

Geriatric Oncology – Pitfalls to Good Care in the Elderly Cancer Patient

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Geriatric Oncology

- Age and Aging
- Epidemiology
- Pathophysiology
- Literature updates
- Future direction

Age is single
most important risk factor
to develop cancer

Epidemiology

- 2010-2050 adults > 85 age is projected to grow from 5.5 to 19 Million
- Cumulative risk to develop cancer increases to age 70
- Lifetime risk 41%
- Latest update of BCBS Health Index 200% increase in AD diagnosis
- Increased ratio of cancer survivors

Aging Population

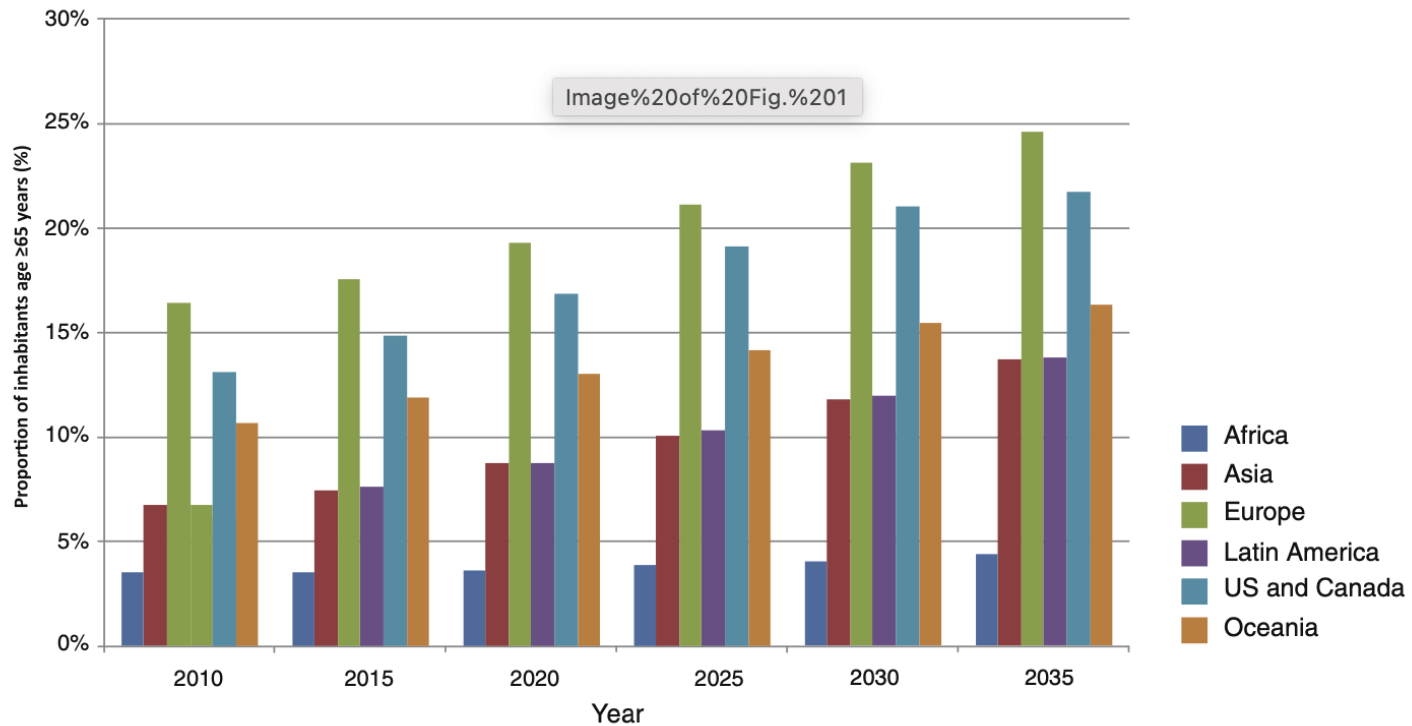


Fig. 1. Older adult population by world region.
(Source: United Nations World Population Prospects) [2].

Aging

- Ubiquitous biological process that results in irreversible decline in physical function across all organ systems to a variety of stressors – triggered through physical, environmental and social factors
- Research revealed that exposure to light could influence the lifespan of drosophila and caloric restriction was found to impact the age, age- related pathologies and longevity in mice and rats
- That exemplified the plasticity of the aging process – critical for longevity
- Biologist have suggested that there is an unappreciated link between aging and many chronic disorders
- As aging is one of the leading risk factors for most chronic disease, it is anticipated that understanding the aging process will facilitate the identification of therapeutic targets

