



Implications of comprehensive geriatric assessment on quality of life in older adults with cancer: an integrative review

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Abstract

Comprehensive geriatric assessment (CGA) improves the quality of care for older adults with cancer, as it identifies geriatric problems and weaknesses that have implications for the health of the individual. Despite the benefits of CGA, difficulties related to time of application and cost of this tool limit its implementation in practice. The purpose of this review is to evaluate the relationship between CGA and the quality of life (QoL) of older adults with cancer, through an integrative review. A search was performed for articles in the PubMed, Medline, IBECs and Lilacs databases, published between 2015 and 2020, that addressed the implications of CGA on the QoL of older adults with cancer and, of the 298 studies found, 21 were selected for analysis. These studies revealed that CGA performs an important role in identifying older adults with a higher risk of QoL impairment during the course of cancer and cancer treatment, as well as guiding the indication of specific geriatric interventions that prevent the deterioration of QoL. Thus, the present review highlights the importance of the broad assessment of older adults with cancer, which, through different spheres, whether prognostic or interventionist, can play a fundamental role in preserving the QoL of this population. It is imperative that strategies are developed that incorporate CGA in the care of older adults with cancer.

Keywords: Geriatric Assessment. Neoplasms. Quality of Life.

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INTRODUCTION

Cancer is a disease associated with aging, and is a major public health problem, currently representing the second leading cause of death in the world, with a tendency to increase over the coming years^{1,2}. The care of older adults with cancer is often challenging, due to its complex constellation of medical and psychosocial issues, and requires the joint efforts of an interdisciplinary team in order to guarantee comprehensive care for these patients^{3,4}. However, as there the health status of older adults of similar ages is highly heterogenous, it is important to identify individuals with risk factors that can negatively influence the treatment of cancer and the evolution of the illness^{5,6}.

A useful tool in the management and monitoring of older adults with cancer is the comprehensive geriatric assessment (CGA), a multidimensional diagnostic process, which goes beyond chronological age to comprehensively assess health status^{7,8}. It consists of a systematic approach, with an emphasis on functional, cognitive, nutritional, psychological and socio-environmental parameters, in addition to the identification of comorbidities and medications used^{9,10}.

CGA allows the identification of geriatric problems and weaknesses that have implications for the health of the individual, and has proved to be a predictive marker for survival and treatment tolerance in older adults with cancer^{3,10,11}. In addition, it provides a platform for dealing with individualized needs and managing reversible conditions, creating opportunities to improve the functional status of older adults with cancer, and assisting in the development of an individualized geriatric care plan^{12,13}.

Another particularity of care for older adults with cancer is that when making decisions on cancer therapy this population tends to value the preservation of quality of life (QoL) and the maintenance of independence more than the response criteria of traditional clinical trials, such as general response rates, survival free from progression or increase in life expectancy^{14,15}. However, few studies incorporate and evaluate QoL as an outcome of interest for cancer treatment¹⁶.

Despite the benefits of CGA and the recommendations of international guidelines^{3,7,12,17} for its routine application in the care of older adults with cancer, these tools require considerable time and resources to be integrated into practice, limiting their widespread use, especially outside of specialized academic environments, requiring more robust data on their benefits, in order to reinforce this approach^{13,18}.

Thus, the objective of this review was to assess the relationship between CGA and the QoL of older adults with cancer.

METHODS

The methodology adopted was an integrative literature review, a process described by Whittemore and Knafl¹⁹, which allows the synthesis of multiple published studies and enables general conclusions to be drawn regarding a particular area of study²⁰.

The present study was carried out using articles published in the electronic scientific databases PubMed, MEDLINE, IBECs AND LILACS, which addressed the implications of CGA for the QoL of older adults with cancer. The search was carried out in March 2020 by two researchers, and was performed independently in order to guarantee the reliability of the present study. Observational studies (cross-sectional, case-control and cohort) and clinical trials, in English, Spanish or Portuguese, published in the period 01/05/2015 to 05/31/2020, were analyzed. The studies could involve older adults with any type of cancer and who were undergoing any type of cancer therapy. As an exclusion criterion, articles that did not address the topic, review articles, monographs, dissertations, theses, abstracts in event annals and book chapters were disregarded.

