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# Impact of Geriatric Assessment on Oncology Outcomes

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# OBJECTIVES

- ✓ Discuss why it is important to talk about cancer and aging
- ✓ Why is it different to provide cancer care to an older population of patients?
- ✓ Present evidence for the use of geriatric principles in the care of the older cancer patient

# What is Aging?

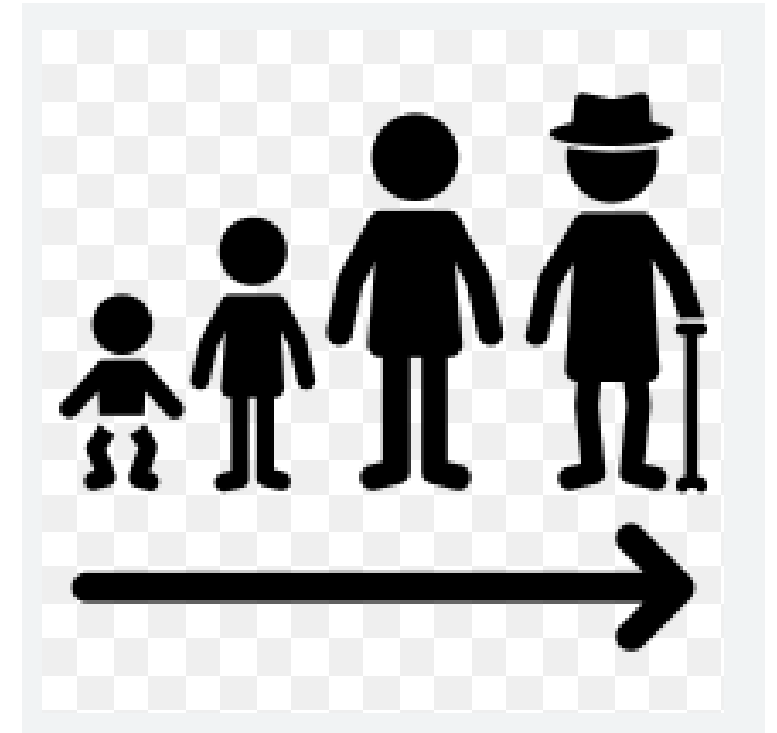
Aging occurs through the gradual accumulation of unrepaired somatic defects when the ability of the body to maintain homeostasis becomes less robust after the reproductive age.



# What Changes with Aging?

- (1) Age-related biological changes among different tissues and organ systems do not necessarily occur at the same time during one's life journey
- (2) Physiologic reserve and vulnerability of older patients are overall affected by biological aging
- (3) Biological changes are greatly impacted by age-related chronic diseases, lifestyle as well as environmental and psychosocial factors. Therefore, adverse consequences during aging can be modified by altering lifestyle and/or environmental factors.

Zang X et al, The Biology of Aging and Cancer Frailty, Inflammation, and Immunity; Cancer J 2017 23:201-205.