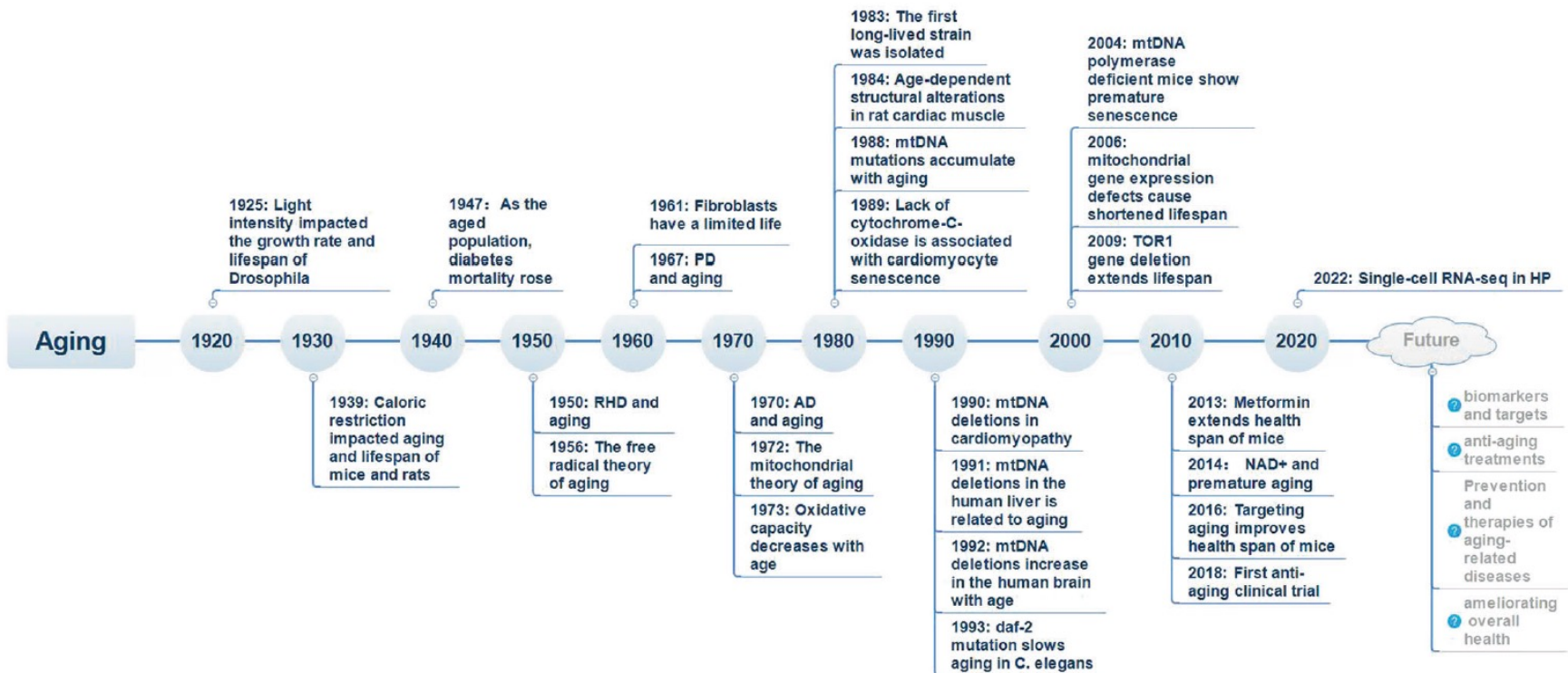
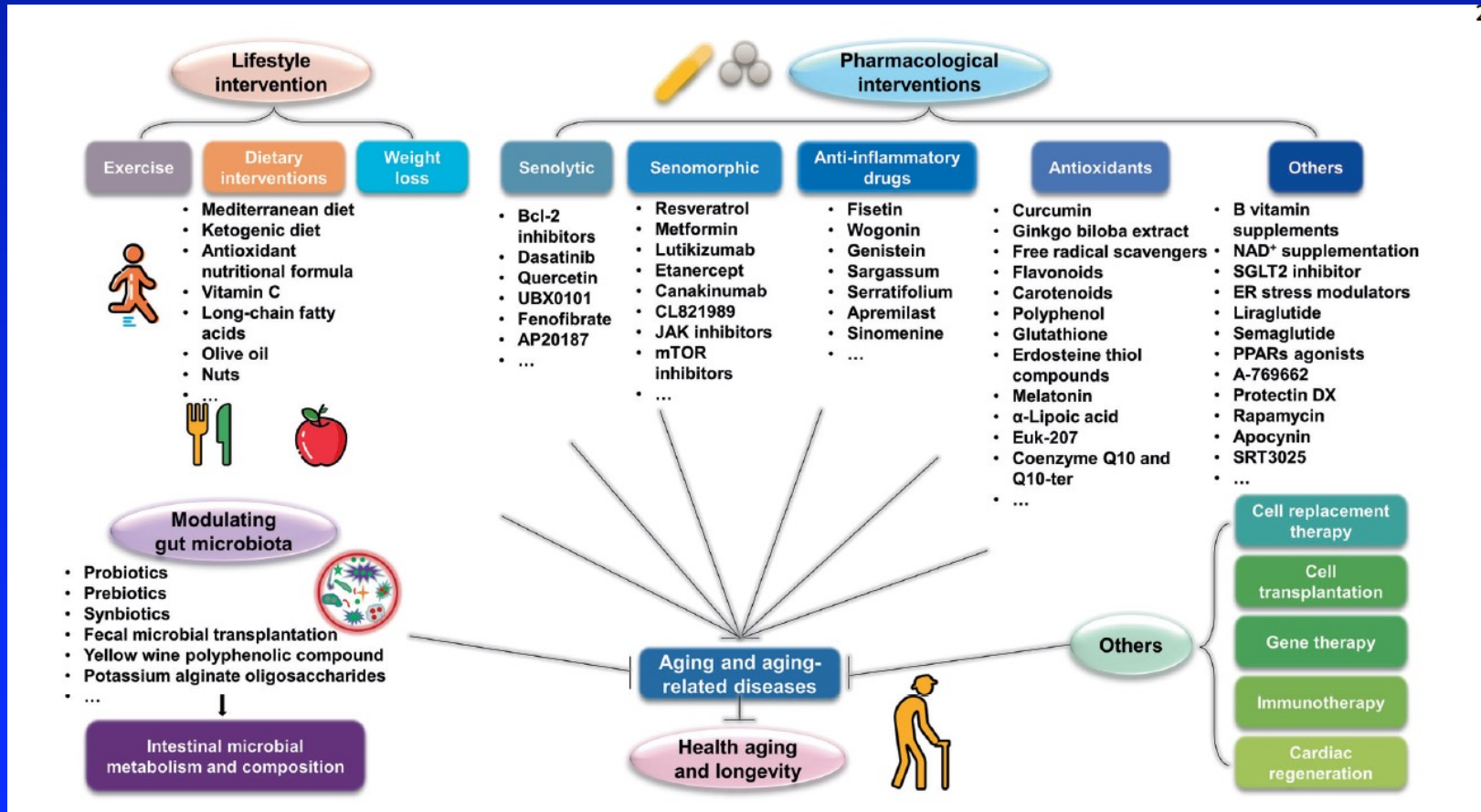


