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Cancer Survivorship Issues in Older Adults

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Epidemiology

Cancer Burden in Older Adults

Advancing age comes bundled with increased cancer incidence and mortality.[1,2] Indeed, the median age at diagnosis of all cancers combined is 69 years for men and 67 years for women.[3] Age-adjusted cancer incidence is ten times higher in the 65+ population compared to their younger counterparts (2,151.2 versus 208.8/100,000 persons).[2] Similarly, age-adjusted cancer mortality is 15-fold higher in the 65+ population (1,068.2 versus 67.3/100,000 persons).[2] Figures 16.1 and 16.2 illustrate the proportions of the commonest cancers incidence and mortality in the 65+ population.[2] As a result, while the total US population is expected to grow by 9% between 1990 and 2010, the incidence of cancer is expected to increase by a disproportionate 32% in the same timeframe.[4,5] These trends are mirrored in countries across the globe.[6,7]

These figures have pressed many private and public institutions to sponsor the development of geriatric oncology as a separate subspecialty. Recent literature has seen a surge in the number of seminal publications specifically devoted to the management of older patients with cancer.[8–11] Geriatric oncology is a rapidly growing field and, while not exhaustive, this chapter will outline the challenges that are unique to this new discipline and briefly explore future research directions.

How Old Is Old?

Physiologically, there are no data to favor one particular age cutoff over the other. Although chronological aging and organ function decline with advancing age are undeniable realities, individual organ functions decline at different rates in different persons. This makes the older population a heterogeneous group when it comes to life expectancy, functional status and secondarily for geriatric oncologists, cancer treatment benefits and tolerance.

A Practical Approach to Geriatric Oncology

Geriatric oncologists are faced with a two-sided challenge: on the one hand, they have to carefully select evidence-based data that are applicable to older cancer patients from an ever-expanding oncology literature addressed to a wider audience. This is a difficult task given the limited representation of older individuals in cancer clinical trials.[12] Indeed, even after removing age as an exclusion criterion from collaborative group trials, only 13% of all participants in the Southwest Oncology Group (SWOG) and 8% of all participants in the European Organization for Research and Treatment of Cancer (EORTC) clinical trials are older than 70,[13,14] compared to 47% of the total US population with cancer in the same age group.[13] A retrospective review of National Cancer Institute (NCI) sponsored clinical trials active between 1997 and 2000 yielded similar conclusions.[15] On the other hand, treating cancer in older patients requires that four unique points be addressed.

Estimating the Patient's Life Expectancy

While the *average* life expectancy of the general population has doubled in the last century,[16] it is important to note that those who live close to or beyond the *average* expectancy are not condemned to imminent death, but contrarily, have the highest odds of surviving even longer.[17] The average life expectancy at ages 65, 75, and 85 years is, respectively, 17.5, 11.2, and 6 years.[18] This concept is key in avoiding the temptation of under-treating older patients based solely on their advanced age.[18,19]

Evaluating the Patient's Comorbidities and Functional Status

Eighty percent of individuals who are 65 years of age or older have at least one comorbidity.[20] Advancing age is associated with an increased vulnerability to multiple comorbidities—such as diabetes, hypertension, arthritis and heart diseases—as well as other age-related conditions, including dementia, incontinence, and balance disorders. The interaction of comorbidity and cancer is a very complex one and is the subject of a detailed discussion below (see **Comorbidity and Cancer**). Comorbidities are independent predictors of survival in cancer patients.[21,22] Accounting for them is an essential step in the management of older patients with cancer.

There are many tools to assess comorbidity with variable content and different goals,[23–26] but there is no consensus on which one to use in routine Geriatric Oncology. Additionally, these tools often require lengthy administration, rendering them less practical for regular use in a busy oncology practice. For example, the Multi-dimensional Assessment of Cancer in the Elderly (MACE), although specifically developed to evaluate comorbidity in older cancer patients, requires 27+/–7 minutes for scoring.[27] We and others have implemented shorter screening questionnaires as a practical substitute to exhaustive geriatric assessment scales (Table 16.1).[28,29] This screening questionnaire can often be

