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Cancer Management in Extremely Elderly Patients: Applying Comprehensive Geriatric Assessment in High-Burden Settings

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Abstract

The demographic shift toward an aging population has resulted in an increasing number of extremely elderly patients (aged 80 years and above) presenting with cancer diagnoses. This population presents unique challenges in oncological care, characterized by physiological vulnerability, multiple comorbidities, polypharmacy, and diminished functional reserves. Comprehensive Geriatric Assessment (CGA) has emerged as an essential tool for optimizing treatment decisions and improving outcomes in this vulnerable population. This review examines the current evidence on cancer treatment approaches in extremely elderly patients, the role of CGA in treatment planning, specific considerations for different treatment modalities, and practical implementation strategies. Evidence demonstrates that chronological age alone should not dictate treatment decisions; instead, a holistic assessment of functional status, comorbidities, and patient preferences should guide individualized care plans. When appropriately selected and managed with CGA integration, extremely elderly patients can benefit from cancer-directed therapies while maintaining quality of life.

Keywords: Extremely Elderly; Cancer Treatment; Geriatric Assessment; Octogenarians; Nonagenarians; Frailty; Chemotherapy Tolerance

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Introduction

The global population is experiencing unprecedented aging, with the fastest growth occurring among individuals aged 80 years and older, often referred to as the "extremely elderly" demographic. The number of persons aged 80 years or older is expected to triple between 2020 and 2050 to reach 426 million [1]. This shift has profound implications for oncology, as cancer incidence increases dramatically with age [2]. Approximately 60% of all cancers and 70% of cancer-related mortality occur in individuals over 65 years, with a substantial proportion affecting those over 80 years [3].

The management of cancer in extremely elderly patients represents one of the most challenging scenarios in modern oncology. These patients often present with advanced disease, multiple comorbidities, reduced physiological reserves, and complex psychosocial needs [4]. Traditional clinical trials have historically excluded this age group, as patients over 80 years accounted for approximately 16% of the population incidence of the relevant malignancies and only 4% of the FDA registration trial population, highlighting unique challenges in generalizability of regulatory decisions to older real-world patients [5, 6]. Consequently, there exists considerable uncertainty and variability in practice patterns, with some clinicians favouring aggressive treatment approaches while others adopt overly conservative strategies based primarily on chronological age.

Comprehensive Geriatric Assessment (CGA) has emerged as a critical tool to bridge this evidence gap [7]. CGA provides a multidimensional evaluation of an elderly patient's functional status, comorbidities, cognitive function, psychological state, social support, nutritional status, and medication use [7, 8]. This holistic assessment enables clinicians to identify vulnerable patients, predict treatment tolerance, and tailor interventions to individual capabilities and goals [7, 8]. The integration of CGA into oncological decision-making for extremely elderly patients represents a paradigm shift from age-based to function-based treatment planning.

This review examines the current state of cancer treatment in patients over 80 years, with particular emphasis on how CGA integration can optimize therapeutic outcomes while preserving quality of life.

Epidemiology and Biological Considerations

Cancer in the Extremely Elderly

The incidence of cancer increases substantially with advancing age, reflecting the cumulative effects of carcinogenic exposures, declining immune surveillance, cellular senescence, and age-related molecular changes [9].

The incidence ranges from fewer than 26 cases per 100,000 people in age groups under age 20, to about 350 per 100,000 people among those aged 45–49, to more than 1,000 per 100,000 people in age groups 60 years and older (Figure 1) [2]. According to the most recent statistical data from NCI's Surveillance, Epidemiology, and End Results (SEER) Program, the median age of a cancer diagnosis is 67 years. This means that half of cancer cases occur in people below this age and half in people above this age. A similar pattern is seen for many common cancer types. For example, the median age at diagnosis is 63 years for breast cancer, 66 years for colorectal cancer, 71 years for lung cancer, and 68 years for prostate cancer [2].

In India, the elderly aged 80-84 years' experience a great disease burden, measured by DALY rates. India's overall DALY rate for the elderly population reached 8112.283 in 2019 [10]. Among older adults, five cancer types contributed most significantly to disease burden: lung and bronchial cancer (908.473), colorectal cancer (752.961), gastric cancer (707.464), breast cancer (597.881), and oral cavity cancer (557.637), as illustrated in Figure 2 [10]. Common malignancies in this population include colorectal cancer, lung cancer, breast cancer, prostate cancer, and hematological malignancies [11]. Cancer incidence is rising among women, particularly those under 65, who now show higher rates than men in corresponding age groups [12].