Fig. 1 Timeline of research on aging and aging-related diseases. RHD rheumatic heart disease, PD Parkinson's disease, AD Alzheimer's disease, mtDNA mitochondrial DNA, NAD⁺ nicotinamide adenine dinucleotide, HP heterochronic parabiosis

Molecular Mechanism

- Ten common features of aging in mammals
- Subdivided in 3 three categories molecular, cellular and systemic alternations:
 - 1) Genomic instability
 - 2) Telomere attrition
 - 3) Epigenetic alterations
 - 4) Loss of proteostasis
 - 5) Compromise of autophagy
 - 6) Mitochondrial dysfunction
 - 7) Cellular senescence
 - 8) Stem cell exhaustion
 - 9) Alteration of intercellular communication
 - 10) Dysfunction of nutrition sensing

Intervention



Terminology

- Agism – like racism, sexism is a form of prejudice or prejudgment that shapes perceptions
- Elderly and geriatric– in literature commonly used is ageist as it does not reflect the heterogeneity of older adults and implies poor health
- A European survey asking older individuals their preferred term indicated a preference for older or senior and strongly rejected terms aged, old, and most strongly elderly
- 1995 the United Nations Committee on Economic Social and Cultural Rights of Older Persons rejected the term *elderly* in preference for the term *older persons*

Older Adult Cancer Care

- > 70 years is currently most common used cut-off for defining patients
- Literature has adopted
- Abundance of literature describes issues of aging associated in cancer patients
- Scientific standards to evaluate older patients are currently still lacking

GUIDELINES

- NCCN – Older Adults Oncology
- AGS – Geriatric Oncology Workgroup
- ASCO – Geriatric Oncology Resources
- SIOG - Clinical Practice Guidelines
- CARG – Cancer and Aging Research Group

Abstract 902 ASH 2022

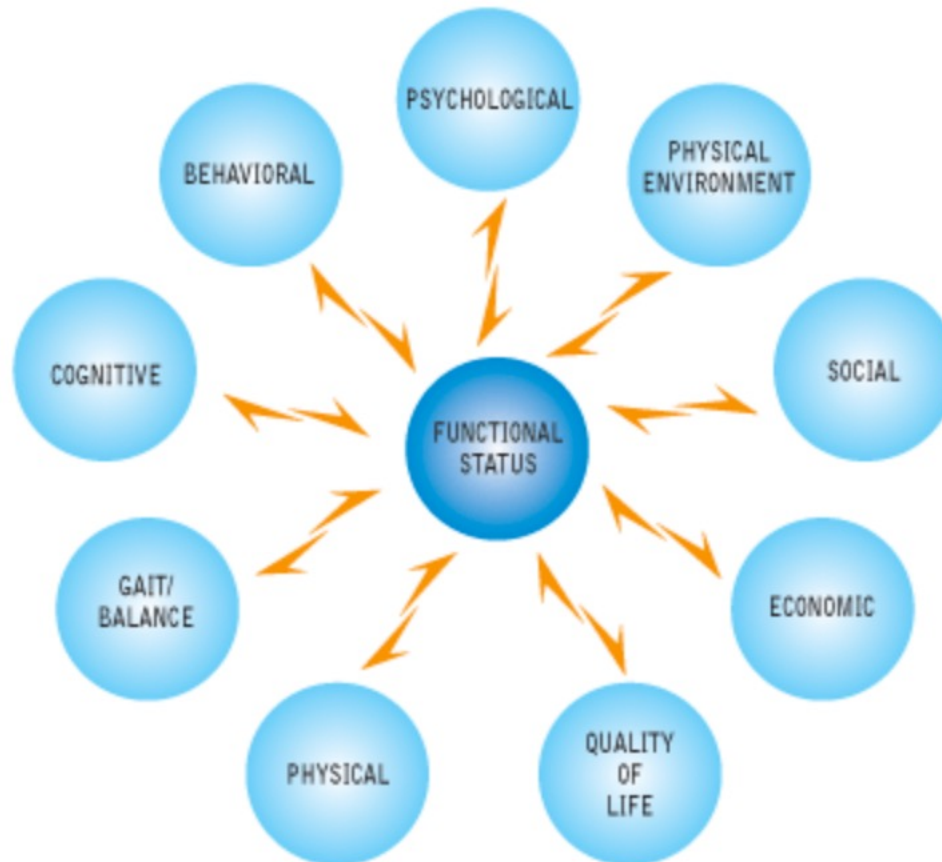
- 215 childhood and adolescent HL treated at St. Jude Children's Research Hospital compared to 282 healthy community controls
- Survivors were a mean of 25 years from diagnosis – submitted blood samples (DNA methylation assay for gene expression) and series of validated neurocognitive testing to assess attention, processing speed, memory and executive functioning
- Difference between biological and chronological age on average 7.7 years among HL survivors
- 80% of HL survivors experienced accelerated epigenetic changes associated with aging versus 23% in the placebo group

