

## CHAPTER 1

# Cancer and the Aging Population

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## Introduction

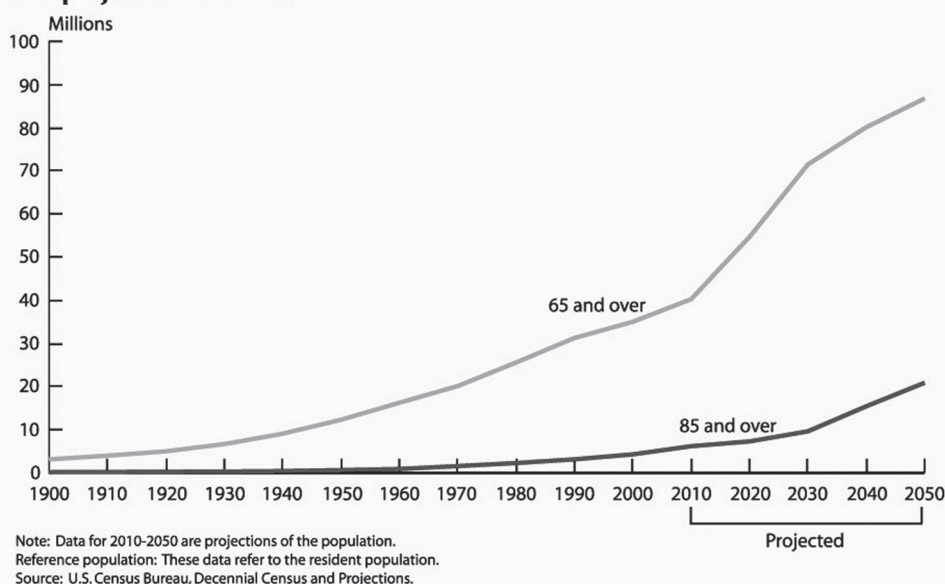
A significant increase in the number of older adults in the United States is projected in the coming decades. Older adults, defined as people aged 65 years and older, possess greater cancer incidence and mortality rates compared to younger people. Approximately 60% of all cancers occur in the older adult population, resulting in an incidence rate that is 10 to 11 times higher than in the younger population (Ershler, 2003; Yancik & Ries, 2004). The risk of developing cancer is 8%–9% in people age 40–59, with a dramatic increase in risk of 20%–30% in people older than 60 years of age (Malik, 2004). Additionally, cancer mortality rates are higher for older adults, with approximately 70% of all cancer deaths occurring in people older than 65 (Ershler). With the steady growth in the aging population and the higher rates of cancer incidence in this group, healthcare providers need to be cognizant of this substantial public health concern that will be occurring in the near future and begin to focus attention on evidence-based approaches to the treatment and care of the older adult with cancer. This chapter will discuss the projections for the aging population, the epidemiologic trends of cancer in older adults, and future implications for healthcare providers caring for the older adult.

## Aging Population

In 2000, an estimated 35 million people in the United States were age 65 or older, accounting for approximately 13% of the total population (Misra, Seo, & Cohen, 2004). This represents a tenfold increase since 1900, when only 3 million people

were age 65 or older. In 2011, the baby boom generation, or those people born between 1946 and 1964, which comprises approximately 75 million individuals, will begin to turn 65. By 2030, it is projected that approximately 70 million people, or 20% of the population, will be older than 65 (U.S. Census Bureau, 1996). The fastest growing segment of the population is the older adult group age 85 and older. This reflects the improved life expectancy that is projected to increase 10 years by 2050. In 2000, an estimated 2% of the population was age 85 or older; however, this age group is projected to expand to almost 80 million, or 5% of the population, by 2050 (U.S. Census Bureau) (see Figure 1-1).

