

Assessing the Older Cancer Patient

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Introduction

By 2030, one in every five individuals will be over the age of 65. Because the incidence of cancer increases with age, over 60% of all new cancer cases and 80% of deaths from cancer occur in people over 65 years of age in the United States and Europe [1–3]. Despite recent advances in geriatric care, elders still remain at risk for adverse events in all settings where cancer is treated. Because elderly patients are largely underrepresented in large cooperative trials [4, 5], there is limited evidence-based information for decision making to help guide the oncologist when caring for the older cancer patient. This can result in either suboptimal or overly toxic treatment.

Important issues need to be addressed before selecting and initiating treatment in elderly patients with cancer. Aging involves changes in the functional, cognitive, emotional, and socioeconomic domains. It is also associated with an increased incidence of comorbidities and geriatric syndromes [6]. Common geriatric syndromes such as delirium, gait imbalance, malnutrition, and incontinence can complicate cancer therapy and, thus, increase patient morbidity and costs of care. Furthermore, cancer treatment can worsen geriatric

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syndromes and comorbid conditions. Often, it is difficult to determine if declining health status is a result of cancer treatment or the patient's underlying disease. A baseline assessment of these multiple dimensions may facilitate the detection of decline, which may be remediable, and improve outcomes [3].

Increasingly, cancer patients are utilizing their oncologist as a primary care physician [7]. Therefore, it is important for the oncologist to become competent in assessing and addressing the geriatric patient, both to determine the most appropriate cancer treatment as well as to create an individualized intervention plan to deal with the multiple health problems that coexist in many elderly cancer patients and improve treatment tolerability. Just as an oncologist strives to make a pathologic diagnosis and assess the stage of disease to prognosticate, it is equally important to assess the characteristics of the elderly patient that may place him or her at risk for adverse outcomes during cancer treatment [6].

Comprehensive Geriatric Assessment

Over the past 15 years, geriatricians have developed and validated a more holistic approach to evaluate the elderly population called the *comprehensive geriatric assessment* (CGA). The CGA is a multidisciplinary, intensive evaluation of a patient who is at significant risk for subsequent functional decline [8]. It measures aspects such as functional status, comorbid medical conditions, nutritional status, psychological state, social support, and geriatric syndromes (Table 1). It involves a multidisciplinary interpretation as well as implementation. The CGA has proven to have benefits including prolongation of life [9, 10], prevention of institutionalization to nursing homes and hospitals [11], prevention of geriatric syndromes [12, 13], and improvement of subjective well-being [14]. Such a comprehensive approach often reveals information missed by routine history and physical alone [6, 15, 16].

Table 1 Components of the comprehensive geriatric assessment [8]

Parameter	Assessment	Administration	Time required
Function	● Activities of daily living (ADL)—eating, dressing, continence, grooming, transferring, using the bathroom	Self- or interviewer-administered	5–10 min
	● Instrumental activities of daily living (IADL)—using transportation, managing money, taking medications, shopping, preparing meals, doing laundry, doing housework, using the telephone		5–10 min
	● Performance status		
Comorbidity	● Number of comorbid conditions	Self- or interviewer-administered	15 min
	● Seriousness of comorbid conditions (comorbidity index)		
Socioeconomic issues	● Living conditions	Self-administered	15 min
	● Presence and adequacy of caregiver		
	● Income		
	● Access to transportation		
	● Financial counsel to discuss cost, coverage options, etc.		
Geriatric syndromes	● Dementia—Mini-Mental Status (MMS)	Interviewer-administered	10 min
	● Depression—Geriatric Depression Scale (GDS)		15 min

Table 1 (continued)

Parameter	Assessment	Administration	Time required
Polypharmacy	<ul style="list-style-type: none"> • Delirium • Falls (all falls should have an assessment) • Osteoporosis (spontaneous fractures) • Neglect and abuse • Failure to thrive • Persistent dizziness 	Self- or interviewer-administered	10 min
	• Number of medications		
	• Drug-drug interactions		
	• Nutritional risk—Mini-Nutritional Assessment		
Nutrition	• Nutritional risk—Mini-Nutritional Assessment	Interviewer-administered	<5 min