Accelerated Aging

- Those with more accelerated epigenetic changes performed worse in terms of memory, learning, attention, and executive function compared to those who had less evidence of premature aging
- Survivors of pediatric Hodgkin lymphoma have an increased risk of cardiopulmonary morbidity, cognitive impairment, premature mortality
- Effects suggest accelerated aging – which may provide a risk for premature onset of dementia

KEY CONCEPT

Comprehensive Geriatric Functional Assessment



Frail

- Common geriatric syndrome that embodies an elevated risk of catastrophic declines in health and function among older adults.

CGA

- Across multiple cancers, articles provide evidence on how older, more vulnerable adults deserve special attention
- Has been shown to be a more reliable way to assess patients than existing oncology performance tools
- Recent updated published review included > 60 studies showing benefit



Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

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Geriatric assessment in the management of older patients with cancer – A systematic review (update)

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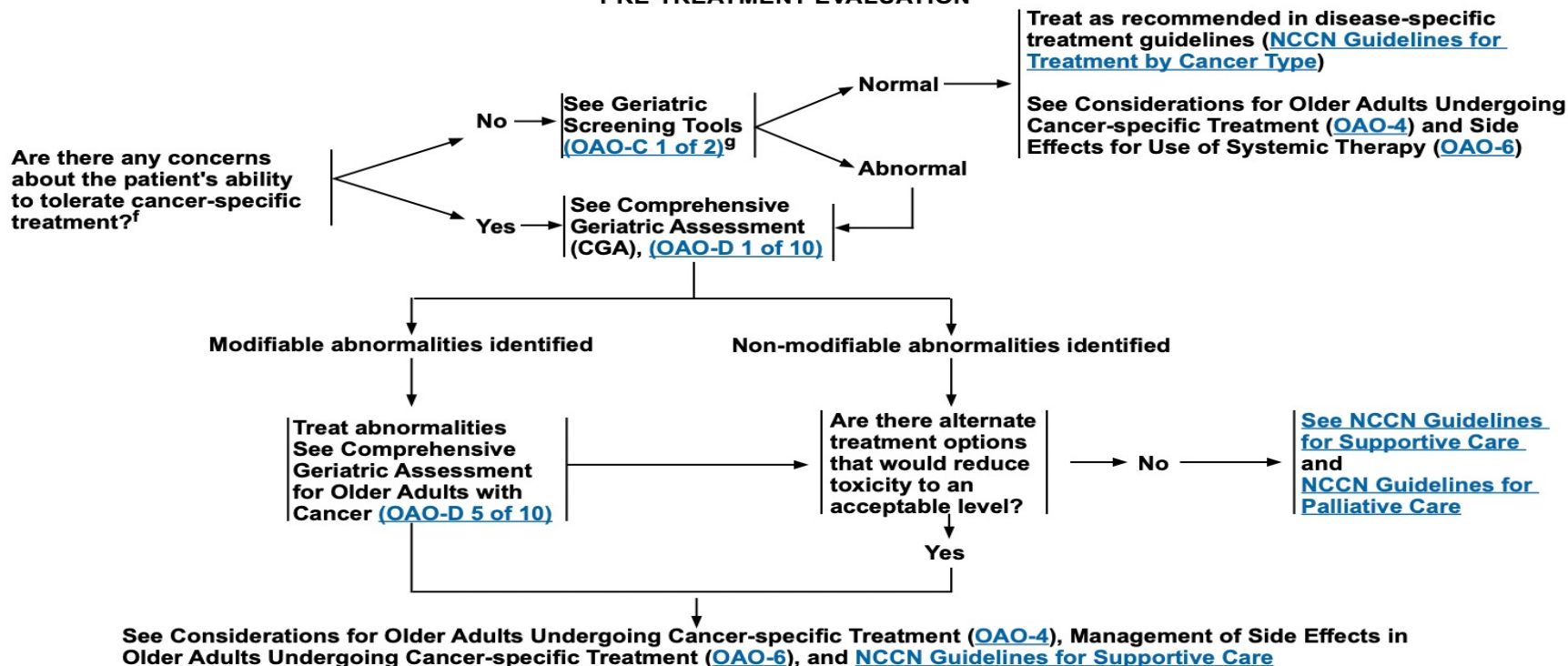
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PRE-TREATMENT EVALUATION^a



^a Assessment of the patient's goals and objectives with regard to his/her cancer diagnosis should be completed prior to initiation of cancer-specific treatment. Supportive and palliative care assessment is recommended for any older adult with cancer (See OAO-2).

^f Concerns can come from the patient, family, or clinician and can be related to the patient's performance status and/or comorbidities.

^g Multiple screening tools have been tested and validated in this setting. Selected geriatric screening tools that have been used to determine if a CGA would be beneficial for older patients with cancer are listed on OAO-C 1 of 2.

