



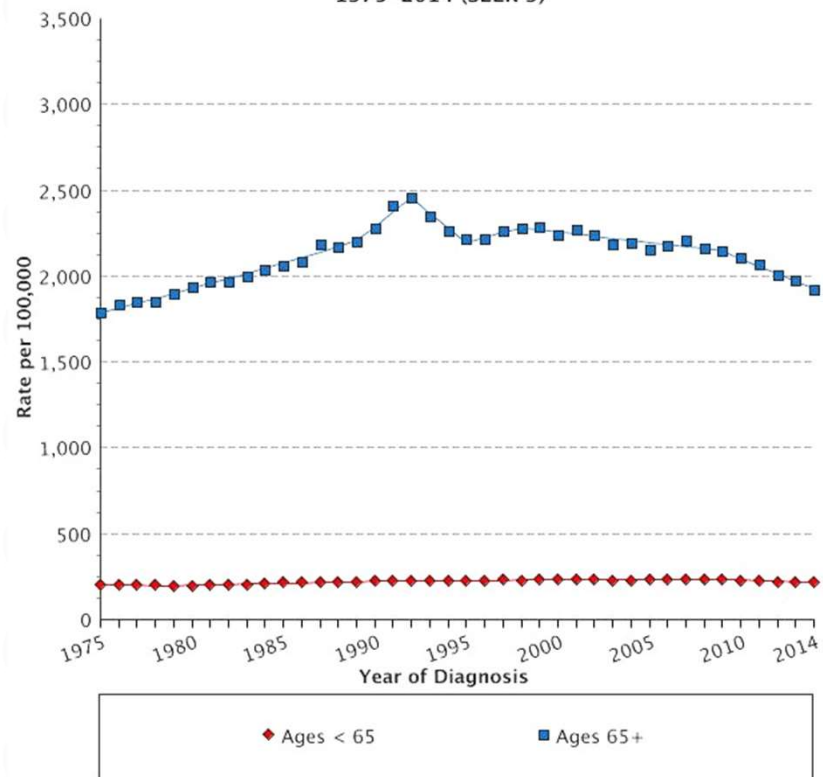
Older Adults with Cancer: Personalized Care

Rawad Elias, MD

Hematology-Oncology & Geriatrics - Hartford HealthCare Cancer Institute

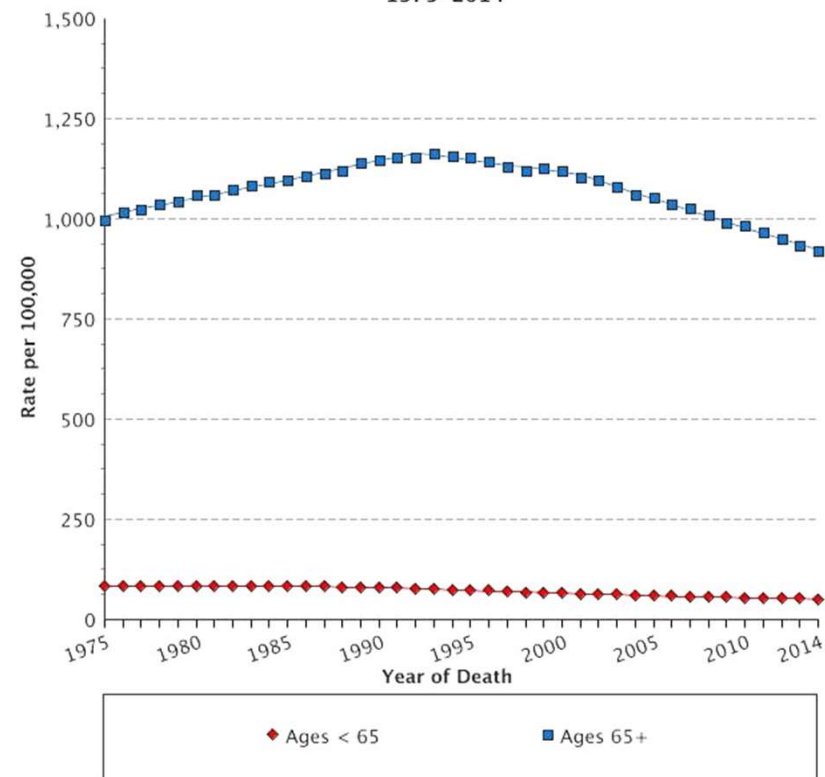
Assistant Professor – University Of Connecticut School of Medicine