# Decision Making & Cancer Treatment in Older Adults is Complex

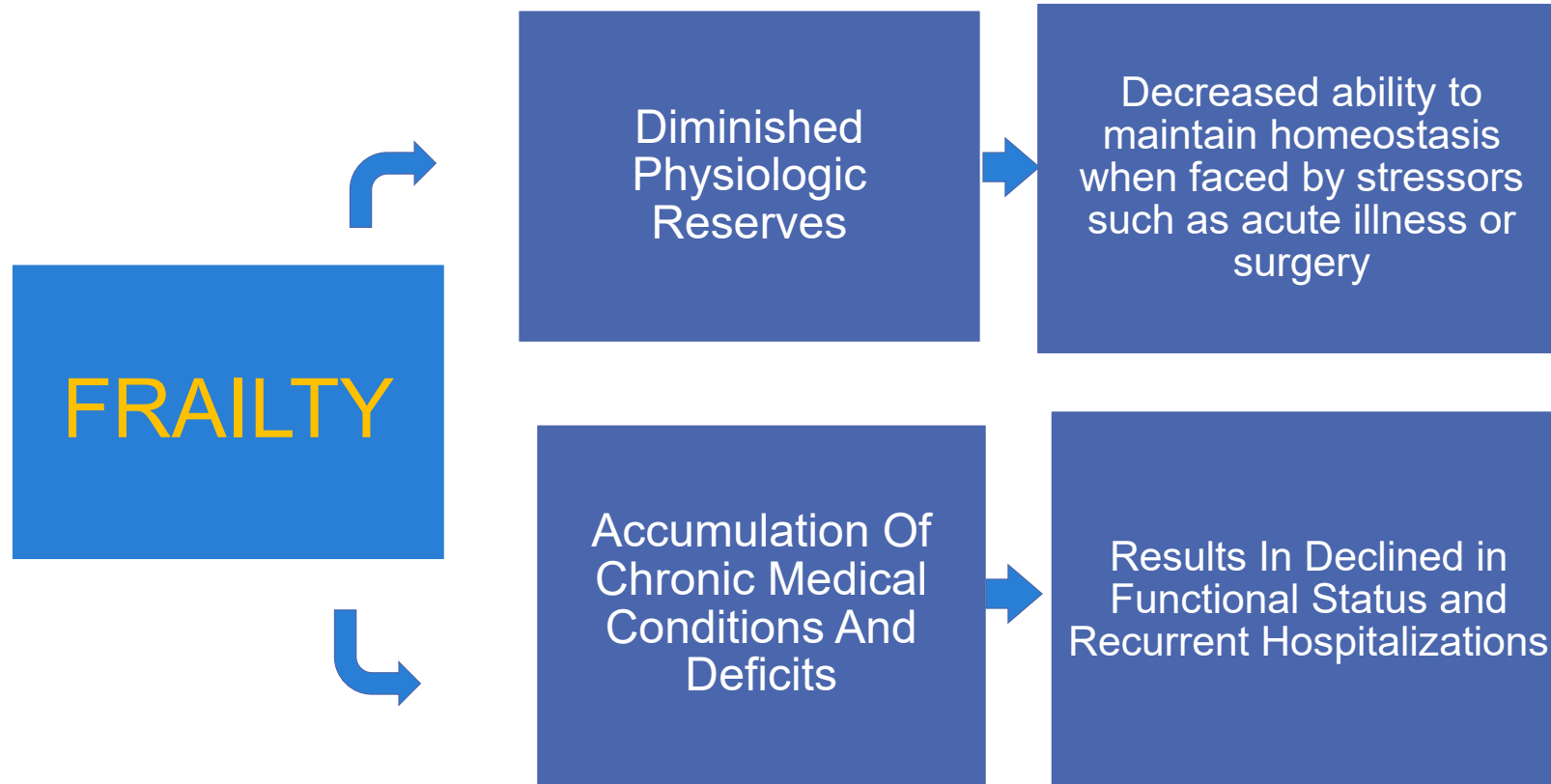


**In 2022**

**Moving Beyond Age**

**Frailty**

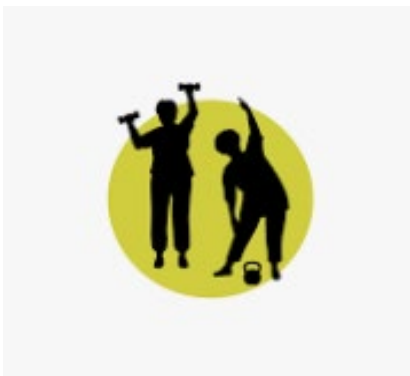
# The Frailty Phenotype



# FRAILITY

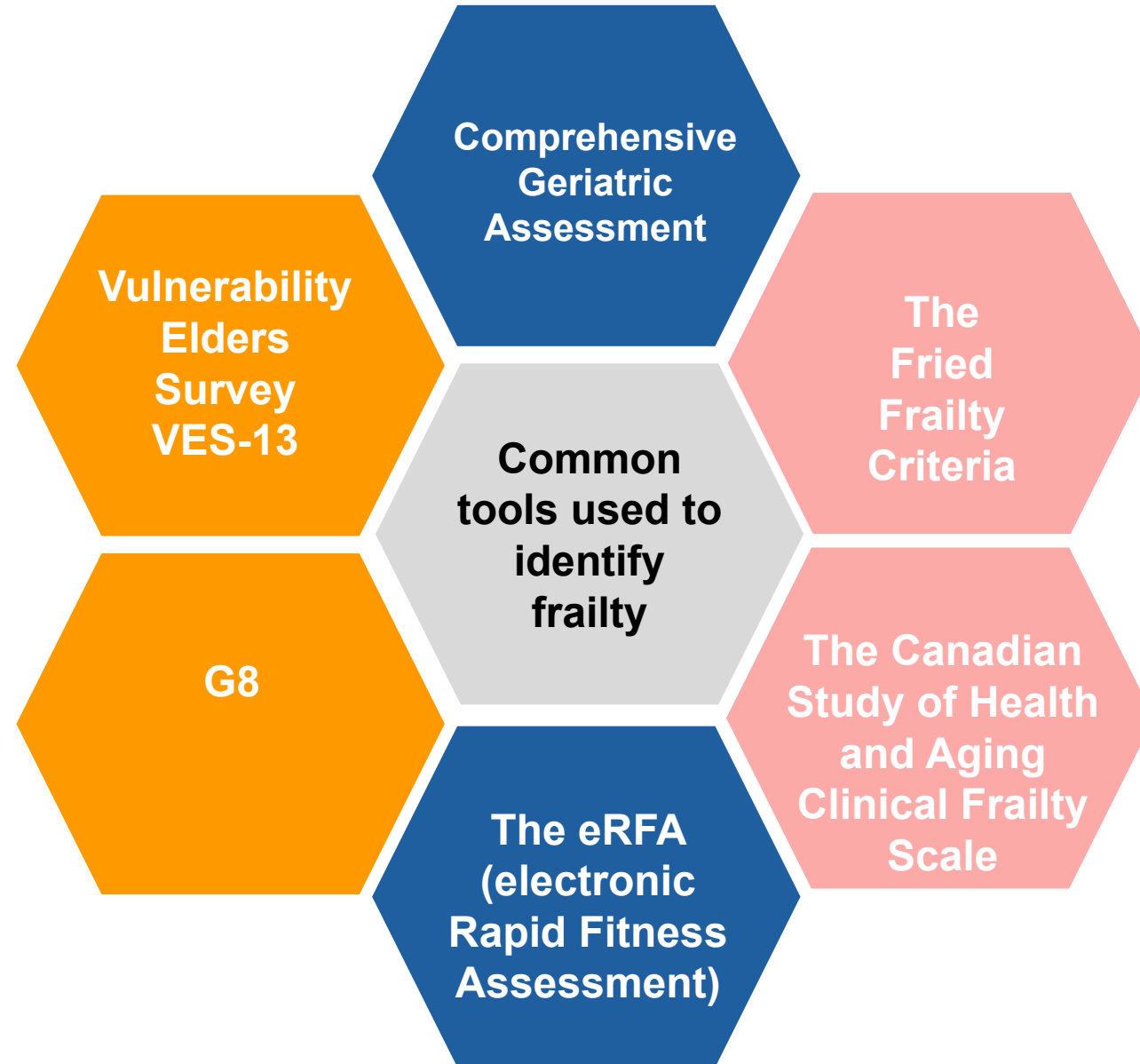
## Components

- Decreased physiologic reserves
- Accumulation of chronic medical conditions
- Reduced functional status



