormone replacement therapy counseling session, this involves assessing possible contraindications to the therapy, assessing menopausal symptoms and individual risks for chronic conditions that might be affected by hormone replacement therapy, relating how these conditions might be modified by the therapy, discussing options besides hormone replacement for reducing risks, and discussing options for hormone replacement regimens. Within the context of this discussion, the characteristics of an adequate hormone replacement therapy counseling session are presented in Table 3. Such a session may take as long as 20 to 30 minutes to complete, may require further assessments (for example, obtaining lipid levels or a mammogram), and concludes with a clear summary of the decision. Providing women with materials to help prepare them before the appointment may improve satisfaction with the decision making and reduce appointment times. One such aide that used a booklet, audiotape, and personal worksheet reduced uncertainty about the choice made and improved comprehension.[41] Other options include the use of workbooks, videotapes, books, and special classes.

Finally, any decision about hormone replacement therapy use should be reevaluated periodically. As the evidence base about chronic diseases changes and the results of randomized trials currently underway become available, both women and their physicians may need to revisit the decision and the factors on which it was based. Women's personal preferences, risk factors, and health status can also change as they age.

Optimal Nutrition for Healthy Aging

What we eat and do not eat and how long and well we live are viewed by many older adults as inextricably tied. Nonetheless, optimal nutrition is a challenging goal for many older adults because several risk factors for malnutrition become more common with age. These risk factors disproportionately affect older women and include depression, living alone, low income, the presence of multiple chronic conditions, and disability. One in five older adults skip meals daily, and only one in eight eat the recommended five or more servings of fruits and vegetables each day. Poor nutrition is a harbinger of poor clinical outcomes in older adults who have an acute health event and can lead to impaired immune function, slower wound healing, cognitive dysfunction, and anemia. In addition, the public pays great attention to weekly news reports in the hopes of learning which nutrients in certain amounts will prove to extend healthy life. Although the future may hold such breakthroughs, this brief section outlines a set of assessment and intervention activities that promote healthy aging based on current scientific knowledge.[42]

Weight, weight history, and weight relative to height are easily obtained measurements that contain much information about health status and nutritional adequacy. Weight losses or gains of 5% or more of body weight over a 6- to 12-month period should prompt clinical evaluation and intervention because they are associated with an increased risk of death and other morbidities, such as hip fracture. Another important assessment is the vitamin B_{12} status. The prevalence of vitamin B_{12} deficiency among older adults is estimated to be 5% to 15%. Routine screening is recommended because the signs and symptoms of vitamin B_{12} deficiency can be elusive. A serum vitamin B_{12} level is the recommended screening test. Levels above 260 pmol per liter (350 pg per ml) rule out the presence of vitamin B_{12} deficiency whereas levels below 110 pmol per liter (150 pg per ml) indicate deficiency. Levels in the intermediate range are difficult to interpret with certainty because about half of people within this range will be deficient in vitamin B_{12} at the tissue level, and the other half will not. In the presence of signs or symptoms that might be attributable to vitamin B_{12} deficiency, some experts favor treatment in this range. Alternatively, some advise obtaining serum levels of homocysteine and methylmalonic acid when B_{12} levels are indeterminate. These tests appear to be more sensitive and specific measures of B_{12} deficiency at the tissue level and can help clarify whether treatment with B_{12} is indicated. Last, assessments of the main physical and psychosocial risk factors for malnutrition (depression, social isolation, poverty, disability) should be part of the standard evaluation of older adults. Multivitamins and nutritional supplements can be recommended to improve nutritional status in those who screen positive. It is equally important to mobilize the health care team to assess the physical and psychosocial needs of the person and to arrange for the needed assistance.

