



Current perspective

## Systematic nutritional screening and assessment in older patients: Rationale for its integration into oncology practice

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### ABSTRACT

As the global population ages, so does the number of older people being diagnosed, treated and surviving cancer. Challenges to providing appropriate healthcare management stem from the heterogeneity common in this population. Although malnutrition is highly prevalent in older people with cancer, ranging between 30 % and 80 % according to some analyses, is associated with frailty, and has been shown to be a major risk factor for poor treatment response and worse overall survival, addressing nutrition status is not always a priority among oncology healthcare providers. Evaluation of nutritional status is a two-step process: screening identifies risk factors for reduced nutritional intake and deficits that require more in-depth assessment. Screening activities can be as simple as taking weight and BMI measurements or using short nutritional questionnaires and asking the patient about unintentional weight loss to identify potential nutritional risk. Using geriatric assessment, deficits in the nutritional domain as well as in others reveal potentially reversible geriatric and medical problems to guide specific therapeutic interventions. The authors of this paper are experts in the fields of geriatric medicine, oncology, and nutrition science and believe that there is not only substantial evidence to support regularly performing screening and assessment of nutritional status in older patients with cancer, but that these measures lead to the planning and implementation of patient-centered approaches to nutrition management and thus enhanced geriatric-oncology care. This paper presents rationale for systematic nutrition screening and assessment in older adults with cancer.

### 1. Background

The aging of our global population is proceeding at a fast pace. And because cancer is predominantly a disease of ageing, the number of older people being diagnosed, treated and surviving cancer is steadily growing. Yet, both cancer and supportive care measures can be complicated due to certain age-related factors, including those factors

that adversely affect adequate nutritional intake. The subspecialty of geriatric oncology was established to improve access to appropriate treatments, support a patient-centered approach to care and treatment, and ensure better outcomes for older adults with cancer [59]. In the older patient with cancer, implementation of screening tools to identify specific risks and assessment tools to identify deficits and resources of functionality and health status are essential to successfully reaching

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these venerable outcomes.

Older people are at increased risk of malnutrition due to many factors [71] and older patients with cancer are no exception. The nutritional status of these patients may be negatively affected at the time of diagnosis by the cancer itself (i.e., due to a mechanical obstruction) or indirectly through tumor-induced metabolic changes [24], and/or by anorexia of aging. During treatment, intake of adequate nutrients may be impeded by gastrointestinal side effects of antineoplastic agents and some novel agents, radiation therapy to specific fields, and the catabolic stress associated with surgery, which is particularly apparent in older patients with poor functional reserves [40]. Unfortunately, neither screening nor assessment of nutritional status are performed with consistency in older patients in real-life oncology practice despite existing evidence that screening tools developed for this population are accurate, sensitive and specific for identifying nutritional deficits [17,4].

Addressing the nutritional status of the older patient with cancer may take a backseat to health issues deemed of greater importance and significance such as cardiac or renal status or even cognitive function. Malnutrition is, however, highly prevalent ranging between 30 % and 70 % and reaching 83 % in older patients scheduled to receive chemotherapy according to a systematic review [10]. In fact, more than half (52 %) of 1030 older-old patients (median age 83) referred for geriatric assessment prior to anticancer treatment selection and initiation were identified as cachexic [54].

The thesis of this position paper is that nutritional screening and assessment of older patients with cancer can identify nutritional problems early on and thereby provide the basis for interventions that lessen or even prevent complications along the cancer trajectory. In the following discussion, we, a group of experts in geriatrics, oncology, and nutrition, identify the benefits of screening and assessment for nutritional deficiencies in older patients with cancer and present our recommendations for implementation of said measures.

## 2. Aging and cancer

It has been estimated that by 2050 about 30 % of the population in Europe will be 65 years of age or older, which will pose significant challenges for the healthcare sector [22] as global health improves and mortality declines. The likelihood of developing cancer increases with age. More than 50 % of people with cancer are 65 years or older, as has been calculated based on the GLOBOCAN 2020 data, and cancer is the leading cause of death in patients between 60 to 79 years of age [60]. Hence, older adults bear a disproportionate burden of the incidence and mortality of cancer [47] and will, in the future, likely predominate in oncology care settings.

There is no typical older person. Rather, the heterogeneity common in the older population is caused by a multitude of factors, among them aging processes, physiologic reserve, and comorbidities as well as by social environment and health behavior. Because of this heterogeneity, chronologic age and biologic (or functional) age can differ widely in individual patients, adding a layer of complexity to treatment decision-making and exposing older adults with cancer to a risk of over- and under-treatment. In geriatric oncology, going beyond chronologic age by understanding the functional age of an individual has high relevance for disease management [62].