The following descriptors were used: *geriatric assessment, cancer, quality of life, geriatric assessment, cancer, quality of life, evaluación geriátrica, cáncer, calidad de vida, avaliação geriátrica, câncer and qualidade de vida*. All descriptors were searched for using separate MeSH terms and then were crossed with the Boolean operator 'and'. The crossing of the descriptors *geriatric assessment*[Mesh].*AND**cancer*[Mesh].*AND**quality of life* resulted in 263 records in PubMed; 229 records in MEDLINE; 1 record in IBECs; and 0 records in

LILACS. Of the articles found, 185 did not include the proposed theme, 92 were excluded because they were review articles and 195 were duplicated in the research platforms (Figure 1).

After selecting the articles, a database was created that allowed the organizing and compilation of the following information from the selected studies: article title, year of publication, country of origin, study design, objective, sample, method and results (report of CGA in the QoL of older adults with cancer).

The variables for analyzing the results included: CGA/QoL instruments and alternate domains; association between the application of CGA and QoL; and correlation mechanisms, either for

providing prognostic information or for assisting in the indication of a specific geriatric intervention. Subsequently, the studies were grouped by similarity of content and the results were interpreted based on the literature related to the theme of the study, enabling the synthesis of knowledge.

RESULTS

In this integrative review, 21 articles that met the previously established selection criteria were analyzed. Below, Chart 1 presents an overview of the articles evaluated, considering authorship, year of publication, country of origin, sample, method, objective, instrument and conclusions.