The biological characteristics of cancer in extremely elderly patients differ from those in younger populations. Age-related molecular alterations, including chromosomal instability, epigenetic modifications, and accumulation of somatic mutations, influence tumor behaviour [9]. Additionally, the tumor microenvironment in aged individuals is characterized by chronic inflammation, immunosenescence, and altered metabolic profiles, which may affect both tumor progression and treatment response [13].

Physiological Changes with Extreme Aging

Patients over 80 years' experience profound physiological changes affecting multiple organ systems. Cardiovascular changes include reduced cardiac reserve, increased arterial stiffness, and diminished baroreceptor sensitivity [14]. Pulmonary alterations manifest as decreased vital capacity, reduced gas exchange efficiency, and weakened respiratory muscles [15]. Progressive nephron loss results in reduced glomerular filtration rate and impaired drug clearance [16], while hepatic changes include decreased hepatic blood flow and altered drug metabolism [17].

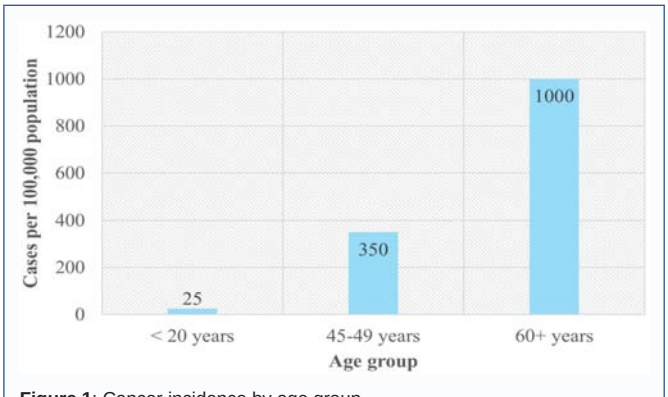

Figure 1: Cancer incidence by age group.

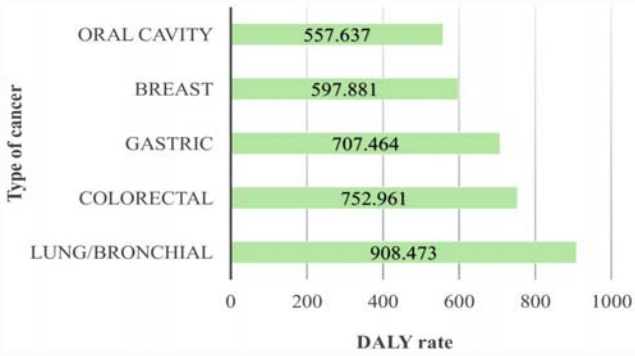

Figure 2: Cancer disease burden in Indian elderly population (aged 80-84 years).
DALY = Disability-Adjusted Life Years.

Bone marrow reserve becomes reduced, with diminished hematopoietic capacity and increased susceptibility to cytopenias [18]. Immunosenescence leads to impaired immune function, increasing infection risk and potentially affecting immunotherapy efficacy [19]. Changes in drug absorption, distribution, metabolism, and excretion create complex pharmacokinetic alterations that significantly impact treatment tolerance and necessitate careful consideration when planning cancer therapies [20].

Comprehensive Geriatric Assessment: Framework And Components

Definition and Rationale

Comprehensive Geriatric Assessment is defined as a multidimensional, interdisciplinary diagnostic process designed to evaluate the medical, psychological, functional, and socioenvironmental factors affecting older adults [21]. For cancer patients, CGA serves multiple purposes, including identifying previously unrecognized health problems, predicting treatment tolerance, guiding treatment modifications, and facilitating discussions about goals of care [7].

The integration of CGA into oncology practice is supported by substantial evidence demonstrating its ability to detect health deficits missed by standard oncological evaluations [8]. Studies show that CGA identifies previously unrecognized impairments in 20-49% of older cancer patients who appear functionally independent by routine clinical assessment [22].

Essential Domains of CGA

According to guidelines from the American Society of Clinical Oncology (ASCO) and the International Society of Geriatric Oncology (SIOG), CGA should evaluate multiple interconnected domains [23]. Functional status assessment encompasses Activities of Daily Living (ADLs) including bathing, dressing, toileting, transferring, continence, and feeding, as well as Instrumental Activities of Daily Living (IADLs) such as managing medications, finances, transportation, shopping, and housekeeping [24]. Functional impairment is a strong predictor of treatment tolerance and survival [24].