**Number of people age 65 and over, by age group, selected years 1900-2000 and projected 2010-2050**



**Figure 1-1. Aging Demographics**

Note. From "Older Americans 2004: Key Indicators of Well-Being," by the Federal Interagency Forum on Aging-Related Statistics, 2005. Retrieved February 3, 2005, from <http://www.agingstats.gov/chartbook2004/population.html>

## Cancer and Aging

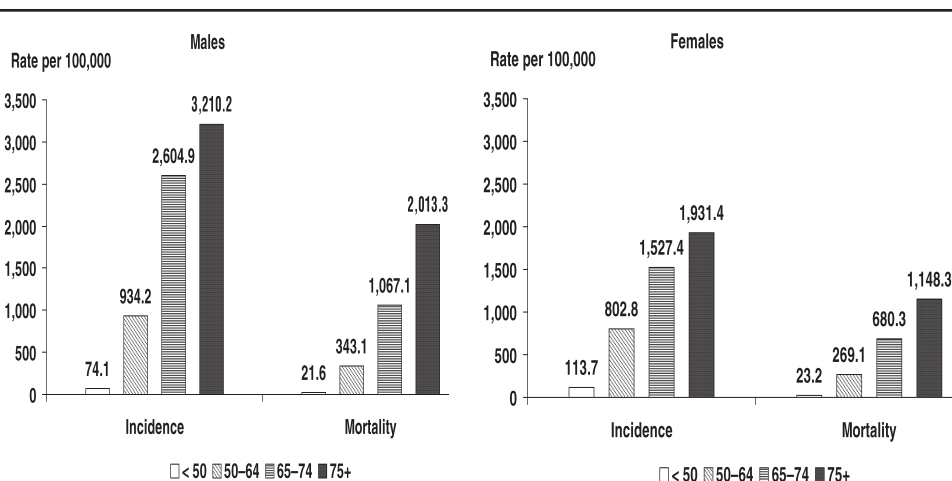
### *Incidence Rates*

Cancer is the leading cause of death in the United States in individuals younger than 85 years of age (Jemal et al., 2005). Cancer has been described as a disease of the older adult, with approximately 60% of all cancers occurring in people older than age 65 (Yancik & Ries, 2000). The increased incidence occurs up to the age of 85 years and declines after age 95 (Yancik & Ries, 1998). The increase in cancer incidence and mortality rates with increasing age also was supported in a recent

annual report on the status of cancer (1973–1999) highlighting the impact of age on cancer burden (Edwards et al., 2002) (see Figure 1-2). A review of incidence data from the Surveillance, Epidemiology, and End Results Program, the National Program of Cancer Registries, the North American Association of Central Cancer Registries, and mortality data from the National Center for Health Statistics found that cancer rates for people 50–64 years of age were 7–16 times higher than rates for younger people (Edwards et al.). There was a two- to threefold increase in incidence rates in people age 65–74 compared to those in the 50–64 year age group. During the period of 1995–1999, the overall cancer incidence rate was stable, although specific age-related changes were noted. For men younger than 50, lung and colorectal cancer rates decreased, but prostate cancer rates increased. For men age 50 and older, a decrease in colorectal cancer incidence occurred for the 50–64 and 65–74 age groups, with an increase in prostate cancer occurrence for men aged 50–64. Lung cancer rates decreased for all of the older age groups. During the period of 1992–1999, cancer incidence rates decreased in African American men and stabilized during 1995–1999 for white men.

For women during the period of 1987–1999, an increase in overall incidence occurred because of increases in breast cancer rates for women 50–64 years of age and increases in lung cancer rates for women 65–74 years of age. Colorectal cancer rates decreased in women younger than 50 but increased in women older than 75 (Edwards et al., 2002).

Prostate, breast, lung, and colorectal cancers are the four most frequently occurring cancers in adults older than 50 (Edwards et al., 2002) (see Figure 1-3). For men older than 50, other frequently occurring malignancies are bladder cancer and non-Hodgkin lymphoma, with increased incidence of pancreatic cancer and leukemias



**Figure 1-2. Average Annual Cancer Incidence and Mortality Rates for All Cancers by Gender and Age, 1995–1999**

*Note.* From “Annual Report to the Nation on the Status of Cancer, 1973–1999, Featuring Implications of Age and Aging on U.S. Cancer Burden,” by B.K. Edwards, H.L. Howe, L.A. Ries, M.J. Thun, H.M. Rosenberg, R. Yancik, et al., 2002, *Cancer*, 94, p. 2770. Copyright 2002 by the American Cancer Society and Wiley-Liss. Reprinted with permission.