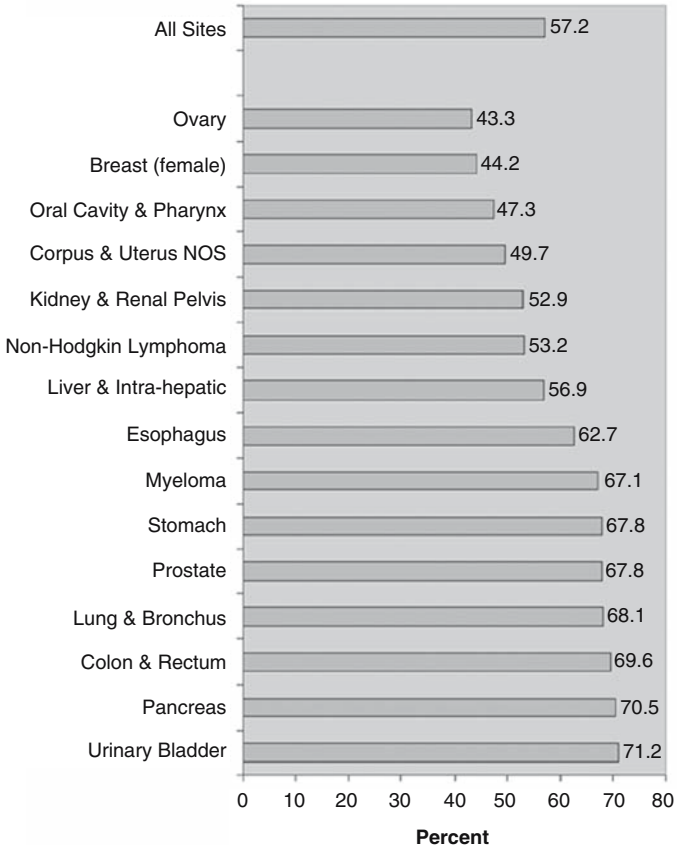

FIGURE 16.1. Age-adjusted cancer incidence in the 65+ population.

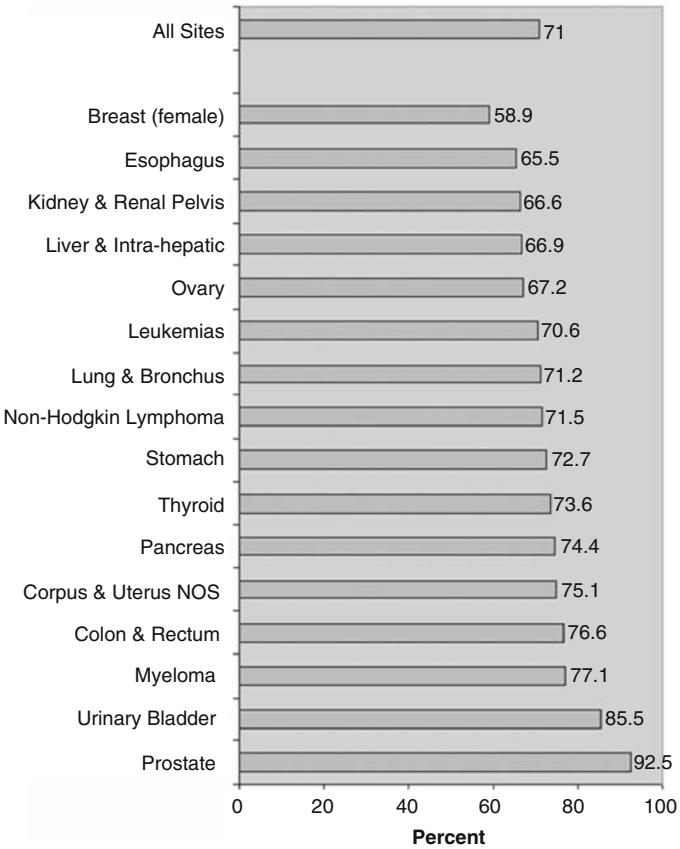

FIGURE 16.2. Age-adjusted cancer mortality in the 65+ population.

