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Integrating a Cancer-Specific Geriatric Assessment Into Survivorship Care

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Older adults constitute the greatest percentage of cancer survivors in the country, with 61% being aged 65 years and older. Assessing older adult cancer survivors beyond chronological age to include changes in functional status is an essential process to help nurses anticipate cancer treatment impact and aid in planning individualized survivorship care. The objective of this article is to identify a method to assess older adult cancer survivors to be used in tailoring survivorship care. A review of geriatric literature was conducted through MEDLINE® and PubMed from 1997–2011 and focused on the pathophysiology of aging, cancer impact, and comorbidities in this population. Results were combined with previous research to provide an evidence-based approach to assessing older cancer survivors. The resulting assessment provides valuable information on the functional status of older adult patients with cancer. This assessment can be used by nurses to develop treatment plans and tailor management strategies to improve quality of life.

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The population of the United States is aging, with about 36.8 million adults aged 65 years and older. That number is projected to rise to 70–75 million by 2030 (National Cancer Institute, 2007). The current size and expected increase of this population mean that the healthcare needs of older adults will create challenges for healthcare systems. When considering healthcare needs along with the cancer-related needs of the population, the scope of those challenges becomes even greater.

Older adults constitute the greatest percentage of cancer survivors in the United States, with 61% of cancer survivors being aged 65 years and older (Bellizzi, Mustian, Paless, & Diefenbach, 2008; Rowland, 2008). A cancer survivor refers to the individual diagnosed with cancer, throughout the trajectory of their life, as well as their families and caregivers (Hewitt, Greenfield, & Stovall, 2006). The need for excellent cancer survivorship care has become apparent and is highlighted in Hewitt et al. (2006).

Cancer survivorship care for this growing population involves combining the expected late and long-term effects of cancer and cancer treatment with information about expected changes in health status that occur with aging. Individuals at

a specific chronological age vary in functionality, cognition, and the ability to handle stress (Walston et al., 2006). Although chronological age is the first component that starts the assessment process, additional tools are needed to understand an individual's functional age and to tailor survivorship care to the needs of an individual. A variety of factors other than chronological age can identify older adults who are at risk of morbidity and mortality. These factors, which may be captured in a geriatric assessment, include functional status, comorbidities, cognition, psychological state, social support, and nutritional status (Hurria et al., 2005; Yancik, 1997). The purpose of this article is to describe a method to assess older adults with cancer prior to or at the beginning of cancer treatment to provide nurses with information to better anticipate care needs throughout treatment and survivorship.

Methods

A review of literature on older adults with cancer focused on the pathophysiology of aging, cancer impact, and comorbidities of this population and was identified through MEDLINE® and PubMed searches from 1997–2011. Starting with Yancik (1997)

and continuing through the current publications on a cancer-specific geriatric assessment, key articles were selected that focused on physical and psychosocial issues that impact the older adult cancer survivor (Hurria et al., 2005; Hurria, Togawa, et al., 2011). Content was organized using a geriatric oncology framework aimed at identifying the unique needs of older adult cancer survivors to tailor management strategies to improve quality of life post-treatment. Content is presented along with approaches used to assess each area.

Physiologic Changes With Aging

Physiologic changes in this patient population may complicate the ability to tolerate treatment regimens (Sawhney, Sehl, & Naeim, 2005; Sehl, Sawhney, & Naeim, 2005). As adults age, multiple systems are commonly affected and the impact on cancer treatment for this population should be anticipated. Changes in eyesight and hearing; endocrine, cardiac, pulmonary, gastrointestinal, and urological systems; and neurological changes such as neuropathy can have a significant impact on the ability to tolerate certain treatment regimens (Keating, Norredam, Landrum, Huskamp, & Meara, 2005; Yancik, 1997; Yancik, Ganz, Varricchio, & Conley, 2001). As the body ages, changes in body composition occur such as increased total body fat and decreased lean muscle mass. These changes can

impact the volume of distribution of drugs in older adult patients with cancer (Wedding, Honecker, Bokemeyer, Pientka, & Hoffken, 2007). The process can be further complicated by hypoproteinemia and anemia, which alter binding of medications to proteins or erythrocytes and also can impact the volume of distribution of medications (Wedding et al., 2007).