Comorbidity assessment involves documentation of coexisting medical conditions using validated tools such as the Charlson Comorbidity Index or the Cumulative Illness Rating Scale-Geriatric (CIRS-G) [25]. Comorbidities affect treatment selection, tolerance, and prognosis [26]. Cognitive function evaluation uses screening instruments such as the Mini-Mental State Examination (MMSE), Montreal Cognitive Assessment (MoCA), or Mini-Cog [27]. Cognitive impairment affects treatment comprehension, adherence, and ability to report symptoms.

Psychological status assessment examines depression and anxiety using validated tools such as the Geriatric Depression Scale (GDS) or Patient Health Questionnaire (PHQ-9). Psychological distress is common in elderly cancer patients and impacts treatment outcomes and quality of life [28, 29]. Social support and environment evaluation assesses caregiver availability, living situation, financial resources, and social network. Adequate social support is crucial for treatment adherence and management of treatment-related complications [30].

Nutritional status is assessed using tools such as the Mini Nutritional Assessment (MNA) or measurement of unintentional weight loss and body mass index [31]. Malnutrition is prevalent in elderly cancer patients and associated with increased toxicity and worse outcomes [32]. Polypharmacy requires comprehensive medication review to identify potentially inappropriate medications, drug-drug interactions, and opportunities for deprescribing. Polypharmacy increases the risk of adverse drug reactions and interactions with cancer therapies [33].

Mobility and fall risk evaluation uses tests such as the Timed Up and Go (TUG) test or assessment of fall history. Falls and mobility impairment predict treatment complications and functional decline [34]. Screening for common geriatric syndromes includes delirium, incontinence, sensory impairment, osteoporosis, and frailty [35].

Screening Tools for Patient Selection

Given the time and resource constraints of conducting full CGA for all elderly cancer patients, validated screening tools help identify those most likely to benefit from comprehensive evaluation. The Geriatric 8 (G8) is a brief 8-item screening tool with high sensitivity for detecting patients who need full CGA [36]. The Vulnerable Elders Survey-13 (VES-13) identifies vulnerable older adults at risk for functional decline [37]. The Senior Adult Oncology Program Screening Questionnaire (SAOP-3) serves as a brief screening tool for older cancer patients [38]. Patients identified as vulnerable through screening should undergo full CGA to guide treatment planning.

The various components of CGA-functional assessment, comorbidity evaluation, cognitive screening, psychological status, nutritional assessment, polypharmacy review, and geriatric syndrome identification-work together in a systematic framework to guide individualized treatment decisions. Figure 3 illustrates the clinical pathway for integrating CGA into cancer care for extremely elderly patients, demonstrating how screening tools, comprehensive assessment, risk stratification, and treatment modifications combine to optimize patient outcomes while minimizing harm (Figure 3).

Cancer Treatment Modalities In Extremely Elderly Patients

Surgery

Surgery remains the primary curative treatment for many solid tumors [39]. Age alone should not be considered a contraindication to surgical intervention; however, careful preoperative assessment is essential [39].

Studies examining surgical outcomes in extremely elderly demonstrate that selected patients can undergo major cancer surgery with acceptable morbidity and mortality rates [40]. According to Royal College of Surgeons of England, surgical mortality in patients>80 years was >25% [41]. Research on colorectal cancer patients over 80 years shows that while postoperative complications are more frequent than in younger patients, carefully selected elderly individuals can achieve comparable long-term survival outcomes [42]. Similarly, studies of breast cancer patients aged 90 and above indicate that surgery plays a leading role in treatment, with favourable outcomes in appropriately selected patients [43].

CGA-identified factors that predict surgical outcomes include functional status and independence in ADLs, comorbidity burden and severity, nutritional status, cognitive function, presence of frailty, and whether surgery is performed as an emergency versus elective procedure [44]. Preoperative optimization guided by CGA findings can improve surgical outcomes through nutritional support for malnourished patients, optimization of comorbid conditions, comprehensive medication review, delirium prevention protocols, enhanced recovery after surgery (ERAS) protocols adapted for elderly patients, and multidisciplinary perioperative care involving geriatricians [45, 46].

Radiation Therapy

Radiation therapy is often well-tolerated in elderly patients and can provide excellent local control with curative or palliative intent [47]. A French multicenter analysis examined radiation therapy feasibility in patients aged 90 years and older, demonstrating that radiation therapy is feasible with acceptable toxicity profiles in carefully selected extremely elderly patients. The study found that treatment completion rates were high, and toxicity was manageable when appropriate dose fractionation and supportive care were implemented [48].