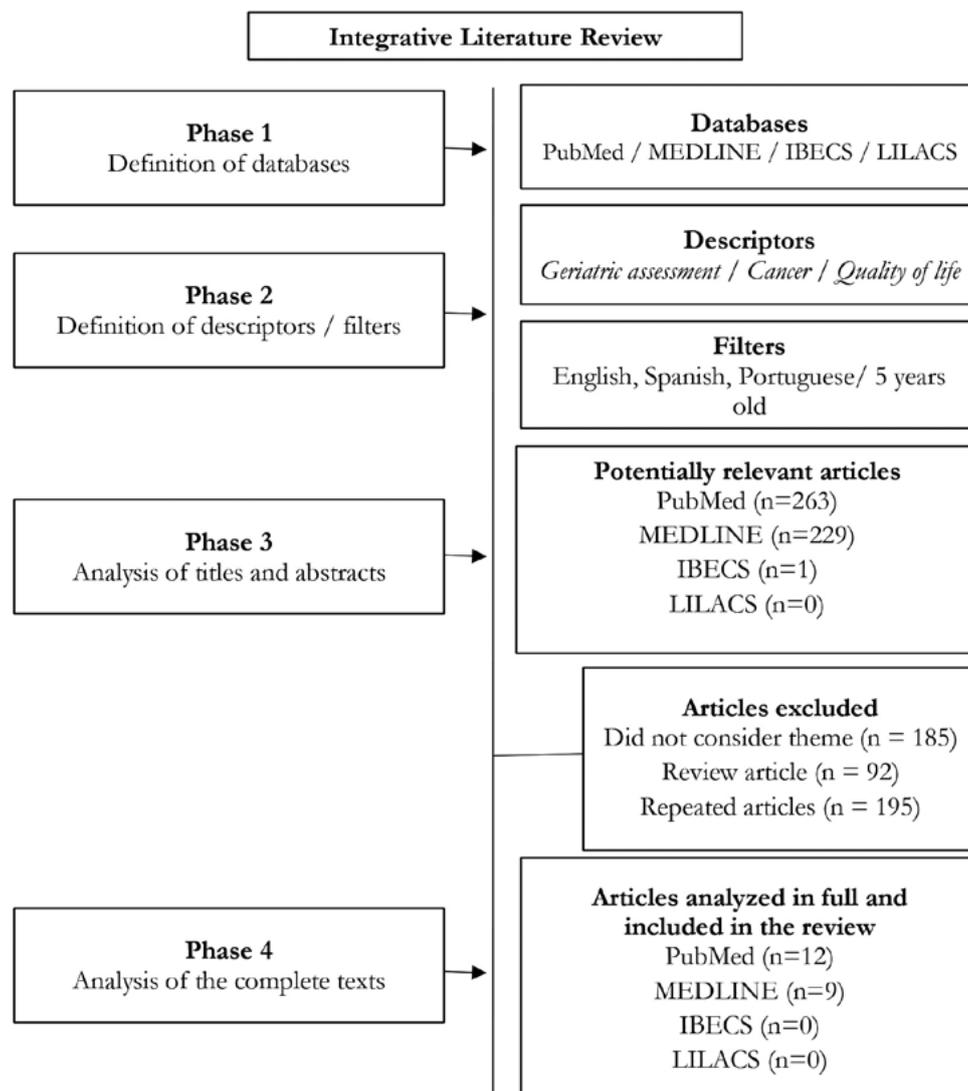


Figure 1. Flowchart of integrative review of scientific evidence on geriatric assessment, cancer and quality of life.

Chart 1. Presentation of the synthesis of articles included in the integrative review.

Authors Year/Country	Sample	Method/Objective	Instrument	Conclusions	Report of CGA and QoL
Pottel et al. ²¹ 2015 / Belgium	≥65 years, head and neck neoplasms, submitted to radiotherapy / N = 100	Cohort / Determine if CGA is indicative of long-term health- related QoL and overall survival	EQ-5D	Vulnerable patients had lower long-term health-related QoL levels	CGA was a predictor of QoL
Baier et al. ²² 2016 / Germany	> 70 years old, any neoplasia, submitted to surgery with curative intention / N = 200	Cohort / Assess the prognostic impact of CGA on independence and QoL six months after surgery	EORTC QLQ-C30	QoL correlated with Karnofsky index, emotional functioning and activities of daily living	CGA was a predictor of QoL
Hempenius et al. ²³ 2016 / Netherlands	≥65 years old, any neoplasm, submitted to elective surgery / N = 260	Clinical trial / Assess the long- term outcomes of a geriatric intervention for the prevention of delirium in frail older adults	Short Form- 36 score	There were no differences between the intervention group and the usual treatment group for any of the outcomes three months after discharge.	Geriatric intervention based on CGA findings did not improve QoL
Pergolotti et al. ²⁴ 2017 / USA	≥65 years, any neoplasm / N = 768	Cohort / Describe functional status and QoL and identify associations with demographic variables, comorbidities and functional status	FACT-G	The presence of comorbidities and reduced levels of activity / functional capacity were associated with worse levels of QoL	CGA was a predictor of QoL
Ribi et al. ²⁵ 2017 / Switzerland	B-cell lymphoma not eligible for intensive treatment / N = 57	Clinical trial / Characterize the patients by objective response and survival based on CGA and QoL and describe QoL changes after treatment	Domains assessed: physical well-being, mood, coping, functional status, tiredness, nausea/ vomiting and taste disorders	CGA impairment is an important factor in clinical outcomes and interventions in specific geriatric domains translate into improved QoL	CGA was a predictor of QoL
Schmidt et al. ²⁶ 2017 / Germany	≥70 years, any neoplasm / N = 100	Clinical trial / Assess the impact of an CGA-based intervention program on QL preservation	EORTC QLQ-C30	Geriatric intervention demonstrated benefit in preserving QoL	Geriatric intervention based on CGA findings helps to preserve QoL