The antioxidant vitamins C, A, and E are receiving much attention in trials aimed to evaluate their ability to prevent heart disease, stroke, cancer, macular degeneration, cataracts, and other age-related conditions. At present, there is insufficient evidence to recommend high-level supplementation with any of these vitamins to promote healthy aging. It is also unclear whether the best physiologic effects of these antioxidants come from dietary intake or supplementation, although many stud-

ies show lower rates of the aforementioned diseases in those consuming larger amounts of fruits and vegetables rich in these antioxidants and perhaps other important, as yet unidentified, micronutrients. Older adults can be encouraged to take a multivitamin as a means of ensuring adequate intake in combination with a diet rich in fruits and vegetables.

So what exciting dietary advice can be given to promote healthy aging? The best advice continues to be increasing fruit and vegetable intake to five or more servings per day, decreasing total fat intake to 30% or less of total calories, and decreasing the intake of saturated fat as a component of total fat, optimizing intakes of calcium and vitamin D to the recommended levels through diet, supplementation, or both, and increasing the use of daily multivitamins.

Physical Exercise for Older Women

Physical activity is one of the most important targets for promoting health in older women. Based on 1990 national estimates, only 24% of women older than 65 engage in regular exercise.[43] Among racial minorities and persons with less than high school education, the prevalence of a sedentary lifestyle is much higher than in whites and in those with more education. We know from many studies, however, that regular physical activity offers tremendous potential for reducing the incidence of disease and mortality risks and preventing disability in the later years of life. Further, there is mounting evidence that physician advice regarding exercise leads to increased physical activity.

Although many of the studies examining the benefits of physical activity were conducted in middle-aged male groups, newer evidence suggests that older women sustain many of the same exercise benefits as men. Results from the Framingham Heart Study showed that all-cause mortality was a third lower in women who exercised than in those who were least active.[44] With respect to cardiovascular health, results from a recent prospective study showed that walking more than four hours per week was associated with a 25% reduction in hospital admissions for cardiovascular disease in a group of healthy elderly women and men observed for four to five years.[45] In the National Health and Nutrition Examination Survey (NHANES) I Epidemiologic Follow-up Study, the incidence of stroke was found to be significantly lower in white women who reported high levels of recreational or nonrecreational physical activity, after controlling for other risk factors.[46] Exercise benefits have been found for other chronic diseases, including reduced risks of diabetes mellitus, hypertension, bone loss and fractures, selected cancers, depression, and obesity.[17,47–49]

As noted earlier, women have the highest incidence of disability, and their rates of disability increase with age. Evidence from both observational studies and randomized trials shows promising benefits from exercise in reducing risks for disability in older women. Recent reports using population-based data have shown that physical activity reduces the risk for lower body disability in older women and men.[50,51] The Longitudinal Study on Aging found that moderate activity such as self-reported walking four to seven days per week was associated with a twofold reduced risk for lower body disability in whites and as much as a sixfold reduced risk in blacks compared with their sedentary counterparts.[51] Randomized trials involving exercise interventions have found reduced risks for falls,[24] improved strength,[52] and improved function[53] in older adults.

Results from randomized trials show that the benefits of exercise in the elderly clearly exceed the risks. As with younger persons, the importance of appropriate warm-up and cooldown periods for preventing exercise-related injuries cannot be overstated.[54] Gradual increases in the level of activity can safely build strength and endurance. The most common reason for stopping regular exercise is the occurrence of injury, so every effort must be taken to prevent injury when engaging in physical activity. More and more community exercise programs are being geared to the needs of seniors. Group exercise activities offer social advantages and group support for exercise maintenance, but home exercise can be better incorporated into daily schedules. Working with patients to help them identify barriers to exercise and to set goals to increase activity has helped to change behaviors. An extensive program, known as Project PACE, has been developed to guide physicians in counseling their patients to exercise[55] and is currently being tested in randomized trials around the country, with positive preliminary reports.[56,57]

The vast majority of older women patients could benefit from their physician's advice to begin or continue regular exercise. Current guidelines from the Centers for Disease Control and Prevention and from the American College of Sports Medicine recommend that all adults engage in 30 minutes or more of moderate-intensity physical activity on most, preferably all, days of the week.[58] The recommendations state that it is not necessary to do exercise for 30 minutes at one time, but that intermittent bouts of activity lasting as long as 10 minutes can be beneficial. As the risks associated with physical inactivity to the health of older women become more evident and numerous, the need for physicians to advise their older women patients to exercise becomes more urgent. The seminal work of Fiatarone and colleagues in which institutionalized nonagenarians participated in high-intensity exercise training showed that one is never too old to start exercising.[59] Older women and, in particular, those who are most at risk for the development of disability stand to gain the most from incorporating physical activity into their daily lives.