## 3. Nutritional status in older patients with cancer

According to the World Health Organization (WHO), malnutrition refers to deficiencies or excesses in nutrient intake, an imbalance of essential nutrients, or impaired nutrient utilization. Numerous factors are causes of impaired nutritional status in older patients with cancer such as decreased intake, depleted muscle mass and systemic effects of the tumor [75]. Prevalence of nutrition risk varies in clinical study reports. Kenis et al., [33] identified risk of malnutrition at 80 % in older adults with cancer after administering the Mini Nutritional Assessment

Short Form (MNA-SF) at the time of treatment decision-making whereas Zhang et al [76] report a prevalence of about 42 %. A systematic review of 44 studies similarly identified risk of malnutrition at 44 % (median; range, 27 %–82 %) [57].

Malnutrition seldom occurs in isolation; rather it is often accompanied by other health issues such as reduced health-related quality of life and increased prior healthcare utilization [73]. Malnutrition is also associated with physical frailty [66], a contributing factor of fatigue, which has been found to be a cause of reduced food intake leading to malnutrition [64]; a not so untypical scenario highlighting the complex and multifaceted problem of malnutrition in older patients with cancer.

There is good clinical evidence of the potential harm of malnutrition in terms of achieving treatment intent and maintaining psycho-social well-being. According to study results, malnutrition in older patients with cancer imposes a higher risk of mortality [1,20,25,29,3,32,77,76] and is a major risk factor for poor treatment responses [45] and chemotherapy-related toxicity [6,70]. It is a risk factor for longer hospital stays [14] and leads to a worse overall survival according to a meta-analysis of 13 studies [9]. Conversely, geriatric syndromes such as cognitive impairment, depressed mood and fall risk were independent risk factors for the development of malnutrition in patients with solid tumors aged  $\geq 70$  years [51].

Ideally, all older patients with cancer should be evaluated by geriatric assessment (GA) to identify deficits in their health and functional status [18]. However, performing an assessment can be resource- and time-intensive. Screening, which is a brief assessment, provides output to aid the clinician in determining if the patient would benefit from a more extensive GA. Screening for problems, therefore, is the first step of a two-step assessment process, as advocated by the International Society of Geriatric Oncology (SIOG) [23].

### 3.1. Clinical value of nutritional risk screening

Nutrition screening should be practical, cost-effective, highly sensitive, and have good specificity and high reliability [5]. Nutrition management is an important constituent of supportive care in cancer and the identification of nutritional deficits early on, as achieved by screening, can provide the basis for appropriate interventions that lessen or possibly prevent complications.

Screening can be as simple and efficient as gathering data on recent weight loss, calculating BMI or administering the validated 6-item Mini Nutritional Assessment-short form (MNA-SF). Other validated screening tools for malnutrition risk include the Nutritional Risk Screening 2002 (NRS-2002), the Malnutrition Universal Screening Tool (MUST), and the 18-item MNA. The choice of tool depends on availability of clinical resources, the goals of screening, familiarity with the tool, and the context of screening [38].

Screening tools have been employed in clinical studies to identify associations between risk of malnutrition and overt malnutrition and both medical and non-medical outcomes in older patients with cancer. A prospective study including over 3000 patients found that 33 % were malnourished and 39 % at nutritional risk following screening within 48 h of hospital admission [14]. In this study, length of hospital stay increased significantly as nutritional status deteriorated. The screening of 800 older patients with cancer revealed that those with malnutrition were more likely to fall than those without malnutrition [69]. Another study of older patients with cancer found a 3.8-fold higher odds of having frailty and 2.5 times higher likelihood of major depression in those who screened positive for malnutrition. Lastly, an association was identified between a low score on MNA and a higher risk of functional decline in older patients with cancer [34].

We support routine nutrition screening for all older patients with cancer, independent of their specific diagnosis and including those who are overweight or with obesity or those who appear “fit”. Nutrition screening should be performed with a validated tool, should be included in a defined clinical protocol, and should result in a plan of action if

screening is positive [56]. Nutrition screening should take place at the time of diagnosis and repeated regularly throughout the cancer pathway [41,5,71].