to be continued

Continuation of Chart 1

Authors Year/Country	Sample	Method/Objective	Instrument	Conclusions	Report of CGA and QoL
VanderWalde et al. ²⁷ 2017 / USA	≥65 years, head and neck or lung cancer undergoing radiotherapy / N = 50	Cohort / Assess the association between functional status based on CGA and treatment tolerance results	EORTC QLQ-C30	There was no association between dysfunction and tolerance, but altered CGA was associated with continuous decline and lack of recovery of QoL	CGA was a predictor of QoL
Goineau et al. ²⁸ 2018 / France	≥75 years old, prostate cancer, submitted to radiotherapy / N = 100	Cohort / Assess the effect of radiotherapy on QoL and identify predictors of QoL reduction	EORTC QLQ-C30	Radiotherapy for prostate cancer was well tolerated among this population and no predictive factor was found to determine which patients would have impaired QoL after radiotherapy	CGA was a predictor of QoL
Phaibulvatanapong et al. ²⁹ 2018 / Thailand	≥70 years old, any neoplasm under systemic treatment / N = 151	Cohort / Assess factors that predispose individual to chemotherapy-related toxicity and QoL	FACT-G	Performance status and the presence of comorbidities were associated with a higher incidence of serious adverse events and worse QoL	CGA was a predictor of QoL
Puts et al. ³⁰ 2018 / Canada	≥70 years old, gastrointestinal, genitourinary or EC II-IV breast cancer, before start of chemotherapy / N = 61	Clinical trial / Explore the feasibility and impact of CGA and an integrated care plan on QoL and cancer treatment decisions	EORTC QLQ-C30	Patients who received CGA-based support had better QoL levels	Geriatric intervention based on CGA findings helps to preserve QoL
Jeppesen et al. ³¹ 2018 / Denmark	Lung neoplasm T1-2N0M0, not candidates for surgical treatment / N = 51	Clinical trial / Investigate whether CGA as part of an interventionist tool can impact QoL and overall survival	EQ-5D	CGA did not impact QoL and overall survival in this population	Geriatric intervention based on CGA findings did not improve QoL
Kirkhus et al. ¹⁴ 2019 / Norway	≥70 years old, any neoplasm under systemic treatment / N = 288	Cohort / Identify potentially modifiable factors that affect physical function and QoL during cancer treatment	EORTC QLQ-C30	Depressive symptoms, reduced mobility and physical symptoms increased the risk of decreases in QoL scores	CGA was a predictor of QoL

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Continuation of Chart 1

Authors Year/Country	Sample	Method/Objective	Instrument	Conclusions	Report of CGA and QoL
Kirkhus et al. ³² 2019 / Norway	≥70 years, any neoplasia / N = 288	Cohort / Investigate whether the frailty identified by an CGA was associated with an increased risk of QoL deterioration during cancer treatment and follow-up	EORTC QLQ-C30	Frail patients had significantly worse physical functioning and QoL during follow-up	CGA was a predictor of QoL
Mohile et al. ³ 2019 / USA	≥70 years old, any neoplasm, impaired CGA domain / N = 541	Clinical trial / Determine whether providing CGA-guided recommendations to oncologists can improve communication about aging-related concerns	FACT-G	Geriatric assessment improves patient-centered communication about aging-related concerns, but has not changed QoL	Geriatric intervention based on CGA findings did not improve QoL
Quinten et al. ³³ 2019 / Belgium	≥70 years old, any neoplasia, submitted to chemotherapy or surgery, G8 ≤ 14 / N = 1424	Cohort / Determine the minimum estimates of clinically important differences in QoL and evaluate prognostic characteristics for these changes in QoL	EORTC QLQ-C30	Minimum estimates of clinically important differences in QoL vary by instrument and treatment, but can be used to assess significant changes in QoL	CGA was a predictor of QoL
Williams et al. ⁵ 2019 / USA	≥65 years, breast cancer / N = 190	Cohort / Assess the association between frailty and QoL	PROMIS®	Frailty in older women with breast cancer was associated with worse QoL results	CGA was a predictor of QoL
de Boer et al. ⁶ 2020 / Netherlands	≥70 years, metastatic breast cancer / N = 100	Cohort / Assess the prevalence of psychosocial diseases and longitudinal changes in functional status, psychosocial functioning and QoL	EORTC QLQ-C30	High prevalence of psychiatric disorders in this population; its identification, through CGA can improve QoL	Geriatric intervention based on CGA findings helps to preserve QoL
Mian et al. ¹⁶ 2020 / Canada	≥65 years, recent diagnosis of multiple myeloma / N = 40	Cohort / Understand the changes in the geriatric domains and QoL parameters during cancer treatment	FACT-G	In this population, QoL remained stable during the 6-month follow-up period; the Timed Up and Go test can provide a dynamic indicator of functional status and QoL	CGA was a predictor of QoL