Evidence for the value of integrating geriatric perspectives into oncology is increasingly being documented in the literature [17–22]. The main objectives of performing geriatric assessments in oncology are to

- provide a gross estimation of life expectancy and help the oncologist understand the impact of the patient's cancer during his or her remaining life,
- identify cancer patients for whom we could expect the greatest benefit from treatment,
- identify medical and social problems that may decrease the tolerance of cancer treatment and/or be amenable to intervention,
- formulate appropriate treatment and management strategies,
- monitor clinical and functional outcomes.

The National Comprehensive Cancer Network (NCCN) recently issued guidelines that recommend that all cancer patients over 70 years of age should receive some form of a geriatric

assessment [15]. The tools for this assessment, however, have not been well specified. Due to its time-intensive nature and the volume of patients seen in a busy oncology clinic, it is not feasible to complete a CGA on every cancer patient older than 70 years.

Who to Screen?

Currently, “elderly” refers to people aged 65 years and over. However, this does not distinguish between people at different stages of the aging process. Chronological age is an unreliable predictor of life expectancy, functional reserve, or the risk of treatment complications in a population [23]. Aging is a very heterogeneous process, and it is unclear why some elderly maintain their physical and cognitive abilities throughout a long life while others lose these same abilities rather early.

The estimated average remaining life expectancy (RLE) has been split into quartiles of longevity by age and health status [24]. A substantial variability in life expectancy exists at each age based on health status. For example, a 75-year-old man in the lower quartile has a remaining life expectancy of 4.9 years, while a man of the same age but in a higher quartile can have an RLE of 14.2 years. Information obtained from a CGA can assist a patient’s classification into the upper, middle, or lower quartiles and thus help guide treatment decisions [24, 25].

Screening

In the past few years, there have been many attempts to identify a reliable and sensitive prescreening instrument to help determine which cancer patients would benefit most from a CGA:

- A self-administered CGA instrument, the Gero-Oncology Health and Quality of Life Assessment, was developed and proved to be a feasible method of obtaining a CGA in a Veteran’s Administration (VA) population. The results were

remarkably similar to data obtained by CGA performed by trained health professionals [26] (Table 2).

- An abbreviated CGA (aCGA), which included items from the Geriatric Depression Scale, mini-mental state examination, activities of daily living and independent activities of daily living scales, was used to identify those patients who would require further intensive evaluation with the full, multidisciplinary CGA [27, 28].
- A “minimal” CGA was developed and evaluated in elderly patients with prostate cancer. The study revealed many geriatric problems that were not clear prior to the prescreening process, such as drug interactions, cognitive problems, depressive symptoms, and malnutrition, that can all impact cancer treatment [29] (Table 3).
- The Vulnerable Elders Survey, VES-13, a 13-item, function-based, self-administered survey that consists of one question

Table 2 Gero-oncology health and quality-f-life assessment [26]

Domain	Instrument	No. of Questions	Citation
Comorbid conditions	OARS Comorbidity Scale	32	[100]
Activities of daily living	EORTC QLQ-C30 subset	5	[101]
Functional status	OARS-IADL	7	[102]
Functional status	Exercise Scale	3	[103]
Pain	Visual Analog Pain Thermometer	1	[104]
Financial	OARS Financial	3	[100]
Social	MOS Social Support Scale	20	[105]
Emotional	Hospital Anxiety and Depression scale	14	[106]
Spiritual	SOBI	15	[107]
Quality of life	EORTC QLQ-30	30	[101]

OARS: Older American Resources and Services; EORTC: European Organization for Research and Treatment of Cancer; QLQ: Quality of Life Questionnaire; IADL: Instrumental Activities of Daily Living; SOBI: Systems of Belief Inventory; MOS: Medical Outcomes Study.