Aging is associated with a reduction in the number of active nephrons in the kidney leading to reduced renal function. A serum creatinine is not an adequate assessment of kidney function in older adult patients with cancer (Wedding et al., 2007), but a creatinine clearance is necessary to obtain an accurate assessment of kidney function. A loss of hepatic mass occurs with aging; however, no significant changes occur in liver function tests. Changes in the intestinal mucosa can impact the oral absorption of medications. In addition, polypharmacy increases the risk of adverse drug reactions. Metabolism of chemotherapy medications may be altered or toxicity increased because of drug interactions (Repetto et al., 2002). Careful evaluation of all medications and an assessment for drug interactions is essential.

Frailty

Frailty is a term used to describe a state of decreased physiologic reserve that places older adults at increased risk for

TABLE 1. Cancer-Specific Geriatric Assessment and Nursing Implications

Domain	Recommended Tools	Tool Administrator	Nursing Implication
Cognition	Blessed Orientation-Memory-Concentration	Healthcare professional	Baseline deficit necessary to anticipate treatment tolerance
Comorbidities	Physical Health Section (subscale of OARS)	Healthcare professional	Rise in comorbidities related to rise in side effects
Functional status	Activities of daily living (MOS physical health subscale)	Self-administered	Identifies need for support in the home
	Instrumental Activities of Daily Living (subscale of OARS)	Self-reported or physician-rated	
	Karnofsky Self-Reported Performance Rating Scale	Self-administered	
	Karnofsky Physician-Rated Performance Rating Scale	Physician-rated	
	Timed Up and Go	Healthcare professional	
	Number of falls in prior six months	Self-report or documented medical record review	Number of falls indicative of rise in risk of injury related to mobility, gait, and balance
Nutritional status	Percent of unintentional weight loss in prior six months Body mass index	Self-reported and healthcare professional Healthcare professional	Weight loss is associated with lower chemotherapy response and lower performance status.
Psychological status	Hospital Anxiety and Depression Scale	Self-reported	Depression related to potential for decreased self-care and loss of independence
Social support and social functioning	MOS Social Activity Limitations Measure and MOS Social Support Survey: Emotional and information and tangible subscales	Self-reported and healthcare professional	Relates to loss of independence and identified need for care support resources post-treatment; identify family and community resources
	Seeman and Berkman Social Ties	Self-reported	

MOS—Medical Outcomes Study; OARS—Older Americans Resources and Services

Note. Based on information from Dewys et al., 1980; Guralnik et al., 1994; Hurria, Cirrincione, et al., 2011; Hurria et al., 2005; Hurria, Togawa, et al., 2011.

adverse consequences. Criteria for frailty described by Fried et al. (2001) include slowness, weakness, weight loss, low activity, and fatigue. Frailty is predictive of adverse outcomes including hospitalization, risk for falls, inability to complete activities of daily living (ADLs), decreased mobility, and death (Fried, Bradley, Towle, & Allore, 2002). Frailty is a multifaceted problem involving several physiologic systems (Walston et al., 2006). The association between cancer therapy and the development or acceleration of frailty is an area of active research.

Cancer-Specific Geriatric Assessment

The cancer-specific geriatric assessment (CSGA), a recently developed and tested assessment for older adults with cancer, consists of an evaluation of the individual's functional status, comorbidities, cognition, psychological status, social functioning, support, and nutritional status. Information gained serves as the basis for treatment planning and anticipating the possible consequences of cancer and its treatment on an older adult cancer survivor (Hurria, Cirrincione, et al., 2011). Using geriatric assessment tools with established reliability and validity, this assessment includes self-administered brief tools combined with three short health provider assessments. The tools are described in Table 1. The mean time to complete the assessment is 22 minutes (range = 6–60 minutes), and the majority of patients can complete the patient portion of the assessment without assistance (Hurria, Cirrincione, et al., 2011).

Assessment of the older adult with cancer is particularly important because treatment and/or cancer can have debilitating effects (Yancik, 1997). The CSGA helps identify areas of vulnerability so that targeted interventions can be applied (Hurria et al., 2005). The domains of the CSGA and measurement tools are described in this article.

