Journal of Visceral Surgery (2019) 156, 37—44

Available online at ScienceDirect www.sciencedirect.com

Elsevier Masson France EM|consulte www.em-consulte.com/en

REVIEW

# The vision and role of geriatric oncology in surgical treatment of the elderly patient

A.F. Bouras[a,b,*], E. Ioos[c], A. Aoudia[d], H. Kaci[a,b], D. Benaibouche[a,b], F. Merad-Boudia[a,b]

[a] *Faculté de médecine d'Alger, Université Benyoucef Benkhedda, Alger 1, Algeria*
[b] *Chirurgie générale et digestive, CHU Lamine Debaghine, boulevard Saïd Touati, Bab El Oued, Alger, 16000, Algeria*
[c] *Médecine polyvalente et gériatrie, centre hospitalier Germon-et-Gauthier, 62408 Béthune, France*
[d] *Clinique de psychiatrie, hôpital Fontan II, CHRU Lille, 59000 Lille, France*

Available online 8 November 2018

**KEYWORDS**
Elderly;
Geriatric oncology;
Cancer;
Surgery;
Geriatric assessment

**Summary** The phenomenon of population aging is constantly on the rise, as are the medical needs of elderly subjects. Oncological treatment concerns an ever larger number of elderly patients, raising a number of not only practical and medical questions, but also the ethical interrogations associated with therapeutic decision-making, quality of life and therapeutic obstinacy (futile medical care). Surgeons are increasingly preoccupied by elderly patients on account of the cancer rate among them, and they are compelled to cope with challenges such as morbimortality and prolonged hospitalization. Geriatric oncology is a discipline of increasing importance of which the goal consists in comprehensive care of the elderly cancer patient, care taking into full account his physical and psychological aging, his somatic and cognitive comorbidities, and, last but least, his life expectancy. The opinions and recommendations of geriatric oncologists provide increasingly more orientation for the oncological therapeutic decision-making processes. The objective of this attempt at clarification is to discuss the contributions of this discipline to everyday surgical activity, to provide surgeons with some tools facilitating initial evaluation of their patients, and to remind the reader of situations in which oncological assistance is of paramount importance.


## Introduction

The phenomenon of population aging, from wherever it may originate, is in constant progression. The proportion of the Algerian population from 60 to 79 years of age will climb from 7.4% of the overall population in 2013 to 20.5% in 2050, reaching 28.4% in 2100 [1]. The situation seems more advanced in France, where at the next turn of the century, the INSEE (French institute of statistics and economic studies) predicts that one out of every three inhabitants will be at least 60 years old, as opposed to one out of three in 2005 [2]. At present, close to one third of cancers occur in persons over 75, and by 2050, that proportion should approximate 50% [3].

* Corresponding author. Chirurgie générale et digestive, CHU Lamine Debaghine, boulevard Saïd Touati, Bab El Oued, Alger, 16008, Algeria.
*E-mail address:* afouadbouras@gmail.com (A.F. Bouras).

https://doi.org/10.1016/j.jviscsurg.2018.10.003
1878-7886/

The elaboration of standardized recommendations for cancer treatment in aged patients is difficult, one of the reasons being the heterogeneity of the elderly population. As a result, a new approach has developed over recent years; geriatric oncology (also known as oncogeriatrics) is not a new medical discipline, but rather the blending of the skills of several specialists (oncologists, geriatricians, organ specialists...) at the service of the elderly cancer patient [4].

Decision-making on treatment or abstention from treatment in the elderly patient is far from presenting a simple choice, especially in as much as patient age is by no means an objective criteria; multidimensional geriatric evaluation is consequently indispensable. In this assessment, it is necessary to steer clear of (a) ''overmedicalization'' in patients for whom pharmacological treatment would not be beneficial in terms of duration and quality of life and (b) its polar opposite, ''undermedcalization'' in patients who, notwithstanding their age, have conserved satisfactory overall health and autonomy. An ultimate goal is to avoid the two extremes; on the one hand therapeutic obstinacy, and on the other hand therapeutic neglect or abandonment.

Oncogeriatric evaluation is carried out by trained geriatricians in a highly specific framework. It mobilizes possibly scarce financial resources, and available time may be at a premium; these factors have led some authors to propose allowing other practitioners, and even members of paramedical professions, to undertake this type of assessment [5]. In addition, given the increasing number of older patients requiring treatment, it is important that other clinicians, such as surgeons, immerse themselves in the specificities of aged subjects in view of providing them with improved management. The goal of this attempt at clarification is to remind the reader of some specificities of elderly subjects and to describe the role of geriatric oncology in the treatment of those suffering from cancer, by proposing basic tools to be applied in everyday evaluation.

## Specificities of the elderly patient

As the population of elderly patients is heterogeneous, there can be no definition of the elderly subject according to age. Balducci has described three different groups of elderly subjects [6]:

- the independent elderly subject, without comorbidity. He presents no geriatric symptom. Management of this subject should not differ from that of younger adults inasmuch as he can benefit from standard treatments;
- the elderly subject presenting comorbidities rendering him dependent as regards a number of actions in daily life. Management of this subject is more often than not symptomatic, in as much as no curative therapy can have beneficial effects on his quality of life;
- the elderly subject situated between these two groups, who presents moderate alteration of his state of health and his independence. Adaptive treatment strategies are often necessary.