Table 3 Minimal comprehensive geriatric assessment [29]

Domain	Instrument	No. of Questions	Citation
Comorbid conditions	CIRS-G	14	[44]
Functional status	Katz ADL	6	[54]
Functional status	Lawton IADL	8	[108]
Functional status	Karnofsky	1	[109]
Cognition	MMSE	11	[110]
Mood	Geriatric Depression Scale	30	[70]
Nutrition	Mini-Nutritional Assessment	19	[111]
Mobility	Timed Up and Go	1	[112]

CIRS-G: Cumulative Illness Rating Scale-Geriatrics; MMSE: Mini-Mental Status Exam; IADL: Instrumental Activities of Daily Living; ADL: Activities of Daily Living.

for age and 12 items that assess health, function, and physical status. The higher the score, the greater the risk for functional decline and/or death. The authors found that the clear cutoff values of the VES-13 tool enabled them to easily stratify their patients as healthy, at average risk; vulnerable, at moderately increased risk; or frail, at extreme risk [25, 30].

- A combination of the self-administered questionnaire and a brief physician assessment, including measures of functional status, falls, comorbidity, cognition, nutritional status, psychological state, social function, and social support, proved feasible to identify the needs of geriatric oncology patients in less than a half-hour (Table 4) [31, 32].
- An instrument that borders between a screening test and an abbreviated CGA is the EASYCare instrument. A tool developed to assess disability in the elderly, it is a compilation of other, validated instruments and assigns an overall disability score from 1 (low disability) to 100 (high disability) (Table 5) [33].
- Fried and colleagues developed an index of frailty that includes five components, the presence or absence of

Table 4 Hurria et al. brief geriatric assessment [31, 32]

Domain	Instrument	No. of Questions	Citation
Comorbid conditions	OARS Comorbidity Scale	32	[100]
Functional status	MOS-ADL	10	[105]
Functional status	OARS-IADL	7	[102]
Functional status*	Karnofsky-Physician	1	[109]
Functional status	Karnofsky-Self-report	1	[113]
Functional status*	Timed Up and Go	1	[112]
Functional status	No. of falls in last six months	1	[114]
Cognition*	Blessed Orientation-Memory-Concentration	6	[115, 116]
Psychological	Hospital Anxiety and Depression Scale	14	[106]
Social	MOS Social Support Scale	20	[105]
Social	Seeman and Berkman Social Ties	4	[98]
Nutrition*	Body-Mass Index	1	[117]
Nutrition	Percent unintentional weight loss in six months	1	[84, 86]

*Needs to be administered by a health-care professional.

OARS: Older American Resources and Services; EORTC: European Organization for Research and Treatment of Cancer; QLQ: Quality of Life Questionnaire; IADL: Instrumental Activities of Daily Living; SOBI: Systems of Belief Inventory; ADL: Activities of Daily Living; MOS: Medical Outcomes Study.

which stratifies the elderly into non-frail, pre-frail, and frail. A person is frail if three or more criteria are met. Pre-frail is defined as meeting one or two criteria [34]. Using this stratification can help guide cancer treatment decisions because elements of the frailty syndrome may help identify older patients likely to develop severe toxicity and side effects in response to treatment. Because of

Table 5 EasyCare instrument [33]

Domain	Instrument	No. of Questions	Citation
Comorbid conditions	CIRS-G	14	[44]
Functional status (ADL/IADL)	GARS-3	18	[118]
Mobility	Timed Up and Go	1	[112]
Quality of life	MOS-20	20	[105]
Mood	MOS-20 subscale		[105]
Well-being	Cantril self- anchoring ladder	10	[119]
Cognition	MMSE	11	[110]
Social	Loneliness Scale	14	[120]

CIRS-G: Cumulative Illness Rating Scale-Geriatrics; GARS-3: Groningen Activity Restriction Scale; MOS: Medical Outcomes Study; MMSE: Mini-Mental Status Exam; IADL: Instrumental Activities of Daily Living; ADL: Activities of Daily Living.

the possibility that the pre-frail elderly may have the most unpredictable response to stressors, they may be the population that would benefit most from a CGA (Table 6).