TABLE 2. Most Common Comorbidities in Older Adult Cancer Survivors

System	Comorbidities
Cardiovascular	Congestive heart failure, coronary artery disease, and hypertension
Cognitive	Hearing, visual changes, and dementia
Endocrine	Diabetes
Gastrointestinal	Constipation, diarrhea, and decrease in absorption
Hepatic	Decrease in circulation and decrease in size; changes P450 inhibition and inducers
Musculoskeletal	Osteoporosis, arthritis, neuropathy, and bone or joint injury
Pulmonary	Chronic obstructive pulmonary disease
Urinary	Decrease in glomerular filtration rate

Note. Based on information from Lichtman et al., 2007; Yabroff et al., 2004; Yancik, 1997.

Functional status: The potential impact of therapy on independence and self-care issues are important factors to consider when weighing the risks and benefits of treatments. The fear of functional or cognitive impairment may affect an older adult's willingness to receive a potentially life-sustaining treatment (Fried et al., 2002). Loss of physical function is a predictor of distress among older adults with cancer (Hurria et al., 2009).

Cancer therapy can produce short- and long-term changes in a patient's functional status. Older adult cancer survivors, when compared to similar older adults who have never had cancer, describe more limitations in mobility and ADLs (Keating et al., 2005). An individual's functional status can be evaluated by self-report or by performance-based measures. The patient can self-report his or her ability to complete ADLs and instrumental ADLs (IADLs). ADLs are very basic self-care skills such as bathing, dressing, transferring, and maintaining continence. IADLs are activities that are necessary to maintain independence in the community, such as shopping, making telephone calls, or managing one's finances. Performance-based measures of functional status, such as the Timed Up and Go tool (Podsiadlo & Richardson, 1991), provide an objective assessment of mobility, balance, muscle strength, and motor processing. Targeted interventions to maintain physical function of cancer survivors are being evaluated during and following treatment (Demark-Wahnefried, Clipp, et al., 2006).

Comorbidities: The number of comorbid medical conditions increases as an individual ages (Fried, Ferrucci, Darer, Williamson, & Anderson, 2004) (see Table 2). These medical problems impact a patient's ability to tolerate cancer treatment and can impact the patient's life expectancy. In the older adult cancer survivor, comorbidities may be present before a cancer diagnosis, exacerbated during and following treatment, or be a consequence of therapy. Common comorbidities in older adult patients include hypertension, arthritis, vision or hearing deficits, and osteoporosis. Examples of comorbid illnesses induced or exacerbated by cancer therapy include neuropathy with taxanes, heart failure with anthracyclines, and increased risk of osteoporosis with aromatase inhibitors (AIs) (Lichtman et al., 2007).

The Older Americans Resources and Services (OARS) physical health section has a comorbidity scale to rate the type of comorbidity and the impact of that comorbidity on daily function (Fillenbaum & Smyer, 1981). Other comorbidity indexes, such as the Charleson-Deyo method (Deyo, Cherkin, & Ciol, 1992), can be used to describe the number and kind of comorbidities present (van Doorn et al., 2001).

Cognitive function: Cognitive assessment of older adult patients with cancer is important to help define deficits that can interfere with the patients' ability to participate in treatment regimens, recognize side effects of therapy, or identify signs of disease progression that warrant attention (Given & Given, 2008). The etiology of the cognitive impairment should be identified. Hearing or vision deficits are sometimes mistaken for cognitive impairment. Potentially reversible and treatable causes of cognitive impairment should also be evaluated. In the older adult with cancer with cognitive changes, an evaluation for metastatic disease to the brain should be considered.

The Blessed Orientation-Memory-Concentration (BOMC) test is a valid and reliable screening tool for gross cognitive

impairment (Hurria et al., 2005; Ibbotson, Maguire, Selby, Priestman, & Wallace, 1994; Katzman et al., 1983). The tool asks memory questions ranging from “what year is it now?” to “say the months in reverse order,” and “repeat the memory phrase,” and can be completed in about five minutes.