TABLE 16.1. Geriatric Screening Questionnaire.*

To be filled by the patient (Yes/No)
1. Have you lost 10 pounds or more in the last 6 months without trying to do so?
2. How are you able to walk? Independent _____ Assist _____ Cane _____ Walker _____ Dependent _____
3. A) In the past year, have you ever lost your urine and gotten wet? B) If you have answered "Yes" to the above question, have you lost urine on at least 6 separate days?
4. Are you able to: • Do strenuous activities, like fast walking or biking? • Do heavy work around the house like washing windows, walls or floors? • Go shopping for groceries or clothes? • Get to places out of walking distances? • Bathe (either a sponge bath or tub bath) or shave? • Dress, like putting on a shirt, buttoning or zipping, or putting on shoes?
5. Do you feel that your needs at home are not being met?
To be filled by healthcare professional
6. Do you feel unsafe or threatened by someone around you?
7. Do you often feel sad or depressed?
8. I am going to give you the names of 3 objects. Please repeat them after me: "Apple, penny, table". Recall at one minute: _____ (of 3)

*Adapted from Reuben and Moore et al.[28,30]

self-administered by the patient with minimal help from family members. The sensitivity, specificity, positive, and negative predictive values of the questionnaire items are well established.[30] Results of the screening test are reported as part of the initial geriatric oncology evaluation and the test subsequently can be repeated at the physician's discretion. Patients who perform poorly in the initial screening test are candidates for referral to a geriatrician who would then perform a comprehensive geriatric assessment.

Increased Susceptibility to Treatment Toxicity in Older Patients

This is the subject of ongoing research and is one of the main barriers to extrapolating clinical trial data obtained from younger trial participants to older cancer patients. Older patients are more susceptible to the side effects of chemotherapeutic agents.[31] Additionally, cancer treatment modalities may impact older patients in a unique fashion. For example, a chemotherapeutic agent that causes peripheral neuropathy may worsen imbalance in an older individual and increase his/her risks of falling and the subsequent morbidity that ensues. Increased treatment toxicity may also negatively affect an often-compromised quality of life. The common problem of polypharmacy in older age increases the likelihood of drug to drug and/or drug to food interactions.[32–34] The impact of treatment modalities on older cancer patients is detailed in "Specific Cancer Management Issues in the Older Population" (p. 219).

Putting Treatment Benefits in Perspective: Absolute Versus Relative Gains

Barring untoward side effects, a treatment that offers a 25% relative reduction of mortality at ten years may be an attractive modality for a 65-year-old patient, whose average life expectancy is otherwise 17.5 years. The same relative risk reduction may not, however, represent a significant survival gain in an 85-year-old with the same disease stage, and whose life expectancy is limited to 6 years. Treatment gains and side effects should be carefully weighed against the individual's life expectancy *and* quality of life. How comorbidities impact life expectancy is also an integral part of the equation.[21,22]

Comorbidity and Cancer

Importance of Integrating Comorbidity and Cancer

Comorbidity is defined as the presence of more than one concomitant chronic health condition in an individual. Conditions such as diabetes, hypertension, and/or other age-related conditions—such as limited self-reliance, dementia, malnutrition or incontinence—represent a problem of significant magnitude while managing older patients. Eighty percent of individuals who are 65 and older have at least one comorbidity; 30% have 3–4 while 15% have seven or more such conditions.[19,21] The routine incorporation of comorbidity assessment in the practice of geriatric oncology is easily justifiable since clinicians must make cancer treatment decisions in the context of preexisting morbidities.[35,36] Moreover, comorbidity and cancer interact intimately. They impact stage at diagnosis,[37] as well as survival, independent of a patient's age and/or tumor stage.[22,38] They also compete with cancer as a cause of death and increase the risks of disability among cancer patients.[21,39] Their presence is often associated with the receipt of less definitive cancer therapy,[40] which in turn leads to poorer treatment outcomes.[17] On the other hand, cancer and its treatment modalities—even the adjunct ones—may impact preexisting morbidities. For example, steroids are potent antiemetics but they can wreck havoc on diabetic control. Similarly, erythropoietin is an effective treatment for cancer-related anemia, but it can worsen hypertension. This is especially true given that older patients are generally more susceptible to developing treatment-related side effects.[31] The concomitant management of comorbidities and cancer presents its own challenges since primary and specialty care may not always be well-coordinated. Patients themselves may not think that the continued management of other conditions is as important after a cancer diagnosis is established.