- Lastly, Rockwood and colleagues defined a frailty index using data from the Canadian Study of Health and Aging (CSHA) by using 70 deficits from the clinical examination (individual items available at <http://myweb.dal.ca/amitnits.CHSAclinical-variables.jpg>) to classify patients as “robust,” “pre-frail,” or “frail,” showing that a phenotypic definition of frailty is predictive of survival [35].

Evaluate Comorbidities

The presence of comorbid conditions increases with age and can have important implications for patients with cancer. Clinical studies in elderly cancer patients have shown that the presence of

Table 6 Fried frailty screener [34]

Research criteria used to define frailty		
Variable	Question	Criteria
Weight loss	"In the past year, have you lost more than 0 lbs unintentionally (i.e., not due to dieting or exercise)?"	If yes, then subject is frail for weight loss criterion.
Exhaustion	Using the CES depression scale, the following two statements are read. (a) I felt that everything I did was an effort. (b) I could not get going. The question is asked: "How often in the last week did you feel this way?"	Subjects answering "2" or "3" to either of these questions are categorized as frail by the exhaustion criterion.
Physical activity	Based on the short version of the Minnesota Leisure Time Activity questionnaire, subjects are asked about whether they do walking, chores (moderately strenuous), mowing the lawn, raking, gardening, hiking, jogging, biking, exercise cycling, dancing, aerobics, bowling, golf, singles or doubles tennis, racquetball, calisthenics, swimming.	Men: those with physical activity <383 Kcal/wk are frail. Women: those with physical activity <270 Kcal/wk are frail.

Table 6 (continued)

Research criteria used to define frailty		
Variable	Question	Criteria
Walk time (cutoffs are gender and height-specific)	Men	Cutoff for time to walk 15 ft is criterion for frailty
	Height \leq 173 cm	\geq 7 seconds
	Height $>$ 173 cm	\geq 6 seconds
	Women	
	Height \leq 159 cm	\geq 7 seconds
	Height $>$ 159 cm	\geq 6 seconds
Grip strength (cutoffs are gender and BMI-specific)	Men	Cutoff for grip strength (kg) is criterion for frailty
	BMI \leq 24	\leq 29
	BMI 24.1–26	\leq 30
	BMI 26.1–28	\leq 30
	BMI $>$ 28	\leq 32
	Women	
	BMI \leq 24	\leq 17
	BMI 23.1–26	\leq 17.3
	BMI 26.1–29	\leq 18
	BMI $>$ 29	\leq 21

BMI = body mass index; CES = Center for Epidemiological Studies.

Adapted from Fried L, Tangen C, Walsoton J, et al. Frailty in older adults: Evidence for a phenotype. *J Gerontol Med Sci* 2001;56A:M146–56.

comorbidity has a negative impact on prognosis, treatment tolerance, disability, as well as the risk of mortality among cancer patients [36–39]. Recently, it has been reported that the presence of multiple comorbidities impacts five-year survival in patients with endometrial, prostate, larynx, and rectal cancer [40, 41]. A pilot study using the CGA in elderly breast cancer patients helped identify new health problems over those detected by traditional history and physical alone [18]. There have been systematic attempts to develop management guidelines for cancer patients with comorbid conditions. The Charlson Comorbidity scale [42, 43] (Table 7) and Cumulative Illness Rating Scale-Geriatrics (CIRS-G) [44] are the most common comorbidity indices in geriatrics [17].

Table 7 Modified Charlson Comorbidity Index (CCI)

6 points each for metastatic solid tumor or AIDS	
3 points each for moderate to severe liver disease	
2 points each for hemiplegia, moderate-to-severe renal disease, diabetes with end-organ damage, and cancer (including leukemia or lymphoma)	
1 point each for every decade over 40	
1 point each for coronary artery disease, congestive heart failure, peripheral vascular disease, cerebrovascular disease, dementia, chronic pulmonary disease, connective tissue disorder, peptic ulcer disease, mild liver disease, diabetes	
<u>Modified CCI Score</u>	<u>Annual Mortality Rate</u>
Low (<3)	0.03
Moderate (4–5)	0.13
High (6–7)	0.27
Very High (≥8)	0.49
Adapted from www.eperc.mcw.edu/fastFact/ff_191.htm and Beddhu et al. Am J Med 2000 108:609–13.	