**Not all older adults are frail**

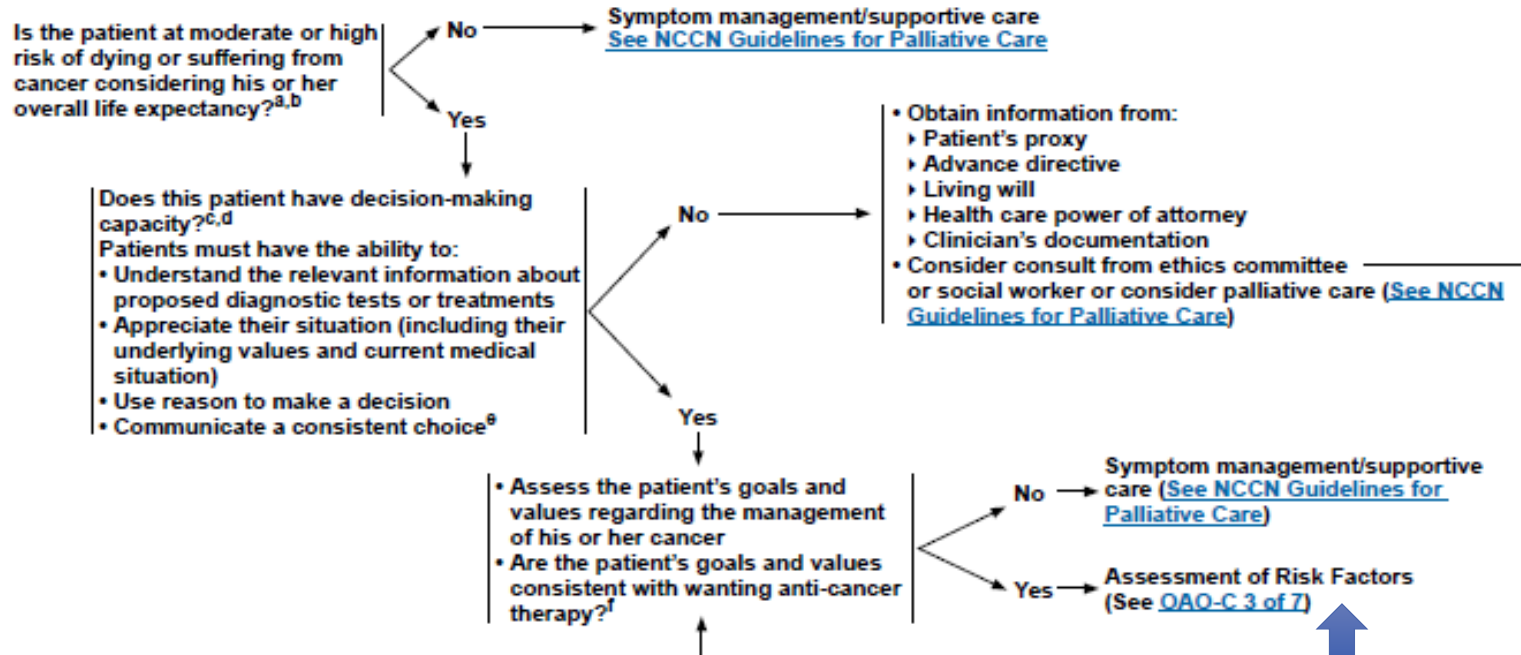
# How do we Identify Frailty?





# APPROACH TO DECISION-MAKING IN THE OLDER ADULT WITH CANCER

## APPROACH TO DECISION-MAKING IN THE OLDER ADULT<sup>a</sup>



<sup>a</sup>Life expectancy calculators are available at [www.eprognosis.com](http://www.eprognosis.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. Note that these calculators should be used in conjunction with clinical judgment.

<sup>b</sup>See [histograms for age-specific life expectancy \(OAO-A\)](#).

<sup>c</sup>Sessums LL, Zembrzaska H, Jackson JL. Does this patient have medical decision-making capacity? JAMA 2011;306(4):420-427.

Copyright © (2012) American Medical Association. All rights reserved.

<sup>d</sup>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(1):138-144.

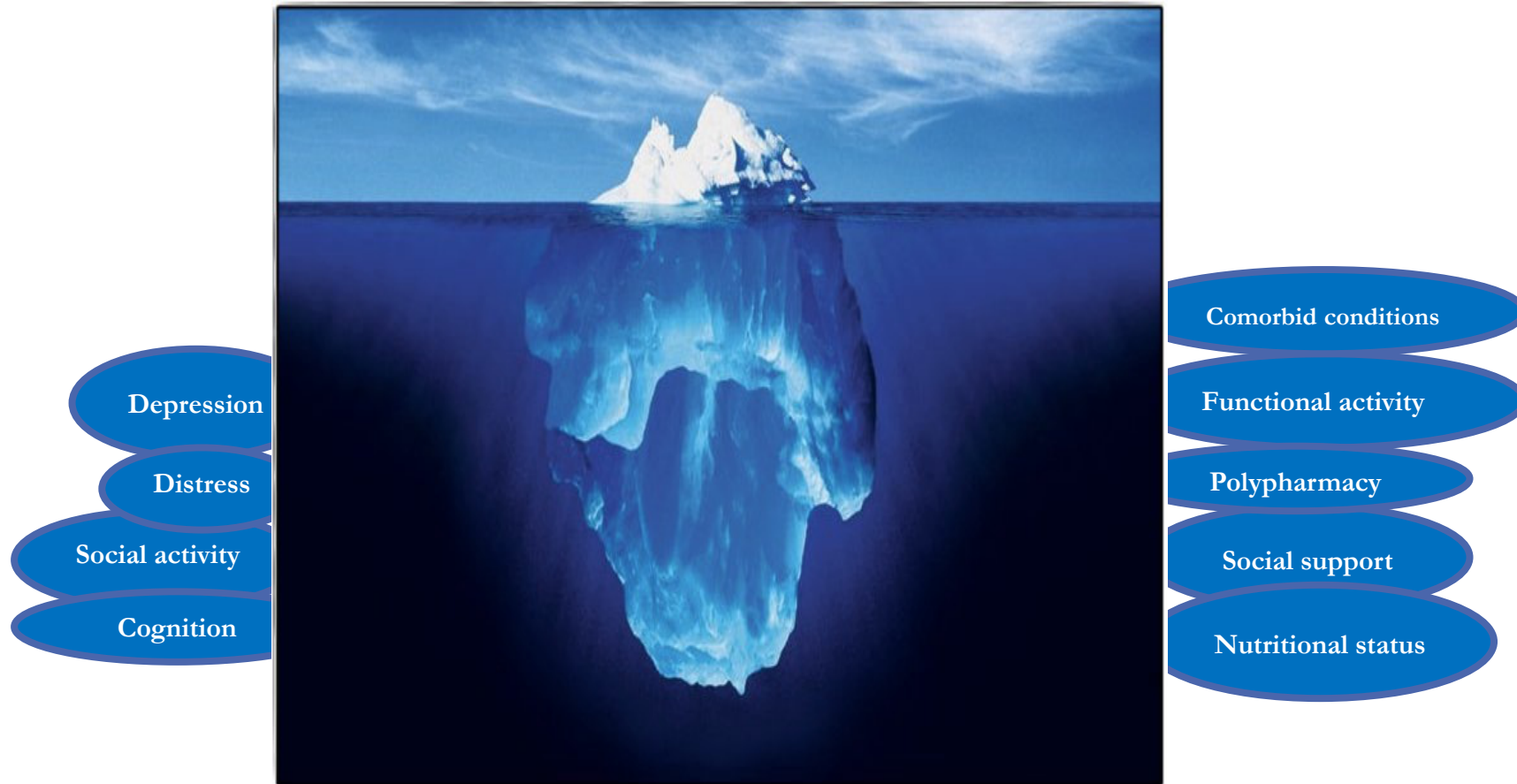
<sup>e</sup>See [Optimizing Communication with Older Adults \(OAO-B\)](#).

