Received: 4 May 2024 | Accepted: 31 July 2024

DOI: 10.1002/agm2.12347

Aging Medicine Open Access WILEY

REVIEW ARTICLE

The increasing prevalence of cancer in the elderly: An investigation of epidemiological trends

Ramya Prathap | Sherlin Kirubha | Aravindhan Thiyaga Rajan | Santhosh Manoharan | Karthikeyan Elumalai

Department of Pharmaceutical Chemistry, Saveetha College of Pharmacy, Saveetha Institute of Medical and Technical Sciences, Chennai, India

Correspondence
Karthikeyan Elumalai, Department of Pharmaceutical Chemistry, Saveetha College of Pharmacy, Saveetha Institute of Medical and Technical Sciences, Chennai, Tamil Nadu 602105, India.
Email: karthikeyanelumalai@hotmail.com; karthikeyane.scop@saveetha.com

Abstract

Cancer poses a significant health threat to the elderly, accounting for a substantial proportion of cancer patients aged 65 and above. As life expectancy continues to rise and the population ages, the incidence of cancer in the elderly is expected to increase further. Age is a major risk factor for the majority of common cancers, with the incidence and prevalence rising as individuals grow older. Factors such as chemoprevention and environmental carcinogen elimination may influence the process of carcinogenesis. Studies reveal that the incidence and mortality rates of various cancers in the elderly and extremely old individuals are on the rise worldwide, with most types peaking around the age of 75 to 90, followed by a sharp decline. Birth cohort and period effects also play a complex role in the connection between aging and cancer risk. Clinical trials often exclude older individuals, limiting our understanding of cancer treatments' effects on this particular age group. More research is needed to focus on the unique requirements of older adults with cancer.

KEYWORDS
cancer, clinical trials, elderly patients, polypharmacy

1 | INTRODUCTION

Cancer remains a leading cause of death worldwide, and the global burden continues to increase at an alarming rate. While improvements in early detection and treatment have led to better outcomes for many patients, a concerning trend has arisen: the growing incidence of cancer among the elderly population.[1–3] As life expectancy rises and the demographic shift towards an aging society accelerates, it is crucial to gain a greater understanding of the epidemiological patterns and risk factors associated with cancer in older adults to develop effective preventive strategies and optimize care delivery.[4,5] This review provides a comprehensive examination of the current literature on the epidemiology of cancer in the elderly. We will examine the key drivers contributing to the rising incidence rates, including lifestyle factors, environmental exposures, and biological mechanisms that may render older individuals more susceptible to cancer development.[6–9]

We will also discuss the specific problems that older cancer patients face, such as having other health issues, being unable to do certain things, and possibly experiencing harmful effects from their treatment, all of which can have a significant impact on clinical decisions and outcomes.[10–13] Supportive care encompasses a wide range of interventions aimed at preventing, minimizing, and alleviating the side effects and complications associated with cancer and its treatment. These interventions may include symptom management, psychological support, nutritional counseling, physical therapy, and social assistance, among others.[14] Effective supportive care can not

only improve patient well-being but also enhance treatment adherence, facilitate better treatment outcomes, and reduce healthcare costs. Despite the acknowledged importance of supportive care, gaps, and disparities persist in its delivery to older cancer patients.[8] Various factors, such as healthcare system constraints, provider knowledge gaps, and patient-related barriers, can hinder the delivery of optimal supportive care services. Furthermore, the aging population's heterogeneity and the presence of multiple comorbidities can pose unique challenges in tailoring supportive care interventions to individual patient needs.[9] The goal of this review is to provide a comprehensive understanding of cancer in the aging population. To achieve this, we have drawn upon the latest epidemiological data and insights from a range of research disciplines. Our ultimate goal is to identify key areas for future research and highlight potential strategies for reducing cancer burden among the elderly.

2 | CANCER EPIDEMIOLOGY AND AGE

Epidemiology is a vital discipline that helps us comprehend the causes and mechanisms of diseases, with age being a significant risk factor for most prevalent cancers. The incidence and prevalence of cancer increase with age due to the length of carcinogenesis, which involves activating cellular oncogenes and suppressing anti-proliferative genes.[15–18] Carcinogenesis takes the longest for late-developing tumors, such as prostate adenocarcinoma, large bowel cancer, or non-melanoma skin cancer. Interventions may extend one or more carcinogenic steps, potentially delaying cancer development.[19] Research indicates that the incidence and death rates of various cancers among the elderly and extremely old are rising globally. A study in the US found that most cancer types increased until they reached a peak at around age 75 to 90, then declined sharply.[20] Mortality rates for the same cancer categories showed similar trends, peaking 5 years after the age at which cancer incidence peaked. Birth cohort and period effects also contribute to this intricate link between aging and cancer risk.[21] The most remarkable aspect of the rapid rise in incidence and death with age is the vast differences between age groups within a community, which are several orders of magnitude greater than those across populations. Exposure to new environments may alter these rates if external environmental factors influence them.[22] A study using data from the International Agency for Research on Cancer (IARC) for Canada, the US, Japan, and the former German Democratic Republic observed trends of cancer incidence peaking and declining at comparable ages.[23]

2.1 | Overview of cancer incidence and prevalence among the elderly

Cancer occurrence rates are influenced by various factors, such as the type, age, and gender of the affected individual. In the United States, certain types of cancer are more common in younger individuals, such as urological cancers, while colorectal, pancreatic, and stomach cancers tend to affect older people.[24] The incidence of cancer also varies depending on geographical location. For instance, Denmark has a higher cancer rate compared to the US, and the oldest age group, those aged 90 and above, has the least number of cases. Among men, prostate cancer is the most prevalent type, followed by lung and colon cancers.[25] Breast cancer is the most frequently occurring cancer in women, and it has a higher mortality rate in individuals aged 80 or more. The elderly age group of 70 and above has the highest cancer incidence rate when compared to other age groups.[26–29]

2.2 | Cancer mortality

Cancer is the leading cause of death for the elderly, with rates increasing consistently until the age of 100 and then falling at centenarian ages. In the UK, breast cancer ranks as the first cause of death, with more than 312.5 per 100,000 women over 90 years old. Men die at a greater rate than women, with prostate and colorectal cancer killing more men than women.[30–34] Geographical region and gender have different effects on cancer death rates, with lung cancer mortality rates decreasing beyond the age of 85 in the US, western Europe, northern Europe, and among women from the UK and Denmark.[35–37] The number of cancer-related fatalities may increase by 90% every year by 2030, with lung, prostate, breast, bladder, and colorectal cancer accounting for the top five causes of death. A 36-year follow-up period examined 337,524 fatalities of all causes, with 56% of those deaths occurring within 3 years.[38–40] Age-related declines in all-cause three-year survival were notable, but improvements occurred between 1975–1979 and 2005–2008. Lung cancer had the biggest percentage difference in three-year survival rates across age groups, while skin cancer showed no age difference.[41–43]

2.3 | Impact of aging on cell function and malignancy

Aging is a natural process that affects cells and tissues, leading to decreased functional efficiency and the emergence of malignant tumors, often resulting in cancer.[44] This process, which reduces species' lifespans due to extrinsic dangers, causes a decrease in their population. Antagonistic pleiotropy, a concept underlying the relationship between cancer and aging, refers to a gene with positive effects in the initial stages but prolonged adverse effects, increasing the risk of cancer with age.[45] Aging also causes degeneration in animals, leading to disorders like neurodegenerative disease, pulmonary insufficiency, cardiac failure, osteoporosis, macular degeneration, and sarcopenia.[46] Research suggests that cellular senescence is the root cause of aging-related chronic diseases and cancer. Aging is a failure of reproduction processes, leading to a lack of division and growth of certain tissues.[47] Cancer cells can initiate proliferative senescence, impairing their replication ability, becoming resistant to drugs, and acquiring genetic faults that promote cancer development.[48] Program theories and cell error and damage

theories are two major concepts in understanding aging. Stem cells, which fail in patent form, enter apoptosis, senescence, or growth arrest stages, indicating that some genetic processes, mainly DNA, are connected with the decline of organisms (Figure 1).[24] Commonalities between cancer biology and aging can help develop new treatments for age-related diseases and cancer.[25,49–52]