Early Detection of Cancers

After age 65, the incidence and mortality rates of cancer for US women are highest for cancers of the

TABLE 4.—*Rates of Cancer Incidence and Mortality in US Women of All Races Aged 65 and Older, 1990 to 1994**

Cancer Site	Incidence Rate/100,000†	Mortality
Breast	443.4	125.6
Colon and rectum	256.6	107.1
Lung and bronchus	236.8	192.8
Corpus and uterus	100.5	23.0
Non-Hodgkin's lymphoma	64.6	35.4
Ovaries	57.9	43.6

*From Ries et al.[60]
†Age-adjusted rates, 1990 to 1994.

breast, colon and rectum, and lung and bronchus (Table 4).[60] For those few cancers that are detectable in a presymptomatic phase and where early treatment improves prognosis, regular cancer screening is an important component of promoting healthy aging. The notable gap between incidence and mortality rates for cancers of the breast and colon and rectum reflect the important results of early detection and effective treatments. Although a thorough review of the scientific evidence regarding cancer screening is beyond the scope of this article, the following recommendations are consistent with the cancer screening guidelines of the Group Health Cooperative of Puget Sound and are derived from a systematic review of the evidence pertaining to the effectiveness of population-based screening programs in improving health outcomes.[61] The recommendations all refer to asymptomatic women and not to those who present with any clinical signs or symptoms of cancer, who should be evaluated individually. Mammographic screening for breast cancer has been consistently shown to reduce breast cancer mortality among women older than 50 and is recommended every one to two years for all women. In addition, older women are encouraged to learn and practice breast self-examination on a monthly basis and to have a yearly breast examination by their physician or another health care provider. Colorectal cancer screening recommendations are now evolving rapidly in health care organizations. The evidence currently supports doing fecal occult blood testing every two years and periodic screening with flexible sigmoidoscopy. The optimal interval for sigmoidoscopic screening has yet to be determined, and various policy-setting organizations have recommended intervals ranging from two to ten years. Finally, death from cervical cancer in women aged 65 and older is rare (9.3 per 100,000) and even less common among women with normal Papanicolaou smears. Whereas Pap smear screening every one to two years is recommended for younger women, consideration can be given to discontinuing screening in older women with documented regular normal Pap smears.

Conclusions

We have attempted to provide concise and well-founded clinical recommendations that can promote healthy aging in older women, including the following specific actions:

- Assess risk factors for fracture and falls and modify those that can be changed. Ensure adequate intake of calcium and vitamin D.
- Engage women in a shared decision-making process about the use of hormone replacement for the long-term prevention of fractures and heart disease. Consider the risks and benefits, preferences, and health history of the individual woman being counseled.
- Monitor weight and discourage weight loss for most women. Evaluate changes in weight, either losses or gains, greater than 5% that occur over a 6- to 12-month period. Screen for vitamin B_{12} deficiency on a regular basis. Encourage the consumption of five or more fruits and vegetables each day, a diet low in total and saturated fat, and the use of a daily multivitamin.
- Encourage women to engage in enjoyable physical activities, especially walking and other low-intensity activities, for 30 minutes most days of the week.
- Encourage women to get regular screening for breast and colorectal cancer.

These interventions, if adopted consistently, have the potential to delay the onset or improve the course of many chronic conditions that are prevalent in later life. In so doing, these behaviors can decrease the period of disability older women experience in their last years and thus, have promise in making women's extended life expectancies a time of greater independence.

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