Evaluate the Patient’s Functional Status

Functional impairment is the inability of an older person to function normally in daily life activities and has been found to be an independent predictor for use of health-care resources, morbidity, and mortality [45–48]. A recent survey indicated that 10–13% of older persons between ages 65–69 have difficulty getting out of bed, and 6–10% need help with routine care. This increases as older people age, with 24–29% of those over the age of 80 needing help getting out of bed, and 29–42% needing help with routine care [49]. Cancer is also associated with increased functional dependence above and beyond that associated for the equivalent age in the population. The prevalence of functional limitations in older cancer patients has been reported as being up to twice as high as that reported in large cohorts of community-dwelling elderly [27, 50].

Functional assessment instruments, such as the Karnofsky Index and Eastern Cooperative Oncology Group Performance Status Scale (ECOG-PS), are widely used to help predict prognosis in cancer patients [51]. However, these instruments do not seem as effective in older patients [17, 52, 53]. In geriatrics, more accurate measures of performance status are the activities of daily living (ADL) and instrumental activities of daily living (IADL) scales. Measurement of ADLs provides a general evaluation of self-sufficiency and mobility. They include six basic functions: bathing, dressing, toileting, continence, transferring, and feeding [54, 55]. IADLs are a measure of eight higher-level functions: using the telephone, transportation, shopping, meal preparation, laundry, performing housework, taking medications, and managing money [56]. Functional status in the elderly patient with cancer may reflect tolerability to chemotherapy, progression of cancer, or general health status [57]. An accurate assessment of functional status can help the oncologist to determine if the patient can comply with medical instructions in addition to identifying potential remediable problems. For example, transportation dependence may contribute to difficulty keeping appointments.

Evaluate Geriatric Syndromes

Another important component of the CGA is to evaluate the patient for the presence of geriatric syndromes: cognitive dysfunction (dementia and delirium), vision and hearing impairment, gait and balance difficulties, malnutrition, incontinence, depression, osteoporosis, and sleep disorders. Impairments in any of these syndromes can have a profound effect on cancer treatment and quality of life.

Cognitive Syndromes (Dementia and Delirium)

In older persons, the two most important cognitive problems are dementia and delirium. Dementia is defined as a significant decline in two or more areas of cognitive functioning, including

one or more functions of memory, recall, and recognition for visual/verbal information, judgment, language, and problem solving [58]. The incidence of dementia increases with age. It has been reported that as many as 50% of all patients over the age of 80 will have dementia [59]. A diagnosis of dementia usually contributes to increased mortality [60].

Delirium is defined as a disturbance of consciousness with a decreased ability to focus and poor attention that develops over a short period of time and fluctuates. It often is associated with changes in cognition and perceptual disturbances, classically visual disturbances. The prevalence of delirium among patients over the age of 65 presenting to the emergency room ranges from 10–24%. Among hospitalized older persons, it is 25–60% and is a predictor of poor prognosis, with an increased risk of short-term mortality by 2–20-fold [61, 62]. Risk factors for delirium include preexisting dementia, severe medical illness, alcohol abuse, diminished functional ability, depression, and hearing and visual impairment [63].

Cognitive function and capacity are important issues to consider in decision making with older patients. The oncologist is obligated to determine whether a patient can follow directions to comply with chemotherapy treatment plans and make informed decisions about treatment. Furthermore, as the patient's underlying cancer progresses or complications of treatment occur, the older patient may become unable to make health-care decisions. Therefore, issues regarding advance directives, establishing health-care proxies, and potential intensity levels of treatment should be discussed early in the course of cancer care and revisited if the patient's disease progresses.

Conversely, cognitive dysfunction can occur secondary to cancer treatment. Dementia has been reported following treatment of brain tumors with radiotherapy, administered alone or in combination with nitrosourea-based chemotherapy [64]. More often, though, chemotherapy predisposes to delirium [65]. In addition, delirium might be the first presenting sign of infection (with or without neutropenia), dehydration, electrolyte disorders (especially hyponatremia), and malnutrition either directly from the tumor or as a side effect from the chemotherapy.