<sup>f</sup>Harrington SE, Smith TJ. The role of chemotherapy at the end of life: when is enough, enough? JAMA 2008;299:2667-2678.

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.

# GA: to Go Beneath the Surface.

A multidimensional, interdisciplinary patient evaluation that leads to the identification of patient problems and the development of a plan for resolving these problems



# Elements of the Geriatric Assessment

## Uncovering Geriatric Syndromes

Domain	Assessment
<b>Function</b>	Basic and instrumental activities of daily living Evaluation of frailty Performance status Gait and balance, falls evaluation
<b>Polypharmacy</b>	Prescription and non-prescription medications Alternative medications Drug-drug interactions Adherence to medications Inappropriate prescribing (Beer's Criteria)
<b>Comorbidities</b>	Number and severity of co-morbid conditions
<b>Cognition</b>	Evaluation for dementia Evaluation for delirium Ability to make treatment-related decisions
<b>Nutrition</b>	BMI, unintentional weight loss, failure to thrive, nutritional assessment
<b>Social support</b>	Living conditions, adequate caregiving, family support, access to transportation, financial counseling, neglect or abuse
<b>Psychological state</b>	Anxiety, depression
<b>Other geriatric syndromes</b>	Incontinence, insomnia, <b>hearing loss, vision impairment</b>

# Development Assessment Tool for Oncologists

1. CARG score
2. CRUSH score
3. CARG-B score

- Hurria et al. JCO 34: 2366-2371 2011
- Extermann M et al Cancer 2011 Nov 9 doi: 10.1002/cncr. 26646
- Magnuson, A et al. JCO 2021 Feb 20;39(6):608-618.



Meet the Researchers	R21/U13 Meetings	CARG Studies	Funding Opportunities	Educational Resources	Resources for the Older Adult	Geriatric Assessment Tools	Geriatric Oncology Events	R25 Nursing Grant	URCC GA Studies	CARG Advocacy	Contact Us
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## PREDICTION TOOL

Gender:

Patient's Age:

Patient's Height:

Patient's Weight:

Cancer Type:

Dosage:  \*

Number of chemotherapy agents:

Hemoglobin:

How is your hearing (with a hearing aid, if needed)?:

Number of falls in the past 6 months:

Can you take your own medicines?:

Does your health limit you in walking one block?:

During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?:

Select Serum Creatinine:

Creatinine Clearance:  \*\*

[Submit](#)

Toxicity Score:

Risk of Chemotherapy Toxicity:

[What does this mean?](#)

\* Dose delivered with first dose for chemotherapy

\*\* Jelliffe formula

## Practical Assessment and Management of Vulnerabilities in Older Patients Receiving Chemotherapy: ASCO Guideline for Geriatric Oncology

Supriya G. Mohile, William Dale, Mark R. Somerfield, Mara A. Schonberg, Cynthia M. Boyd, Peggy S. Burhenn, Beverly Canin, Harvey Jay Cohen, Holly M. Holmes, Judith O. Hopkins, Michelle C. Jamelsins, Alok A. Khosra, Heidi D. Klepin, Stuart M. Lichtman, Karen M. Mustian, William P. Tew, and Arti Huria

Author affiliations and support information (if applicable) appear at the end of this article.

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S.G.M., W.D., and A.H. were co-chairs.

Clinical Practice Guideline Committee approved: March 8, 2018.

**Editor's note:** This American Society of Clinical Oncology (ASCO) Clinical Practice Guideline provides recommendations, with comprehensive review and analysis of the relevant literature for each recommendation. Additional information, including a Data Supplement with additional evidence tables, a Methodology Supplement, slide sets, clinical tools and resources, and links to patient information at [www.cancer.net](http://www.cancer.net), is available at [www.asco.org/supportive-care-guidelines](http://www.asco.org/supportive-care-guidelines).

Reprint requests: American Society of Clinical Oncology, 2318 M Street, Suite 800, Alexandria, VA 22314; e-mail: [guidelines@asco.org](mailto:guidelines@asco.org).