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Continuation of Chart 1

Authors Year/Country	Sample	Method/Objective	Instrument	Conclusions	Report of CGA and QoL
Nipp et al. ¹³ 2020 / USA	≥65 years, incurable gastrointestinal or lung cancer / N = 62	Clinical trial / Determining the feasibility of a transdisciplinary intervention based on an CGA	FACT-G	Transdisciplinary intervention aimed at the care needs of older adults showed encouraging estimates to improve QoL	Geriatric intervention based on CGA findings helps to preserve QoL
Nipp et al. ⁸ 2020 / USA	≥70 years, recent diagnosis of incurable gastrointestinal neoplasm N = 132	Cohort / Determine whether categorizing patients as vulnerable by an CGA could identify those with the worst health outcomes	EORTC QLQ-C30	Patients identified as vulnerable by CGA have worse QoL and overall survival	CGA was a predictor of QoL
Quinten et al. ¹⁵ 2020 / Belgium	≥70 years old, early stage breast cancer N = 109	Case-control / Assess the relationship between CGA and QoL	EORTC QLQ-C30	Functional measures of CGA are strongly correlated with the patient's self-reported functioning; the initial altered CGA has a modest probability of predicting deterioration of QoL	CGA was a predictor of QoL

CGA: comprehensive geriatric assessment; QoL: quality of life; Euro Quality of Life Instrument-5D: EQ-5D; European Organization for Research and Treatment of Cancer Quality of Life Core Questionnaire-C30; EORTC-QLQ-C30; Functional Assessment of Cancer Therapy-General: FACT-G; Patient-Reported Outcomes Measurement Information System®: PROMIS®; United States of America: USA.

DISCUSSION

Disorders of physical functioning, nutritional deficit and psychosocial problems occur in about 20-40% of older adults diagnosed with cancer³⁴⁻³⁷. Such changes, tracked by the application of CGA, can identify frail patients, in which the manifestations related to neoplastic disease and cancer treatment are associated with a substantial burden of symptoms and can reduce the functional state and threaten the ability to live independently of older adults, negatively affecting QoL during the course of the disease³².

Accordingly, several studies evaluated showed that patients with impairment in a CGA domain had worse QoL than patients without such impairment, that is, they presented greater deterioration in QoL indexes during follow-up^{5,6,8,15,21,22,24,25}. Pottel et al.²¹ identified that the classification of vulnerability, based

on impairment in two or more CGA domains, was an independent predictor for lower scores in QoL indices in a population of 100 older adults with head and neck cancer, in a follow-up period of up to 36 months.

As CGA is a multidimensional approach process, different domains may be altered and predict greater susceptibility to the impairment of QoL in older adults with cancer. While some studies used the classification of patients as vulnerable or frail, using a specific gradation^{5,8,21,25,32}, others evaluated the impact of different domains individually, with the geriatric factors found to be most often predictive of a relevant decrease in QoL being functional capacity (Karnofsky index, activities of daily living or ECOG performance status), emotional functioning and body mass index^{6,14,15,22,24,29}. Only one study²¹ demonstrated that the greater the number of altered CGA domains, the greater the impact on QoL.

Most of the studies evaluated described overall QoL score. In studies that report the domains measured separately, the impairment of the QoL of older adults with CGA dysfunction often occurs in different spheres, including physical, emotional, cognitive and social function, performance of role and symptoms^{5,8,14,15, 27,32}.

Despite this logical association between vulnerability and worsening QoL of older adults with cancer, some studies evaluated did not show a statistically significant association between changes in CGA and QoL impairment. Goineau et al.²⁸ applied CGA to a cohort of older adults who underwent intensity-modulated radiation therapy for prostate cancer. No geriatric parameter was predictive of impaired QoL after treatment, however in this study, radiotherapy was well tolerated and QoL was preserved in most patients. Likewise, a study conducted by Mohile et al.¹⁸ did not detect statistically significant differences between groups in the QoL scale score, regardless of baseline CGA values. Despite this, the study demonstrated that including CGA in oncology consultations improved patient-centered communication about concerns related to aging and patient and caregiver satisfaction.

In addition, Kirkhus et al.³² followed a cohort of older adults with cancer and found that although most aspects of QoL were worse in patients classified as frail by CGA, the changes followed a similar course to non-frail patients, however, as the former had lower QoL baseline values, changes of the same magnitude affected these patients more profoundly.