Sources of Comorbidity Data

Multiple sources could be exploited to collect comorbidity data and they should ideally be used in a complementary fashion:

(1) *Medical records* are widely considered to be the most comprehensive source of information. They are easily accessible to multiple providers with the spreading computerization of clinical care. Limitations include the inconsistent access between hospitals and patients,[41] as well as the introduction of a bias resulting from varying health care utilization among patients.

(2) *In medical interviews*, patients are often a good source of data if they were made aware of their comorbidities in prior medical encounters. Some studies have demonstrated that patients are as reliable as medical records as a source of their comorbidity,[42] although reliability obviously decreases with dementia and recall problems. Medical interviews are good means to assess the *severity* of comorbidities, since their impact on functional status can be directly appreciated.

(3) *In administrative datasets*, the computerization of billing information has resulted in large databases that are often coded using ICD-9-CM nomenclatures. These, however, are seldom complete as conditions could be addressed by clinicians but not adequately translated onto billing records. Other limitations include the inconsistent translation between some comorbidity indices and ICD-9-CM coding[43–45] and the lack of data on severity of comorbidity.

Note that some comorbidities are often overlooked and therefore underrecorded in routine clinical practice. Depression and anxiety are classic examples of underrecognized morbidities.[46,47] Others include cognitive impairment, malnutrition, and anemia.

Comorbidity Indices

There are multiple tools to evaluate and score morbidities, each with different goals and outcomes.[22,25,27,48–52] Their descriptions are outlined in Table 16.2. As stated earlier, there is no consensus on which tool is best adapted to routine clinical practice.[24,26]

TABLE 16.2. Commonly used comorbidity indices.

	Description	*Advantages*	*Disadvantages*
Charlson Index[25]	Provides an overall score based on a composite of values assigned to 19 comorbidity conditions; estimates risk of death from comorbid conditions	• Shorter administration time than ICED • Validated in evaluation breast cancer patients • Derived from medical records	• No measure of severity of comorbidity • No functional • Dichotomous
Satariano and Ragland[22]	Modified Charlson index providing survival estimates in breast cancer	• Validated in breast cancer patients	• No measure of severity of comorbidity • No functional evaluation
Index of Co-Existing Diseases (ICED)[51–52]	Integrates measures of ten functional areas, each divided into three levels of severity; chart-based review	• Provides functional evaluation • Provides and estimate of severity of disease	• Average overall reliability (kappa 0.5–0.6) and Index of Disease Severity subindex (kappa 0.4–0.5)
Kaplan and Feinstein[50]	Assigns scores from 1 to 3 to comorbidity in various organ systems	• Provides an estimate of severity of disease • Validated in several cancers, including breast, prostate and head and neck	• No functional evaluation
Multidimensional Assessment of Cancer in the Elderly (MACE)[27]	Integrates measures of comorbidity, functional status, depression, balance, physical function and disability	• Validated in cancer patients • Provides a structured evaluation of functional status	• Lengthy administration (27 +/– 7 min)
Multiple Informants Analysis[48]	Combined scoring of the Charlson, ICED, PS and American Society of Anesthesiologists Index	• Superior in estimating the overall effect of comorbidity than separate models that included only one index	• Lengthy administration (average: 30 minutes*)

*T Lash, personal communication.

Quantification of the Impact of Comorbidities on Cancer

This area has largely benefited from the work of Yancik et al., using a cohort of male and female colon cancer patients who were 55 years and older as a model.[21] High and moderate-impact comorbidities were identified (Table 16.3). The relationship between the number of comorbidities and overall survival was reported: Patients with 5 or more comorbidities had lower survival rates than those who have 4 or less (Mortality risk ratio = 1.44 in patients with 5 to 6 comorbidities and 1.85 in those with 7 or more). Comorbidities with the highest association with increased mortality were also identified (Table 16.4).

TABLE 16.3. High- and moderate-impact comorbidities.