#### 4. Geriatric assessment

Geriatric assessment (GA) is a multidimensional, multidisciplinary evaluation of an older individual's functional status, cognitive and psychological status, comorbidities, social support, and nutritional status that addresses items beyond information provided by routine exam and chronological age [23,7]. GA involves the use of various validated tools to systematically assess health status and physiologic reserve capacities. Results can reveal potentially reversible functional and medical problems to guide subsequent patient-centered therapeutic interventions [37]; Wildiers 2015) even in patients with seemingly good performance status at initial presentation [28,55,57]. Data collected on nutrition during GA focuses on food and fluid intake, weight, body mass index (BMI), etiologic factors possibly contributing to the development of malnutrition as well as weight loss over the last three and six months.

##### 4.1. Clinical value of geriatric assessment

Nutrition is recognized as a critical domain within the GA according to results of a Delphi consensus of geriatric oncology experts [43]. Using GA, several studies have examined an association between nutritional status and treatment tolerance, treatment-associated risks of toxicity, and survival outcomes. For example, physical function and nutritional deficits were most often associated with mortality and systemic treatment-related outcomes; malnutrition was especially predictive for the risk of early withdrawal of chemotherapy [8]. Nutritional status and mobility were determinants of 1-year mortality, independent of tumor stage, age and comorbidity in patients with a median age of about 79 years with head and neck cancers [68]. In a large, mixed cancer diagnosis population in which 67 % were identified as malnourished at study begin, nutritional deficit noted on GA was a significant predictor of survival [55].

Considering the health complexity of older adults, authors examined GA predictors of mortality in older patients with GI malignancies. Those without malnutrition or depression had the best 1-year survival whereas those with malnutrition, stage IV disease and functional limitations had the worst 1-year survival [74]. Similarly, the presence of malnutrition significantly increased the risk of all-cause mortality in older patients with solid tumors but not in those with hematologic malignancies [77].

An astonishing 52 % of 336 patients with GI malignancies and a mean age of 70 years had nutritional deficits on GA, which was associated with reduced health-related quality of life (HRQoL) and increased healthcare utilization [73]. In terms of treatment intent, in univariable analysis [11,27,48,63] as well as in multivariable analysis [63] a deficit identified in the nutrition domain of GA led to a modification in the cancer treatment plan. In two studies that included patients with non-Hodgkin lymphoma, malnutrition was associated with treatment non-completion [2,53].

Nutritional screening and assessment recommendations are included in global clinical practice guidelines published by professional healthcare organizations and societies. The use of routine, structured GA to assess nutritional status for patients aged  $\geq 65$  years is endorsed by ASCO [15], NCCN [19], EORTC [52], and SIOG [72], ESPEN recommends regular screening and assessment of nutritional intake, weight change and BMI beginning with cancer diagnosis and repeated for all patients with cancer [46].

Beyond the screening step, and potentially also in the context of GA, which remains the reference framework, consensus has been reached on the Global Leadership Initiative on Malnutrition (GLIM) criteria to diagnosis malnutrition [13], a relatively simple tool suitable for implementation in all clinical settings. The GLIM criteria have been extensively validated and reported to provide clinically sound assessment of

malnutrition, also in older adults, thereby providing a valuable addition to the malnutrition diagnostic toolbox [12].

#### 5. Positive assessment of nutrition deficit: next steps

It is not the intent of this paper to provide a detailed description of the measures to be implemented following the identification of nutritional deficits. This third and clearly "good practice" next step should be discussed in a multidisciplinary team that includes dietitians/nutritionists, geriatricians, oncologists, and nurses as well as relevant healthcare professionals present in the care setting.

#### 6. Discussion

The issue is not whether screening or GA should be performed but rather routinely performing both evaluations to identify actual or potential nutritional deficits in older patients with cancer. Evaluation of nutritional status is a two-step process: screening identifies nutrition risks that require more in-depth assessment. The practicality of some screening and assessment tools may be influenced by the setting, clinical situation, and competency of the administrator and a "one size fits all" implementation concept may be unrealistic. Hence, these situational variables may dictate the best tool to use in terms of tool performance and data collected. In sum, the best screening or assessment tool to use is the tool that will be used consistently and systematically.