On the same token, other, more recent definitions by the International Society of Geriatric Oncology (SIOG 1 et 2) make distinctions between patients liable to benefit from therapeutic management, vulnerable patients for whom treatment must be adjusted, and fragile patients who require palliative care [7].

In a 2009 report, the French Institut national du cancer (INCa) proposed its own definition of the elderly patient: ''An elderly patient can be characterized by a health production model corresponding to a specific morbid and socio-economic condition, which renders him distinct from younger patients due to pronouncedly more frequent incapacity and therapeutic failure, along with increasing uncertainty as to his capacities for revalidation subsequent to the disease. This existing situation is premised on the deleterious effects of pathologies and of aging, as these two elements generate degradation of the physiological functions [8]''.

Fragility in the elderly subject is defined as a diminution of functional reserves leading to diminution of that person's adaptative capacities when faced with even minimal stress. Fragile elderly patients are often more than 80 years old and present a number of geriatric symptoms, frequently including malnutrition, falls, cognitive disorders [9] and social fragility; when suffering from digestive cancer, they will have to undergo surgery and, in all likelihood, neoadjuvant and/or adjuvant therapy. A recent cohort study showed that so-called geriatric postoperative events (pressure ulcers, confusion, dehydration, falls...) occurred at least one times out of two in patients more than 75 years old, most often during operations involving the digestive tract, all surgical disciplines taken together [10]. Wishing to assign an order of magnitude to surgical onslaught and the bodily reserves it mobilizes, some authors have compared the stress of having an elderly patient undergo a major operation to the stress he would experience when running a marathon [11].

Subsequent to surgical treatment, discharge of elderly patients from a surgery unit does not necessarily entail their return home, two main reasons being their loss of independence (even following ''minor'' operations) and their social isolation. It often becomes necessary to plan for transfer to a continuing care and rehabilitation unit (SSR, in France), transfer that can be anticipated by the surgeon, following shared assessment with the geriatrician and the social worker [12].

Last but not least, elderly patients may be living in conditions of fragility due to solitude (distance, widowhood, deterioration of the social fabric) or economic insecurity. The consequences of these factors can exert direct influence on the results of long-term management.

### The elderly patient and malnutrition

The causes of malnutrition in elderly patients are multiple, and they may conveniently be divided into three groups:

- socio-economic fragility resulting in difficult access to balanced nutrition;
- difficulties connected with dietary intake (dementia, anorexia associated with age as well as multiple medication use); altered mastication; altered sense of taste due to age; digestive disorders subsequent to a cerebrovascular accident...);
- difficulties connected with nutrient absorption [13].

Proposed by the French health authority (HAS) [14], Table 1 details these different obstacles. The concrete consequences include delayed inordinately delayed scarring, immunodepression of which one of the corollaries is heightened occurrence of nosocomial infections [15], as well as deterioration of bone mass, of muscle strength and of cognitive status, leading to a consequential delay in regaining a measure of independence [16] and a risk

**Table 1** Situations in which an elderly patient risks malnutrition.

| Situations | Possible causes |
|---|---|
| Psycho-socio-environmental | Social isolation |
| | Bereavement |
| | Financial difficulties |
| | Mistreatment |
| | Hospitalization |
| | Lifestyle modification: admission to institution |
| Oral-dental disorders | Chewing impairment |
| | Poor dental health |
| | Ill-suited apparatus |
| | Dry mouth |
| | Oropharyngeal candidiasis |
| | Dysgueusia |
| Swallowing disorders | ENT pathology |
| | Neurodegenerative or vascular pathology |
| Psychiatric disorders | Depressive syndromes |
| | Behavioral disorders |
| Dementia syndromes | Alzheimer's disease |
| | Other dementias |
| Other neurological disorders | Acute confusional state |
| | Alertness disorders |
| | Parkinsonian syndrome |
| Long-term medical treatments | Polypharmacy |
| | Medications provoking dry mouth, dysgueusia, digestive disorders, anorexia, drowsiness... |
| | Long-term corticosteroids |
| All acute illness or decompensation from a chronic illness | Pain |
| | Infectious pathology |
| | Fracture entailing functional impotence |
| | Surgical intervention |
| | Severe constipation |
| | Bedsores |
| Dependence in daily life activities | Nutritional dependence |
| | Mobility dependence |
| Restrictive diets | Salt-free diet |
| | Slimming diet |
| | Anti-diabetic treatment |
| | Cholesterol-lowering drug |
| | Long-term low residue diet |

of bedriddenness and bedsores. It is for these reasons that, according to the different nutritional scores available, from 25 to 60% of hospitalized elderly patients are in a state of malnutrition or at risk of becoming malnourished [13,16]. For example, in up to 40% of cases elderly patients presenting with neoplasic colorectal pathology also suffer from preoperative malnutrition [15], leading to pronouncedly increased postoperative morbimortality. Other practical consequences include significantly prolonged hospital stays, similarly prolonged periods of convalescence following intensive care or surgery, hospital readmissions [12,16] and excess mortality at 1, 2 or 3 years [17]. Last but least, predominance of malnutrition in elderly patients outside of hospital establishments is estimated at 5 to 10% [16].

## Nutritional assessment

Elderly patients with cancers are confronted with a dual nutritional problem, a problem that has been identified more and more concretely over recent years with the introduction of soft tissue volumetry and the study of muscle mass (sarcopenia), which enables increasingly precise oncological prognosis [18].