High-impact comorbidities	
History	Current
Cardiac	Cardiac
Arrest	Angina
Congestive heart failure	Arrhythmias
Lung	Myocardial infarction
Emphysema	Valvular disease
Renal failure	Type 1 diabetes
	Cancer
Moderate-impact comorbidities	
Current	
Alcohol Abuse	
Anemia	
Asthma	
Deep vein thrombosis	
Depression	
Gastrointestinal diseases	
Hypertension	
Lipid abnormalities	
Liver diseases	
Mental diseases	
Stroke/Transient ischemic attack	
Tobacco abuse	

Source: Adapted from Yancik et al.[21]

Cancer Screening in Older Individuals

Cancer screening in older individuals comes with its own sets of problems and characteristics:[53]

TABLE 16.4. Specific comorbidities and mortality risk ratio in patients with colon cancer.

Comorbidity	*Mortality risk ratio*
Liver disease	3.04
Other serious comorbidity	2.33
Alcohol abuse	2.20
Deep vein thrombosis	2.06
Renal failure	1.99
Emphysema	1.67
Depression	1.63
Thyroid/glandular disease	1.49
Severe heart disease (high-impact)	1.48
Diabetes mellitus	1.37
Anemia	1.25

Source: Adapted from Yancik et al.[21]

(1) The characteristics of a given screening test may change with age. For example, the sensitivity and specificity of mammography gradually increases with advancing age.[54] Similarly, the specificity of PSA screening for prostate cancer decreases with age because of the increased prevalence of benign prostatic hyperplasia.

(2) Tumors may have a different biology in older patients (e.g., slower growth rate).[55] This leads to an increased detection of slowly growing tumors, known as length-time bias.

(3) Older individuals have a shorter life expectancy compared to younger counterparts, by virtue of their advanced age or associated comorbidities. The detection of an asymptomatic tumor may not translate into a longer survival in the older individual, therefore questioning the rationale of screening at extremes of age. In general terms, the impact of screening is evident 3 to 5 years later and the value of screening may be therefore limited in individuals with shorter life expectancy.[56,57]

(4) This over-detection of clinically nonsignificant tumors may lead to treatments that adversely affect the quality of life of the older individual and may represent an unjustified healthcare cost to the community.[56]

Specific Cancer Management Issues in the Older Population: Treatment Modalities

Older cancer patients benefit from the same treatment modalities widely used in the management of cancer, including surgery, radiation therapy and chemotherapy. The following section highlights how these modalities are applied to older cancer patients. However, treatment choices in older patients go beyond the mere age-associated physiological and/or pathological changes. Older patients often have a different outlook on life, caring more about their quality of life rather than longevity; how they opt for one therapeutic modality over the other has not been fully studied. Additionally, social and/or financial considerations may ultimately affect their choice. For example, lumpectomy followed by radiation therapy for breast cancer has yielded similar survival results as a more extensive mastectomy, however older patients may still opt for mastectomy since it obviates the need for postoperative radiation therapy, which requires additional logistic arrangements over several weeks.

Cancer Surgery in Older Patients

Surgery is an integral part of a multimodality approach to the treatment of most cancers; its use is very frequently a prerequisite for treatment plans with a curative intent. Geriatric surgery has been the subject of excellent reviews elsewhere.[58–60] The following section highlights some of its most salient aspects.

Increased Operative Risks in Older Age

Surgery has advanced by giant leaps in the latter part of the twentieth century. It has benefited from innovative technology, safer anesthetics agents, the advent of a large array of antibiotics, enhanced intra-operative monitoring, and postoperative intensive care. Surgical risks have been proportionally withered. Age-related physiologic changes and accumulating comorbidities continue, however, to expose older patients to specific risks.[61–64] These changes involve all major organ systems (see Table 16.5).