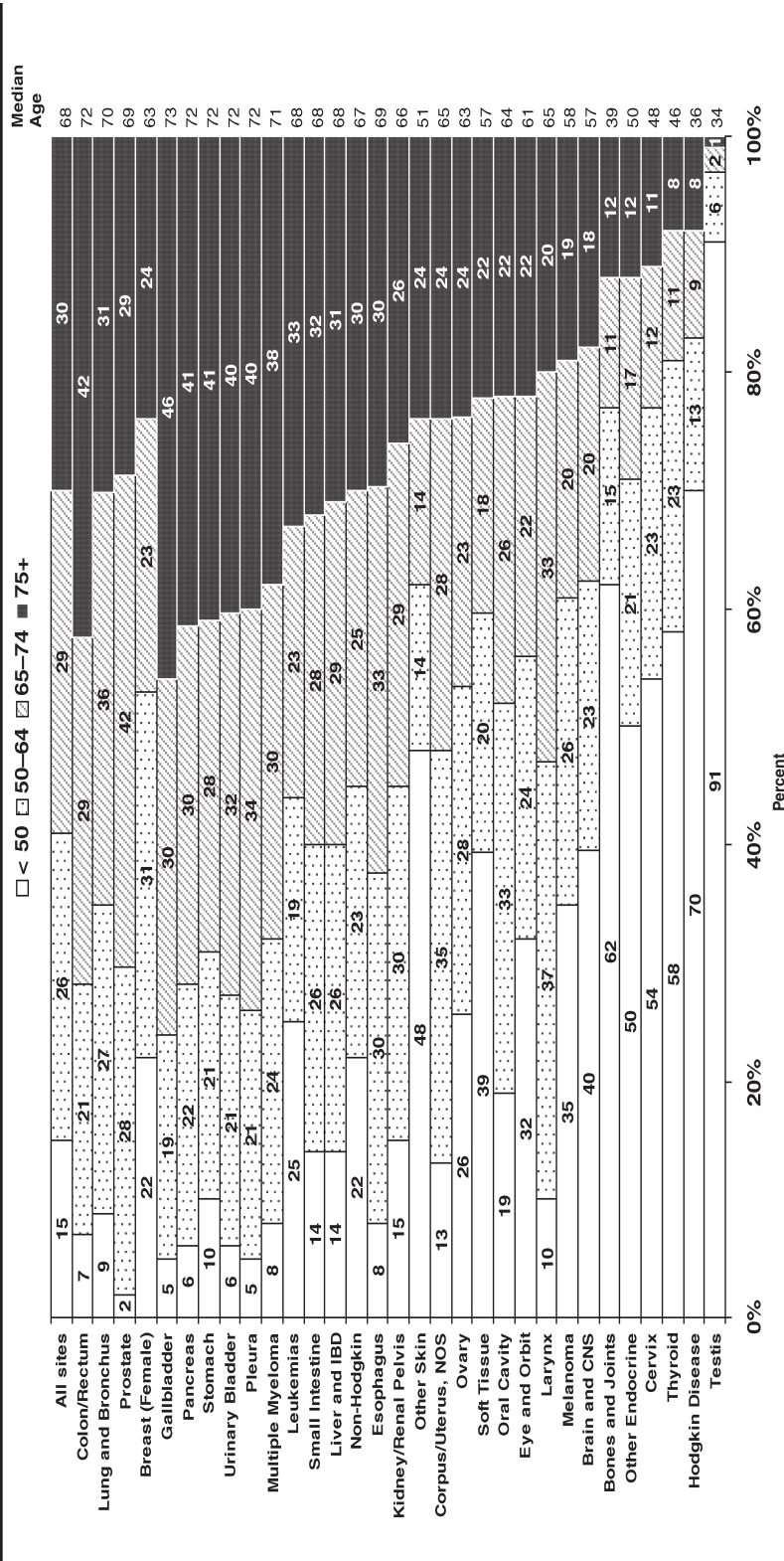


Figure 1-3. Age Distribution and Median Age for the Incidence of Major Cancers

Note. From "Annual Report to the Nation on the Status of Cancer, 1973-1999, Featuring Implications of Age and Aging on U.S. Cancer Burden," by B.K. Edwards, H.L. Howe, L.A. Ries, M.J. Thun, H.M. Rosenberg, R. Yancik, et al., 2002, *Cancer*, 94, p. 2782. Copyright 2002 by the American Cancer Society and Wiley-Liss. Reprinted with permission.

in people age 75 and older (Edwards et al.; Kennedy, 2001). For women older than 50, other frequently occurring malignancies are uterine cancer and non-Hodgkin lymphoma, with increased incidences of pancreatic cancer and leukemias also noted for those 75 and older (Edwards et al.; Kennedy).