Several tools designed for assessment of nutritional state and, most importantly, risk of malnutrition, are now used in everyday clinical practice. The Mini nutritional assessment-Short Form (MNA-SF), of which the design targets the elderly subject, is among the most widely used [19]. It is a validated and non-invasive test whose result can be calculated in a matter of minutes. Its questions have to do with loss of weight, appetite, cognition, independence or Body Mass Index (BMI), with a maximum score of 14 [20]. If the score is lower than 11, a more in-depth assessment (the MNA in the proper sense) is carried out. Its sensitivity to malnutrition and its specificity approximate 100%, and its correlation with the MNA is excellent [19,20]. Even though this test is the one usually recommended for use in general practice, [20], there exist numerous other tests, such as the Geriatric Nutritional Risk Index (GNRI), which is based on clinical and biological data, the Subjective Global Assessment (SGA), the Nutrition Risk Screening (NRS 2002), and the Malnutrition Universal Screening tool (MUST) which is similar to the MNA-SF (21).

Several studies have proposed comparison of these scores on cohorts of various sizes, in conventional hospitalization or intensive care, and none of these scores significantly differ [21,22], leading to suggested use of the most rapid test, as is recommended by the European Society for Clinical Nutrition and Metabolism [20].

More concretely speaking, malnutrition is confirmed by lowered albuminemia and pre-albuminemia, and/or weight loss; that said, special attention should be paid to malnutrition in obese patients, which is not always immediately obvious. One elderly patient out of two presents with albuminemia lower than 30 g/liter, which corresponds to a diagnostic criteria for severe malnutrition [14]. As regards coding for the item ''malnutrition'' in the ICD 10, only the just-mentioned parameters are taken into account, a factor that should in no way detract from the value of the previously evoked tests.

The impact of this assessment resides in the decision to initiate these malnourished patients to oral, enteral or parenteral nutrition and, a fortiori, to peri-operative immuno-nutrition. When complemented by measures such as monitoring by dieticians to optimize nutritional care, these evaluations help to reduce postoperative mortality and to improve tolerance of chemotherapies and quality of life [23,24].

## The elderly patient and mental well-being

Cognitive disorders accompany aging, with a mental decline seemingly more rapid in 65-to-70-year-old subjects [25], and prevail over reasoning and memory. Assessment is called for when reduced independence and different complaints are reported, and it may be necessary to search for underlying dementia [26]. Dementias such as Alzheimer's disease are responsible for masking subjacent somatic symptoms such as cancer [27], and only 50% are diagnosed in a timely manner [28].

One of the neuropsychic disorders present in dementias is apathy [29], which is characterized among other symptoms as a lessening of interest, a lack of preoccupation as regards oneself, one's health and one's activities, along with a lack of emotional reactivity to positive or negative events [30]. In addition to the memory impairment for which it may be responsible, apathy pronouncedly interferes with a subject's involvement in his medical care and his degree of interest in medical matters. In such situations, family involvement and designation of a trusted support person take on major importance. Last but not least, in patients presenting with dementia such as Alzheimer's disease, reduced life expectancy has been observed, with a median of 4.2 years for men and 5.7 years for women following initial diagnosis [31]. Diminished life expectancy should be taken into account prior to any consequential therapeutic decision.

Mood disorders in the elderly patient also condition his or her perception of the illness, its treatment, and his or her degree of compliance [32]. Depression is particularly frequent in the elderly subject, with prevalence approximating 13% [33]. Its clinical presentation is peculiar, with frequent non-specific subjective complaints of fatigue and diffuse or localized pains, as well as cognitive complaints, at times rendering diagnosis quite difficult [34].

Due to its clinical presentation, which differs from that in young subjects and is likely to involve cognitive disorders [35], depression in the elderly may be belatedly treated, if not remain untreated [36]. Cognitive disorders can either improve or persist subsequent to treatment of depressive disorders by selective serotonin reuptake inhibitors [37,38]. Correction of depressive syndromes not only enables improved quality of life, but also leads to better therapeutic compliance [39].

As concerns standardized evaluation of these patients, the Geriatric Depression Scale (GDS) [40], which is a multi-item questionnaire, with simple and coherent alternative responses, remains the most sensitive and specific tool for detection of depressive disorders in the elderly subject [41]. Cognitive evaluation by the Mini Mental State (MMS) [42] is indicated for early detection of cognitive disorders.

## Chemotherapy and radiation therapy in the elderly subject

If age is a risk factor for cancer, this is largely due to the lengthiness of the carcinogenesis process, to the heightened sensitivity of aging tissues to environmental carcinogens and to other bodily modifications. In parallel, age-associated phenomena can heighten chemotherapy aggressiveness and impose dose modifications; common symptoms include decreased renal function and blood mass, lowered detoxifying activity of the cytochrome P450, decreased intestinal absorption and diminution of the hematopoietic reserve [43]. Patients may also be subject to diagnostic delay, with diagnoses frequently given during metastatic extension; one of the reasons for the delay consists in banalization of the symptomatology by the patient or his kith and kin [23].