Considerations for treatment planning include hypofractionation, where shorter treatment courses with higher doses per fraction reduce the number of visits, improving convenience and reducing transportation burden [49]. For patients with limited life expectancy, shorter palliative courses may provide symptom relief without excessive treatment burden [49].

Systemic Therapy: Chemotherapy

Chemotherapy in extremely elderly patients remains controversial, with concerns about toxicity, treatment tolerance, and benefit-risk ratios. However, emerging evidence suggests that selected elderly patients can benefit from systemic therapy when guided by CGA [50].

Multiple studies have examined chemotherapy feasibility and outcomes in patients over 80 years. A retrospective review of cancer patients aged 80 and older treated at a comprehensive cancer center found that both single and multi-agent therapy appeared to be feasible, and 1-year overall survival rates were over 50% [3]. Another study examining the feasibility of delivering cytotoxic therapy to patients 80 years and older confirmed a high risk of hospitalization or treatment discontinuation due to toxicity, despite frequent dose modifications [51].

CGA-derived factors predicting chemotherapy tolerance include

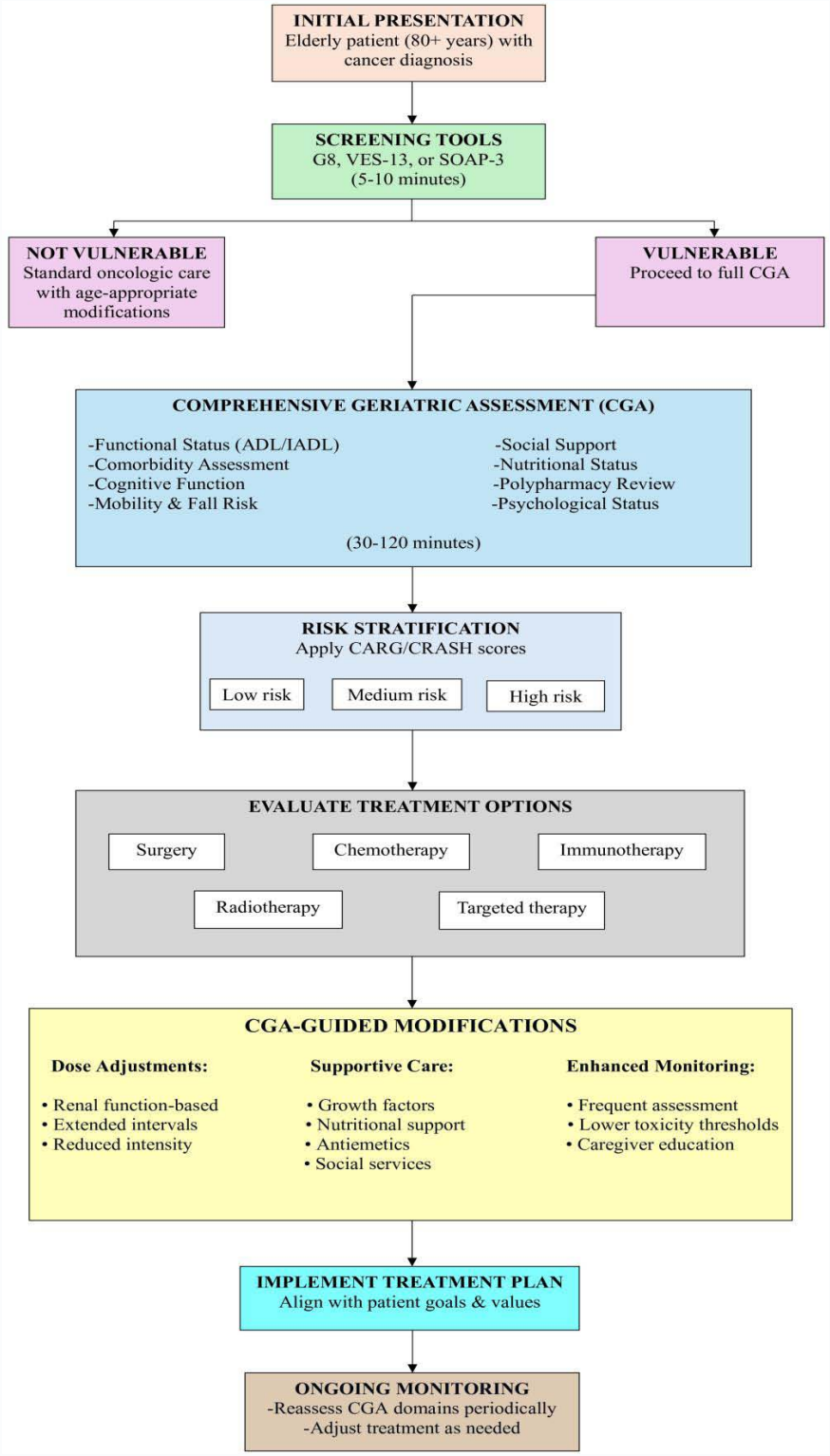

Figure 3: Clinical pathway for integrating Comprehensive Geriatric Assessment into cancer care for extremely elderly patients
CGA = Comprehensive Geriatric Assessment, G8 = Geriatric 8 (screening tool), VES-13 = Vulnerable Elders Survey-13, SOAP-3 = Senior Adult Oncology Program Screening Questionnaire-3, ADL = Activities of Daily Living, IADL = Instrumental Activities of Daily Living, CARG = Cancer and Aging Research Group, CRASH = Chemotherapy Risk Assessment Scale for High-Age Patients

functional status, nutritional status, comorbidity burden, cognitive function, social support, and laboratory parameters reflecting renal and hepatic function [52].

Several validated tools have been developed to predict chemotherapy toxicity. The Cancer and Aging Research Group (CARG) toxicity tool predicts grade 3-5 chemotherapy toxicity using CGA variables including age, cancer type, planned dose intensity, hemoglobin, creatinine clearance, hearing impairment, number of

Table 1: Treatment modalities for extremely elderly cancer patients – evidence, predictive factors, and modifications.
CGA = Comprehensive Geriatric Assessment, ADL = Activities of Daily Living, ERAS = Enhanced Recovery After Surgery, CARG = Cancer and Aging Research Group, CRASH = Chemotherapy Risk Assessment Scale for High-Age Patients, GI = Gastrointestinal, irAEs = Immune-related Adverse Events.

Treatment Modality	Key Evidence in 80+(years) Patients	CGA Factors Predicting Tolerance	Common Toxicities/ Challenges	Recommended Modifications