3 | CHALLENGES IN DIAGNOSING CANCER IN ELDERLY PATIENTS

The significance of cancer diagnosis in improving the outcomes for older people is highlighted by the fact that they are often unable to access modern diagnostic facilities, resulting in longer wait times for procedures.[53] This age-related variability in cancer detection may be attributed to the dual role of the patient and their physician. Comprehensive cancer care involves extensive diagnostic and staging procedures that inform therapeutic interventions and prognosis. A thorough physical examination is essential for diagnosing diseases in older patients, although the quality of gynecological exams may be lacking, particularly in terms of providing holistic care for elderly women.[54] In older patients, milder diagnostic approaches may be more appropriate due to factors such as patients not recognizing symptoms, attributing them to age-related norms, or being dismissive of their health.[55] Physicians may hold stereotypes, adopt a pessimistic therapeutic approach, and lack knowledge about normal aging, leading them to prescribe alternative treatment methods. Tissue harvesting with CT, MRI, PET, and EUS imaging all merged. Figure 2 indicates CT scans of pancreatic carcinoma that is in contact with the splenic artery and of a pancreatic oblastenocarcinoma. On precontrast T2-weighted images, cancer tissue mostly appears less dense than the normal pancreas, while angiogenesis will not be observed, and on post-contrast T2-weighted images, it appears less dense or stays the same.[35]

The outcomes of cancer screening tests among older people are still being researched, particularly since no randomized controlled trials have been conducted specifically for this age group.[56–59] By 2025, it is anticipated that pancreatic cancer in Western countries will rise to second place on the list of cancer fatalities, highlighting the need for additional investment in diagnostics and screening. Early detection of pancreatic cancer remains challenging, but the implementation of diagnostic methods can enhance this possibility.[60] Although existing techniques used in trials do not provide accurate assessments of pancreatic cancer at its early stages, more advanced methods should be developed that take into account individual diseases and medications to achieve successful treatment outcomes.[61] Early detection of pancreatic cancer is essential for improving overall health outcomes and reducing the risk of death in old age. However, there are potential contradictions to consider when evaluating the benefits of select cancer screenings.[62]

4 | ELDERLY CANCER PATIENTS' POLYPHARMACY

4.1 | Clinical implications and management

Polypharmacy is a widespread practice among elderly cancer patients, who often take multiple prescription drugs to treat various health conditions. This can result in severe drug interactions, hospitalization, and adverse reactions to medication, delirium, falls, and cognitive impairment, increasing the risk of hospitalization, healthcare use, or even death.[63] However, polypharmacy does not necessarily indicate poor quality care or treatment, especially when multiple drugs are required to treat chronic conditions. Although polypharmacy is becoming more common among the general population, it is particularly prevalent among elderly cancer patients, with those aged 73 or older being more likely to

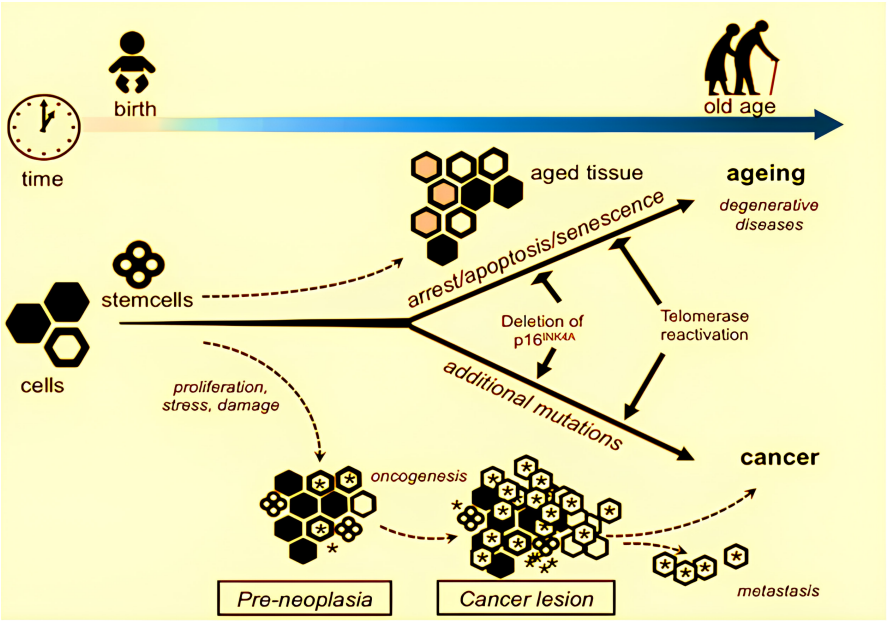

FIGURE 1 The ongoing interaction of stem cells with cancer and aging.[24]

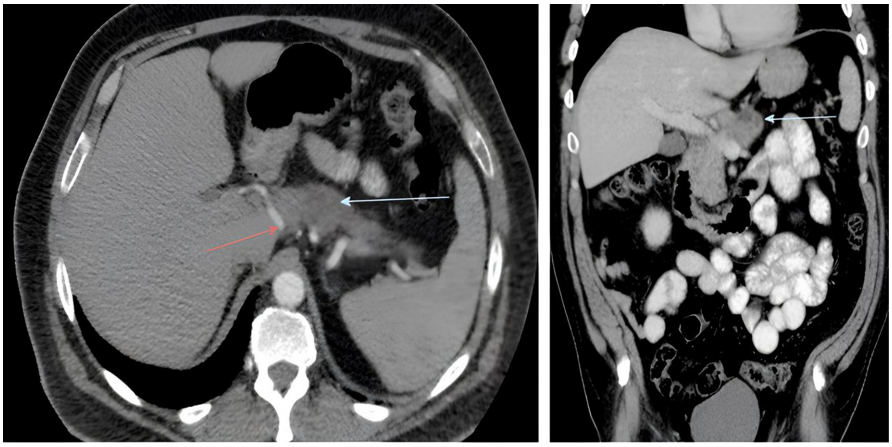

FIGURE 2 CT scanning image of pancreatic carcinoma. The image shows a large mass in the pancreas with surrounding tissue involvement.[35]

experience drug side effects that are often exacerbated by their age-related conditions.[64] The pharmaceutical appropriateness index, a three-point measure, is used to determine the appropriateness of medication. Among patients aged 73 or older, the median number of prescriptions used is seven, making polypharmacy a significant concern for elderly cancer patients.[65] These patients often take medications such as antihypertensive, lipid-lowering, antiplatelet, anticoagulant, and bisphosphonate drugs for preventative purposes. In the US, 25%–91% of cancer patients take chemotherapy medications (CAMs) due to expected benefits, active engagement in treatment, natural techniques, symptom relief, and avoidance of toxic effects.[66–69]

4.2 | Management of polypharmacy

Collaboration among primary care physicians, specialists, nurses, and clinical chemists is vital for providing optimal treatment for elderly cancer patients. A comprehensive geriatric assessment entails evaluating all prescription, over-the-counter, and herbal medications. Pharmacists, with their expertise in drug histories, are better equipped to obtain accurate information on medications than doctors or nurses.[70] Accessing resources on drug interactions is essential for assessing their therapeutic value. Greater understanding of clinically significant interactions may aid in prevention and diagnosis. A technique developed by Singaporean chemists to evaluate anticancer drug interaction databases for quality assurance is a valuable resource.[71] In long-term care and skilled nursing facilities, polypharmacy is prevalent, with 13%–74% of patients taking nine or more medications. Deprescribing drugs in these facilities may reduce mortality by 25%. Government authorities monitor the use of psychiatric drugs, particularly antipsychotics, closely.[72] Deprescribing involves identifying and discontinuing medications when risks outweigh benefits, taking into account a patient's care objectives, functionality, life expectancy, values, and preferences. Further research is needed to identify high-risk or low-benefit medications and prioritize their discontinuation.[73] Pharmacists can enhance prescription and deprescribing through interprofessional, team-based treatment.