Note: All recommendations are category 2A unless otherwise indicated.
Clinical Trials: NCCN believes that the best management of any patient with cancer is in a clinical trial. Participation in clinical trials is especially encouraged.

Screening Tools

GERIATRIC SCREENING TOOLS

Abbreviated CGA (aCGA)^{1,2}
Barber questionnaire³
Fried Frailty Criteria^{4,5}
Geriatric (G-8)⁶⁻⁸
Groningen Frailty Index²
Triage Risk Screening Tool (TRST)⁸
Vulnerable Elders Survey (VES-13)^{7,9-12}

**COMPREHENSIVE GERIATRIC ASSESSMENT
CARE PROCESS FOR OLDER ADULTS WITH CANCER**

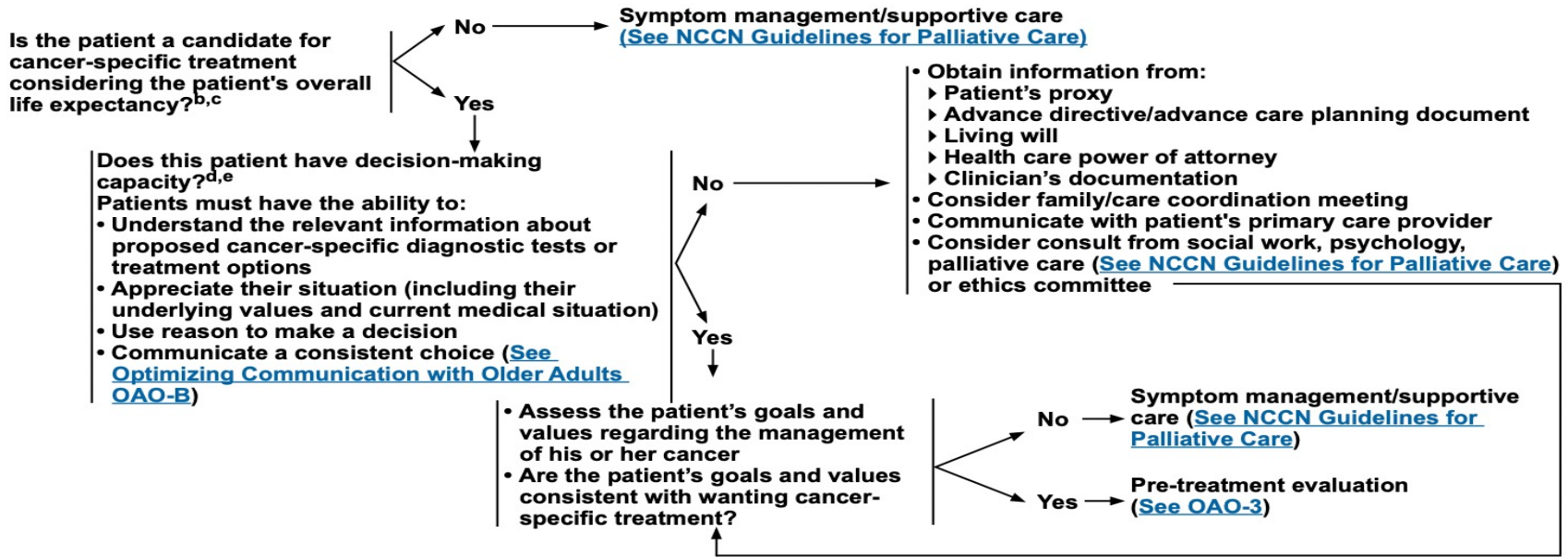
Impairment in any domain may consider the following:

Domain Impaired	Potential Interventions
Functional Status (See OAO-C 2 of 8)	Physical therapy referral Occupational therapy referral Home safety evaluation/Home health care Evaluate fall risk Promote exercise
Cognition/Memory (See OAO-C 3 of 8 and OAO-F)	Involve caregiver Assess/minimize potentially inappropriate medications (See OAO-I) Delirium prevention Assess capacity and ability to consent to treatment (See OAO-1) Identify health care proxy/collaborative decision maker Cognitive testing/neuropsychology referral
Social Support/Caregiver Burden	Transportation assistance Home health care Home safety evaluation Support groups Refer to psychiatry/psychology Spiritual care
Psychological Status: Anxiety/Depression	Complementary (non-pharmacological) modalities such as guided imagery, meditation, relaxation, acupuncture, etc. Counseling Refer to psychiatry/psychology Start medications to treat anxiety/depression Support programs Spiritual care
Nutrition (See OAO-C 4 of 8)	Nutrition consult Make specific dietary recommendations Oral care Supplemental nutrition Physical/Occupational therapy if function related

With permission from Mohile SG, Velarde C, Hurria A, et al. J Natl Compr Canc Netw 2015 Sep;13(9):1120-30.

[See References \(OAO-C 7 of 8\)](#)

APPROACH TO SHARED DECISION-MAKING IN THE OLDER ADULT PRIOR TO CANCER-SPECIFIC TREATMENT^a



^a Assessment of the patient's goals and objectives with regard to his/her cancer diagnosis should be completed prior to initiation of cancer-specific treatment. Supportive and palliative care assessment is recommended for any older adult with cancer.

^b Life expectancy calculators are available at www.epronosis.com. Note that these calculators are used to determine anticipated life expectancy (independent of the cancer). They could be utilized in clinical decision-making to weigh whether the cancer is likely to shorten the patient's life expectancy or whether the patient is likely to become symptomatic from cancer during his or her anticipated life expectancy.