Preoperative Risk Assessment

Careful preoperative evaluation of older patients is a crucial step in estimating operative risk and plan interventions to reduce them to a minimum.[65] Controversy persists over how extensive preoperative risk assessments should be.[66–69] Of interest, several preoperative risk assessment scales consider age per se as a factor that increases the risks of an adverse cardiac event in noncardiac surgical interventions. For example, age >70 years contributes 5 points to the Goldman index of cardiac risk in noncardiac surgical procedures.[70,71] Similarly, being 80 years of age or older automatically puts a patient in class II (out of possible V) in the American Society of Anesthesia (ASA) scale.[72] However, these scales remain heavily weighted by the presence or absence of comorbid conditions, rather than by age alone. For example, clinical evidence of congestive heart failure and a history of recent myocardial infarction contribute 11 and 10 points respectively to the Goldman index,[70] overshadowing the more limited contribution of age to the final score.

Reduction of Operative Risks

Multiple interventions have been advocated to reduce operative risks in older patients. These include (1) correction of

TABLE 16.5. Age-related changes and increased surgical risks.

Organ system	*Physiologic and pathologic age-related changes*	*Surgical risks*
Cardiovascular	• Increased atherosclerosis • Increased risk of arrhythmias • Decreased ventricular distensibility • Increased dependence on preload	• Increased sensitivity to fluid shifts • Increased risk of cardiac ischemia • Increased risk of congestive heart failure
Kidney	• Decreased renal mass • Decreased renal blood flow • Decreased GFR	• Risks of acid-base balance disturbances • Risk of electrolytes imbalance • Increased sensitivity to renally cleared drugs • Increased risk of renal ischemia
Liver	• Decreased hepatic mass • Decreased hepatic blood flow	• Increased sensitivity to hepatically cleared drugs
Pulmonary	• Decreased pulmonary volumes • Decreased compliance • Decreased ciliary function	• Risk of postoperative atelectasis • Risk of postoperative pneumonia
Central Nervous System	• Decreased cerebral mass • Decreased cerebral blood flow • Dementia	• Difficulty obtaining informed consent • Risk of postoperative delirium • Slow postoperative recovery and prolonged hospitalization

reversible metabolic parameters,[73] (2) use of beta-blockers to reduce perioperative mortality from cardiac events,[65] (3) adequate blood pressure control,[65] (4) close monitoring of volume status using invasive pulmonary artery catheters,[74] although their benefit is contested,[75] and (5) most importantly, avoid the delay in surgery which exposes the patient to higher risks of needing an emergent intervention,[59] or a more extensive surgery secondary to tumor progression.

In conclusion, surgical risks related to aging are mostly related to coexisting morbidities, rather than to age by itself. Therefore, older patients should not be denied a chance at curative treatment based on their age alone.

Radiation Therapy in Older Cancer Patients

Like surgery, radiation therapy plays a central role in the treatment of older cancer patients, both as part of a multimodality approach and/or with a palliative intent.[76] There are no convincing data that tissue tolerance to radiation therapy is different in older than in younger patients. Most laboratory data were obtained in rapidly growing tissue cultures and apply only to acute radiation toxicity.[77] Tolerance of radiation therapy in older patients is modulated by existing comorbidities. Specifics of radiation treatment in older patients with breast, lung, gastrointestinal and genitourinary cancers are beyond the scope of this chapter and have been extensively reviewed elsewhere.[78,79] Radiation therapy improves the quality of life in older patients and it has proven especially efficacious in controlling tumor-induced pain.[80–82] Social issues such as transportation continue to pose a significant logistic and financial burden on those who lost their physical and/or financial independence.

Chemotherapy in Older Cancer Patients

Chemotherapy is a mainstay treatment for many types of cancer. Two retrospective trials showed that chemotherapy toxicity does not differ between older and younger patients.[83,84] Results of these trials, however, should be carefully interpreted, since stringent exclusion criteria may preclude their generalization to the average older patient. The pharmacology of individual antineoplastic agents in older patients is extensively reviewed elsewhere.[85]

Every aspect of drug pharmacokinetics is potentially affected in older patients and this explains in part why they have an increased rate of chemotherapy toxicity.

Absorption

Mucosal atrophy, decreased gastrointestinal motility, and splanchnic blood flow are all documented changes in older patients and can account for decreased absorption of drugs in the older population.[86] This is especially important given that an increasing number of new chemotherapeutic agents, such as capecitabine and imatinib, are orally administered.