Radiation therapy and chemotherapy are essential tools in the management of cancers in elderly persons; while these treatments are necessary in conventional management of several types of cancer, they are often proposed exclusively, without curative treatment including surgery. The different comorbidities mentioned above can exert an influence on therapeutic approaches, particularly as regards adjuvant chemotherapy and, ultimately, surgery, thereby incurring the risk of under-treatment of elderly patients whose comorbidities do not create insuperable difficulties [44].

While pretherapeutic assessment indicates a patient's overall momentary capacities, it is difficult at that time to assess his or her capacity to cope with aggressive chemotherapy, especially when it is postoperative. And in an elderly patient, chemotherapy can prove particularly toxic, leading to the appearance of cardiomyopathy, neuropathies, mucositis, myelodysplasia or acute myeloid leukemia [43]. In addition, recent targeted therapies may likewise be toxic and occasion cardiotoxicity (Trastuzumab), arterial hypertension, thromboembolic accidents (Bevacizumab), or congestive heart failure (Sunitinib) [43].

There may exist numerous obstacles to high-quality adjuvant treatment of elderly patients. Postoperative morbidity and longer hospital stays at times render it difficult to assess a patient and to propose adjuvant treatment. Moreover, in elderly patients chemotherapy may be suspended for various reasons, such as disease evolution, poor tolerance or exacerbation of other comorbidities. It should nevertheless not be forgotten that adjuvant chemotherapy is equally effective in young and in elderly subjects [45], and that it indeed lengthens survival.

Lastly, there are major limitations in the literature insofar as the majority of studies validating therapeutic protocols have involved patients under 65 years of age [5,44], which means that subjects over 65 are under-

represented. In addition, patients with major comorbidities are regularly excluded from trials, thereby rendering it problematic to generalize the results in accordance with real-life conditions...

## The contributions of geriatric oncology

### Definition and objectives of the scores

Amongst elderly patients, there exists sizable heterogeneity in their capacities to tolerate ''heavy'' treatments such as radiation therapy, chemotherapy or surgery. Tools have been developed for selection of patients to undertake these treatments. Once cancer is diagnosed in an elderly patient, multi-dimensional assessment is called for, and it should include not only evaluation of the preceding items (comorbidities, functional status, nutritional status, cognition, mood), but also of that person's socioeconomic conditions [46]. Assessment can be carried out during a consultation, or in day hospital separate from surgical intervention, so as to avoid the impact of an operation on the patient's basic overall condition. This is known as standardized or comprehensive geriatric assessment (CGA) or else, more widely, as an ''onco-geriatric consultation'' allowing for thorough going evaluation of the patient in the different areas mentioned. The goals of this assessment are multiple: to detect anomalies or other comorbidities not identified in clinical history, to predict severe toxicities associated with treatments, to help to determine their type and intensity [46,47] and, more broadly, to provide an approximate estimate of life expectancy, and thereby avoid ''futile care'' or therapeutic obstinacy. In another words, an onco-geriatrician strives to assess the patient's life expectancy at a given point in time, to evaluate the likely consequences of the cancer on his life potential, and to estimate the patient's remaining quantity of life with satisfactory quality of life.

In the 1990's, oncologists and geriatricians began to study the CGA, leading in 2005 to a series of recommendations, which were updated in 2014 [46,48]. The CGA is a reproducible tool based on validated scales generally including the MNA, the MMS, the GDS, Activities of daily living and Instrumental Activities of daily living (ADL-IADL, scales assessing patient independence by their ability to carry out certain daily life tasks; it also compiles the results of test on physical performance and equilibrium [22,49]. Amongst the elderly population, the CGA helps to identify patient profiles, paving the way for appropriate treatment. A patient is branded ''fragile'' when et least two of the tests reveal perturbations [11]. That said, the CGA may be difficult to apply; in some establishments, there is no geriatrics ward near the department dealing with cancer, and low financial valuation (in the pay-per-use framework) of the CGA is cited by some authors as a factor limiting its expansion [47].

On a parallel track, but remaining in the setting of the CGA, scores predicting survival of elderly persons have come into being, with cancer as one among other items. One example is the Charlson Comorbidity index [50], which is widely used in the USA; another is the Lee score [51], which is designed to predict a percentage of chances of survival at 4 years by taking into account not only cancer, but also age, respiratory and cardiac status, independence and physical strength. For instance, it is permissible not to propose aggressive treatment for a patient whose chances of being alive in 4 years are 15%.

At times it is impossible to assess a patient who has just undergone surgery; his reserves may be underestimated; when this occurs, he will require reevaluation at a later date in a day hospital, and the outset of his treatment may be postponed accordingly. Given this factor and the numerous time constraints and energy demands it imposes, numerous teams have endeavored to tabulate scores stemming from assessment of the elderly patient by using shorter questionnaires administered at bedside, and filled out, if possible, by the patient himself. Expressly designed for cancer cases, the G8 and the Vulnerable Elders Survey or VES-13 (Table 2) [49] are scores presenting the advantages of being rapidly calculated, simple of use, and utilizable by paramedics as well as medical staff. That much said, their role consists above all in screening patients at risk of fragility, and not in confirming the effective existence of fragility (only the CGA can do so). A consensual attitude would consist, as has been proposed by Rodin or Balducci [49,52], in using a progressive screening algorithm initially applying the VES-13, and only subsequently the CGA (Fig. 1). It matters to remember that none of these scores or scales is apt to predict the morbi-mortality of a treatment, a factor that remains a major limitation in surgical settings.