5 | TREATMENT CHOICES FOR ELDERLY CANCER PATIENTS

The complexity of making treatment decisions for individuals with advanced age is largely due to a scarcity of evidence in radiation oncology and insufficient trials, which can result in either under treatment or overtreatment in cases such as prostate and head and neck cancer.[74] It is essential to comprehend the reasons behind positive responses and adopt an individualized care approach that includes collaborating with geriatric medicine for a holistic treatment plan. Assessing patients' needs through patient-centered treatment can help identify the necessary social, dietary, psychological, physical, and cognitive support systems.[75]

5.1 | Chemotherapy

The medical field is experiencing a scarcity of new cytotoxic drugs each year, and the research on these drugs is progressing at a slow pace. Treatment regimens are tailored to the individual based on the current tumor generation and past test results. Although cytotoxic drugs offer benefits in treating metastatic cancer, their effectiveness is restricted due to the limited number of cancer cell types they can treat and the risk of severe side effects.[76–81] Chemotherapy can alleviate discomfort and extend patients' lives, but a cure is not always guaranteed. It is employed in four primary settings: supplemental treatment strategies, pre-operative therapy, neoadjuvant therapy, and advanced stages.[82] Cytotoxic drugs operate outside cells and impede processes necessary for cell growth and development. Future chemotherapy doses will depend on the most significant variations in pharmacokinetics among patients.[83]

5.2 | Perioperative chemotherapy

Percutaneous chemotherapy (POC), commonly referred to as POC, is becoming more widely used in the treatment of advanced gastrointestinal cancer (GC). Research has demonstrated that POC can

alleviate symptoms and stimulate the body's natural process of programmed cell death, known as apoptosis.[84] Additionally, multi-modal approaches, such as perioperative chemotherapy, are also gaining popularity. The development of immunotherapy and personalized medicine is expected to further improve patient outcomes and reduce the risk of toxic side effects. Two phase III clinical trials conducted in Asia have shown significant improvements in both overall survival and disease-free survival for patients with advanced EGJ adenocarcinoma.[85] The use of palliative chemotherapy, in combination with established and innovative medication formulations, may also enhance patient outcomes. However, it is important to note that there have been no phase III clinical trials conducted to evaluate the efficacy or toxicity of chemotherapy in patients aged 65 and older.[86–90]

5.3 | Palliative radiation therapy

Palliative care for terminally ill cancer patients has gained widespread acceptance, as approximately one-fourth of cancer patients have metastasized. Palliative radiation therapy (RT) is a cost-effective and efficient method for enhancing quality of life and alleviating tumor-related symptoms.[91] It addresses bone and brain metastases, spinal cord compression, and symptoms associated with the tumor. Postoperative RT reduces the likelihood of additional surgeries and improves functional status by promoting remineralization and bone repair. Despite this, older cancer patients are less likely to receive therapy and often have more advanced illnesses.[92] Inadequate use is also observed based on chronological age, with fewer treatment options for patients aged 70 and older with metastatic malignancies. When immobilizing older patients for radiation therapy, factors such as arthritis, Parkinson's disease, and range of motion should be taken into account.[93] Geriatric conditions like hearing impairment and dementia may affect communication during the setup and consent process, and patients may experience disorientation and distress in the hospital environment.[94]

5.4 | Radiotherapy

Ionizing radiation is a crucial treatment option for cancer, with more than 60% of patients receiving it. This treatment option reduces tumor incidence, increases local tumor cure rates, and improves patient survival.[95] It can also prevent surgical amputation and provide cosmetic improvement in cases where limbs are inoperable or have reattachment chances. However, it is essential to understand therapeutic goals, patient data, and radiation resistance. Older individuals are more vulnerable to radiation due to factors such as fatigue, microsites, xerostomia, dehydration, infections, and cognitive impairment.[96] Advances in magnetic resonance imaging and CT-based three-dimensional visualization have improved computer-aided planning processes, resulting in shorter schedules for curative and palliative whole-body radiation. Surgical resections for EGJ cancer include full resection combined with long-term lymphatic drainage for survival.[97]

5.5 | Radical prostatectomy

Robotic technology (RP) has substantially enhanced surgical procedures for prostate cancer by enabling the removal of cancer cells and preserving erectile function. As a result, personalized treatment plans based on factors such as age, tumor size, and grade can now be developed for patients.[98] PSMA PET scans have been particularly helpful in treating high-grade prostate cancer, particularly early or recurrent tumors in men. Although traditional prostate surgery methods have their challenges, robotic technology has significantly reduced the associated risks.[99] With cancer-focused therapy, survival rates can reach up to 91% after surgery, and the likelihood of successful delivery reaches 95% if only one high-risk factor is present and 79% if three high-risk factors are involved.[100] This advancement has led to more effective and efficient treatment for prostate cancer, reducing the need for invasive procedures and the risk of complications. Overall, robotic technology has significantly lowered the risks associated with prostate surgery, resulting in improved patient outcomes and quality of life.[28]

5.6 | Stereotactic radiosurgery

Robotic prostatectomies are a non-invasive procedure that can eliminate intracranial tissues or lesions that may be difficult to access or unsuitable for open surgery. The Concha's arc indentation provides precision for delivering small, focused radiation beams to the target site. Research has shown that elderly patients are less likely to experience complications and maintain their bathroom excellence.[101–104] Stereotactic radiosurgery is a treatment for brain problems that requires minimal surgery and precise radiation beams. The design of radiosurgery is challenging due to the need for accurate target localization and minimal tissue damage. Stereotactic radiosurgery (SRS) uses high-energy beams to provide precise radiation without harming healthy areas.[105–107]

6 | COMPLICATIONS OF TREATMENTS

Elderly individuals are more prone to the harmful effects of toxins and cytotoxic chemicals, leading to conditions such as myelodepression, anemia, thrombocytopenia, microsites, and enterocolitis. Age-related factors that make elderly tissues more susceptible include a decrease in the size of the stem cell compartment, a reduced ability to metabolize harmful drugs, and a significant reduction in functional tissue.[100–103] It is not only the elderly who are affected by myelotoxicity, but patients at the end of their lifespan and the limitation of pharmacological approaches due to lower drug doses in chemotherapy regimens also pose challenges.[104] In-hospital morbidity

TABLE 1 Screening tool examples presently in use for geriatric assessments (CGAs).

General health status domain	Specific domain components	Screening tools available for assessment of the specific domain components
Physical health status	Comorbidities Nutrition	Charlson Comorbidity Index (CCI), Cumulative Illness Rating Scale for Geriatrics (CIRS-G) Subjective Global Assessment (SGA), Mininutritional Assessment (MNA), Geriatric Nutritional Risk Index (GNRI)
	Medications	Review history of medications, Beers criteria
Functional status	Frailty Activities of daily living (ADLs) Instrumental activities of daily living (IADLs)	Frailty Index (FI) by deficit accumulation, Fried Frailty Index [18], Vulnerable Elders Scale-13 (VES-13) Barthel's Index Rating Scale [20], Katz Index of Independence in ADLs Functional Activity Questionnaire, Rapid Disability Rating Scales
	Falls and balance test	History of falls, Berg Balance Scale, Timed Up and Go Test, Tinetti Gait and Balance Test, Fall Risk Assessment Scale for the Elderly (FRASE), Fall Risk Index
	Gait speed	Average In-home Gait Speed (AIGS)
	Strength	Handgrip Test
Psychological well-being	Cognitive function Depression and anxiety	Minimental Status Examination (MMSE), Montreal Cognitive Assessment (MoCA), Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE), Simple Clock Drawing Test Geriatric Depression Scale (GDS), Hamilton Rating Scale for Depression (HRSD), Geriatric Anxiety Inventory (GAI), Geriatric Anxiety Scale, Hospital Anxiety and Depression Scale
Socioeconomic status	Social support Environment	General questionnaire, Medical Outcomes Survey Social Support Financial capabilities, transport facilities, technology use, home safety questionnaires

TABLE 2 Selected screening instruments presently in use for conducting a condensed geriatric evaluation.