Psychological assessment: Recognizing an individual’s emotional and psychological composition can assist tremendously in planning care for the older adult patient. Depression in older adults may be related to decreased functional status and may signal the need for more social support and family interventions to meet their healthcare needs (Given & Given, 2008; Keating et al., 2005). Anxiety and fear of recurrence are concerns facing patients of all ages. Keating et al. (2005) found that older adult cancer survivors reported similar rates of depression as younger cancer survivors despite overall poorer self-rated health (Keating et al., 2005). However, depression in older adult patients with cancer may go underrecognized and further research is needed to optimally identify and treat depressive symptoms in older adults. Interventions aimed at maintaining physical and social functioning to promote psychological well-being is an essential part of caring for older adult cancer survivors.

The Hospital Anxiety and Depression Scale (HADS) is a valid and reliable tool for measuring anxiety and depression and it can be completed by the patient (Ibbotson et al., 1994). Research is needed to further understand the psychological impact of cancer on older adults and to evaluate its effect on independence and well-being (Given & Given, 2009).

Social support and social functioning: The social component of the CSGA includes an evaluation of both social functioning and social support. The older cancer survivor faces increased burden and decreased tolerance of negative side effects after cancer treatment that may be further compounded if social support is not present (Given & Given, 2009). The combined results of cancer and its treatment may significantly affect the older survivor, impacting their ability or desire to be social. Patients may withdraw from family and friends and lose access to social support systems outside of their family (Bellizzi et al., 2008; Given & Given, 2008).

The Medical Outcomes Study (MOS) Social Activity Limitations Measure provides information on the overall impact of the disease on social functioning (Stewart & Ware, 1992). This tool identifies how much patients’ physical or emotional problems interfere with their social functioning. Social and physical functioning has been shown to have a negative impact on an older adult patient’s ability to tolerate cancer treatment (Bellizzi et al., 2008; Keating, Ayanian, Cleary, & Marsden, 2007; Yancik et al., 2001).

Nutritional status: In the older adult population, a low body mass index (BMI) is associated with an increased risk of mortality (Landi et al., 2000). In patients with cancer, unintentional weight loss during the six months before chemotherapy is associated with decreased performance status, lower chemotherapy response rates, and poorer survival (Dewys et al., 1980; Newman et al., 2001). Simple screening tools, such as measuring the percent of unintentional weight loss and BMI, can be used to identify patients at risk for nutritional deficiency for whom further evaluation with a nutritionist may be beneficial. Because nutrition status can significantly deteriorate during cancer treatment, serial screening is needed to understand

the pattern of nutritional change in older adult patients during cancer treatment and survivorship and to identify those who might benefit from a consultation with a nutritionist.

Implications for Nursing Practice

In caring for older adult patients with cancer, advanced practice nurses are in a position to guide patients through treatment planning and potential survivorship issues. Recognizing the implications of the CSGA on the care prescribed will help nurses coordinate services and anticipate post-treatment survivorship care needs.

Functional Status

An older adult patient’s ability to perform ADLs and IADLs is essential to maintaining independence. Fatigue post-treatment is a common side effect in cancer survivors and can impact an older adult’s ability to remain independent. Neuropathy is an additional long-term effect of cancer therapy that can impact functional capacity. The nurse can identify whether patients need assistance with their daily activities. Those who require assistance can be referred for consideration of a home health aide to assist with daily activities. Nurse navigators can help coordinate appointments to decrease the number of office visits. A physical therapy evaluation could be initiated to try to maintain or improve the patient’s functional status. Research on promoting an exercise regimen has been shown to positively affect the ability of an older adult patient with cancer to maintain strength and mobility, improve oxygenation, and aid sleep (Demark-Wahnefried, Pinto, & Gritz, 2006).

Comorbidities

Older patients with comorbidities at baseline may have intensified symptoms after treatment. The most common comorbid illnesses include hypertension, diabetes mellitus, and coronary artery disease (Yabroff, Lawrence, Clauser, Davis, & Brown, 2004). When comparing cancer survivors to healthy controls, conditions that contributed to physical limitations primarily included arthritis, back or neck problems, bone or joint injury, hypertension, and lung or breathing problems (Yabroff et al., 2004). Patients with diabetes have an increased risk of long-term chronic neuropathy, which may be painful as well as decrease mobility. Managing pain in older adult patients may be necessary to maintain independence and decrease the consequences of unrelieved pain on sleep, mobility, nutritional intake, and cognitive function (American Geriatrics Society Panel on Pharmacological Management of Persistent Pain in Older Persons, 2009; Paice, 2011). Regular assessment and treatment of comorbidities is necessary throughout treatment and long-term survivorship.