Distribution

Several factors affect drug distribution in older patients: (1) Decreased body water by about 20% in older patients leads to decreased volume of distribution of polar drugs, such as methotrexate and mitomycin-C. (2) Plasma albumin decreases by an average of 15% to 20% in older patients, leading to an increased unbound fraction of protein-bound drugs such as etoposide, anthracyclins, and taxanes.[87] (3) Increased body fat leads to increased half-life and lower clearance of fat-soluble agents. (4) Changes in the shape of the area under the curve (AUC), with water soluble drugs show higher plasma concentrations and shorter half-lives, while fat-soluble drugs show lower plasma concentrations and prolonged half-lives. These changes affect both drug efficacy and toxicity profile. (5) Anemia can significantly increase the toxicity of red-blood-cell-bound drugs such as taxanes and anthracyclines.

Hepatic Clearance

Decreased liver size and reduced hepatic blood flow both contribute to reduced clearance of hepatically cleared chemotherapeutic agents.[88] Several of the Cytochrome P450 enzyme activity decline with age, leaving the patient at risk for increased toxicity from delayed clearance.[89,90] Moreover, older patients are commonly subject to polypharmacy. CYP3A4 is inhibited by a large number of commonly prescribed drugs, leaving patients at risk for increased of toxicity from CYP3A4-dependant chemotherapy agents, such as cyclophosphamide, ifosfamide, taxanes, tamoxifen, and vinca alkaloids.

Renal Clearance

Glomerular filtration rate (GFR) steadily decreases at the rate of 1 ml/year in individuals who are 40 years or older.[91] This decrease is not proportionally translated into an increased serum creatinine value because of the parallel reduction in muscle mass. Serum creatinine and estimates of creatinine clearance such as the Cockroft-Gault formula may therefore overestimate the renal GFR.[92] This in turn may result in increased serum levels and toxicity of any of the renally excreted agents. Drugs such as carboplatinum and bleomycin should have their doses reduced by 25% to 30% in moderate renal insufficiency (creatinine clearance of 10 to 30 ml/min), whereas the use of other agents such as cisplatinum, methotrexate and nitrosoureas should be completely avoided.

Prevention of Chemotherapy-Induced Toxicity in Older Patients

Neutropenia

Older patients are at a higher risk of hematopoietic toxicity because of limited hematopoietic reserves and decreased response to hematopoietic growth factors.[93] Older patients are more liable to develop clinically significant neutropenia, although this finding was contested by other studies.[84,94] Several trials have demonstrated the value of adding a granulocyte colony-stimulating factor (G-CSF) to moderately myelosuppressive chemotherapy regimens.[95–97] These trials provide the bases for the regular use of G-CSF in older patients receiving such chemotherapy. Although G-CSF use is associated with reduced neutropenia and risk of sepsis, complete remissions and overall survival remain generally unchanged.[98]

Anemia

Anemia of chronic disease is a common complication of cancer and its various treatment modalities. Several studies

have shown that anemia is an independent predictor of survival in older individuals.[99–101] Anemia significantly impacts quality of life, with increased fatigue,[102] difficulty in concentrating, impaired memory,[103] and increased susceptibility to complications from red blood cell-bound chemotherapy agents.[104] Synthetic erythropoietin use has been associated with relief of anemia of chronic disease and improved quality of life.[105] Newer agents, such as glycosylated erythropoietin, have a very long half-life that allows their administration on a bimonthly basis. Interestingly, concomitant G-CSF administration may augment erythropoietin efficacy in treating anemia in diseases such as myelodysplastic syndromes.[106]

Mucositis and Diarrhea

Two reports have yielded contrasting results regarding the incidence of mucositis in older cancer patients. One argues for an increased incidence, while the other states that there were no age-associated differences in the incidence of gastrointestinal toxicities.[107,108] Interventions to reduce oral mucositis include oral cryotherapy, careful oral hygiene. The use of G-CSF is associated with reduced mucosal ulcerations, presumably through its effect in increasing salivary neutrophils.