Screening tools	Purpose	Method of assessment
G8 screening questionnaire	Identify geriatric impairments in elderly patients across all CGA domains	8-item clinical assessment conducted by health care provider: food intake, weight loss, mobility, neuropsychological problems, body mass index, medication usage, self-perception of health, and age
Vulnerable elders survey-13	Identify elderly patients who are "vulnerable," that is, at risk of functional worsening or death over 2 years	12-item clinical assessment conducted by health care provider: physical activities, ADL/IADLS, age, self-rated health, and comorbidities
Flemish version of the triage risk screening tool	Identify elderly patients who are at risk for readmission following discharge	5-item clinical assessment conducted by health care provider: presence of cognitive impairment, living alone or no caregiver available, walking difficulty and history of falls, recent hospitalization, and polypharmacy (≥5 medications)
Study of osteoporotic fractures index	Measure "prefrailty" and "frailty"	3-item clinical assessment conducted by health care provider: weight loss, inability to rise from chair, and poor energy
Groningen frailty indicator	Measure physical, social, and/or psychological impairment	15-item clinical assessment conducted by health care provider: mobility, vision, hearing, nutrition, comorbidities, cognition, psychosocial, and physical fitness
Fried frailty criteria	Measure "frailty"	5-item clinical assessment conducted by health care provider: weight loss, handgrip, gait speed, exhaustion, and physical performance
Abbreviated comprehensive geriatric assessment (aCGA)	Select items from the CGA to expedite assessment	15-item clinical assessment conducted by health care provider: from Geriatric Depression Scale, MMSE, ADLs, and IADLs

rates are higher for patients over 75 years old who undergo rectal cancer surgery, and mortality rates increase with age.[104] Treatment mortality remains a significant concern, with factors such as tumor stage, comorbidities, and presentation playing independent roles. There are established scoring systems for both patients and surgeons, including the Surgical Risk Scale, Cr-POSSUM, Physiological and Operative Severity Score for Enumeration of Mortality and Morbidity, and POSSE ACS and ACPGBI.[105]

7 | VARIOUS HEALTHCARE ISSUES REQUIRE A MULTIDISCIPLINARY APPROACH TO PROVIDE THE BEST CARE POSSIBLE

The elderly population is at high risk for chronic illnesses such as arthritis, diabetes, cerebrovascular diseases, and cardiovascular diseases. A comprehensive geriatric assessment (CGA) is necessary to optimize treatment choices and address chronic health deficits in older cancer patients.[106] CGA evaluates an individual's health in areas such as physical health, socializing, and psychological wellness. It is essential to identify individuals at risk for falls and modify therapeutic strategies accordingly. In oncology, CGA is a multidisciplinary method used to identify and treat health problems in elderly individuals.[107] A pilot trial in older patients with early-stage breast cancer revealed additional health issues, improving oncological therapy for about one-third of the patients and improving their quality of life. The Multidimensional Assessment for Cancer in the Elderly (MACE) was created to standardize and evaluate a CGA-based scale for older cancer patients. However, further research is needed to determine if a CGA can effectively address treatment decision making, treatment-related toxicity, and survival.[108] Table 1 summarizes the many health domains that may be assessed using screening tools and questionnaires; however, not all of these instruments are necessary for a complete CGA. A number of shortened screening instruments that determine whether individuals would probably benefit from a complete CGA have been developed (Table 2).

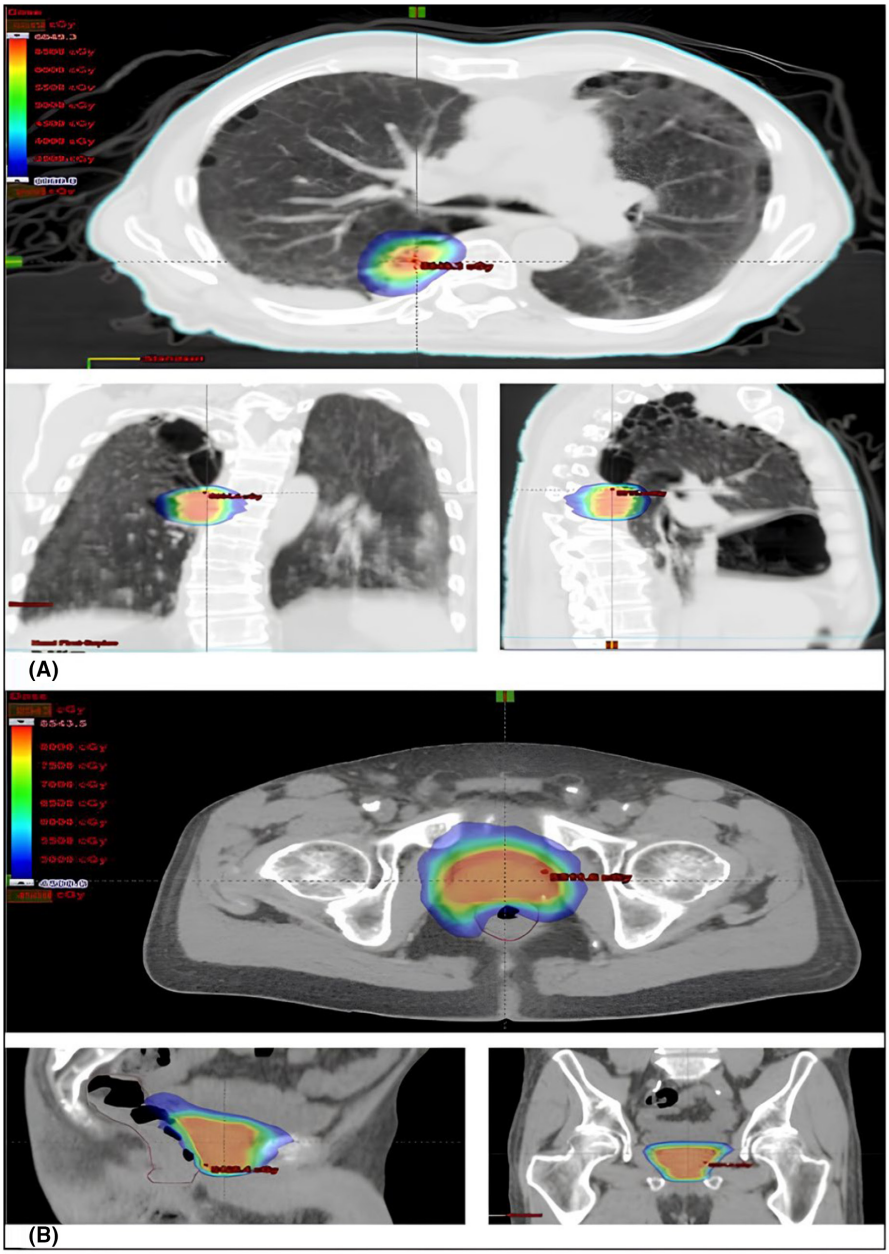

FIGURE 3 (A) The stereotactic body RT for an elderly man with several comorbidities and stage IIA NSCLC next to his spine. (B) A patient with prostate cancer who had high-dose VMAT treatment without sacrificing healthy tissue (the brown-contoured rectum).[55]