## ***Mortality Rates***

Since 1950, cancer-related mortality rates have decreased in younger individuals but increased for individuals aged 65 years or older (Misra et al., 2004). A 4% decrease in cancer mortality rates occurred between 1971 and 1990, with an additional 7.7% reduction between 1991 and 1995 for people younger than 65. However, cancer mortality for people older than 65 increased by 15% between 1971 and 1990, with an additional 0.6% increase between 1991 and 1995. The increase in the number of cancer deaths reported for the older age group is reflected in the growth of the aging population (Yancik & Ries, 2004). For men 40 years of age and older, the most common cause of cancer-related death is lung cancer, followed by colorectal cancer for men 40–79 years of age and prostate cancer for men 80 years of age and older (Jemal et al., 2005).

Additional information from the latest annual report on the status of cancer (Edwards et al., 2002) indicated that during the period of 1993–1999, a decrease in mortality rates of 1% per year occurred for all cancers. The decrease was reflected in all age groups for men and women, except for women older than 75. Lung cancer mortality rates decreased for men in all age groups and for women younger than 65. Prostate cancer mortality rates decreased in all age groups except for men older than 75. Breast cancer mortality rates decreased for women younger than 65, with increases noted for African American women older than 75. Overall, cancer mortality rates for all sites combined decreased in women younger than 75 years of age, except for lung cancer, which decreased in women younger than 65. Figure 1-2 highlights mortality rates for all age groups during the period of 1995–1999. Males, in general, have higher mortality rates, partly because of increased tobacco use (Yancik & Ries, 2004).

The type of cancer also may influence mortality rates in older adults. Historically, cancers in the older adult are believed to be less aggressive (Repetto & Balducci, 2002). Certain cancers, however, have been found to present and act differently in older versus younger people. Older women with breast cancer have more indolent tumors that are better differentiated and possess a higher concentration of hormone receptors (Balducci, 2003). The decreased levels of sex hormones in older adults contributes to a hormonal environment that is less likely to stimulate growth of the breast cancer. In contrast, acute myeloid leukemia (AML) in older patients is associated with an approximate 70% higher prevalence of multidrug resistance (MDR-1) gene expression in comparison to younger patients, who present with approximately a 15%–20% multidrug resistance. The higher prevalence of the MDR-1 gene results in a decreased sensitivity to chemotherapy (National Comprehensive Cancer Network, 2004). Furthermore, the number of normal hematopoietic stem cells may be decreased because of the involvement of early pluripotent hematopoietic progenitors in the older adult (Balducci; Balducci & Lyman, 1997; Repetto & Balducci). As a result, AML is more difficult to treat in the older adult and is associated with a poorer prognosis and an increased risk of recurrence (Balducci & Extermann, 2001).