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0732-183X/18/3622w-2326w/\$20.00

### A B S T R A C T

#### Purpose

To provide guidance regarding the practical assessment and management of vulnerabilities in older patients undergoing chemotherapy.

#### Methods

An Expert Panel was convened to develop clinical practice guideline recommendations based on a systematic review of the medical literature.

#### Results

A total of 68

#### Recommendations

In patients ≥

vulnerabilities

a minimum,

Panel recom-

validated to

screen for

screen for

nutrition. E

Assessment

Scale for High-

Age Patients)

tools are recom-

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Geriatric-8

or Vulnerable

Elders Survey-

13 can help

to predict mor-

tality. Clin-

icians should

use a validat-

In patients > 65 years receiving chemotherapy geriatric assessment should be used to identify vulnerabilities that are not routinely captured in oncology assessments

Panel recommended that a validated tool be used to screen for malnutrition. Efficacy of the Geriatric Assessment Scale for High-Age Patients (eGAS) tools are recommended to obtain estimates of chemotherapy toxicity risk; the Geriatric-8 or Vulnerable Elders Survey-13 can help to predict mortality. Clinicians should use a validated tool listed at ePrognosis to estimate noncancer-based life expectancy  $\geq 4$  years. GA results should be applied to develop an integrated and individualized plan that informs cancer management and to identify nononcologic problems amenable to intervention. Collaborating with caregivers is essential to implementing GA-guided interventions. The Panel suggests that clinicians take into account GA results when recommending chemotherapy and that the information be provided to patients and caregivers to guide treatment decision making. Clinicians should implement targeted, GA-guided interventions to manage nononcologic problems. Additional information is available at [www.asco.org/supportive-care-guidelines](http://www.asco.org/supportive-care-guidelines).

# Practical Assessment and Management of Vulnerabilities in Older Patients Receiving Chemotherapy: ASCO Guideline for Geriatric Oncology

## THE BOTTOM LINE

### RECOMMENDATIONS

1. Patients  $\geq 65$  yo receiving chemotherapy, GA should be used to **identify vulnerabilities** or geriatric impairments that are not routinely captured in oncology assessments
2. Validated and practical tools should be used to **assess vulnerabilities** and **predict adverse outcomes**
  - a. At a minimum: assess cognition and nutrition
  - b. Recommended IADL for cognitive impairment
  - c. Either the CARG or the risk of chemotherapy toxicity

At a minimum:

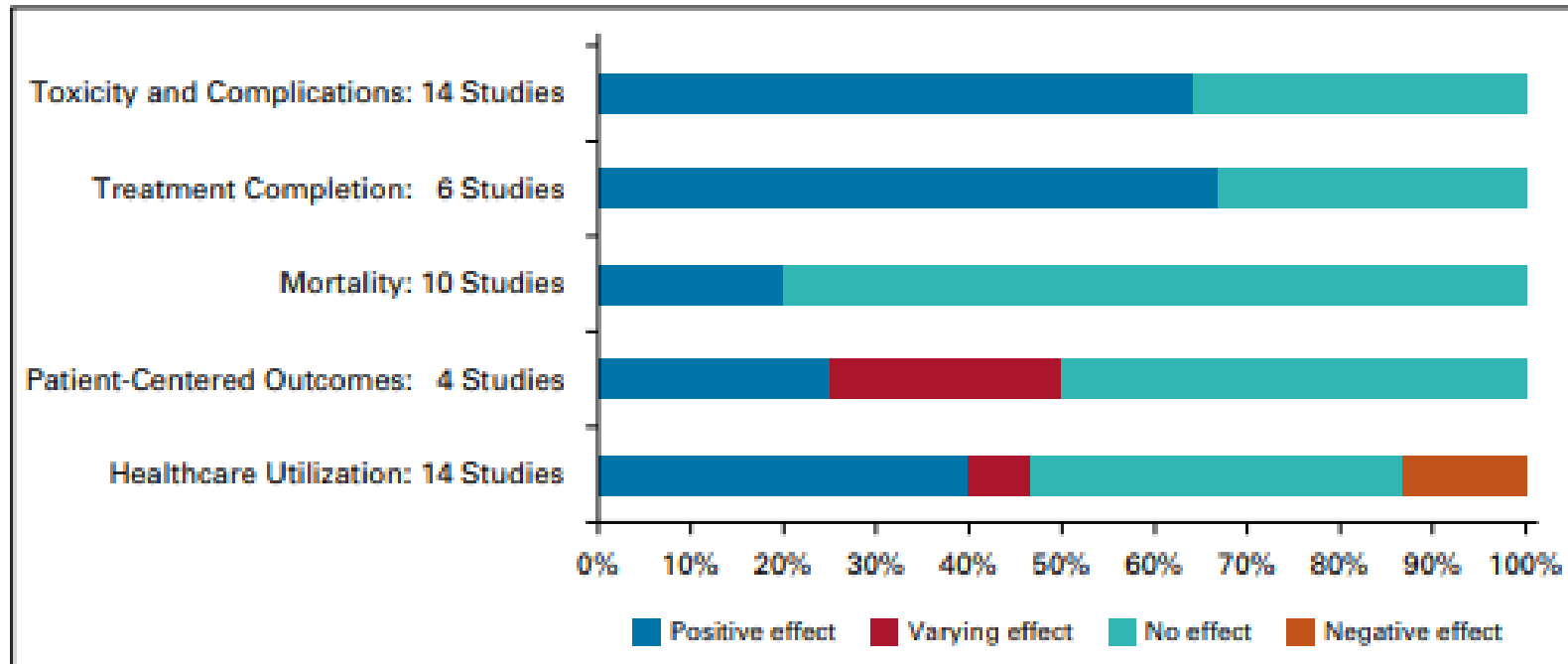
  - ✓ Assessment of function
  - ✓ Comorbidities
  - ✓ Falls
  - ✓ Depression
  - ✓ Cognition
  - ✓ Nutrition
3. Clinicians should use the Schonberg or Lee Index (ePrognosis) to **estimate life expectancy**
  - a. Answer NO to “presence of cancer” to obtain an estimation of competing(non-cancer) risks of mortality
4. Approaches for implementing GA in older adult with cancer
  - a. Apply results of GA to **develop individualized plan**
  - b. Take into account GA when recommending treatment
  - c. Implement targeted GA-guided targeted interventions to manage non-oncologic problems