8 | IMPACT OF CANCER AND ITS TREATMENTS ON THE QUALITY OF LIFE OF ELDERLY PATIENTS

Clinical cancer research highlights the significance of quality of life (QOL) in evaluating treatment options for patients, particularly when therapies are unlikely to significantly extend overall survival.[63] For example, if a therapy for metastatic cancer enhances QOL, it might be recommended even if it doesn't improve survival. QOL assessments can be beneficial for older cancer patients when the expected toxicity of a therapy is substantial. Patients may opt for treatments that enhance their quality of life, such as chemotherapy, even if they don't impact survival significantly.[109] The drug vinorelbine, which is a semisynthetic vinca alkaloid (Figure 3), works well for older people with advanced non-small-cell lung cancer (NSCLC).[55] Patients receiving vinorelbine reported fewer symptoms linked to lung cancer and improved QoL functioning, although the side effects were more severe.[55] Lung cancer is a special type of solid tumor that makes seniors more susceptible and in need of extra care. The drug vinorelbine, a semisynthetic vinca alkaloid, is effective for older people with advanced NSCLC. However, patients with severe side effects reported better QoL functioning.[82] Docetaxel immunotherapy is now considered the new standard of care for older patients. Exercise and a home-based diet have shown potential for enhancing lifestyle choices among older cancer survivors. Future research should include larger sample sizes and therapies with long-lasting benefits to help this vulnerable group.[110]

9 | PROSPECTS FOR THE FUTURE AND RESEARCH PRIORITIES

Age discrimination in the allocation of healthcare resources and treatment decisions is becoming a pressing issue that requires further

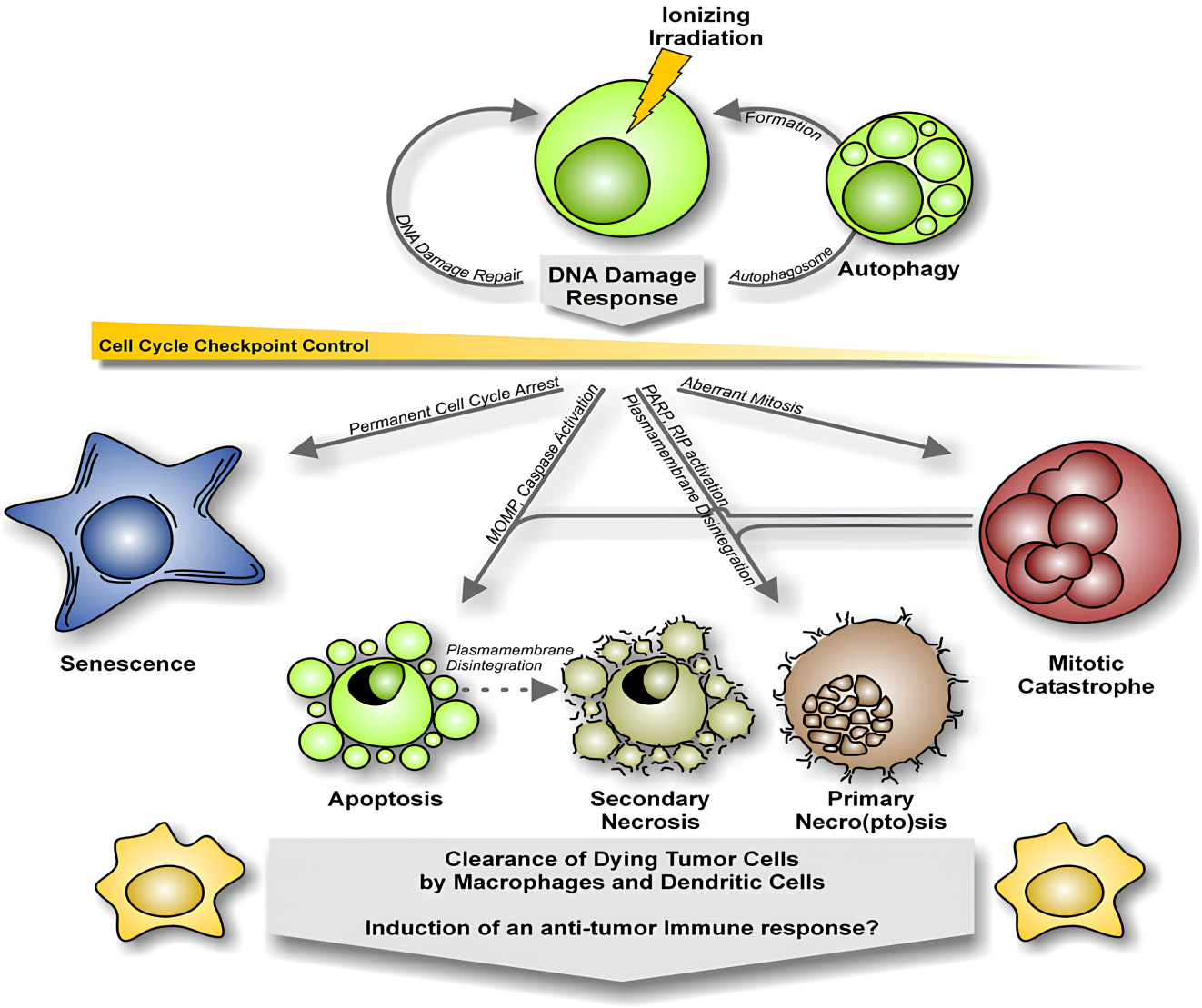

FIGURE 4 The mechanisms that cause ionizing radiation to have an effect on cell death.[72]

examination of individual and societal access patterns. It is essential to study comorbid medical conditions such as diabetes, heart disease, and arthritis to understand their impact on survival.[89] Advancements in therapeutic options, including IGRT, ART, IMRT, and SBRT, have improved radiation effectiveness and reduced side effects (Figure 4).[72] While conventional radiation therapy is often chosen for older individuals due to its lower risk, newer options like temozolomide (TMZ) may be more suitable for patients aged 70 or older.[85] Investigating cancer survivorship factors such as nutrition, physical activity, smoking, alcohol consumption, sexual behavior, and environmental toxins is critical for enhancing care and promoting long-term survival. Implementing physical rehabilitation programs can help cancer survivors manage, control, or prevent negative outcomes.[92]

10 | CONCLUSION

Cancer is a major health concern for the elderly population, with incidence and prevalence increasing with age. Epidemiological studies have shown that age is a significant risk factor for most common cancers, primarily due to the duration of carcinogenesis. Research has revealed that the incidence and mortality rates of various cancers among the elderly and extremely old are increasing worldwide, with most cancer types peaking at around age 75 to 90 and then declining sharply. Despite the increasing prevalence of cancer in the elderly, clinical trials often exclude older individuals, limiting the understanding of cancer treatments' effects on this age group. Additionally, a number of factors, such as limitations in the healthcare system and patient-related barriers, may make supportive care interventions that aim to prevent and alleviate side effects and complications linked to cancer and its treatment ineffective.

AUTHOR CONTRIBUTIONS

Data were extracted by RP and SK. Any disagreements were resolved by ATR. Moreover, SM conducted critical analysis. KE prepared the manuscript draft. All authors contributed to the in-depth revisions of the manuscript and approved the final version.

ACKNOWLEDGMENTS

The authors would like to express our gratitude for providing library facilities at Saveetha Institute of Medical and Technical Sciences, India. We'd also like to thank QuillBot for helping us polish the language.

FUNDING INFORMATION

There was no external fund taken for this current research.

CONFLICT OF INTEREST STATEMENT

The authors have no competing interest at all.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data was created or analyzed in this study.