**Table 2** Components of the Vulnerable Elderly Score (VES-13).

| Items assessed | Score |
|---|---|
| *Age* | |
| 75—85 years | 1 |
| > 85 years | 3 |
| *Self-rated health* | |
| Good, very good, excellent | 0 |
| Fragile or poor | 1 |
| *ADL/IADL: needs help for* | |
| Bathing or showering | 1 |
| Shopping for personal items | 1 |
| Managing money | 1 |
| Walking across the room | 1 |
| Doing light housework | 1 |
| *Difficulties for physical activities* | |
| Stooping, crouching, kneeling | 1 |
| Scrubbing floors, washing windows | 1 |
| Reaching or extending arms above shoulder level | |
| Lifting or carrying objects as heavy as 10 pounds | 1 |
| Walking a quarter of a mile | 1 |
| Writing or handling small objects | 1 |

Score >/: 3: ''vulnerable'' patient, with risk of death 4.2 times greater at 1 year. AD: activities of daily living; IADL: instrumental activities of daily living.

## Impact of the recommendations; how they are followed up

The recommendations issued following geriatric case monitoring have an undeniable impact on subsequent decisions, and whatever the ''timing'' of an assessment, its impact is observable. In the literature, it can affect management by following two distinct sequences:

- the first sequence consists in discussing a treatment and initiating its administration prior to any onco-geriatric consultation; in this case the procedure or intervention influences the course of treatment through a change of

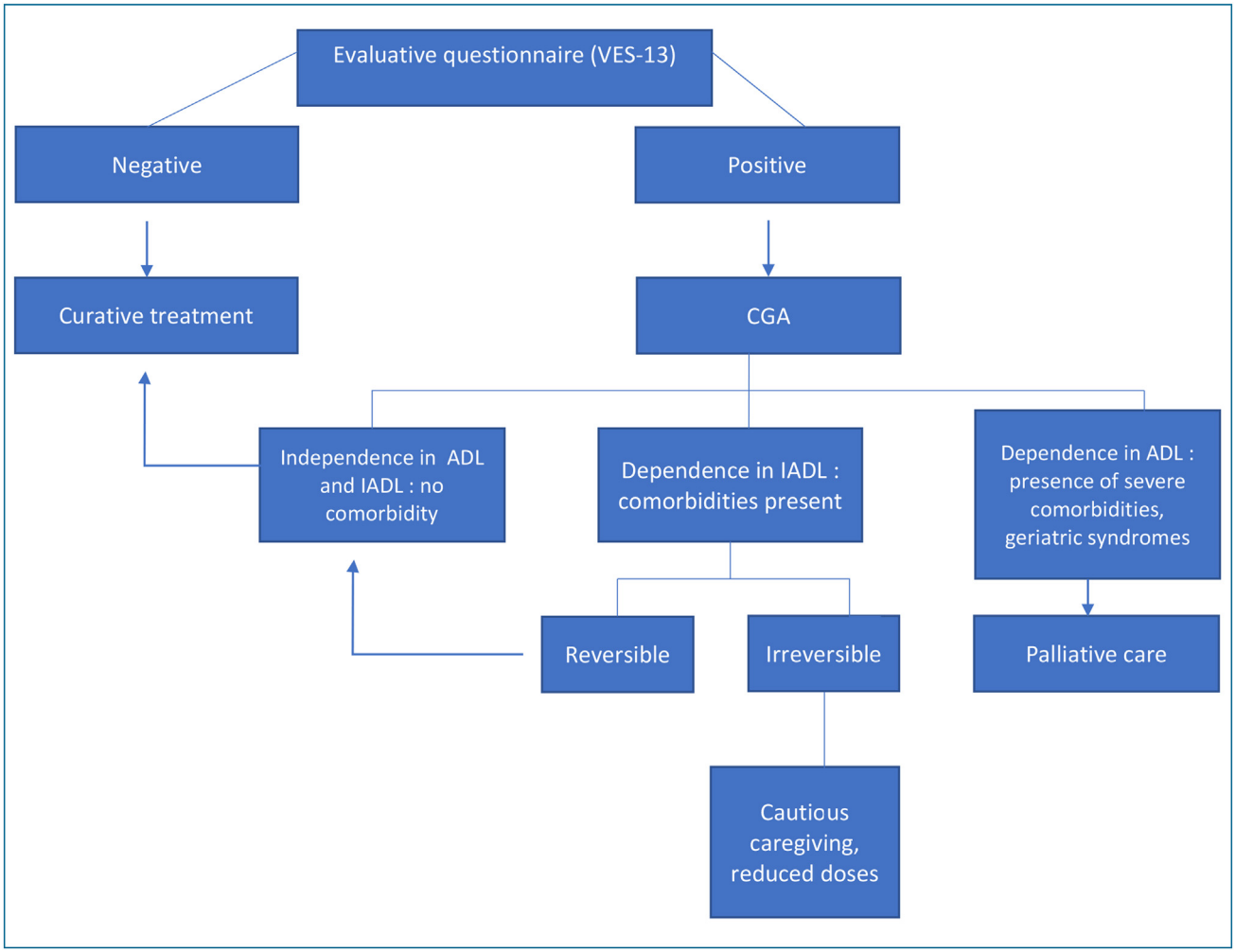


**Figure 1.** Algorithm applying the VES-13 score proposed by Balducci [52]. VES: vulnerable elders survey; CGA: comprehensive geriatric assessment; ADL: activities of daily living; IADL: instrumental activities of daily living.

molecules or readjustment of doses. As 20 to 60% of patients have their treatments modified, impact is major [47,53,54];

- the second, and in all likelihood the most frequently advised sequence, consists in proposing, during a multidisciplinary team meeting (MTM), an onco-geriatric consultation in the event of suspected fragility and/or need for major treatment.