Depression

Depression, clinical or subclinical, is associated with increased mortality [66]. In community-dwelling elderly patients, the prevalences of depressive symptoms and major depressive disorder are 15% and 1–3%, respectively [67]. Factors associated with depression in the elderly include gender, alcohol and substance abuse, polypharmacy, family history, and medical conditions such as stroke, Alzheimer's disease, cancer, and heart disease [67]. Since older patients often deny depressive symptoms, present with somatic complaints, or have comorbid anxiety or cognitive impairment, it is often difficult to recognize depression in an older patient.

A diagnosis of cancer, particularly those that are incurable, may lead to depressive symptoms. For example, increased dependency or the anticipation of reduced life expectancy can precipitate symptoms. Many of the symptoms of depression, such as appetite change, weight loss, and loss of energy, are similar to cancer symptoms [68]. Affect assessment is particularly important to assess during cancer treatment because depressed patients are less likely to adhere to treatment regimens. There is a marked tendency for oncologists to underestimate the level of depressive symptoms on routine history and physical [69]. A simple inquiry can be used as a screen, such as "Do you often feel sad or depressed?" This single question, however, tends to be overly sensitive and should be used in conjunction with the Geriatric Depression Scale, available in 5-, 15-, and 30-item varieties [70].

Falls Risk: Assess Gait and Balance Impairment

Older patients are more likely to have gait and balance impairments, which increase their risk of falling [71]. There is a high rate of injury as a result of falls among older persons who do not have cancer, and it is likely that older cancer patients are at

an even higher risk for serious injury due to several factors. First, cancer patients frequently have fatigue, dizziness, dehydration, or other symptoms that increase the likelihood of a fall. In addition, cancer patients with bony metastases to the hip, wrist, or vertebral body have a higher chance of a fracture due to structural weakness of the bone. Also, for patients with a low platelet count, the chances for serious morbidity and mortality are greater.

The treatment of an older patient with chemotherapy may also contribute to gait and balance instability. Side effects (e.g., cerebellar toxicity, peripheral neuropathy, dizziness, dehydration, and fatigue) of commonly used oncology agents include the increased chance of instability and falls [72] (Table 8). The risk of falling can be assessed by asking all older patients if they have fallen in the last year, and then performing a multifactorial falls assessment by testing balance, gait, and lower extremity strength. Performing this assessment on patients who screen

Table 8 Chemotherapy side effects that contribute to falls

Cisplatin	Delayed peripheral neuropathy Sensory impairment Loss of proprioception
Taxanes, Vinca Alkaloids	Peripheral neuropathy (exacerbated with cisplatin)
Flurouracil (5-FU)	Cerebellar toxicity
Cytarabine (Ara-C)	Cerebellar toxicity

positive for falls, and then treating their risk factors, can reduce falls by 30–40% [73]. For all these reasons, the older cancer patient should be assessed for gait and balance instability prior to and during the course of chemotherapy.

Vision Impairment

The prevalence of visual impairment defined as a visual acuity of 20/40 or worse is 4–5% among persons over the age of 65

and 10–21% for those over the age of 75 [74]. Among older persons, the prevalence of common causes of visual impairment is 36% for cataracts, 14% for macular degeneration, 7% for diabetic retinopathy, and 5% for glaucoma [75]. The leading cause of blindness among African-Americans is cataracts, whereas for Caucasians it is macular degeneration.

Cancer treatment of an older patient with poor visual acuity poses additional risks beyond the normal complications of chemotherapy. First, many chemotherapy regimens and underlying malignancies can cause symptoms of fatigue, dizziness, and peripheral neuropathy, which, combined with visual impairment, can greatly increase the risk of a fall. Furthermore, the morbidity (e.g., hip fractures) and mortality of such a fall may be greater, especially in patients with low platelet counts, bleeding disorders, or bony metastases [76]. Medication compliance may also be hindered if the patient lives alone and cannot see well enough to read the labels [77].