Surgery	• Acceptable morbidity/mortality in selected patients • Mortality >25% in 80+ years • Comparable long-term survival with careful selection • Breast cancer surgery successful even in 90+ patients	• Functional status (ADL independence) • Comorbidity burden • Nutritional status • Cognitive function • Frailty status • Emergency vs elective procedure	• Higher postoperative complications • Delirium risk • Prolonged recovery • Functional decline • Increased length of stay	• Preoperative nutritional support • Comorbidity optimization • Comprehensive medication review • Delirium prevention protocols • Enhanced recovery (ERAS) protocols • Multidisciplinary perioperative care
Radiation Therapy	• Generally well-tolerated in elderly • Feasible in 90+ patients with acceptable toxicity • High treatment completion rates • Excellent local control possible	• Performance status • Transportation access • Caregiver availability • Life expectancy • Comorbidities	• Fatigue • Skin reactions • Site-specific toxicities • Transportation burden	• Hypofractionation (fewer visits) • Shorter palliative courses • Enhanced supportive care • Transportation assistance • Appropriate dose fractionation
Chemo-therapy	• Single and multi-agent therapy feasible • 1-year survival >50% in selected patients • High risk of hospitalization/dis-continuation • Benefit when CGA-guided	• Functional status • Nutritional status • Comorbidity burden • Cognitive function • Social support • Renal/hepatic function • CARG/CRASH scores	• Myelosuppression • Nausea/vomiting • Neuropathy • Fatigue • Infection risk • Renal toxicity	• Dose reductions based on renal function • Extended cycle intervals • Preferential use of oral agents • Enhanced supportive care (antiemetics, growth factors) • Close toxicity monitoring • Lower intervention thresholds
Targeted Therapy	• Often favorable toxicity profile vs chemotherapy • May be particularly suitable for elderly • De novo resistance possible (e.g., breast cancer endocrine therapy)	• Cognitive function (oral adherence) • Cardiovascular status • GI function • Medication management ability • Molecular markers	• Diarrhea • Skin reactions • Cardiovascular effects • Drug interactions • Treatment resistance	• Oral administration convenience • Simplified dosing schedules • Careful monitoring of specific toxicities • Medication adherence support • Regular resistance monitoring
Immuno-therapy	• Transformed treatment across tumor types • Questions about efficacy/toxicity in very elderly • Age-related immunosenescence considerations	• Immune function status • Autoimmune disease history • Organ function • Performance status • Cognitive function (symptom reporting)	• Immune-related adverse events (irAEs) • Pneumonitis • Colitis • Hepatitis • Endocrinopathies • Delayed toxicities	• Careful patient selection • Enhanced toxicity monitoring • Prompt irAE management • Patient/caregiver education on symptoms • Multidisciplinary management of toxicities