Age-Adjusted SEER Incidence Rates
By Age
All Sites, All Races, Both Sexes
1975-2014 (SEER 9)

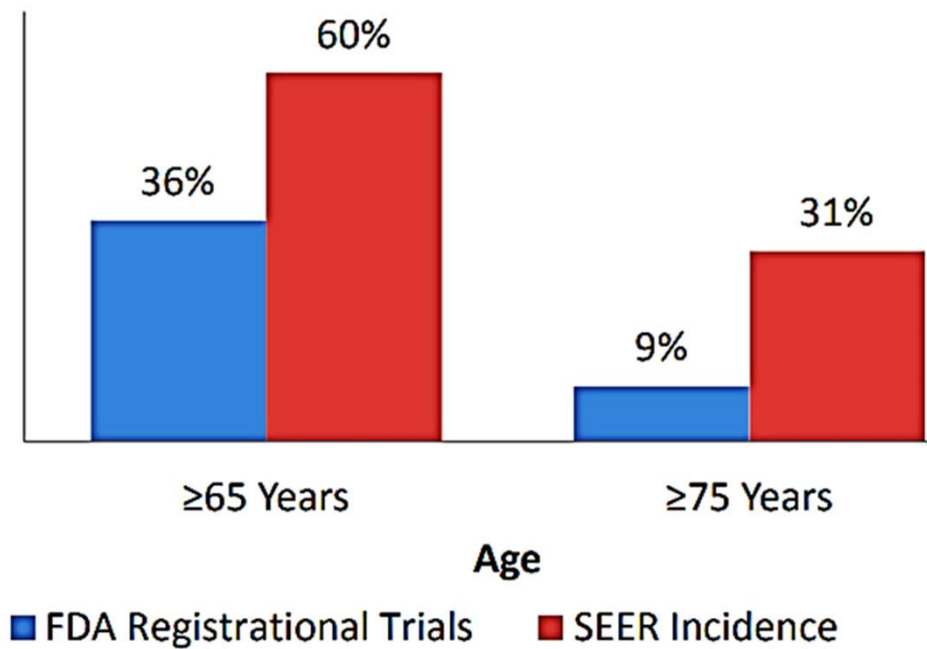
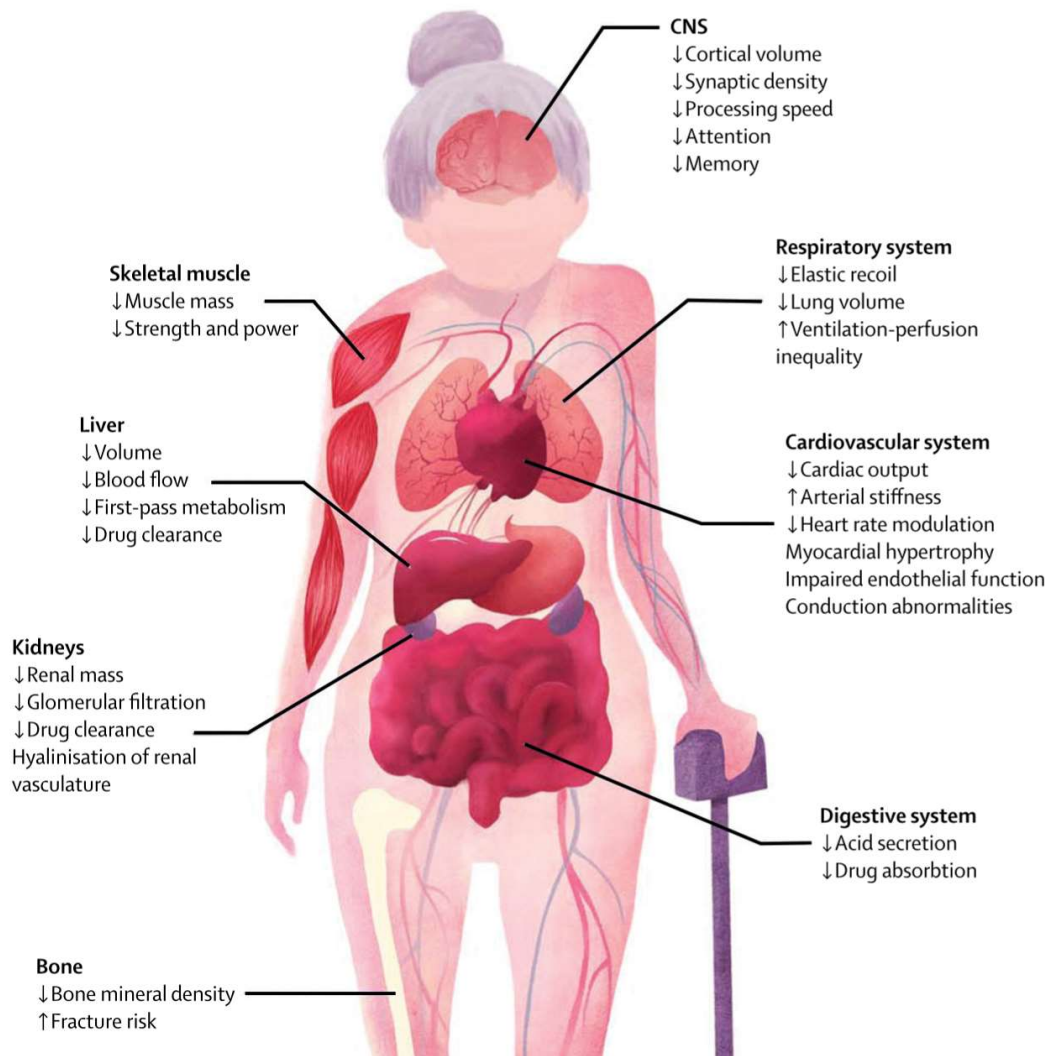