^c See Life Expectancy of General Population (OAO-A).

^d Sessums LL, Zembrzuska H, Jackson JL. Does this patient have medical decision-making capacity? JAMA 2011;306:420-427.

^e McKoy JM, Burhenn PS, Browner IS, et al. Assessing cognitive function and capacity in older adults with cancer. J Natl Compr Canc Netw 2014;12:138-144.

Note: All recommendations are category 2A unless otherwise indicated.

Clinical Trials: NCCN believes that the best management of any patient with cancer is in a clinical trial. Participation in clinical trials is especially encouraged.

Implementation of clinical recommendations from the geriatric oncology clinic

[Tuan Hoang](#) • [Narhari Timilshina](#) • [Mohammed Hassan Habib](#) • ... [Lindy Romanovsky](#) • [Richard Norman](#) •

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Published: May 23, 2023 • DOI: <https://doi.org/10.1016/j.jgo.2023.101534> •



Check for updates

Benefit of GO

- 100 patients visiting the GO clinic (mean age of 80.5 years, 62% male, 52% with planned curative intent, with GU being most common) received a median of six recommendations (range of 2–12), regardless of sex, cancer stage, cancer site, and treatment intent.
- Medication optimization (27%), patient education (26%), and referral to allied health (14%) were the top recommendations. At 6m follow-up, 83% of all recommendations were implemented
- Patient education was implemented at a 100% rate
- The most common reasons for recommendations not being implemented were patient transfer to palliative care/death and patient declining recommendations due to busy appointment schedules

POINT-COUNTERPOINT SERIES | [ARTICLES IN PRESS](#), 101482

Achieving harmony in oncological geriatric assessment – Should we agree on a best set of tools?

[Pierre Soubeyran](#)   • [Carine Bellera](#) • [Elena Paillaud](#)

[Open Access](#) • Published: April 04, 2023 • DOI: <https://doi.org/10.1016/j.jgo.2023.101482>

[SOUBEYRAN ET AL. VOLUME 14, ISSUE 5, 101482, JUNE 2023](#)

Standard

- Minimum standardization of geriatric assessment domains and tools in research and clinical practice to ensure an appropriate pathway from research evidence to routine implementation
- Literature is prolific in identifying geriatric domains with impact on survival, early death , toxicity, functional decline and showing how comorbidities and geriatric impairment may modify the toxicity profile of various cancer treatments
- Consensus has been reached internationally between SIOG and ASCO to retain functional status, comorbidity, cognition, depression, and nutrition as the minimal domains to study in older patients with cancer.
- SIOG considers also fatigue, social status and support, and the presence of geriatric syndromes, and ASCO adds falls

Standard

- Literature shows that about one-third of treatment decisions are modified following geriatric assessment results
- Consequently- oncological decisions should be based on solid data, *i.e.*, on simple, valid, accurate, and reliable tools with metrics.
- Although GA remains the best way to evaluate a patient's general status it is not routinely implemented in practice because it is time- and resource-consuming
- Sharing a common language and a common dataset will facilitate the merging of hospital databases for large studies and performance of artificial intelligence studies to solve essential questions in such a heterogeneous population.

Chemotherapy Toxicity Prediction Tools

- CARG Prediction Tool
http://www.mycarg.org/chemo_toxicity
- Predicting Chemotherapy Toxicity in Older Adults with Cancer: a Prospective Multicenter Study
- CRASH Score Calculator

Crash Score Calculator

Table 4. The Chemotherapy Risk Assessment Scale for High-Age Patients (CRASH) Score

Predictors	Points		
	0	1	2
Hematologic score^a			
Diastolic BP	≤72	>72	
IADL	26-29	10-25	
LDH (if ULN 618 U/L; otherwise, 0.74 /L*ULN)	0-459		>459
Chemotox ^b	0-0.44	0.45- 0.57	>0.57
Nonhematologic score^a			
ECOG PS	0	1-2	3-4
MMS	30		<30
MNA	28-30		<28
Chemotox ^b	0-0.44	0.45-0.57	>0.57

Non-chemotherapy

- Retrospective analysis of 982 patients at 18 academic centers across the US and Europe looked at age 80 years or older, treated with single agent IO. NSCL, Melanoma and GU cancers. Patients in >90 years and older cohort discontinued treatment earlier and had slightly more side effect
- Chimeric Antigen Receptor T-cell therapy has been shown to be an effective therapeutic option for older adults with similar RR. Age should not be an absolute contraindication for the use of these therapies for these patients. Older adults may have a higher incidence of neurologic toxicities and require close monitoring