# Impact of Geriatric Assessment and Management (GA&M) on Oncology Outcomes

- ✓ In recent years, increasing evidence has shown that GA&M can improve the course of treatment, with less chemotherapy-related toxicity and lower rates of complications after surgery.
- ✓ Studies that have shown a positive effect of GA&M on outcomes have generally used multifactorial interventions, highlighting the need of a holistic approach to the older patient with cancer.
- ✓ These studies were done in multiple geographic settings and cancer types, most are RCTs and use a range of different GA approaches



Effect of GA&M on course of treatment and different treatment outcomes—toxicity and complications, treatment completion, mortality, patient-centered outcomes, and healthcare utilization.



Siri Rostoft, MD, PhD et al. JCO 2021, Volume 39, Issue 19

JAMA Oncology | Original Investigation

# Geriatric Assessment-Driven Intervention (GAIN) on Chemotherapy-Related Toxic Effects in Older Adults With Cancer A Randomized Clinical Trial

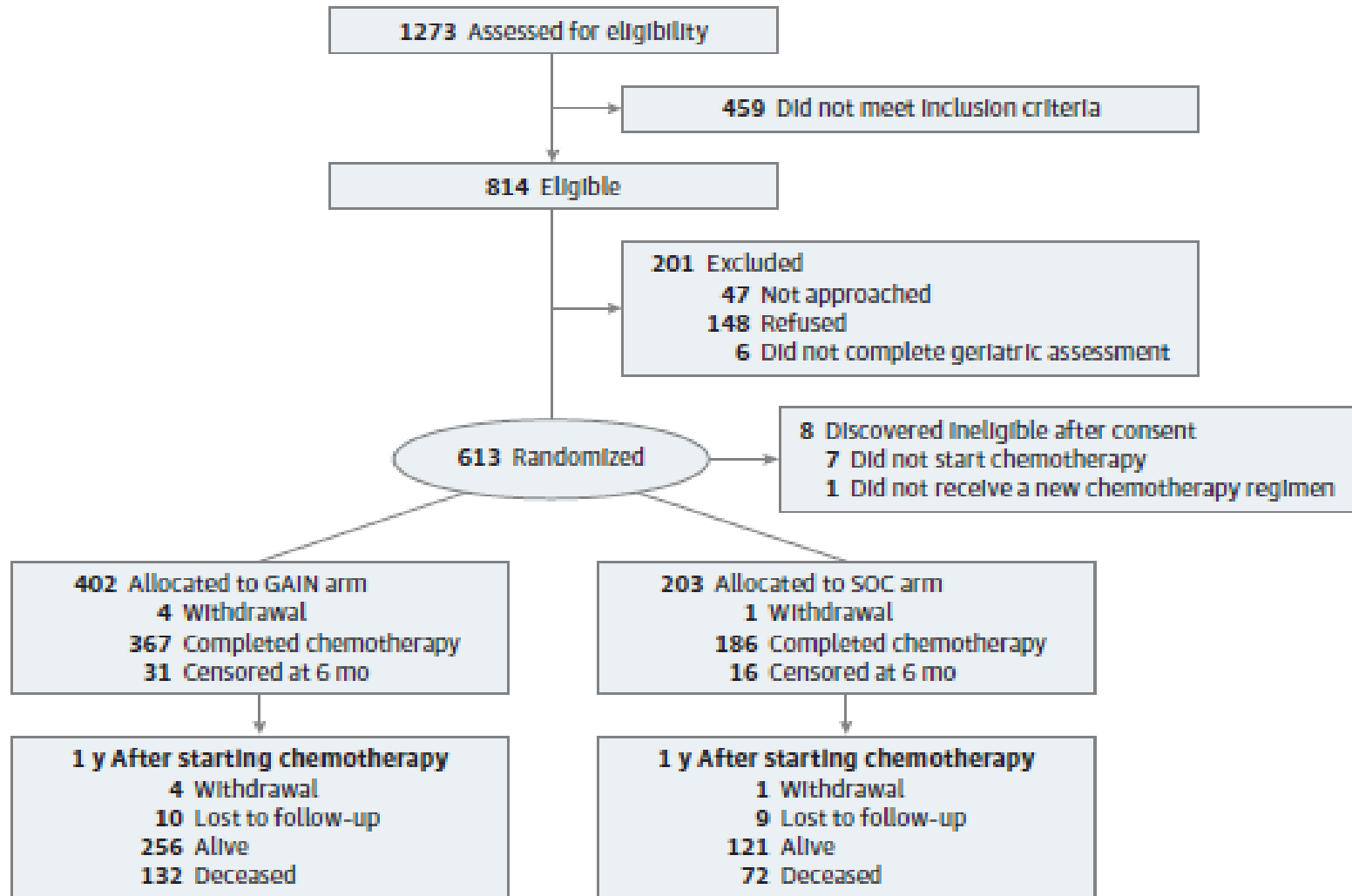
Daneng Li, MD; Can-Lan Sun, PhD; Heeyoung Kim, MPH; Enrique Soto-Perez-de-Celis, MD; Vincent Chung, MD; Marianna Koczywas, MD; Marwan Fakih, MD; Joseph Chao, MD; Leana Cabrera Chien, MSN; Kemeberly Charles, BS; Simone Fernandes Dos Santos Hughes, MD; Vani Katheria, MS; Monica Trent, BS; Elsa Roberts, BS; Reena Jayani, MD; Jeanine Moreno, MSN; Cynthia Kelly, MSN; Mina S. Sedrak, MD, MS; William Dale, MD, PhD

**Question:** Can GA intervention reduce grade 3 or higher chemotherapy –related toxic-effects in older adults with cancer?