Osteoporosis and bone health play a significant role in the older adult cancer survivors’ ability to maintain independence.

Web-Based Resource for Patient Outcomes

The PROMIS® tool from the National Institutes of Health can be used to measure health outcomes from the patient perspective. To learn more, visit www.nihpromis.org/measures/availableinstruments.

Aging and menopause are associated with decreased osteoblast activity and increased bone resorption, leading to decreased bone mass and bone weakness. Chemotherapy can also be associated with bone loss (Reeder & Brufsky, 2010). Women aged 50 and older have a one in three chance of a vertebral fracture and a one in six chance of a hip fracture (Solomon, 2002). Osteoporotic fractures occur in 2 million people per year in the United States, with the cost of these fractures being an estimated \$19 billion per year (National Osteoporosis Foundation, 2011). Fifty percent of patients with a hip fracture experience a decrease in functional status and 20% die within one year; however, only one in four of all women with osteoporotic fractures receive adequate treatment for osteoporosis (Solomon, 2002). The American Society of Clinical Oncology (ASCO) recommended that oncology professionals include regular assessment of women's bone health as part of their treatment plan (Hillner et al., 2003). Patients with breast cancer taking AIs are at increased risk for fractures (Eastell et al., 2008). Although accelerated bone loss occurs in women treated with anastrozole over tamoxifen, treatment with anastrozole extended disease-free survival and the side effect profile may impact the way providers prescribe these medications (Eastell et al., 2008). Nurses can help manage bone health through collaboration with the treating physicians and patient education regarding the prevention and treatment of bone loss, including promoting exercise to maintain bone health and improve mobility.

The ASCO bone health task force has made recommendations for screening women for osteoporosis risk factors. Hillner et al. (2003) defined high risk factors that include women aged 65 years and older, women aged 60–64 years with a family history of osteoporosis, body weight of less than 70 kg, prior nontraumatic fracture or other risk factors, postmenopausal women of any age receiving AIs, or premenopausal women with therapy-associated premature menopause (Hillner et al., 2003). Follow-up recommendations for patients with breast or prostate cancer who have had antiestrogen and antiandrogen therapies should have a baseline dual-energy x-ray absorptiometry (DEXA) scan to ascertain their risk for fracture. Bone marrow density (BMD) screenings usually take place for women aged 65 and older, those who have a family history of fractures, those with non-traumatic fracture and weigh less than 70 kg, and for men aged 70 years or older.

The DEXA method for diagnosing and measuring osteoporosis has become the accepted measurement, although it can vary depending on the machine. Patients should be evaluated on the same machine whenever possible to provide the most accurate score for comparing osteoporosis staging.

The World Health Organization has developed a fracture risk algorithm tool that uses clinical factors such as weight, height, and high-risk information (i.e., smoking, previous fractures, glucocorticoids, or alcohol use) and compares with a BMD t score to provide a 10-year probability of major bone fracture. That score can then be used to provide osteoporosis risk-reduction strategies to prevent fractures in the future (Gralow et al., 2009).

Again, the key recommendations nurses can promote for bone health for all patients is calcium and vitamin D supplements (1,000 mg per day from food and supplements for those aged 50 and younger without risk, and 1,200 mg per day for those older than age 50). Additional pharmacologic interven-

tions are recommended for patients with cancer and others at high risk for osteoporosis. Weight-bearing exercise and resistance training should be recommended, as well as avoiding tobacco or excess alcohol intake.

Pharmacologic management aimed at preventing AI-associated bone loss in breast cancer survivors with the use of bisphosphonates can be considered (Van Poznak et al., 2010). Treatment using both drugs has shown a significant increase in BMD of the lumbar spine and total hip in comparison to AI treatment alone (Van Poznak et al., 2010). For men on androgen deprivation therapy, screening and treatment for osteoporosis recommendations are the same as the general population, which includes calcium supplements, vitamin D₃, and additional treatment for those with a fracture risk of greater than 3% in 10 years (National Comprehensive Cancer Network, 2012).