Once again, impact is considerable, especially as regards surgery; in a recent series the number of subjects presenting in a first MTM and theoretically requiring surgery, and then in a second MTM afeter geriatric case monitoring, was divided by 5 [53]. In addition, early onco-geriatric assessment reduces last-minute cancellations of surgical interventions and is likely to permit better surgical outcomes in patients operated subsequent to evaluation [55]. Last but not least, the sequence allows fragile patients to avoid risky or useless surgery.

As with the opinions expressed in MTMs, recommendations are advisory rather than binding, and they may be divided into four categories:

- confirmation of standard treatment;
- modification of treatment (example: change of chemotherapy);
- dose adjustment;
- supportive or palliative care [54].

They are associated with other recommendations aimed at reducing treatment-associated complications and at optimizing post-hospital care. Objectively and in the majority of cases, the adjustments proposed by geriatrics teams consist in lightening chemotherapy or in opting for therapeutic abstention. Having completed assessment, a team may deem that an elderly subject is too fragile and that for him or her, no benefit in terms of quality of life is to be expected from chemotherapy; that said, it is not always easy to put forth this type of conclusion.

It would seem that generally speaking, geriatricians' opinions are not frequently solicited by surgeons; in a SIOG survey published in 2015, only 6.4% of the surgeons having filled out the form stated that they cooperated closely with geriatricians [56]. On the other hand, CGA recommendations are very often followed; according to several publications, rate of adherence ranges from 48% to 85% [57,58]. A number of factors affect adherence; they include the quality of the relationship between the patient and the family physician, practitioner who remains a partner of paramount importance, along with patient gender (male sex) [59,60], as well as factors associated with the elderly person's overall deterioration, which is strongly predictive of non-compliance with recommendations [57].

Lastly, it would be of interest to consider the contribution of geriatric oncology in an emergency context. Facilitation of systematic discussion with colleagues in geriatrics about

elderly cancer patients consulting due to an acute surgical problem could in certain cases be conducive to realistic treatment (which is at times sorely lacking), thereby avoiding either therapeutic obstinacy or treatment cessation for patients still maintaining vital reserves.

## Conclusions

In a constantly aging population, care and treatment of elderly subjects has become an issue of major importance. Simple pre-therapeutic evaluation no longer suffices to provide necessary information on a patient's overall ability to endure complex treatment, and in many cases, assessment by specialized colleagues becomes vitally necessary. In this evaluation, attempts are made to measure a subject's vitality parameters, particularly with regard to nutrition, independence and cognition, the objective being to obtain informed advice on the realistic possibilities of useful treatment. Collaboration in the decision-making process involving the oncologist, the surgeon and the geriatrician is consequently instrumental to improved treatment and, more specifically, to avoidance of therapeutic obstinacy or its polar opposite, undertreatment.

**Key points**

The number of elderly patients in need of treatment possibly involving cancer surgery is growing.

Standardized onco-geriatric assessment of these patients is necessary prior to making an important decision or initiating complicated treatment (surgery, chemotherapy).

The major parameters to be taken into consideration when examining the elderly patient include: nutritional status, degree of independence, cognitive and mood-related (thymic) status, and major comorbidities.

Simple and easily usable tools need to be made more widely known; for example, a number of scores enable assessment of the elderly patient's condition and facilitate his possible referral to geriatric oncology.

The goals of onco-geriatric assessment are to detect anomalies and other previously non-identified comorbidities in the patient's clinical history, to predict the severe toxicities associated with certain treatments, to determine type and intensity of recommended treatment, and to provide an approximate estimate of life expectancy.

The ultimate goal of this assessment being to improve the quality of life of elderly patients and to avoid therapeutic obstinacy, it should ideally be carried out prior to presentation in a multidisciplinary team meeting.

## Disclosure of interest

The authors declare that they have no competing interest.

## References

[1] Perspectives de la population mondiale : révision de 2012. Rapport du département des affaires économiques et sociales de l'ONU (DAES) juin 2013. https://population.un.org/wpp/.

[2] Robert-Bobée I. Projections de population pour la France métropolitaine à l'horizon 2050. INSEE Première n(1089); 2006.

[3] InCa. Institut National du Cancer. Etat des lieux et perspectives en oncogériatrie. http://www.e-cancer.fr/publications/71-soins/557-etat-des-lieux-et-perspectives-en-oncogeriatrie, consulted on October 15th 2017.

[4] Terret C, Droz JP. Definition and outline on geriatric oncology. Prog Urol 2009;19(Suppl 3):75—9.

[5] Soubeyran P, Bellera C, Goyard J, et al. Screening for vulnerability in older cancer patients: the ONCODAGE Prospective Multicenter Cohort Study. PLoS One 2014;9:e115060.

[6] Balducci L. Management of cancer in the elderly. Oncology 2006;20:135—43.

