

## 6e

## Women's Health

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The National Institutes of Health's Office of Research on Women's Health celebrated its twentieth anniversary in 2010 with a new strategic plan recognizing the study of the biologic basis of sex differences as a distinct scientific discipline. It has become clear that both sex chromosomes and sex hormones contribute to these differences. Indeed, it is recommended that the term *sex difference* be used for biologic processes that differ between males and females and the term *gender difference* be used for features related to social influences. The clinical discipline of women's health emphasizes greater attention to patient education and involvement in disease prevention and medical decision-making and has become a model for patient-centered health care.

### DISEASE RISK: REALITY AND PERCEPTION

The leading causes of death are the same in women and men: (1) heart disease, and (2) cancer (Table 6e-1; Fig. 6e-1). The leading cause of cancer death, lung cancer, is the same in both sexes. Breast cancer is the second leading cause of cancer death in women, but it causes about 60% fewer deaths than does lung cancer. Men are substantially more likely to die from suicide and accidents than are women.

Women's risk for many diseases increases at menopause, which occurs at a median age of 51.4 years. In the industrialized world, women spend one-third of their lives in the postmenopausal period. Estrogen levels fall abruptly at menopause, inducing a variety of physiologic and metabolic responses. Rates of cardiovascular disease (CVD) increase and bone density begins to decrease rapidly after menopause. In the United States, women live on average about 5 years longer than men, with a life expectancy at birth in 2011 of 81.1 years compared with 76.3 years in men. Elderly women outnumber elderly men, so that age-related conditions such as hypertension have a female preponderance. However, the difference in life expectancy between men and women has decreased an average of 0.1 year every year since its peak of 7.8 years in 1979. If this convergence in mortality figures continues, it is projected that mortality rates will be similar by 2054.

Public awareness campaigns have resulted in a marked increase in the percentage of U.S. women knowing that CVD is the leading cause

of death in women. In 1997, the majority of U.S. women surveyed thought that cancer (35%) rather than heart disease (30%) was the leading cause of death in women (Fig. 6e-2). In 2012, these perceptions were reversed, with 56% of U.S. women surveyed recognizing that heart disease rather than cancer (24%) was the leading cause of death in women (Fig. 6e-2). Although awareness of heart disease has improved substantially among black and Hispanic women over this time period, these groups were 66% less likely than white women to recognize that heart disease is the leading cause of death in women.

Nevertheless, women younger than 65 years still consider breast cancer to be their leading health risk, despite the fact that death rates from breast cancer have been falling since the 1990s. In any specific decade of life, a woman's risk for breast cancer never exceeds 1 in 34. Although a woman's lifetime risk of developing breast cancer if she lives past 85 years is about 1 in 9, it is much more likely that she will die from CVD than from breast cancer. In other words, many elderly women have breast cancer but die from other causes. Similarly, a minority of women are aware that lung cancer is the leading cause of cancer death in women. Physicians are also less likely to recognize women's risk for CVD. Even in 2012, only 21% of U.S. women surveyed reported that their physicians had counseled them about their risk for heart disease. These misconceptions are unfortunate as they perpetuate inadequate attention to modifiable risk factors such as dyslipidemia, hypertension, and cigarette smoking.

### SEX DIFFERENCES IN HEALTH AND DISEASE

#### ALZHEIMER'S DISEASE

(See also Chap. 448) Alzheimer's disease (AD) affects approximately twice as many women as men. Because the risk for AD increases with age, part of this sex difference is accounted for by the fact that women live longer than men. However, additional factors probably contribute to the increased risk for AD in women, including sex differences in brain size, structure, and functional organization. There is emerging evidence for sex-specific differences in gene expression, not only for genes on the X and Y chromosomes but also for some autosomal genes. Estrogens have pleiotropic genomic and nongenomic effects on the central nervous system, including neurotrophic actions in key areas involved in cognition and memory. Women with AD have lower endogenous estrogen levels than do women without AD. These observations have led to the hypothesis that estrogen is neuroprotective.

**TABLE 6e-1 DEATHS AND PERCENTAGE OF TOTAL DEATHS FOR THE LEADING CAUSES OF DEATH BY SEX IN THE UNITED STATES IN 2010**

Cause of Death	Female			Male		
	Rank	Deaths	Deaths, %	Rank	Deaths	Deaths, %
Diseases of heart	1	290,305	23.5	1	307,384	24.9
Malignant neoplasms	2	273,706	22.1	2	301,037	24.4
Cerebrovascular diseases	3	77,109	6.2	5	52,367	4.2
Chronic lower respiratory diseases	4	72,657	5.9	4	65,423	5.3
Alzheimer's disease	5	58,130	4.7	8	25,364	2.1
Accidents (unintentional injuries)	6	44,938	3.6	3	75,921	6.2
Diabetes mellitus	7	33,581	2.7	6	35,490	2.9
Influenza and pneumonia	8	26,482	2.1	10	23,615	1.9
Nephritis, nephrotic syndrome, and nephrosis	9	25,611	2.1	9	24,865	2.0
Septicemia	10	18,743	1.5	12	16,069	1.3
Essential hypertension and hypertensive renal disease	11	15,788	1.3	16	10,846	0.9
Chronic liver disease and cirrhosis	12	11,105	0.9	11	20,798	1.7
Parkinson's disease	13	9161	0.7	14	12,871	1.0
Intentional self-harm (suicide)	14	8087	0.7	7	30,277	2.5
Pneumonitis due to solids and liquids	15	7803	0.6	17	9208	0.7

**Note:** Category titles beginning with "other" or "all other" are not ranked when determining the leading causes of death.

**Source:** Data from Centers for Disease Control and Prevention: National Vital Statistics Reports, Vol. 61, No. 4, May 8, 2013, Table 12, [http://www.cdc.gov/nchs/data/nvsr/nvsr61/nvsr61\\_04.pdf](http://www.cdc.gov/nchs/data/nvsr/nvsr61/nvsr61_04.pdf).