Cancer sites include invasive cases only unless otherwise noted.

Age-Adjusted U.S. Mortality Rates
By Age
All Sites, All Races, Both Sexes
1975-2014



Cancer sites include invasive cases only unless otherwise noted.



Older Adults with Cancer: How to Evaluate?



The “eyeball test” ?

Physicians’ judgement and comprehensive geriatric assessment (CGA)
select different patients as fit for chemotherapy

Domains of CGA	Category	Frail	Vulnerable	Fit		All n=
ADL	<100	6	38	49	42%	93
	=100	0	22	69		91
IADL	<8	6	36	46	39%	88
	=8	0	24	73		97
MNA	Poor	2	6	8	34%	16
	At risk	4	26	32		62
	Good	0	28	78		106

ECOG PS?

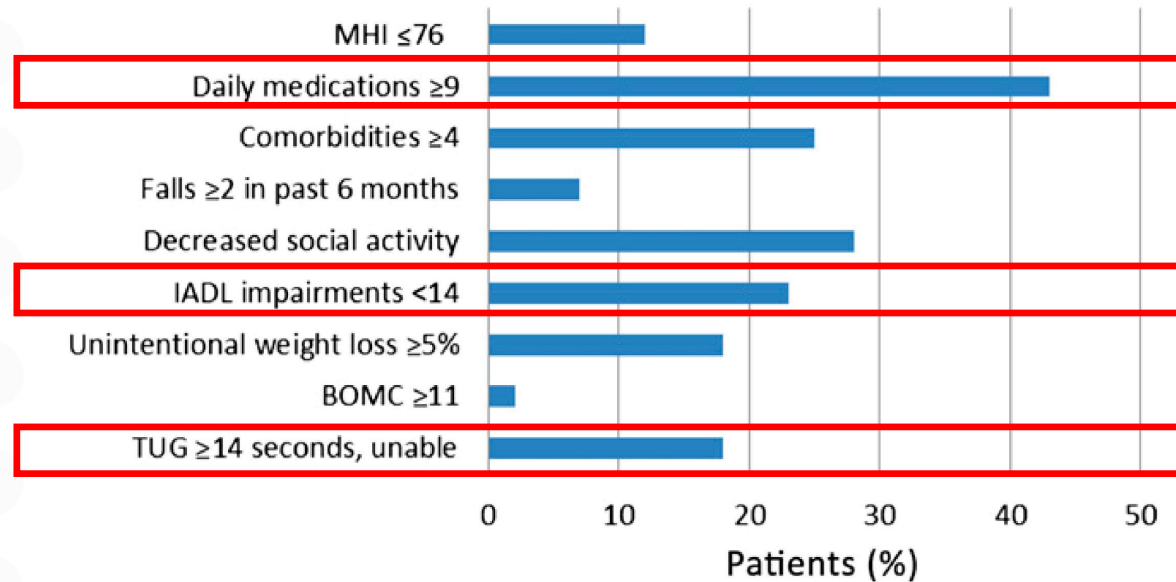
Comprehensive Geriatric Assessment Adds Information to Eastern Cooperative Oncology Group Performance Status in Elderly Cancer Patients: An Italian Group for Geriatric Oncology Study

Table 5. Association Between PS, Number of Comorbidities,* and CGA

	No. of Comorbidities ≥ 2	ADL- Dependent	IADL- Dependent	MMS- Impaired	GDS- Impaired
Good PS (< 2), %	13.0	9.3	37.7	27.6	31.7
Correlation coefficient	− .15	− .27	− .52	− .31	.30
P	.002	< .01	< .01	< .01	< .01

Performance Status: KPS?