Immunotherapy

Supplemental Table 2. Patient Characteristics

	All (%)	NSCLC (%)	Melanoma (%)	Genitourinary [†] (%)	Other (%)
	928 (100)	345 (37.2)	329 (35.5)	153 (16.5)	101 (10.9)
Age at ICI start					
Median (range)	83.0 (75.8-97.0)	82.9 (78.4-95.0)	83.2 (78.0-97.0)	83.8 (75.8-96.0)	83.3 (80.0-94.1)
<85yo	626 (67.5)	252 (73.0)	210 (63.8)	99 (64.7)	65 (64.4)
85-89yo	242 (26.1)	83 (24.1)	89 (27.1)	43 (28.1)	29 (28.7)
≥90yo	60 (6.4)	10 (2.9)	30 (9.1)	11 (7.2)	7 (6.9)
Sex					
M	589 (63.5)	221 (64.1)	199 (60.5)	99 (64.7)	70 (69.3)
F	339 (36.5)	124 (35.9)	130 (39.5)	54 (35.3)	31 (30.7)
ECOG					
0	194 (20.9)	53 (15.4)	97 (29.5)	25 (16.3)	19 (18.8)
1	492 (53.0)	192 (55.7)	176 (53.5)	76 (49.7)	48 (47.5)
2+	218 (23.5)	85 (24.6)	51 (15.5)	50 (32.7)	32 (31.7)
Unknown	24 (2.6)	15 (4.3)	5 (1.5)	2 (1.3)	2 (2.0)
PD-L1 status					
Positive	172 (18.5)	151 (43.8)	5 (1.5)	3 (2.0)	13 (12.9)
Negative	60 (6.5)	44 (12.8)	9 (2.7)	2 (1.3)	5 (5.0)
Unknown	696 (75.0)	150 (43.5)	315 (95.7)	148 (96.7)	83 (82.2)
Regimen					
αPD-1	806 (86.9)	322 (93.3)	285 (86.6)	103 (67.3)	96 (95.0)
αPD-L1	79 (8.5)	23 (6.7)	1 (0.3)	50 (32.7)	5 (5.0)
αCTLA-4	43 (4.6)	0 (0)	43 (13.1)	0 (0)	0 (0)

[†]includes renal cell carcinoma, urothelial carcinoma, prostate cancer

Medication

- Corticosteroids
- Benzodiazepine
- First generation antihistamines
- Histamine-2 receptor blockers
- Antipsychotics
- SSRI antidepressants
- Antiemetics
- Antiepileptic Drugs

Clinical Trials

- Age as exclusion criteria
- Comorbidities
- Misperception/Assumptions
- Performance Status
- Polypharmacy
- Cost
- Transportation
- > 80% of elderly patients are treated community based

Quality of Life

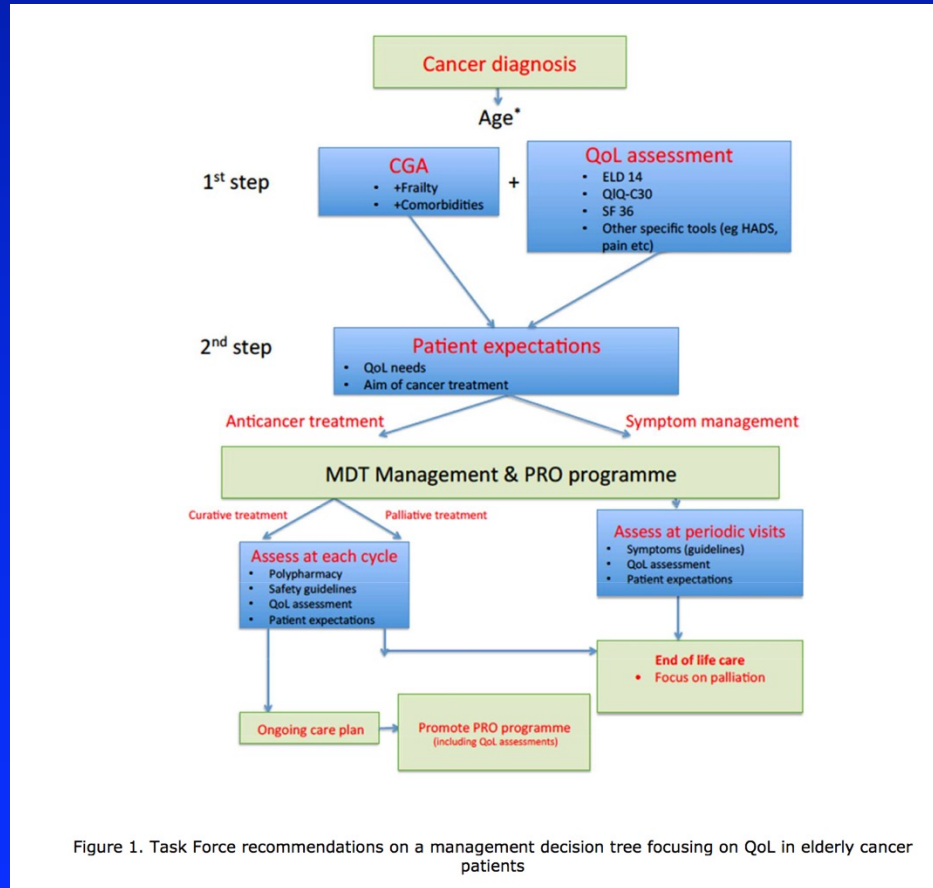


Figure 1. Task Force recommendations on a management decision tree focusing on QoL in elderly cancer patients



CONSIDERATIONS FOR OLDER ADULTS UNDERGOING CANCER-SPECIFIC TREATMENT^a

Goal-Concordant
Care →

- Patient's goals and objectives should be assessed in context with life expectancy, comorbidities, cognitive, functional, psychologic/psychosocial and nutritional status, aggressiveness of the disease, and treatment approach. [\(See OAO-3\).](#)
- There are data to suggest correlation between low social support and a higher risk for mortality. In patients with low levels of social support, consider referral to social work and/or case management to explore home supports and community resources.
- Multidisciplinary team management, patient-specific treatment approach with shared decision-making and palliative/supportive care for symptom management should be an integral part of cancer care in older adults. [See NCCN Guidelines for Supportive Care](#) and [NCCN Guidelines for Palliative Care](#).