Hearing Impairment

The prevalence of hearing impairment in the community is about 25–40% in persons over the age of 65 and 70–80% in those over the age of 75. The prevalence is even higher in nursing home settings, about 80–85% [78, 79].

Hearing impairment is relevant to cancer care because of the ototoxicity of chemotherapeutic agents and because of the effect of hearing impairment on treatment. Several chemotherapeutic agents and other medications that are used commonly in oncologic practice have substantial ototoxicity [80]. Cisplatin (Platinol), a widely used anticancer drug, is cochleotoxic. Some studies suggest that some level of hearing toxicity occurs in 65–70% of people exposed to Cisplatin at a total dose greater than 200 mg/m² [81]. Total deafness has been reported. Furthermore, the ototoxicity of Cisplatin is synergistic with gentamicin (Garamycin). Other cancer agents with reported ototoxicity include carboplatin (Paraplatin), dichloromethotrexate (DCM), and

vincristine (Oncovin) [82]. Also, medications such as furosemide (Lasix), vancomycin (Vancocin), and metronidazole (Flagyl) are toxic in some instances, especially when used in conjunction with gentamicin.

Sensory deficits such as hearing also affect the ability to give adequate informed consent in oncology. The ability to comprehend speech frequently diminishes with age due to impaired hearing and central auditory processing disorders [83]. This becomes a substantial problem in a busy and noisy cancer clinic setting. Consonant sounds tend to be the most difficult since much of the sound is concentrated in higher frequencies, where hearing loss due to presbycusis most commonly occurs.

Nutritional Status

Poor nutritional status is an independent predictor of functional dependency and survival in the elderly population. Weight loss is a common finding in older persons [84]. There are many causes for unintentional weight loss, including acute infections, depression, drugs (including chemotherapeutic agents, laxative abuse, thyroid medications, and amphetamines), conditions that prevent food consumption (e.g., painful mouth sores, newly applied orthodontic appliances, loss of teeth), loss of appetite, malignancy, smoking, and AIDS. It is important to differentiate weight loss due to malignancy from weight loss due to other reversible causes.

In the presence of cancer, the prevalence of malnutrition is higher [85]. Malnutrition and unintentional weight loss are associated with increased toxicity of chemotherapy, lower response rates, decreased performance status [86], and poorer survival [87, 88]. However, in attempting to optimize patient outcomes, reversible factors that affect nutritional status should be addressed. These factors include depression, smoking and alcohol use, dysphasia, mucositis, changes in taste and smell, difficulty chewing, inability to shop or cook, and

medication side effects. The mini-nutritional assessment is an easy tool to utilize in the outpatient setting and can help detect the risk of malnutrition while albumin and BMI are still in the normal range [73].

Incontinence

Incontinence is often mistaken to be a part of normal aging, and its impact on a patient's quality of life is underappreciated. The prevalence of incontinence in the elderly varies considerably. In the community, incontinence ranges from 15-30%, but in nursing home settings, as many as 50-60% of patients may have incontinence [89].

Metastatic disease to the brain or spinal cord can interfere with nerve pathways needed for normal micturation and cause incontinence [90, 91]. Furthermore, incontinence is sometimes an early sign of underlying urinary tract infection, which may lead to sepsis in older cancer patients. The treatment of cancer may also precipitate or worsen incontinence. Fluids and diuretics are often given in conjunction with chemotherapy and can worsen the symptoms of incontinence, making mild symptoms moderate or severe, and therefore adversely affect quality of life [92]. The history and physical examination are essential in distinguishing transient from chronic causes of incontinence.

Sleep Disorders

Sleep disturbance is a common problem among both the elderly and cancer patients. Approximately 50% of all older persons report a sleep complaint, 30% of which is of a chronic nature. Studies of insomnia in cancer patients have shown that 30-50% of newly diagnosed or recently treated patients have sleep difficulties, with many reporting insomnia lasting several years post-therapy [93]. The consequences of insomnia include worsening of cancer-related fatigue and functional impairment

comprising both cognitive and psychomotor impairment [93]. Unfortunately, unlike aspects of cancer such as depression, nausea, and pain, sleep receives little attention from oncologists. There is a misperception that sleep difficulties are always due to depression or anxiety. Although it is true that psychiatric disorders are often associated with sleep disturbance, cancer is often a precipitating factor for insomnia since both the diagnosis and treatment are a series of stressful events.