Geriatric Assessment-Identified Deficits in Older Cancer Patients With Normal Performance Status

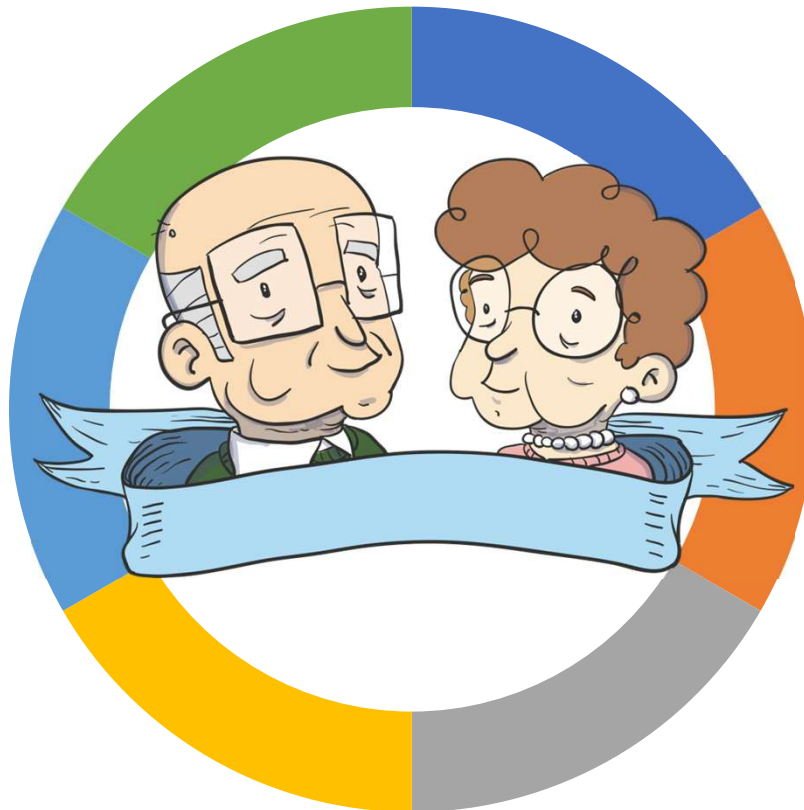


The Comprehensive Geriatric Assessment

Medication

**Psycho-
Social**

Nutrition



Function

Comorbidity

Cognition

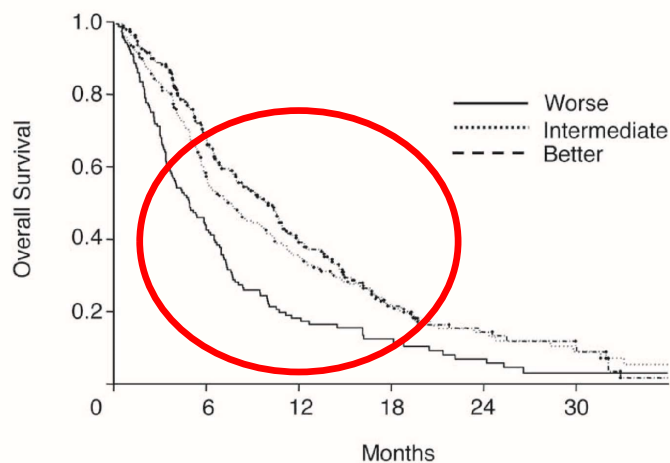
Geriatric Impairments in Older Adults with Cancer

Relevance of a systematic geriatric screening and assessment in older patients with cancer: results of a prospective multicentric study