Surgery →

- Chronologic age is not the primary consideration for surgical risk; all older adults undergoing surgery should undergo an assessment for components of frailty including comorbidities, cognition, mobility, functional status, and nutrition.
- The [American College of Surgeons \(ACS\) Geriatric Surgery Verification \(GSV\) Program](#) provides a framework for hospitals to take an interdisciplinary approach to continuously optimize surgical care for older adults. The GSV Program includes 32 standards to improve surgical care for older adults with an emphasis on goals of care and shared decision-making, assessment of geriatric-specific vulnerabilities (eg, cognition, mobility), and interdisciplinary postoperative care.¹
- The [ACS National Surgical Quality Improvement Program Surgical Risk Calculator](#) includes both geriatric-specific predictors and geriatric-specific outcomes; the ACS Surgical Risk Calculator can be a useful tool for sharing patient-specific predicted outcomes after surgery and facilitating a more informed discussion regarding risks of surgery.²
- Delirium is preventable and the most common postoperative complication in older adults; the American Geriatrics Society (AGS) practice guideline on postoperative delirium in older adults covers the topic areas of delirium risk factors, diagnosis and screening, prevention, medical evaluation, and pharmacologic treatment.^{3,4} [See OAO-F 2 of 3.](#)

^a Assessment of the patient's goals and objectives with regard to his/her cancer diagnosis should be completed prior to initiation of cancer-specific treatment. Supportive and palliative care assessment is recommended for any older adult with cancer [\(See OAO-2\)](#).

Note: All recommendations are category 2A unless otherwise indicated.

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[References](#)

OAO-4

[Journal of Clinical Oncology](#) > [List of Issues](#) > [Volume 39, Issue 19](#) >

REVIEW ARTICLES | Caring for Older Adults With Cancer

Models of Care in Geriatric Oncology



[Andrew E. Chapman](#), DO¹ ; [Rawad Elias](#), MD²; [Elana Plotkin](#), BS³; [Lisa M. Lowenstein](#), PhD, MPH⁴; and [Kristine Swartz](#), MD⁵

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Model	Description	Advantage	Disadvantage
Screen and refer	Screen with validated tool and refer	Less time and resources intense	Need to have available resources and see multiple providers
Shared care model	Medical management divided between primary care provider and oncologist	Relationship often exists already	My lack geriatric focus
Multidisciplinary consultative model	Patient referred and GA performed by multidisciplinary team	Can evaluate and influence a large number of patients	Outcomes may be limited by a primary oncologists after recommendations, most patient not followed longitudinally
Geriatric driven	A geriatrician in clinic	Can follow and be available longitudinally	Limited by available geriatric trained providers
Geriatric oncologist	Dual trained provider	More control over outcomes	Limited by the number of dual trained physicians
Self assessment	Patient completes questionnaire with several variables completed by trained staff	Fewer resources needed	Expertise needed to interpret assessment

ASCO 2023

- Survivorship
- Shift from assessment to targeted interventions
- Advanced care planning
- Prediction of treatment toxicity in targeted therapies
- Importance of multidisciplinary care

Health Care System Concepts

The diagram illustrates the 4Ms Framework, a central concept surrounded by four key areas: What Matters (top, yellow circle with a person icon), Medication (right, green circle with a pill icon), Mentation (bottom, blue circle with a person reading icon), and Mobility (left, orange circle with a person walking icon). The central text reads "4Ms Framework".

Age-Friendly Health Systems

An initiative of The John A. Hartford Foundation and the Institute for Healthcare Improvement (IHI) in partnership with the American Hospital Association (AHA) and the Catholic Health Association of the United States (CHA).

For related work, this graphic may be used in its entirety without requesting permission.
Graphic files and guidance at ihi.org/AgeFriendly

What Matters
Know and align care with each older adult's specific health outcome goals and care preferences including, but not limited to, end-of-life care, and across settings of care.

Medication
If medication is necessary, use Age-Friendly medication that does not interfere with What Matters to the older adult, Mobility, or Mentation across settings of care.

Mentation
Prevent, identify, treat, and manage dementia, depression, and delirium across settings of care.

Mobility
Ensure that older adults move safely every day in order to maintain function and do What Matters.

Prevention -Blue Zones

- Danish Twin Study established that around 20% of an average person's life expectancy is dictated by genes, 80% lifestyle
- National Geographic expedition, led by Dan Buettner, to uncover the secrets of longevity, evolved into the discovery of the 5 places around the world where people consistently live over 100 years old, dubbed the Blue Zones.
- Scientists and anthropologists were able to distill evidence-based common denominators of these Blue Zones into 9 commonalities that they call the Power 9.

Power 9

- 1) Move naturally
- 2) Purpose
- 3) Downshift
- 4) 80% rule
- 5) Plant slant
- 6) *Wine @ 5*
- 7) *Belong*
- 8) *Love ones first*
- 9) *Right tribe – group of 5 friends*

Summary

- Aging is the result of a combination of physical, environmental and social factors
- Aging impacts chronic disease including cancer – science on impactful therapy is evolving
- Validated assessment screening tools and interventions
- Literature reveals that in a third of patients treatment changes are made
- Some cancer survivors show signs of accelerated aging
- Continued research is needed to improve the outcome in older adults