falls, limitations in walking, and medication count. This tool has been validated and helps clinicians stratify risk [53]. The Chemotherapy Risk Assessment Scale for High-Age Patients (CRASH) predicts severe toxicity and mortality risk in elderly cancer patients receiving chemotherapy [54].

For extremely elderly patients, treatment modifications guided by CGA may include dose reductions or adjustments based on renal function, extended intervals between cycles, preferential use of oral agents when appropriate, enhanced supportive care including antiemetics, growth factors, and nutritional support, and close monitoring for toxicity with lower thresholds for intervention [55]. Research on elderly patients with advanced non-small cell lung cancer (NSCLC) demonstrates that geriatric evaluation and CGA alternatives can predict chemotherapy toxicity, guiding treatment selection [52].

Targeted Therapy and Immunotherapy

Targeted therapies and immunotherapy represent important treatment options for elderly patients, often with more favourable toxicity profiles than traditional chemotherapy [56]. Molecularly targeted agents may be particularly suitable for extremely elderly patients due to oral administration convenience, generally lower rates of myelosuppression, and potential for better tolerability [57]. However, specific toxicities such as diarrhea, skin reactions, and cardiovascular effects require monitoring. Older patients with breast cancer may show de novo resistance to endocrine therapy, necessitating careful treatment selection and monitoring [58].

Immune checkpoint inhibitors have transformed cancer treatment across multiple tumor types [59]. Age-related immunosenescence raises questions about efficacy and toxicity in very elderly patients. Careful monitoring and prompt management of immune-related toxicities are essential.

Table 1 provides a comprehensive summary of treatment modalities, predictive factors, toxicities, and recommended modifications for extremely elderly cancer patients.

Implementation of CGA in Clinical Practice

Models of Care Delivery

The optimal model for delivering CGA to elderly cancer patients depends on available resources, clinical setting, and institutional infrastructure. The traditional gold standard model consists of a comprehensive multidisciplinary clinic conducted at a single time point and location. During one visit, patients receive CGA from a geriatrician or geriatric oncologist, oncologic treatment planning from the primary oncologist, and access to supportive care services including dietitians, pharmacists, physical and occupational therapists, and social workers. This approach minimizes multiple clinic visits and facilitates coordinated care but requires substantial resources and specialized personnel [60].

In high resource settings where both geriatric oncologists and geriatricians are available, a two-step consultative model can be implemented. The oncologist performs initial screening using validated tools such as G8, VES-13, or SAOP-3, and patients identified as vulnerable are referred to a geriatrician or geriatric oncologist for

Table 2: Models for implementing Comprehensive Geriatric Assessment across different resource settings.
CGA = Comprehensive Geriatric Assessment, G8 = Geriatric 8 (screening tool), VES-13 = Vulnerable Elders Survey-13, SAOP-3 = Senior Adult Oncology Program Screening Questionnaire-3.