[7] Ferrat E, Paillaud E, Caillet P, et al. Performance of four frailty classifications in older patients with cancer: prospective elderly cancer patients cohort study. J Clin Oncol 2017;35(7):766—77.

[8] Institut national du cancer. État des lieux et perspectives en oncogériatrie; 2009. www.e-cancer.fr.

[9] Arveux I, Faivre G, Lenfant L, et al. Le sujet âgé fragile. Revue Geriatr 2002;27:569—81.

[10] Tan HJ, Saliba D, Kwan L, Moore AA, Litwin MS. Burden of geriatric events among older adults undergoing major cancer surgery. J Clin Oncol 2016;34(11):1231—8.

[11] Kenig J, Zychiewicz B, Olszewska U, Richter P. Screening for frailty amongolder patients with cancer that qualify for abdominal surgery. J Geriatr Oncol 2015;6:52—9.

[12] Bouras AF. Hospital discharge of elderly patients after surgery: fast track recovery versus the need for convalescence. J Visc Surg 2014;151:89—90.

[13] Agarwal E, Miller M, Yaxley A, Isenring E. Malnutrition in the elderly: a narrative review. Maturitas 2013;76:296—302.

[14] H.A.S. Stratégie de prise en charge en cas de dénutrition protéino-énergétique chez la personne âgée. http://www.has-sante.fr/portail/upload/docs/application/pdf/synthese_denutrition_personnes_agees.pdf/. consulted on October 15th 2017.

[15] Schwegler I, von Holzen A, Gutzwiller JP, Schlumpf R, Mühlebach S, Stanga Z. Nutritional risk is a clinical predictor of postoperative mortality and morbidity in surgery for colorectal cancer. Br J Surg 2010;97:92—7.

[16] Sheean PM, Peterson SJ, Chen Y, Liu D, Lateef O, Braunschweig CA. Utilizing multiple methods to classify malnutrition among elderly patients admitted to the medical and surgical intensive care units (ICU). Clin Nutr 2013;32:752—7.

[17] Persson MD, Brismar KE, Katzarski KS, Nordenström J, Cederholm TE. Nutritional status using mini nutritional assessment and subjective global assessment predict mortality in geriatric patients. J Am Geriatr Soc 2002;50:1996—2002.

[18] Cornet M, Lim C, Salloum C, et al. Prognostic value of sarcopenia in liver surgery. J Visc Surg 2015;152:297—304.

[19] Rubenstein LZ, Harker JO, Salvà A, Guigoz Y, Vellas B. Screening for undernutrition in geriatric practice: developing the short-form mini-nutritional assessment (MNA-SF). J Gerontol A Biol Sci Med Sci 2001;56:366—72.

[20] Kaiser MJ, Bauer JM, Ramsch C, et al. MNA-International Group. Validation of the Mini Nutritional Assessment short-form (MNA-SF): a practical tool for identification of nutritional status. J Nutr Health Aging 2009;13:782—8.

[21] Poulia KA, Yannakoulia M, Karageorgou D, et al. Evaluation of the efficacy of six nutritional screening tools to predict malnutrition in the elderly. Clin Nutr 2012;31:378—85.

[22] Kyle UG, Kossovsky MP, Karsegard VL, Pichard C. Comparison of tools for nutritional assessment and screening at hospital admission: a population study. Clin Nutr 2006;25:409—17.

[23] Coutaz M, Morisod J. Cancer in older patients: which assessment before treatment decisions. Rev Med Suisse 2011;7:963—7.

[24] Mabrut JY. Renutrition and perioperative immunonutritions in programmed adult digestive surgery. J Chir (Paris) 2008;145(Suppl 4):1—5.