The nurses' role in managing these potential complications in a proactive and anticipatory fashion will positively impact the quality of life for the older adult cancer survivor. Screening older patients who are at high risk of developing disabilities related to treatment side effects and comorbidities and managing these issues early may prevent subsequent physical disability (Fried et al., 2004).

Cognitive Function

A focus on cognition is an essential part of improving quality of life for the older adult cancer survivor and helping them to maintain their independence and care for themselves at home (Brem & Kumar, 2011). Recognizing older adult patients' ability to follow their prescribed regimen and appointment schedule is essential to the success of cancer treatment (Given & Given, 2009). Assisting patients who are experiencing cognitive problems begins by identifying its existence. Differentiating cognitive changes from psychological distress, quality of life, or depression is an important part of the evaluation process (Brem & Kumar, 2011). Structured cognitive training programs are being evaluated to determine if they can improve cognitive functioning.

Psychological and social assessment: Psychological well-being may impact cognitive functioning. Recognizing existing psychological issues or changes in baseline status is important. Mood changes and depression may be treatable and can improve functioning for this population (CancerCare, 2007; Keating et al., 2005; Yancik et al., 2001).

The combined consequences of cancer and its treatment may increase a patient's need for functional assistance. Recognizing the social functioning and support needs pretreatment will help nurses anticipate supportive care that will be needed during and after treatment (Bellizzi et al., 2008; Given & Given, 2009). Lack of home support may affect the older adult survivor's ability to follow prescribed management recommendations and seek help if needed. Coordinating social support networks through community resources or family support is an important part of complete care of the patient.

Nutritional status: Evaluating an older patients' nutritional status before, during, and after treatment can identify patients with unintentional weight loss or an abnormal BMI who may benefit from a nutritional consultation. Identifying those at risk and intervening before severe weight loss occurs can make a difference in chemotherapy response rates and survival (Dewys et al., 1980;

Implications for Practice

- ▶ Assessing older adults prior to cancer treatment can provide essential information to better anticipate care needs throughout treatment and survivorship and improve quality of life.
- ▶ A cancer-related geriatric assessment provides information on physical, psychosocial, cognitive, nutritional, and comorbidity status to help evaluate patients' individualized morbidity and mortality risk from treatment.
- ▶ Preserving function and mobility in older adult patients improves adherence to treatment and maintains independence.

Newman et al., 2001). Nurses can play a role in helping patients maintain nutritional health throughout treatment and cancer survivorship. Older adults in general have a decreased appetite and decreased intake. Educating the older adult patient with cancer on supportive interventions like food supplements or appetite stimulants may also be helpful. Referring patients to nutritionists for additional support is essential for high-risk patients who are experiencing weight loss and low BMIs.

Conclusion

Establishing a method of evaluating older adults prior to treatment as well as recognizing the deficits that may be related to cancer treatment and aging in that population of survivors is essential to providing effective and comprehensive survivorship care. Incorporating the CSGA into oncology care would provide a more comprehensive overview of the physical and psychological state of an older adult patient and identify areas where interventions may potentially be beneficial (Hurria et al., 2005). The CSGA was reported to be feasible in an outpatient oncology setting and in cooperative group trials (Hurria et al., 2005; Hurria, Cirrincione, et al., 2011). A geriatric assessment provides information beyond the standard history and physical assessment and identifies those patients at increased risk for chemotherapy toxicity (Hurria, Togawa, et al., 2011). Incorporating this information in the older adult patient's survivorship care plan will allow for a truly individualized plan. Nurses will have the necessary information needed to coordinate resources and support systems for appropriate and effective follow-up care of the older adult cancer survivor.

The nurse can play an essential role in establishing a baseline screening for the unique needs of the older adult patient with cancer, which will assist providers with direct treatment and survivorship follow-up services. Nursing research is needed to describe the specific benefits this screening and intervention will have on the quality of life and independence of the older adult cancer survivor.

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