	<i>n</i>	%	95% CI
Questionnaire completed by the treating physician (<i>n</i> = 1967)	1820	92.5	91.4–93.7
Patients with unknown geriatric problems detected (<i>n</i> = 1820)	931	51.2	48.9–53.5
Detected geriatric problems related to: (<i>n</i> = 931)			
Functionality	373	40.1	36.9–43.2
Nutrition	350	37.6	34.5–40.7
Fatigue	341	36.6	33.5–39.7
Falls	284	30.5	27.6–33.5
Depression	253	27.2	24.3–30.0
Pain	221	23.7	21.0–26.5
Cognition	177	19.0	16.5–21.5
Social status	95	10.2	8.3–12.2

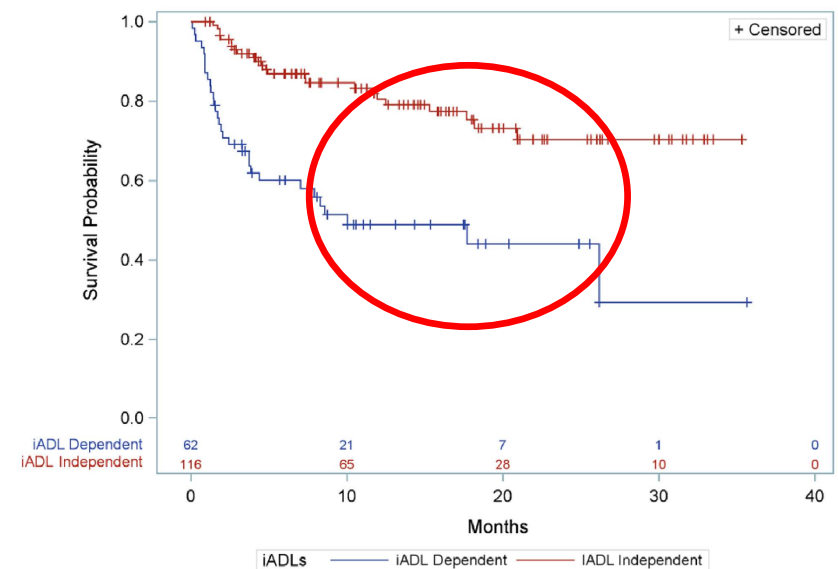
Geriatric Impairments in Oncology: Survival

Pretreatment Quality of Life and Functional Status Assessment Significantly Predict Survival of Elderly Patients With Advanced Non–Small-Cell Lung Cancer Receiving Chemotherapy: A Prognostic Analysis of the Multicenter Italian Lung Cancer in the Elderly Study



Kaplan-Meier—estimated overall survival curves according to pretreatment IADL categories

Function, Survival, and Care Utilization Among Older Adults With Hematologic Malignancies



Kaplan-Meier curves depicting association between IADL dependency and survival in aggressive hematologic malignancies.

Geriatric Impairments in Oncology: Survival

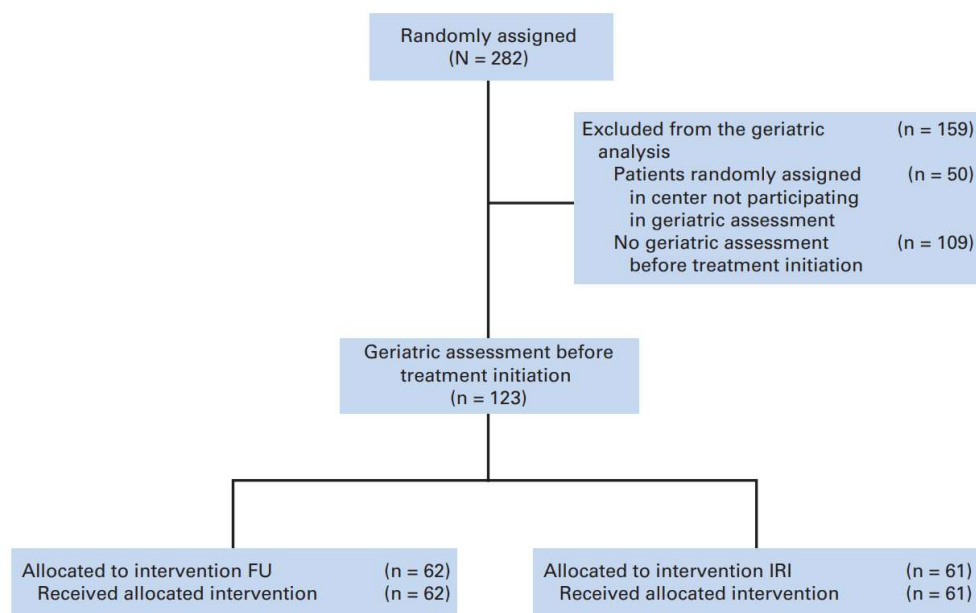
Predictors of Early Death Risk in Older Patients Treated With First-Line Chemotherapy for Cancer