Cancer Survivorship in Older Adults

Recent and anticipated demographic changes in the United States have magnified the concentration of cancer survivors among persons ≥65 years of age. At present 61% of the estimated 10.1 million cancer survivors are ≥65 years of age[109] and the number of incident cases in this age group is expected to double over the next 30 years.[110] Furthermore, recent gains in life expectancy have occurred at the end of life. For example, the average life expectancy of a 75 year old woman is nearly 12 years (17 years if healthy), and that of an 85 year old woman is 5.9 years (9.6 years if healthy).[111] These gains mean that older persons have, on average, longer periods of time when they are at risk for recurrences and of dying of their cancers than was true in the past, and this magnifies the importance of cancer survivorship in this population.

Yet very little is known about long-term cancer survivorship in older adults. Recent investigators have taken advantage of national probability surveys, including the National Health Interview Survey[112] and the Medicare Current Beneficiary Survey[113] to compare the health and functional status of older cancer survivors to that of older persons without cancer. Both have documented poorer health and functional status among cancer survivors, compared to persons without cancer. Although these surveys reflect large representative samples, study limitations include reliance on self-report of cancer, comorbidities, and functional status; unknown and presumably varying lengths of survivorship; and cross-sectional study designs. Furthermore, they include no detail about stage at diagnosis and treatment.

In spite of the lack of systematic data, attention to three key considerations will serve to enhance the quality of life of these older cancer survivors: (1) surveillance for recurrence and attention to attendant fears, (2) management of persisting side effects related to cancer therapies, and (3) management of comorbid conditions and attention to appropriate preventive strategies. Using the example of breast cancer, we address each of these in turn.

Guidelines for breast cancer survivors' care recommend annual history, physical examination and mammography, but no surveillance with blood chemistry tests or X-rays for distant metastases unless symptoms warrant.[114–116] This is because clinical trials of intensive follow-up (physical examination, mammography, blood tests, and X-rays) of breast cancer patients have demonstrated that recurrences can be detected slightly earlier using this approach, but that there is no difference in survival.[117,118] The lack of a survival benefit is because asymptomatic recurrences represent only a minority of recurrences (about 15% to 25%).[119] Published studies suggest that older women are at risk for receipt of less than guideline surveillance.[120–121] However, the consequences of this undersurveillance have not been well studied. Indeed, a recent systematic review of surveillance mammography after treatment of primary breast cancer highlights surveillance in older women as a key area for further study.[122]

Side effects of therapy also can be problematic for older persons and interact with coexisting conditions. In the context of breast cancer, these include, for example, radiation and chronic obstructive pulmonary disease; chemotherapy-induced peripheral neuropathy and hip or knee osteoarthritis or gait disorders; and radiation/axillary dissection and shoulder problems, including rotator cuff injuries, tendonitis, and bursitis. A recent observational study of older women with early stage breast cancer documented that over half reported a decline in upper body function over a four-year period, compared to 10% in a similarly aged sample of older women without breast cancer.[123]

As noted earlier, comorbidity is a major risk factor for mortality and this is also true for older breast cancer patients, particularly the oldest old (≥85 years of age) where 82% of women die of conditions other than breast cancer.[40] Furthermore, there is evidence suggesting that a breast cancer diagnosis interacts with comorbidity to increase the risk of death from causes other than breast cancer.[22,124] Putative explanations include tumor-host interactions, long-term adverse affects of therapy, and/or lack of quality care and management of other conditions. Although recent analyses of the SEER-Medicare database suggest that older breast cancer survivors receive high quality preventive services, disparities related to older age, being African American, being of lower socioeconomic status, living in rural areas, and not receiving care in a teaching hospital have been observed.[125] Whether a diagnosis of breast cancer is associated with an increased burden of disease or modifies the quality of care for prevalent conditions when compared to similar women is unknown. It is likely that both are true. Thus, careful attention to preventive interventions such as influenza vaccination, assessment of bone health, and colorectal cancer screening, as well as management of existing conditions and the early identification and management of new ones is critical. In the setting of multiple physician providers, as occurs commonly in cancer care for older adults, this requires meticulous communication among them so that responsibilities for management are clear.

Summary

Cancer care for older adults is challenging—from diagnosis and initial care through long-term survivorship. The evidence on which to base sound clinical decisions is modest, but

growing. As the epidemic of cancer in old age gains momentum, it behooves providers and researchers to focus attention on this important group of patients.

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