## ***Survival Rates***

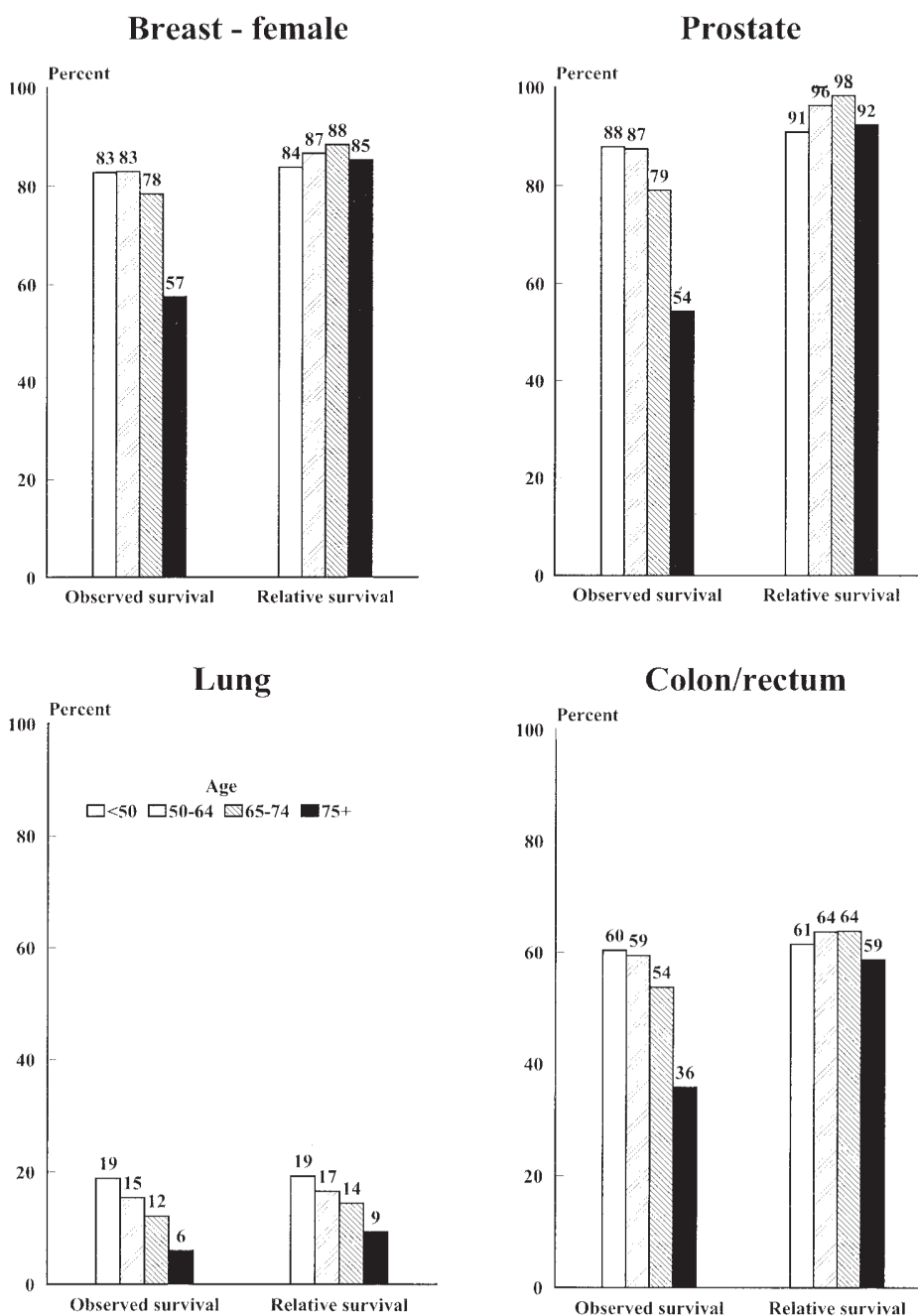
Despite the increase in cancer incidence, mortality rates have shown a slight decrease during the period 1995–1999 in older adults. This may be attributed to improvements in treatment and supportive care. Consequently, relative survival rates or the ratio of the observed survival rate to the expected rate for a group of people from the general population for lung, colorectal, breast, and prostate cancers are not affected by age. However, observed five-year survival rates, the reflection of total mortality in a patient group regardless of cause, are lower for older adults, especially people age 75 or older, in comparison to younger adults (Edwards et al., 2002) (see Figure 1-4). Overall, women have better survival rates for cancer tumors common to both men and women (Yancik & Ries, 2004).

## **Future Implications**

According to Edwards et al. (2002), if current cancer incidence rates were applied to the population projections for the next five decades, the number of patients with cancer would double from 1.3 million to 2.6 million between 2000 and 2050 because of population growth and aging (see Figure 1-5). Furthermore, a 12% increase in the cancer population is expected in adults age 75 and older, with a projection of 1,102,000 people by 2050 (Edwards et al.). For adults age 85 and older, cancer incidence rates are estimated to increase fourfold by 2050. These projections have a direct impact on future health care in research, practice, and educational settings. The following discussion will address the numerous issues related to each of these settings in caring for the older adult with cancer.