REFERENCES

1. Song M, Engels EA, Clarke MA, Kreimer AR, Shiels MS. Autoimmune disease and the risk of anal cancer in the US population aged 66 years and over. *J Natl Cancer Inst*. 2023;116:309-315. doi:10.1093/jnci/djad187
2. Griebling TL. Re: Localised prostate cancer in elderly men aged 80–89 years, findings from a population-based registry. *J Urol*. 2019;201:838. doi:10.1097/01.ju.0000553998.44096.f5
3. Dąbrowski M, Grondecka A. Diabetes as a risk factor of hospitalization in the surgical ward due to cancer in the elderly and middle-aged population. *Arch Med Sci*. 2017;5:1025-1030. doi:10.5114/aoms.2016.58666
4. Sütlü S, Yilmaz M, Mandiracioğlu A. Identifying the caregiver burden for the elderly population aged ≥85 years in a province. *Ege Tıp Dergisi*. 2020;59:302-309. doi:10.19161/etd.834236
5. Yu GZ, Jia XC, Geng ZC, Tang HJ, Zhang J, Liu YL. P144 epidemiological characteristics of breast cancer in Chinese population aged 25–70 years old. *Breast Cancer*. 2011;20:S28. doi:10.1016/s0960-9776(11)70087-x
6. Battisti NML, Sehovic M, Extermann M. Assessment of the external validity of the National Comprehensive Cancer Network and European Society for Medical Oncology guidelines for non–small-cell lung cancer in a population of patients aged 80 years and older. *Clin Lung Cancer*. 2017;18:460-471. doi:10.1016/j.cllc.2017.03.005
7. Okazaki M, Bando H, Tohno E, et al. Investigation of the significance of population-based breast cancer screening among women aged under 40 years. *Breast Cancer*. 2020;28:75-81. doi:10.1007/s12282-020-01131-x
8. Hugo GJ. Projecting Australia's aged population: problems and implications. *J Aust Popul Assoc*. 1984;1:41-56. doi:10.1007/bf03029375
9. Mishra V. India's projected aged population (65+), projected life expectancy at birth and insecurities faced by aged population. *Ageing Int*. 2019;45:72-84. doi:10.1007/s12126-019-09350-0
10. Ruggles S. Reconsidering the northwest European family system: living arrangements of the aged in comparative historical perspective. *Popul Dev Rev*. 2009;35:249-273. doi:10.1111/j.1728-4457.2009.00275.x
11. Vrinten C, Wardle J. Is cancer a good way to die? A population-based survey among middle-aged and older adults in the United Kingdom. *Eur J Cancer*. 2016;56:172-178. doi:10.1016/j.ejca.2015.12.018
12. Bruk Z, Ignatjeva S, Sianko N, Volosnikova L. Does age matter? Life satisfaction and subjective well-being among children aged 10 and 12 in Russia. *Pop Rev*. 2021;60:10-13. doi:10.1353/prv.2021.0004
13. Kaleru T, Vankeshwaram VK, Maheshwary A, Mohite D, Khan S. Diabetes mellitus in the middle-aged and elderly population (>45 years) and its association with pancreatic cancer: an updated review. *Cureus*. 2020;12:e8884. doi:10.7759/cureus.8884
14. Sancar N. Cancer incidence 2010–2014 among the North Cyprus population of adults aged 15 and over. *Turk J Oncol*. 2017;32:43-54. doi:10.5505/tjo.2017.1583
15. Wessler JD, Pashayan N, Greenberg DC, Duffy SW. Age–period–cohort analysis of colorectal cancer in East Anglia, 1971–2005. *Cancer Epidemiol*. 2010;34:232-237. doi:10.1016/j.canep.2010.03.012
16. Gheybi K, Buckley E, Vitry A, Roder D. Occurrence of comorbidity with colorectal cancer and variations by age and stage at diagnosis. *Cancer Epidemiol*. 2022;80:102246. doi:10.1016/j.canep.2022.102246
17. Hiyoshi A, Fall K, Bergh C, Montgomery S. Comorbidity trajectories in working age cancer survivors: A national study of Swedish men. *Cancer Epidemiol*. 2017;48:48-55. doi:10.1016/j.canep.2017.03.001

18. Guo P, Li K. Trends in esophageal cancer mortality in China during 1987–2009: age, period and birth cohort analyzes. *Cancer Epidemiol*. 2012;36:99-105. doi:10.1016/j.canep.2011.12.003
19. Bora K. Distribution of multiple myeloma in India: heterogeneity in incidence across age, sex and geography. *Cancer Epidemiol*. 2019;59:215-220. doi:10.1016/j.canep.2019.02.010
20. Cameron JK, Baade P. Projections of the future burden of cancer in Australia using Bayesian age-period-cohort models. *Cancer Epidemiol*. 2021;72:101935. doi:10.1016/j.canep.2021.101935
21. Pretzsch E, Nieß H, Bösch F, et al. Age and metastasis – how age influences metastatic spread in cancer. Colorectal cancer as a model. *Cancer Epidemiol*. 2022;77:102112. doi:10.1016/j.canep.2022.102112
22. Rutherford MJ, Dickman PW, Coviello E, Lambert PC. Estimation of age-standardized net survival, even when age-specific data are sparse. *Cancer Epidemiol*. 2020;67:101745. doi:10.1016/j.canep.2020.101745
23. Tjalma WAA. There is no point in cervical cancer screening below 25 years of age. *Cancer Epidemiol*. 2016;45:177. doi:10.1016/j.canep.2016.10.018
24. Xu Z, Hertzberg VS. Bayesian area–age–period–cohort model with carcinogenesis age effects in estimating cancer mortality. *Cancer Epidemiol*. 2013;37:593-600. doi:10.1016/j.canep.2013.07.002
25. Goh I, Lai O, Chew L. Prevalence and risk of polypharmacy among elderly cancer patients receiving chemotherapy in ambulatory oncology setting. *Curr Oncol Rep*. 2018;20:38. doi:10.1007/s11912-018-0686-x
26. Tarabeia J, Green MS, Barchana M, et al. Increasing lung cancer incidence among Israeli Arab men reflects a change in the earlier paradox of low incidence and high smoking prevalence. *Eur J Cancer Prev*. 2008;17:291-296. doi:10.1097/cej.0b013e3282f0c0b7
27. Priyadarshini S, Swain PK, Agarwal K, Jena D, Padhee S. Trends in gynecological cancer incidence, mortality, and survival among elderly women: A SEER study. *Aging Med*. 2024;7:179-188. doi:10.1002/agm2.12297
28. Kumar D, Shankar H. Prevalence of chronic diseases and quality of life among elderly people of rural Varanasi. *Int J Contemp Med Res*. 2018;5:2393-2915. doi:10.21276/ijcmr.2018.5.7.16
29. Chidambaram S, Hong SA, Simpson MC, Osazuwa-Peters N, Ward GM, Massa ST. Temporal trends in oropharyngeal cancer incidence, survival, and cancer-directed surgery among elderly Americans. *Oral Oncol*. 2022;134:106132. doi:10.1016/j.oraloncology.2022.106132
30. Olivo-Marston SE, Singh S, Hood RB, Adetona O. Abstract 4218: cancer prevalence among Ohio firefighters: data from the Ohio cancer incidence surveillance system (OCISS) 1996–2019. *Cancer Res*. 2023;83:4218. doi:10.1158/1538-7445.am2023-4218
31. Tarabeia J, Nitzan-Kaluski D, Green MS. P-314 the paradox of low lung cancer incidence and high prevalence of smoking among Arab men in Israel. *Lung Cancer*. 2005;49:S198. doi:10.1016/s0169-5002(05)80808-6
32. Stallard E. Estimates of the incidence, prevalence, duration, intensity, and cost of chronic disability among the U.S. Elderly. *North Am Actuar J*. 2011;15:32-58. doi:10.1080/10920277.2011.10597608
33. Binbay T, Ulas H, Alptekin K, Elbi H. Psychotic disorders among immigrants from Turkey in Western Europe: an overview of incidence and prevalence estimates, and admission rates. *Turk J Psychiatry*. 2012;23:53-62. doi:10.5080/u6608
34. Rahman MS. Prevalence and risk factors of fear of falling among elderly: a review. *Med J Clin Trials Case Stud*. 2018;2:000185. doi:10.23880/mjccs-16000185
35. Ahmadi M, Rezaie J. Ageing and mesenchymal stem cells derived exosomes: molecular insight and challenges. *Cell Biochem Funct*. 2020;39:60-66. doi:10.1002/cbf.3602
36. Lamaison C, Tarte K. Impact of B cell/lymphoid stromal cell crosstalk in B-cell physiology and malignancy. *Immunol Lett*. 2019;215:12-18. doi:10.1016/j.imlet.2019.02.005
37. Carosio S, Berardinelli MG, Aucello M, Musarò A. Impact of ageing on muscle cell regeneration. *Ageing Res Rev*. 2011;10:35-42. doi:10.1016/j.arr.2009.08.001
38. Murphy T, Thuret S. The systemic milieu as a mediator of dietary influence on stem cell function during ageing. *Ageing Res Rev*. 2015;19:53-64. doi:10.1016/j.arr.2014.11.004
39. Behrens A, van Deursen JM, Rudolph KL, Schumacher B. Impact of genomic damage and ageing on stem cell function. *Nat Cell Biol*. 2014;16:201-207. doi:10.1038/ncb2928
40. Hazeldine J, Lord JM. The impact of ageing on natural killer cell function and potential consequences for health in older adults. *Ageing Res Rev*. 2013;12:1069-1078. doi:10.1016/j.arr.2013.04.003
41. Bharati K. Challenges in Management of Elderly and Frail Alzheimer's disease patients. *Open Access J Frailty Sci*. 2024;2:1-4. doi:10.23880/oajfs-16000105
42. Gounant V, Lavolé A, Quoix E. Ongoing challenges of using immunotherapy in special populations: poor performance status patients, elderly patients, and people living with HIV. *Lung Cancer*. 2020;145:71-75. doi:10.1016/j.lungcan.2020.04.025
43. Azitoune S, Isfaoun Z, Hessissen L. Challenges in diagnosing and managing Hypereosinophilia in pediatric patients: a case report. *Int J Sci Res*. 2023;12:1906-1908. doi:10.21275/sr23904002305
44. Alon S. Psychosocial challenges of elderly patients coping with cancer. *J Pediatr Hematol Oncol*. 2011;33:S112-S114. doi:10.1097/mph.0b013e318230ddcb
45. Hosokawa O. Screening and minimally invasive treatment for gastric cancer are important challenges in elderly patients. *Gastric Cancer*. 2011;15:5-6. doi:10.1007/s10120-011-0120-7
46. Aprillia Ariestine D, Syarifah S. Relationship between polypharmacy, length of hospitalization, and delirium among hospitalized elderly patients. *Glob J Res Anal*. 2023;12:43-46. doi:10.36106/gjra/8409312
47. Ogata K, Katsuya H, Shirahashi A, et al. Polypharmacy in elderly cancer patients. *Ann Oncol*. 2014;25:v100. doi:10.1093/annonc/mdu436.115
48. Venniyoor A. Polypharmacy in the elderly on immunotherapy: problem or opportunity? *Cancer Res Stat Treat*. 2021;4:583. doi:10.4103/crst.crst_184_21
49. Efremova E, Shutov A. Polypharmacy in elderly and senile patients with cardiovascular comorbidity. *Atherosclerosis*. 2023;379:S181. doi:10.1016/j.atherosclerosis.2023.06.606
50. Bandidwattanawong C, Rattanaserikulchai P, Jetsadavanit N. Polypharmacy and potentially-inappropriate medications are prevalent in the elderly cancer patients receiving systemic cancer therapy and they co-relate with adverse outcomes. *BMC Geriatr*. 2023;23:775. doi:10.1186/s12877-023-04471-3
51. Kumari S, Jain S, Kumar S. Effects of polypharmacy in elderly diabetic patients: a review. *Cureus*. 2022;14:e29068. doi:10.7759/cureus.29068
52. Lees J, Chan A. Polypharmacy in elderly patients with cancer: clinical implications and management. *Lancet Oncol*. 2011;12:1249-1257. doi:10.1016/s1470-2045(11)70040-7
53. Jorgensen TL, Hallas J, Herrstedt J. Polypharmacy in elderly cancer patients. *J Clin Oncol*. 2010;28:9074. doi:10.1200/jco.2010.28.15_suppl.9074
54. Kose E, Wakabayashi H, Yasuno N. Polypharmacy and malnutrition Management of Elderly Perioperative Patients with cancer: a systematic review. *Nutrients*. 2021;13:1961. doi:10.3390/nu13061961
55. Muss H. S36 adjuvant treatment of elderly breast cancer patients. *Breast*. 2007;16:S10. doi:10.1016/s0960-9776(07)70059-0
56. Serkan G. Supportive care or specific treatment? On elderly cancer patients. *Eur J Med Invest*. 2023;7:123-129. doi:10.14744/ejmi.2023.87282