# ELIGIBILITY

- ✓ Patients  $\geq 65$  from City of Hope between 8/2015 – 2/2019
- ✓ Diagnosis: Solid tumor cancer – Any Stage
- ✓ Starting treatment: Chemotherapy any line and combinations including combined with targeted therapy

Figure 1. CONSORT Flow Diagram



# METHODS

## Baseline GA (paper or tablet)

- ✓ Patient portion – Self assessment
  - ✓ Functional status, Comorbidities, Psychological state, Social Support, Nutritional State, Race and Ethnicity
- ✓ HCP portion (study NP)
  - ✓ Karnofsky, TUG, BOMC, Weight and Height (BMI), Unintentional weight loss

## Fulmer SPICES assessment

- ✓ Sleep, Eating problems, incontinence, confusion, falls, skin breakdown.

## CARG chemotoxicity score calculated

# METHODS - PATIENT RANDOMIZATION (2:1)

## GAIN ARM (410 patients)

- ✓ Results of GA reviewed by MDT
- ✓ Study NP implement interventions and make referrals
- ✓ Study NP follows with patient education, coordination as needed for 6 months
- ✓ Up to 12 months for survival analysis

## SOC ARM (203 patients)

- ✓ GA results sent to the Oncologist
- ✓ If there was severe depression/anxiety or cognitive impairment oncologist was notified.

# OUTCOMES

## PRIMARY

- ✓ Incidence of Grade  $\geq 3$  chemo-toxicity

## SECONDARY

- ✓ Completion of Advanced Directives
- ✓ ED Visits
- ✓ Unplanned hospitalizations and rehospitalizations
- ✓ Average LOS
- ✓ Chemo-dose modifications
- ✓ Early discontinuation of therapy

# RESULTS

## GAIN ARM (402 PATIENTS)

- 3971 POTENTIAL INTERVENTIONS ( mean 10 PER PATIENT)
- **77%** were implemented

## SOC ARM (203 PATIENTS)

- 2029 POTENTIAL INTERVENTIONS (mean 10 PER PATIENT)
- **12.5%** were implemented by the oncologist



# RESULTS : PRIMARY OUTCOME

## SIGNIFICANTLY LOWER CHEMOTHERAPY-RELATED TOXIC EFFECTS

- ✓ GAIN ARM: 203 of 402 patients (50.5%; 95% CI, 45.6% to 55.4%) developed grade 3 or higher chemotherapy-related toxic effects
- ✓ SOC ARM: 123 of 203 patients (60.6%; 95%CI, 53.9% to 67.3%) developed grade 3 or higher chemotherapy-related toxic effects.



**GAIN ARM HAD A 10.1% STATISTICALLY SIGNIFICANT REDUCTION IN CHEMOTHERAPY-RELATED TOXIC EFFECTS:** hematologic (anemia, neutropenia) and non-hematologic (infection, fatigue, hyponatremia)

# CONCLUSION

**Integration of a multidisciplinary intervention should be considered for older adults receiving chemotherapy.**

# Evaluation of geriatric assessment and management on the toxic effects of cancer treatment (GAP70+): a cluster-randomised study

*Supriya G Mohile, Mostafa R Mohamed, Huiwen Xu, Eva Culakova, Kah Poh Loh, Allison Magnuson, Marie A Flannery, Spencer Obrecht, Nikesha Gilmore, Erika Ramsdale, Richard F Dunne, Tanya Wildes, Sandy Plumb, Amita Patil, Megan Wells, Lisa Lowenstein, Michelle Janelins, Karen Mustian, Judith O Hopkins, Jeffrey Berenberg, Navin Anthony, William Dale*

**Question:** Can a geriatric assessment intervention reduce serious toxic effects in older patients with advanced cancer who are receiving high risk treatment?

# ELIGIBILITY

- ✓ Patients  $\geq 70$  from 40 community oncology practices across the US
- ✓ Diagnosis: Solid tumor cancer or lymphoma – incurable
- ✓ GA: At least one impaired domain
- ✓ Starting treatment: Palliative chemotherapy with goal to prolong survival and/or reduce symptoms
- ✓ Ability to provide informed consent

# Participant Practices

Practices from the U of R NCI Community Oncology Research Program (UR NCORP) Research Base network.

- ✓ NCORP is a national network that brings cancer clinical trials and care delivery studies to people in their communities.
- ✓ Community oncology practices are not physically located at an academic institution
- ✓ Practice clusters were built from community oncology practices that expressed interest in study participation.
- ✓ If an oncologist, coordinator, or research nurse or any other research study staff worked at multiple community practices those practices would be grouped into a cluster. Because of this crossover, multiple community oncology practices could be in one practice cluster, and practice clusters varied in size

# METHODS : PATIENT RANDOMIZATION (1:1)

## INTERVENTION ARM (349 patients in 16 practices)

- oncologists received a tailored geriatric assessment summary and management recommendations
- At study entry, oncologists received brief training about geriatric assessment and were told that they had autonomy for how they wished to use this strategy for their enrolled patients.

## USUAL CARE ARM (369 patients in 24 practices)

- no geriatric assessment summary or management recommendations were provided to oncologists. Oncologists received alerts for significantly impaired scores on depression and cognitive screening tests

# OUTCOMES

## PRIMARY

- Proportion of patients who had any grade 3–5 toxic effect (based on National Cancer Institute Common Terminology Criteria for Adverse Events version 4) over 3 months.