## ***Research Implications***

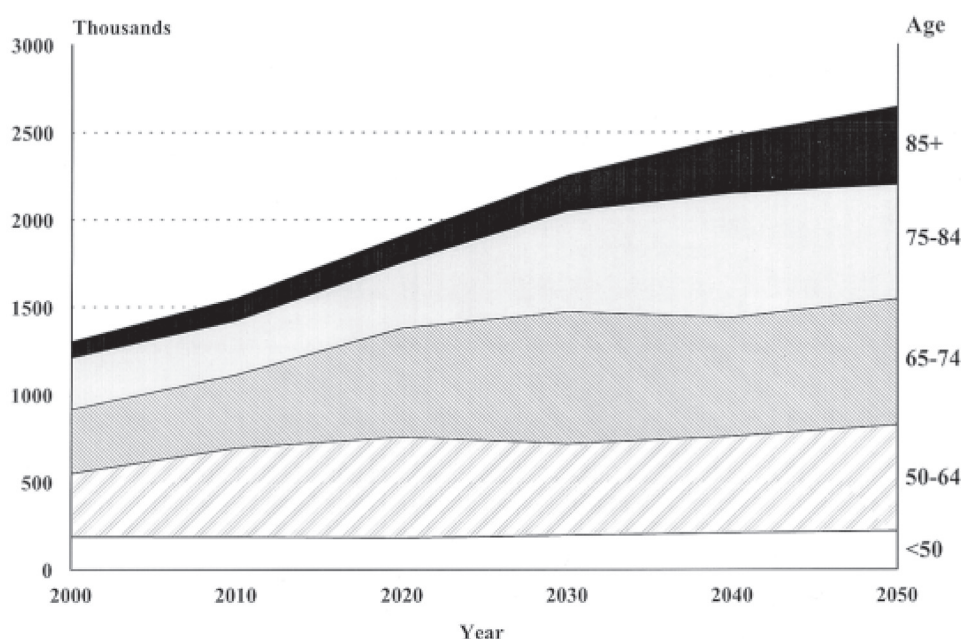
Given the projected population growth in the older age group and the increased cancer incidence rates, more research activities are needed involving the older adult with cancer. Research areas should include care across the cancer continuum, social support issues, quality-of-life factors, and survivorship. Several organizations are now emphasizing older adult cancer issues as research priorities. Currently, the National Cancer Institute (NCI) and the National Institute on Aging (NIA), both part of the National Institutes of Health (NIH), are funding a five-year, approximately \$25 million grant program for eight research centers that will focus on cancer and aging to facilitate and expedite research in this area (NIH, 2004). Seven research areas were identified at a recent NIA/NCI workshop: patterns of care; treatment efficacy and tolerance; effects of comorbidity; prevention, risk assessment, and screening; psychosocial issues and medical effects; palliative care, end-of-life care, and pain relief; and the biology of aging and cancer. Results of the Oncology Nursing Society (ONS) Year 2005 Research Priorities Survey identified 20 research priorities: quality of life, decision making about treatment in advanced disease, patient/family education, decision making about treatment, pain, tobacco use and exposure, screening/early detection of cancer, prevention/risk reduction, palliative care, evidence-based practice, nurses as advocates, fatigue/lack of energy, cancer recurrence, curative treatment/care, patient outcomes of cancer care, cognitive impairment/mental status changes, late effects of treatment, hospice/end of life, initial cancer diagnosis, and ethical



**Figure 1-4. Five-Year Observed and Relative Survival Rates**

*Note.* From "Annual Report to the Nation on the Status of Cancer, 1973–1999, Featuring Implications of Age and Aging on U.S. Cancer Burden," by B.K. Edwards, H.L. Howe, L.A. Ries, M.J. Thun, H.M. Rosenberg, R. Yancik, et al., 2002, *Cancer*, 94, p. 2785. Copyright 2002 by the American Cancer Society and Wiley-Liss. Reprinted with permission.