57. Avery EJ, Kessinger A, Ganti AK. Therapeutic options for elderly patients with advanced non-small cell lung cancer. *Cancer Treat Rev*. 2009;35:340-344. doi:10.1016/j.ctrv.2008.10.008
58. Sarris EG, Harrington KJ, Saif MW, Syrigos KN. Multimodal treatment strategies for elderly patients with head and neck cancer. *Cancer Treat Rev*. 2014;40:465-475. doi:10.1016/j.ctrv.2013.10.007
59. Zongren G, Mingyao C, Shen W. Surgical treatment of lung cancer for elderly patients. *Lung Cancer*. 2000;29:145-146. doi:10.1016/s0169-5002(00)80488-2
60. Wasil T, Lichtman SM. Treatment of elderly cancer patients with chemotherapy. *Cancer Invest*. 2005;23:537-547. doi:10.1080/07357900500202770
61. Mukherji D, Pezaro CJ, Shamseddine A, De Bono JS. New treatment developments applied to elderly patients with advanced prostate cancer. *Cancer Treat Rev*. 2013;39:578-583. doi:10.1016/j.ctrv.2012.12.004
62. Lichtman SM. Guidelines for the treatment of elderly cancer patients. *Cancer Control*. 2003;10:445-453. doi:10.1177/107327480301000602
63. Jeremic B. Radiochemotherapy as the standard treatment for both elderly and non-elderly fit patients with locally advanced (stage III) nonsmall cell lung cancer. *Lung Cancer*. 2013;82:176. doi:10.1016/j.lungcan.2013.07.019
64. Idrees M, Tejani M. Current treatment strategies for elderly patients with metastatic colon cancer. *Cureus*. 2019;11:e4713. doi:10.7759/cureus.4713
65. Depboylu B. Treatment and patient related quality of life issues in elderly and very elderly breast cancer patients. *Transl Cancer Res*. 2020;9:S146-S153. doi:10.21037/tcr.2019.07.08
66. Eisemann M. Factors influencing Swedish doctors' decision-making in the care of incompetent elderly patients. *Cancer Treat Rev*. 1996;22:141-144. doi:10.1016/s0305-7372(96)90077-8
67. Laws A, Cheifetz R, Warburton R, et al. Nodal staging affects adjuvant treatment choices in elderly patients with clinically node-negative, estrogen receptor–positive breast cancer. *Curr Oncol*. 2020;27:250-256. doi:10.3747/co.27.6515
68. Pasetto LM, Monfardini S. Colorectal cancer screening in elderly patients: when should be more useful? *Cancer Treat Rev*. 2007;33:528-532. doi:10.1016/j.ctrv.2007.04.004
69. Morrison J. Breast cancer – your treatment choices. *Cancer Nurs Pract*. 2013;12:10. doi:10.7748/cnp2013.11.12.9.10.s12
70. Balducci L. Treating elderly patients with hormone sensitive breast cancer: what do the data show? *Cancer Treat Rev*. 2009;35:47-56. doi:10.1016/j.ctrv.2008.08.001
71. Goodman A. Endometrial cancer in the elderly: does patient age influence the choice of treatment interventions and do age-related treatment choices impact survival? *Menopause*. 2018;25:963-964. doi:10.1097/gme.0000000000001163
72. Steyerberg EW, Neville B, Weeks JC, Earle CC. Referral patterns, treatment choices, and outcomes in locoregional esophageal cancer: a population-based analysis of elderly patients. *J Clin Oncol*. 2007;25:2389-2396. doi:10.1200/jco.2006.09.7931
73. Wildiers H, Paridaens R. Taxanes in elderly breast cancer patients. *Cancer Treat Rev*. 2004;30:333-342. doi:10.1016/j.ctrv.2003.12.001
74. De Glas N. SP-0315: treatment choices in the elderly: focus on breast cancer. *Radiother Oncol*. 2016;119:S146. doi:10.1016/s0167-8140(16)31564-x
75. McKenna RJ. Clinical aspects of cancer in the elderly. Treatment decisions, treatment choices, and follow-up. *Cancer*. 1994;74:2107-2117.
76. Zarogoulidis K. Reasonable choices for cytotoxic or cytostatic treatment in elderly advanced non-small cell lung cancer patients. *J Lung Dis Treat*. 2015;1:e102. doi:10.4172/2472-1018.1000e102
77. Borg MA. Prolonged perioperative surgical prophylaxis within European hospitals: an exercise in uncertainty avoidance. *J Antimicrob Chemother*. 2013;69:1142-1144. doi:10.1093/jac/dkt461
78. Taylor R. Perioperative chemotherapy for gastro-oesophageal cancer. *Lancet Oncol*. 2006;7:624. doi:10.1016/s1470-2045(06)70783-5
79. Chan G, Chee CE. Perioperative chemotherapy for liver metastasis of colorectal cancer. *Cancer*. 2020;12:3535. doi:10.3390/cancers12123535
80. Colizza S, Rossi S, Daffina A. Questionnaire survey of perioperative antibiotic prophylaxis in Italian surgical departments. *J Chemother*. 2002;14:59-64. doi:10.1179/joc.2002.14.1.59
81. Peiper CH, Seelig M, Treutner K-H, Schumpelick V. Low-dose, single-shot perioperative antibiotic prophylaxis in colorectal surgery. *Chemotherapy*. 1997;43:54-59. doi:10.1159/000239536
82. Joensuu H. Primary chemotherapy of breast cancer followed by perioperative chemotherapy: feasible, but are there clinical benefits. *Ann Oncol*. 2003;14:1460-1462. doi:10.1093/annonc/mdg423
83. Jain A. Perioperative chemotherapy for gastric cancer in FLOT4. *Lancet*. 2020;395:e2. doi:10.1016/s0140-6736(19)32505-x
84. Halushko OA. Carbohydrate balance in the perioperative period. *Infus Chemother*. 2020;3:28-30. doi:10.32902/2663-0338-2020-3.2-28-30
85. So A. Perioperative chemotherapy: the case for adjuvant chemotherapy for muscle-invasive bladder cancer. *Can Urol Assoc J*. 2013;2:225-227. doi:10.5489/cuaj.604
86. Morandini S. Chemotherapy safety in the perioperative environment. *Nursing*. 2018;48:11-13. doi:10.1097/01.nurse.0000531004.17471.34
87. Massat MB. Charting new courses in palliative radiation therapy: technology's role. *Appl Radiat Oncol*. 2018;48:11-13. doi:10.37549/aro1161
88. Suh J. Comfort zone: the integral role of palliative radiation therapy. *Appl Radiat Oncol*. 2018;4:1156. doi:10.37549/aro1156
89. Donkor A. Complementary medicine use among cancer patients undergoing palliative radiation therapy. *J Palliat Care Med*. 2013;S3:005. doi:10.4172/2165-7386.s3-005
90. Hayden K, Connolly M. Knowledge of palliative radiation therapy amongst oncology and palliative care nurses. *Int J Radiat Oncol Biol Phys*. 2018;102:e729. doi:10.1016/j.ijrobp.2018.07.1954
91. Tanner C. Palliative radiation therapy for cancer. *J Palliat Med*. 2011;14:672-673. doi:10.1089/jpm.2011.9689
92. Illidge T. SP-0683 combining immunotherapy with radiotherapy. *Radiother Oncol*. 2023;182:S573. doi:10.1016/s0167-8140(23)67414-6
93. Wong S. SP-0008 patient comfort during radiotherapy. *Radiother Oncol*. 2023;182:S4. doi:10.1016/s0167-8140(23)67280-9
94. Kaidar-Person O. SP-0005 breast reconstruction and radiotherapy. *Radiother Oncol*. 2021;161:S2. doi:10.1016/s0167-8140(21)08448-6
95. Harrington K. SP-0408: molecular targeting with radiotherapy. *Radiother Oncol*. 2016;119:S190. doi:10.1016/s0167-8140(16)31657-7
96. Bratman S. SP-0226 biomarker-guided precision radiotherapy. *Radiother Oncol*. 2021;161:S158. doi:10.1016/s0167-8140(21)08520-0
97. Vaarkamp J. Partial boosting of prostate tumours: forward planned conformal radiotherapy vs. inverse planned intensity modulated radiotherapy. *Radiother Oncol*. 2002;63:232; author reply 233. doi:10.1016/s0167-8140(02)00067-1
98. Kechagioglou P, Williams T, Bowler M. PO-0949: maximising patient access to advanced breast radiotherapy techniques and personalised radiotherapy. *Radiother Oncol*. 2020;152:S507. doi:10.1016/s0167-8140(21)00966-x