Geriatric assessment is considered complex and resource demanding [49] and seems to be seldom employed in clinical practice: only 20 % of surveyed international oncology providers reported using GA due to barriers such as lack of time and adequate staff [16], and in another survey, 60 % of US oncologists did not use GA with 44 % responding that GA was too cumbersome to incorporate into routine practice [26]. (Of note, only 7 % of participants in the Gajra survey replied they did not use GA because it has not been proven to enhance outcomes in older patients with cancer.) By contrast, screening can provide useful information with less effort than assessment. It provides a rough, but objective, insight into patients' nutritional status to unmask underlying impairment [38]. Screening for nutritional deficits, therefore, cannot and should not be time- or resource intensive. Weight and BMI measurements as well as asking the patient about unintentional weight loss and food intake are easily incorporated into physical exam activities at baseline and throughout the cancer pathway. Nonphysician health practitioners who have an established role in caring for patients with cancer in a variety of settings can adeptly screen patients and distinguish older patients in need of more comprehensive evaluation. Utilizing the competencies of these members of the multidisciplinary team has potential cost effectiveness and efficiency benefits; no specialized training and education beyond standard oncology knowledge is required [65]. The 6-item MNA-SF, for example, takes less than 4 min to complete and is simple to administer [31] making nutritional screening practical in "real" clinical practice [18].

It is recommended to screen older patients with cancer for nutritional risk at the planning stage for initial treatment or at commencement of treatment and, because nutritional status is dynamic and may improve or worsen, re-screening should take place at regular intervals thereafter [30]. Further, screening should take place at the time of hospital or care home admission and at outpatient clinic appointments. Patients at known high-risk for the development of malnutrition, such as head and neck primary or those with upper digestive cancers, would probably benefit from a more in-depth GA with a focus on the nutrition domain at first encounter with oncologic services.

Much of the clinical evidence cited here demonstrates the interplay of deficits in different domains on nutritional status and disease- and patient-related outcomes. Based on this evidence, assessment of nutritional status, a key predictor for mortality and chemotherapy-related outcomes according to a large database [44], together with one or two other domains in GA may provide information necessary to develop

patient-centered anti-cancer treatment and care [67]. A meta-analysis of 46 studies analyzing which domains of the GA were predictive of patient-related treatment outcomes, for example, identified the domains functional status and nutrition as the most predictive domains for mortality [8]. These authors conclude that physical function and nutritional status should be included in the GA for older patients with cancer.

According to a Cochrane review, clinical leadership, specialty knowledge and competence, multidisciplinary team meetings, and involving patients and caregivers in goal setting and tailoring treatment plans are among critical success factors for GA [21]. Ideally, GA should be performed by healthcare professionals with training in geriatric medicine familiar with the administration of the instruments [43] taking into consideration the patient's condition (nutritional and clinical condition), planned treatment course, and expected outcome. Worldwide, however, there is a shortage of geriatric oncologists and most oncologists practice in settings where geriatric expertise is not available [72]. One solution gaining acceptance in global practice is the upskilling of oncologists, nurses, and allied health professionals to be able to administer, interpret and implement into practice the findings of GA [62]. In addition to upskilling through education, we advocate the dissemination of clinical evidence to strengthen and support the feasibility and efficiency of GA to assess nutritional status [61]. And we agree with Seghers (2023), that clinical implementation of GA in geriatric oncology is only feasible where there is support from both management at local hospital levels and policymakers on national and/or international level.

In clinical trials, GA is often implemented to examine the association between a GA deficit and study endpoints [35,36,42]. Clinical trial endpoints may not be of interest to older patients with cancer who tend to place a higher priority on maintaining quality of life and independence than on outcomes of treatment and tend to want more information and to play a bigger role in decision making [50]. To this end, using patient reported outcomes (PROs) in either paper or digital format to screen and assess for nutrition status not only actively involves the patient in communicating their perspective [58], but can also decrease the time and personnel load required to complete an evaluation.

As previously stated, if screening for nutritional risk is positive, a more detailed assessment should be implemented, ideally including several other domains to obtain reliable data on the patient's state of health and functionality and any co-existing problems. The implementation of nutrition management strategies including counseling, supplement prescription, or educational measures should follow.

Nutritional screening and assessment should be a standard form of evaluation, integrated into treatment protocols and clinical trials. Because significant heterogeneity and center-level differences in implementation make it difficult to interpret data generated from screening and assessment tools [39], a recommendation would be to test available tools in various clinical settings to evaluate setting appropriateness. The goal of this process would be to identify which tools work best in which settings to screen and assess for nutritional deficits, which would assist in moving forward to procuring homogeneous data for later analysis and possibly closing the gap between national clinical practice recommendations on nutrition screening and assessment and routine practice. Ideally, a gold standard tool endorsed by professional societies would benefit patients and clinical practice, and facilitate a deeper understanding of the scope of nutritional issues in the older cancer population.

In conclusion, owing to the key role nutrition plays in older patients with cancer, not addressing nutrition in this population can be thought of as undertreatment. Nutritional deficits can be effectively screened and assessed. The obtained information can then be used to guide multidisciplinary decisions for patient-centered management approaches.

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## CRedit authorship contribution statement

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