## SECONDARY

- Effects of geriatric assessment on treatment intensity
- Effects of geriatric assessment on survival over one year
- **Exploratory outcome:** effect of the intervention on GA domains

# RESULTS

- ✓ 40 practice clusters : 16 randomly assigned to the geriatric assessment intervention and 24 assigned to usual care enrolled participants, including
- ✓ 156 oncologists
- ✓ 718 eligible patients (349 and 369)
  - Mean Age 77 (SD 5.4)
  - 43% Female
  - Mean number of GA impairments : 4.5
  - Cancer types: Breast , GI, GU GYN



## RESULTS : PRIMARY OUTCOME

➤ 440 (61%) of 718 evaluable patients had any grade 3–5 toxic effect within 3 months of starting a new treatment regimen

➤ **177 [51%]** of 349 of patients in the intervention group had grade 3–5 toxic effects

➤ **263 [71%]** of 369 patients in the usual care group had grade 3–5 toxic effects

**Relative Risk [RR] 0·74 (95% CI 0·64–0·86; p=0·0001).**

## RESULTS : PRIMARY OUTCOME

- ✓ Lowest risk was for non-haematological grade 3-5 toxic effects for patients in the intervention group (adjusted RR 0·72, 95% CI 0·52–0·99;  $p=0\cdot045$ ; clustering effect  $p<0\cdot0001$ )
- ✓ No statistically significant reduction in haematological toxicity risk (adjusted RR 0·85, 95% CI 0·70–1·04;  $p=0\cdot11$ ; clustering effect  $p=0\cdot36$ ;

## RESULTS : SECONDARY OUTCOMES

- ✓ The intervention was associated with a higher likelihood of receiving **reduced intensity treatment** (adjusted RR 1·38, 95% CI 1·06 to 1·78; p=0·015; clustering effect p=0·024).
- ✓ Patients in the intervention group had **fewer falls** over 3 months (35 [12%] of 298 patients vs 68 [21%] of 329 patients; adjusted RR 0·58, 95% CI 0·40–0·84; p=0·0035)
- ✓ Patients in the intervention group had more medications discontinued = **less polypharmacy** (mean adjusted difference 0·14, 95% CI 0·03–0·25; p=0·015).

# RESULTS : SECONDARY OUTCOMES

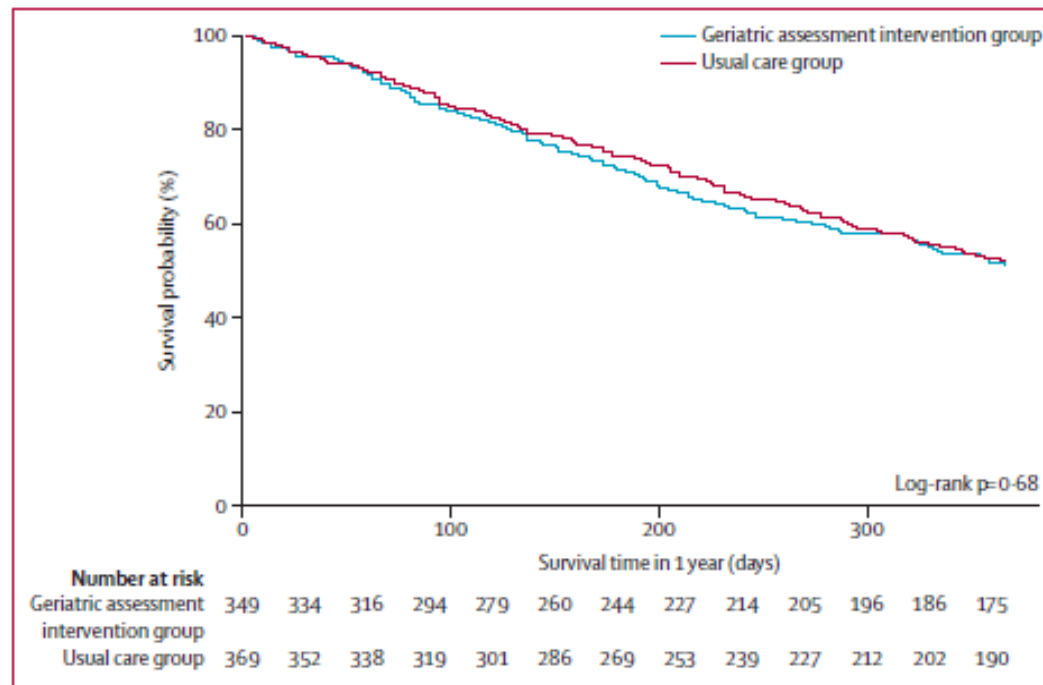


Figure 4: Survival over 1 year by study group

# CONCLUSION

- ✓ Geriatric assessment intervention reduced the risk of serious toxic effects from cancer treatment by over 20%.
- ✓ In the intervention group, more patients received reduced treatment intensity at cycle one (ie, primary dose reduction), indicating an effect on treatment decisions.
- ✓ Patients in the intervention group had fewer falls
- ✓ Patients in the intervention group had more medications discontinued, reducing polypharmacy.
- ✓ Reduced dose intensity in the intervention group did not compromise survival, which was similar between the study groups at 6 months and 1 year.

**Geriatric assessment with management should be integrated into the clinical care of older patients with advanced cancer and ageing-related conditions.**

## IN SUMMARY

- ✓ Frailty is common in older patients with cancer, making them more prone to adverse health outcomes.
- ✓ GA&M can improve the decision-making process and outcomes across a variety of settings.
- ✓ The assessment itself improves communication by highlighting risks and therefore leads to a broader understanding of the situation for both the treating oncologist and the patient and caregivers
- ✓ GA establishes a baseline status before cancer treatment is initiated. Without a baseline assessment of functional status, cognition, or mobility, it is difficult to notice and address deterioration in these domains during the course of treatment.
- ✓ Finally, current challenges are about implementation in daily practice. Various organization systems have been proposed and evaluated depending on the setting and on available resources.



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