Several cancer therapies increase the risk of developing insomnia. For example, patients with postchemotherapy nausea and vomiting report a high rate of insomnia, which may be secondary to the effects of certain antiemetic medications known to cause insomnia such as dexamethasone (Decadron), prochlorperazine (Compazine), metoclopramine (Reglan), and granisetron (Kytril) [87, 88]. Furthermore, drugs such as tamoxifen can cause side effects that interfere with sleep in breast cancer patients, such as hot flashes, a symptom shared by prostate cancer patients with androgen deprivation therapy [94]. Cancer pain is also a common cause of insomnia, with one study showing that 37% of cancer patients with pain report difficulty initiating sleep [95].

Assess Social Issues

Living Conditions

The physical environment can play a big role in the day-to-day function and health of older patients. Mismatches between a patient's capabilities and environmental demands can result in disability. The prevalence of environmental hazards in the homes of older persons is high. Some studies on falls suggest that between 35–45% of falls are attributed to home hazards, such as poor lighting, inadequate bathroom grab rails and stairway banisters, exposed electrical cords, clutter on the floor, and throw rugs [96]. Home assessment can help, performed by visiting physicians, nurse, or social workers using a home safety checklist provided by the National Safety Council. Home assessment can also provide other valuable information

on nutritional adequacy, sanitary conditions, medication use and misuse, social interactions, and elder abuse and neglect.

Caregiver Support

Social support is another important yet often neglected topic in the health care of the elderly. There are many potential sources of support, including family, friends, caregivers, neighbors, other patients, and volunteers from agencies. Caregiver support is essential for several aspects of the cancer patient's treatment, including transportation, timely management of fever, bleeding, and other emergencies during chemotherapy, as well as emotional and psychological assistance. Involving families through education and counseling can help support the elderly cancer patient and prevent or slow functional deterioration [97]. For very frail older patients, the availability of assistance from family and friends is the determining factor for whether a functionally dependent older person remains at home or is institutionalized [7]. Often, there is one caregiver that assumes most of the responsibilities for the older cancer patient. Community-based services aimed at reducing this burden may help in maintaining social support over a longer period of time. Social isolation or the lack of social ties is an independent predictor of mortality in the geriatric population [98].

Religion

Older adults commonly turn to spirituality and religion when they meet difficult life-changing events and experience personal losses. Several studies have been conducted on spirituality and health. One study found religiosity positively associated with health-enhancing attitudes and behaviors and inversely associated with health-compromising behaviors and adverse health-related outcomes [99]. Oncologists need to be aware that religion may be more important as a person ages and that formal instruments to assess its importance are being developed.

Strategy

The key components of the geriatric assessment can be divided into steps [73]:

1. data gathering,
2. discussion among the team,
3. development of the treatment plan,
4. implementation of the treatment plan,
5. monitoring response to the treatment plan, and
6. revising the treatment plan.

No current model that includes these elements has been proven to be the most effective with respect to outcomes and cost. This remains to be determined, and research in this area is still underway. Future research needs to be dedicated to developing assessment strategies that can be performed with the available resources in busy community oncology practices as well as traditional academic centers while still retaining predictive value for both treatment toxicity and overall survival.

Conclusion

In addition to benefiting the management of older cancer patients, the routine usage of a geriatric assessment by oncologists can provide a common language in the management of older cancer patients, which is essential both for the retrospective evaluation of equality of care as well as for the prospective assessment of outcomes in clinical trials.

Therefore, the recognition of the importance of the performing a CGA in elderly cancer patients may be regarded as the introduction of “geriatric thinking” into the oncology setting [21]. Optimal training of future medical oncologists should include a better understanding of these clinical and research problems of managing the older population.

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