99. Messaoud A, Boualga K. 1043 poster the conformational radiotherapy in localized prostate cancers. Experience of Radiotherapy Oncology Department. *Radiother Oncol*. 2011;99:S389. doi:10.1016/s0167-8140(11)71165-3
100. Stewart AJ, Lee YK, Saran FH. Comparison of conventional radiotherapy and intensity-modulated radiotherapy for post-operative radiotherapy for primary extremity soft tissue sarcoma. *Radiother Oncol*. 2009;93:125-130. doi:10.1016/j.radonc.2009.06.010
101. Barrett A. 1Exploiting scientific progress in radiotherapy. *Radiother Oncol*. 1996;40:S3. doi:10.1016/s0167-8140(96)80007-7
102. De Neve W. IMRT and focused radiotherapy. *Radiother Oncol*. 2007;82:S12. doi:10.1016/s0167-8140(07)80039-9
103. Lund K. SP-0026: immobilization in radiotherapy: is it necessary in the age of image guided radiotherapy. *Radiother Oncol*. 2015;115:S13. doi:10.1016/s0167-8140(15)40026-x
104. Krisch M. SP-0720 microbeam radiotherapy. *Radiother Oncol*. 2021;161:S555. doi:10.1016/s0167-8140(21)08698-9
105. Yarnold J. 3Genetic aspects of radiotherapy. *Radiother Oncol*. 1996;40:S3. doi:10.1016/s0167-8140(96)80009-0
106. Fuller C. SP-036 integration of imaging and radiotherapy innovation: head and neck radiotherapy applications. *Radiother Oncol*. 2019;132:20. doi:10.1016/s0167-8140(19)30202-6
107. Verheij M. SP-0370: radiotherapy. *Radiother Oncol*. 2014;111:S143. doi:10.1016/s0167-8140(15)30475-8
108. Muren LP. Fractionated radiotherapy reviewed. *Radiother Oncol*. 2009;92:S17. doi:10.1016/s0167-8140(12)72626-9
109. Yarnold J. 13 new radiotherapy strategies in breast cancer: partial breast radiotherapy. *Radiother Oncol*. 2006;78:S5. doi:10.1016/s0167-8140(06)80507-4
110. Mirimanoff R-O. New radiotherapy technologies for meningiomas: 3D conformal radiotherapy radiosurgery stereotactic radiotherapy. Intensity-modulated radiotherapy proton beam radiotherapy spot scanning proton radiation therapy. *Radiother Oncol*. 2004;71:247-249. doi:10.1016/j.radonc.2004.05.002

How to cite this article: Prathap R, Kirubha S, Rajan AT, Manoharan S, Elumalai K. The increasing prevalence of cancer in the elderly: An investigation of epidemiological trends. *Aging Med*. 2024;7:516-527. doi:10.1002/agm2.12347