Resource Setting	Model Type	Personnel Requirements	Assessment Components	Advantages	Limitations
HIGH RESOURCE	**Comprehensive Multidisciplinary Clinic** (Gold Standard)	• Geriatric oncologist or geriatrician • Oncologist • Dietitian • Pharmacist • Physical/occupational therapist • Social worker • Nurse coordinator	• Complete CGA (all 8-9 domains) • Oncologic evaluation • Supportive care assessment • Same-day results integration	• Minimizes patient/ caregiver visits • Optimal coordination • Immediate intervention • Comprehensive assessment • Best patient experience	• Resource-intensive • Requires specialized personnel • High infrastructure needs • Limited availability • May not be reimbursed adequately
HIGH RESOURCE	**Two-Step Consultative Model**	• Oncologist • Geriatrician or geriatric oncologist • Support staff for screening	• Initial screening (G8, VES-13, SAOP-3) • Full CGA for vulnerable patients • Oncologic assessment	• Optimizes resource utilization • Tiered approach • Focuses intensive assessment on those who need it • Cost-effective	• Multiple visits required • Coordination challenges • Requires geriatric specialists • Potential delays in treatment
MODERATE RESOURCE	**Shared-Care Model**	• Geriatrician (separate visit) • Oncologist (separate visit) • Care coordinator • Support services	• CGA by geriatrician • Oncologic assessment by oncologist • Interdisciplinary collaboration	• More resource-efficient • Utilizes existing services • Feasible in more settings • Maintains quality assessment	• Greater patient/ caregiver burden (multiple visits) • Coordination challenges • Potential communication gaps • Longer time to treatment
LOW RESOURCE	**Oncologist-Led Focused Assessment**	• Oncologist (with geriatric training) • Oncology nurse • Available support services	• Geriatric screening tools • Selected CGA components • Focused interventions for identified deficits	• Feasible without geriatric specialists • Can be implemented widely • Better than no assessment • Scalable	• Less comprehensive • Requires oncologist training • May miss subtle issues • Limited specialist support • Time constraints
INNOVATIVE	**Telehealth/Digital Model**	• Remote geriatric specialist • Local oncologist • Digital health platform • Technical support	• Video-assisted CGA • Patient-reported outcomes • Digital monitoring tools • Remote consultations	• Overcomes geographic barriers • Reduces travel burden • Continuous monitoring possible • Access to specialists remotely • Convenient for mobility-limited patients	• Requires technology access • Digital literacy needed • Physical exam limitations • Connectivity requirements • Reimbursement challenges

comprehensive evaluation. This tiered approach optimizes resource utilization [8].

In moderate resource settings, the shared-care model involves patients undergoing separate evaluations by a geriatrician and oncologist, potentially at different times. The geriatrician performs the CGA while the oncologist conducts oncologic assessment. An interdisciplinary team collaborates to develop an integrated care plan. While this model is more resource-efficient, it places greater burden on patients and caregivers due to multiple visits [61].

In low resource settings where geriatric specialists are unavailable, oncologists can utilize geriatric screening tools and selected CGA components to inform management decisions. Focused interventions targeting identified deficits can still improve outcomes. Training oncology staff in geriatric principles enhances care quality [62].

Innovative approaches include telehealth and video-assisted CGA, which offer promising alternatives to in-person assessment, particularly valuable for extremely elderly patients with mobility limitations or those in remote locations. Digital health tools and patient-reported outcome measures can facilitate ongoing monitoring between visits [63].

Table 2 summarizes the various CGA implementation models, their resource requirements, and key features across different healthcare settings.

Timing of Assessment

CGA should ideally be performed prior to treatment initiation to inform initial treatment planning, before finalizing the treatment plan to incorporate assessment findings, periodically during treatment to identify emerging issues, and after treatment completion to plan survivorship care or end-of-life transition [7].

Practical Recommendations

Early morning appointments may be challenging for extremely elderly patients who require caregiver assistance with morning ADLs. Mid-morning or early afternoon appointments better accommodate patient and caregiver needs. The setting for assessment should be accessible and comfortable. Many extremely elderly individuals have vision, hearing, or mobility impairments making travel to multiple locations burdensome. Whenever possible, assessments should occur in familiar, accessible environments. Comprehensive CGA typically requires 30-120 minutes. While time-intensive, this investment provides critical information that prevents inappropriate treatment and reduces costly complications [64].

Managing Specific Challenges In Extremely Elderly Cancer Patients

Polypharmacy and Drug Interactions

Extremely elderly cancer patients commonly take multiple medications for comorbid conditions. Polypharmacy increases risks of drug-drug interactions, adverse effects, and non-adherence [33]. A comprehensive medication review should identify potentially inappropriate medications using criteria such as the Beers Criteria or STOPP/START criteria, detect drug-drug and drug-disease interactions, evaluate for medications that may interfere with cancer treatment, consider deprescribing medications with limited benefit, and simplify medication regimens when possible [65].

Nutritional Support

Malnutrition is highly prevalent in elderly cancer patients and associated with increased treatment toxicity, complications, and mortality [32]. Nutritional factors have been specifically linked to chemotherapy toxicity in older adults with solid tumors [66]. Rather than relying on appetite stimulants or high-calorie supplements, evidence-based approaches include addressing reversible causes of poor intake such as medication side effects, depression, and dental problems, enhancing social aspects of eating, providing palatable nutrient-dense foods, offering feeding assistance when needed, engaging dietitians for individualized nutrition plans, and considering enteral nutrition in selected cases [66].