[25] Singh-Manoux A, Kivimaki M, Glymour NM, et al. Timing of onset of cognitive decline: results from Whitehall II prospective cohort study. BMJ 2012;344:d7622.
[26] Rainfray M. How to care for elderly patients with cognitive impairment? Cancer Radiother 2015;19(6-7):386—90.
[27] Kosaka Y, Fujii M, Ishizuka S, Azumi M, Yamamoto T, Sasaki H. Dementia of patients with cancer. Geriatr Gerontol Int 2010;10:269—71.
[28] Dubois B, Touchon J, Portet F, Ousset PJ, Vellas B, Michel B. The 5 words'': a simple and sensitive test for the diagnosis of Alzheimer's disease. Presse Med 2002;31:1696—9.
[29] Chase TN. Apathy in neuropsychiatric disease: diagnosis, pathophysiology, and treatment. Neurotox Res 2011;19:266—78.
[30] Marin RS. Apathy: a neuropsychiatric syndrome. J Neuropsychiatry Clin Neurosci 1991;3:243—54.
[31] Larson EB, Shadlen MF, Wang L, et al. Survival after initial diagnosis of Alzheimer disease. Ann Intern Med 2004;140:501—9.
[32] Chabrier M, Bezy O, Mouret MA, Bay JO, Jalenques I. Impact of depressive disorders on adherence to oral anti-cancer treatment. Bull Cancer 2013;100(10):1017—22.
[33] Beekman AT, Copeland JR, Prince MJ. Review of community prevalence of depression in later life. Br J Psychiatry 1999;174(4):307—11.
[34] Greenstein SP, McGonigle D, Kellner CH. Latelife depression. In: Simon AB, New AS, Goodman WK, editors. Mount Sinai Expert Guides: Psychiatry. Chichester, West Sussex: John Wiley & Sons Ltd; 2017. p. 312—21.
[35] Gottfries CG. Is there a difference between elderly and younger patients with regard to the symptomatology and aetiology of depression? Int Clin Psychopharmacol 1998;13(Suppl 5):13—8.
[36] Sanglier T, Saragoussi D, Milea D, Tournier M. Depressed older adults may be less cared for than depressed younger ones. Psychiatry Res 2015;229:905—12.
[37] Trivedi MH, Greer TL. Cognitive dysfunction in unipolar depression: implications for treatment. J Affect Disord 2014;152:19—27.
[38] Katona C, Livingston G. Safety and Efficacy of Antidepressants in Older People. Eur Neuropsychopharmacol 2001;11(Suppl 3):144—5.
[39] Gutzmann H, Qazi A. Depression associated with dementia. Z Gerontol Geriatr 2015;48:305—11.
[40] Yesavage JA, Brink TL, Rose TL, et al. Development and validation of a geriatric depression screening scale: a preliminary report. J Psychiatr Res 1982;17:37—49.
[41] Rhondali W, Freyer G, Adam V, et al. Agreement for depression diagnosis between DSM-IV-TR criteria, three validated scales, oncologist assessment, and psychiatric clinical interview in elderly patients with advanced ovarian cancer. Clin Interv Aging 2015;10:1155—62.
[42] Folstein MF, Folstein SE, McHugh PR. Mini-mental state''. A practicalmethod for grading the cognitive state of patients for the clinician. J Psychiatr Res 1975;12:189—98.
[43] Rodrigues G, Sanatani M. Age and comorbidity considerations related to radiotherapy and chemotherapy administration. Semin Radiat Oncol 2012;22:277—83.
[44] Chen RC, Royce TJ, Extermann M, Reeve BB. Impact of age and comorbidity on treatment and outcomes in elderly cancer patients. Semin Radiat Oncol 2012;22:265—71.
[45] Balducci L, Beghe C. The application of the principles of geriatrics to the management of the older person with cancer. Crit Rev Oncol Hematol 2000;35:147—54.
[46] Wildiers H, Heeren P, Puts M, et al. International Society of Geriatric Oncology consensus on geriatric assessment in older patients with cancer. J Clin Oncol 2014;32:2595—603.
[47] Kenis C, Bron D, Libert Y, et al. Relevance of a systematic geriatric screening and assessment in older patients with cancer: results of a prospective multicentric study. Ann Oncol 2013;24:1306—12.
[48] Extermann M, Aapro M, Bernabei R, et al. Use of comprehensive geriatric assessment in older cancer patients: recommendations from the task force on CGA of the International Society of Geriatric Oncology (SIOG). Crit Rev Oncol Hematol 2005;55:241—52.
[49] Rodin MB, Mohile SG. A practical approach to geriatric assessment in oncology. J Clin Oncol 2007;25:1936—44.
[50] Charlson ME, Pompei P, Ales KL, MacKenzie CR. A new method of classifying prognostic comorbidity in longitudinal studies: development and validation. J Chron Dis 1987;40:373—83.
[51] Lee SJ, Lindquist K, Segal MR, Covinsky KE. Development and validation of a prognostic index for 4-year mortality in older adults. JAMA 2006;295:801—8.
[52] Balducci L. Aging, frailty, and chemotherapy. Cancer Control 2007;14:7—12.
[53] Caillet P, Canoui-Poitrine F, Vouriot J, et al. Comprehensive geriatric assessment in the decision-making process in elderly patients with cancer: ELCAPA study. J Clin Oncol 2011;29:3636—42.
[54] Aliamus V, Adam C, Druet-Cabanac M, Dantoine T, Vergnenegre A. Geriatric assessment contribution to treatment decision-making in thoracic oncology. Rev Mal Respir 2011;28:1124—30.
[55] Partridge JS, Harari D, Martin FC, Dhesi JK. The impact of pre-operative comprehensive geriatric assessment on post-operative outcomes in older patients undergoing scheduled surgery: a systematic review. Anaesthesia 2014;69(Suppl 1):8—16.
[56] Ghignone F, van Leeuwen BL, Montroni I, et al. International Society of Geriatric Oncology (SIOG) Surgical Task Force. The assessment and management of older cancer patients: A SIOG surgical task force survey on surgeons' attitudes. Eur J Surg Oncol 2016;42(2):297—302.
[57] Press Y, Punchik B, Kagan E, Barzak A, Freud T. Which factors affect the implementation of geriatric recommendations by primary care physicians? Isr J Health Policy Res 2017;25:6—7.
[58] Shah PN, Maly RC, Frank JC, Hirsch SH, Reuben DB. Managing geriatric syndromes: what geriatric assessment teams recommend, what primary care physicians implement, what patients adhere to. J Am Geriatr Soc 1997;45:413—9.
[59] Maly RC, Leake B, Frank JC, DiMatteo MR, Reuben DB. Implementation of consultative geriatric recommendations: the role of patient-primary care physician concordance. J Am Geriatr Soc 2002;50:1372—80.
[60] Reuben DB, Maly RC, Hirsch SH, et al. Physician implementation of and patient adherence to recommendations from comprehensive geriatric assessment. Am J Med 1996;100:444—51.