The impact of the aging process on the pharmacodynamic and pharmacokinetic mechanisms of medications is widely known, thus resulting in the minimization of normal tissue tolerance to antineoplastic agents and greater toxicity, which plays an important role in the QoL of this population^{29,38}. Thus, the ability of the CGA to predict tolerability to cancer treatment is of crucial importance, as it can assist in anticipating measures aimed at preventing treatment toxicity. Phaibulwatanapong et al.²⁹ found that disorders of functional capacity, nutritional status and the presence of comorbidities were factors considered predictive of severe toxicity and impaired QoL in older adults with cancer.

In addition to the impact on tolerance to cancer treatment, the progressive decrease in the functional reserve of multiple organ systems associated with aging also influences the individual's ability to recover from acute toxicities, resulting in prolonged functional deficits and, consequently, in a reduction in QoL^{24,29,30}. In this context, CGA may also represent a predictor of the inability to recover QoL after antineoplastic therapy. In fact, two studies^{21,27} demonstrated that older adults with basal dysfunction in CGA, in addition to having a more significant drop in QoL indexes, were more likely to keep their QoL levels low even after the end of cancer treatment.

Thus, the possible benefit of cancer treatment in older patients must be weighed against the potential harm it causes and, as treatment options for older adults are based on extrapolations of evidence derived from clinical trials that predominantly involve younger or older patients without functional impairment, CGA may represent a useful tool in treatment decisions^{18,29,39}. Previous studies have described that CGA findings can lead to changes in cancer treatment in approximately 30% of the treatment plans of older adults, aiming to ensure better tolerance and, consequently, a positive impact on QoL^{40,41}. One study evaluated showed that CGA can assist in this process of individualization of cancer treatment, causing a positive impact on QoL³³.

Systematic symptom assessments, interventions targeting specific geriatric concerns and supportive interdisciplinary care can improve the outcomes of older adults with cancer. Therefore, it is recommended that the CGA is followed by an integrated care plan to address the issues identified^{30,32}. A study by Schmidt et al.²⁶ carried out a pilot intervention test with intensified support therapy during the care of older adults with advanced cancer and the results showed that the overall QoL measure of most participants (72%) improved or remained stable. Other selected studies that evaluated the implementation of targeted interventions based on CGA findings also showed better QoL outcomes in patients assigned to the intervention group, than in those designated for usual care^{13,30}.

Jeppensen et al.³¹ used CGA as part of an interventionist tool to optimize the general health status of included patients and, while statistically

significant differences between groups were not found, there was a reduction in long-term QoL scores in the group that did not receive a geriatric intervention, which did not occur in the intervention group. Only one study²³, which carried out a geriatric intervention aimed at the risk factors for postoperative delirium in older patients classified as frail submitted to surgery for a solid tumor, did not demonstrate benefits in the QoL outcome in the follow-up of these patients. However the incidence rate of delirium, which was below expectations, and the high standard of basic care in the control group may have influenced the long-term results.

The usefulness of CGA in improving the results of older adults with cancer has been described in previous review studies⁴²⁻⁴⁴, demonstrating its benefits in different outcomes, such as improved treatment tolerance and overall survival. However, data on the implications of the approach on the QoL of this population are scarce, demonstrating the importance of the present study. The limitation of the study, however, was the fact that it did not use all the databases in the field of health, therefore encompassing a smaller sample of studies. However, the review allowed gaps in the literature to be identified, particularly the lack of studies with more objective designs aimed at understanding the benefits and viability of CGA, and which specifically assess its impact on QoL, an

important outcome for the older adult population, in order to provide relevant information that can be used to facilitate treatment decisions. During the search on the research platforms, three clinical trials in progress were identified which have a better design and a larger sample, and which will offer more robust data on this theme (NCT02704832; NCT02284308; NCT02748811)⁴⁵⁻⁴⁷.

CONCLUSION

From the analysis of scientific production on the relationship of CGA and QoL in older adults with cancer, the importance of a comprehensive evaluation of these people was evidenced, both for prognostic definitions and treatment tolerability, as well as to assist in cancer treatments and the guidance of support interventions. Through these different applications, it was observed that CGA helps to preserve the QoL of this population.

These results suggest the importance of developing strategies for incorporating CGA into the care of older adults with cancer, in order to guarantee a comprehensive approach for these individuals and the best care possible for this vulnerable population, prioritizing the improvement of QoL.

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