Cognitive Impairment and Decision-Making Capacity

Cognitive impairment complicates treatment planning, informed consent, symptom reporting, and treatment adherence. Management strategies include screening for delirium before attributing symptoms to dementia, involving family caregivers in treatment discussions and symptom monitoring, simplifying treatment regimens when possible, providing written instructions and using teach-back methods, considering capacity assessment for treatment decisions, and integrating cognitive status into toxicity risk assessment [67].

Advance Care Planning

Advance care planning (ACP) is a vital component of CGA, particularly for extremely elderly patients. ACP facilitates discussions about goals of care, values, and preferences for future medical treatment [68]. Key elements include eliciting patient goals such as prolonging life, maintaining independence, relieving suffering, or maximizing family time, discussing realistic expectations for treatment outcomes, addressing preferences for life-sustaining treatments, identifying healthcare proxy or surrogate decision-maker, documenting advance directives, and revisiting and updating plans as clinical status changes. ACP ensures that treatment plans align with patient values and prevents unwanted aggressive interventions at the end of life [68].

Social Support and Caregiver Burden

Extremely elderly cancer patients often depend on family caregivers for transportation, medication management, symptom monitoring, and ADL assistance. Caregiver burden assessment and support are essential components of comprehensive care [69]. Interventions include assessing caregiver health, capacity, and willingness, providing caregiver education and training, connecting families with community resources and support services, considering respite care options, and monitoring for caregiver burnout [69].

Immunization in Elderly Cancer Patients

Older adults with cancer face increased risks from vaccine-preventable infections due to immunosenescence and treatment-related immunosuppression [70]. CGA provides an opportunity to review and update immunizations. Annual influenza vaccination is recommended [71]. Pneumococcal vaccination with PCV13 at age 65 followed by PPSV23 one year later is indicated [72]. Two doses of recombinant zoster vaccine should be administered 2-6 months apart for adults 50 years and older [73]. A single dose of Tdap followed by Td booster every 10 years completes the tetanus, diphtheria, and pertussis series [74]. Vaccination timing should be coordinated with cancer treatment, ideally administered before initiation of immunosuppressive therapy or during treatment breaks when immune function is optimal [75].

Outcomes and Quality of Life

When treatment decisions use Comprehensive Geriatric Assessment (CGA) rather than age alone, elderly cancer patients achieve meaningful outcomes. CGA-guided modifications reduce toxicity while maintaining efficacy. For extremely elderly patients, quality of life often outweighs survival. Treatment decisions should prioritize patient-defined quality of life, functional status, symptom management, and alignment with personal values and goals.

Challenges and Barriers to CGA Implementation

Despite strong evidence supporting CGA in elderly cancer care, implementation faces significant barriers. Resource constraints include limited geriatricians and oncologists, insufficient time, inadequate reimbursement, and knowledge gaps about applying CGA findings. Patient factors involve physical or cognitive limitations and appointment burden, while geographic barriers limit access to specialized services. System-level challenges include lack of standardized tools, poor electronic health record integration, and insufficient coordination between oncology and geriatric services. Addressing these requires workforce development, payment reform, care delivery innovation, and research investment.

Future Directions and Research Needs

Future research priorities include dedicated clinical trials for patients over 80, incorporating CGA into trial design, and developing age-appropriate endpoints. Biomarkers should identify predictors of treatment response and toxicity, while precision medicine approaches account for age-related changes. Care delivery innovation should evaluate telehealth, nurse-led or pharmacist-led models, and artificial intelligence (AI) tools for CGA interpretation. Patient-centered research must assess preferences, validate quality-of-life instruments, and examine advance care planning interventions specific to extremely elderly cancer patients.

Conclusion

Cancer treatment in extremely elderly patients requires individualized assessment beyond chronological age. Comprehensive Geriatric Assessment provides essential framework for evaluating treatment tolerance and optimizing outcomes. Evidence demonstrates that appropriately selected patients over 80 can benefit from cancer-directed therapies when guided by CGA, with modifications reducing toxicity while maintaining efficacy. Implementation faces barriers including resource constraints and knowledge gaps, yet adaptable care models can overcome these challenges. As this population grows,

integrating geriatric principles into oncology is essential for delivering patient-centered care that aligns with individual capabilities, values, and quality-of-life goals.

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