**Figure 1-5. Projected Number of Cancer Cases for 2000–2050**

*Note.* From “Annual Report to the Nation on the Status of Cancer, 1973–1999, Featuring Implications of Age and Aging on U.S. Cancer Burden,” by B.K. Edwards, H.L. Howe, L.A. Ries, M.J. Thun, H.M. Rosenberg, R. Yancik, et al., 2002, *Cancer*, 94, p. 2786. Copyright 2002 by Wiley Interscience. Reprinted with permission.

issues (Berger et al., 2005). The National Institute of Nursing Research (2004) also highlighted the need for further research in the areas of chronic illness, including supporting family caregivers, end-of-life and palliative care issues, health promotion and disease prevention, quality of life, and symptom management. Many of these areas apply directly to the older adult with cancer and will be important research activities with the aging population. Nurses can play a key role in research activities and focus on specific areas of nursing practice and nursing outcomes. Although the nursing profession has taken a lead role in symptom management research, clinical studies specifically targeting older adults are lacking. Research areas specific to older adults with cancer that are lacking evidence-based data are detailed in Chapter 2. Furthermore, nurses can play a pivotal role in facilitating participation by the older adult in clinical trials.

### ***Clinical Practice Implications***

Because of the many physical and psychosocial factors surrounding the older adult with cancer, care for these individuals can be challenging. However, given the projected population changes in numbers of older adults within the next few decades, professional organizations are now recognizing the paucity of empirical evidence and are calling for greater attention to care of the older adult with cancer.



Recently, ONS and the Geriatric Oncology Consortium published a joint position on cancer care in the older adult (ONS, 2004). This position highlights requisite areas necessary to care for the older adult with cancer and the great need for empirical evidence to guide practice.

A major issue is the existence of comorbidities. The older adult is at higher risk for not only cancer but also other chronic health problems such as heart disease, hypertension, diabetes, and chronic obstructive pulmonary disease. Four out of five individuals 65 years of age or older have one or more coexisting comorbidities (Yancik, Ganz, Varricchio, & Conley, 2001). In addition, many older adults may possess other geriatric abnormalities such as deficits in self-care, malnutrition, metabolic disorders, depression, limitations in mobility and functional status, and cognitive impairments. Healthcare providers will need to possess astute assessment skills and address not only side effects of cancer and treatment but also be knowledgeable of other confounding diseases and their treatments. Nurses are in a key position to conduct comorbidity and functional assessments to identify limitations of the older adult, to facilitate treatment for reversible conditions identified by these assessments, and to make appropriate referrals for social support and community resources.

The cost of cancer and cancer treatment presents other challenges for the older adult. Retirement often is associated with limited income and financial resources. Economic status should be assessed and discussed with the older adult, and estimated costs of treatment should be reviewed prior to the initiation of treatment. Indirect costs of treatment, such as transportation and medications, also must be considered.

### *Educational Implications*

To provide expert care, nurses and other healthcare providers will require formal training and educational programs focusing on the unique characteristics of the older adult with cancer. Oncology nurses will require a strong foundation in geriatric assessment, aging changes, and symptom management. Furthermore, nurses should have a broad knowledge base regarding other comorbidities and medical disorders that may be present in the older adult with cancer that can affect cancer and treatment.

Because of this need for geriatric nursing education, programs are now being developed to assist nurses in acquiring knowledge pertaining to the care of the older adult. One publication by the Hartford Geriatric Nursing Initiative and the American Association of Colleges of Nursing (2004) is intended to assist nurse educators in integrating geriatric nursing content into curricula. A second program, Nurse Competence in Aging, is a new initiative that is specifically targeting 400,000 practicing nurses who belong to specialty nursing organizations in an effort to improve the quality of health care of older adults through integration of gerontology content and knowledge (Scholder, Kagan, & Schumann, 2004). This project is a five-year, \$5 million initiative that is being funded by the Atlantic Philanthropies.

Educational strategies specific for the older adult also are critical. In a review of patient education literature over a 10-year period, Chelf et al. (2001) found that patients with cancer want information about their illness; prefer discussion and education from their physician, although they found nurses and written materials to be important; identify high reading levels in printed materials; and suggest that other resources, such as the Internet, videotapes, audiotapes, and telephone contact, may help to improve cancer education. This review, however, did not discuss patient

education specifically for the older adult. Clearly, further research addressing patient education and the special needs, such as sensory impairments, of the older adult are important for the future.

## Conclusion

The projected growth of the older adult population has a direct impact on health care and the specialty of oncology. Healthcare providers need to address many research, practice, and education issues involving the older adult with cancer that have received minimal attention in the past. Additional research and greater focus on the older adult with cancer will produce much-needed evidence-based practice approaches.

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