Table 4. Logistic Regression Model Analysis for Early Deaths (within 6 months) That Occurred for All Patients Who Received First-Line Chemotherapy (n = 339)

Risk Factor*	Odds Ratio	95% CI	P
Mini Nutritional Assessment			
Good nutrition, score > 23.5	1	Reference	
At risk/poor nutrition, score ≤ 23.5	2.77	1.24 to 6.18	.013
Localized	1	Reference	
Advanced	3.9	1.59 to 9.73	.003
Timed Get Up and Go			
No impairments (≤ 20 seconds)	1	Reference	
Impaired	2.55	1.32 to 4.94	.006
Impaired	2.55	1.32 to 4.94	.006

Geriatric Impairments in Oncology: Treatment Tolerability

Geriatric Factors Predict Chemotherapy Feasibility:
Ancillary Results of FFCCD 2001-02 Phase III Study in
First-Line Chemotherapy for Metastatic Colorectal Cancer
in Elderly Patients



Geriatric Impairments in Oncology: Treatment Tolerability

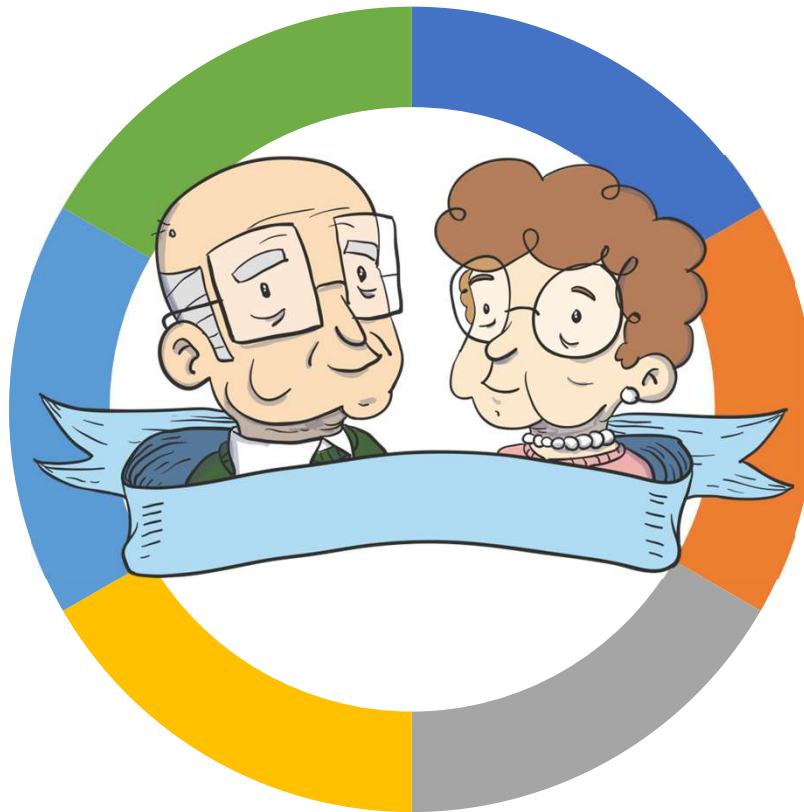
Geriatric Factors Predict Chemotherapy Feasibility:
Ancillary Results of FFCD 2001-02 Phase III Study in
First-Line Chemotherapy for Metastatic Colorectal Cancer
in Elderly Patients

Table 3. Multivariate Analysis for Grade 3 to 4 Toxicity

Predictive Factor	OR	95% CI	P
Female	1.53	0.50 to 4.71	.454
Impaired cognitive function (MMSE \leq 27/30)	3.84	1.24 to 11.84	.019
No previous adjuvant chemotherapy	3.85	0.67 to 22.03	.130
Irinotecan arm	5.03	1.61 to 15.77	.006
Impaired autonomy (IADL)	4.67	1.42 to 15.32	.011
Better mood	0.41	0.12 to 1.36	.145

The Comprehensive Geriatric Assessment

ONCOLOGY



“Fitness”
Assessment

Geriatric
Interventions

Prediction of
Chemotherapy
Toxicity

Prediction of
Surgical
Toxicity

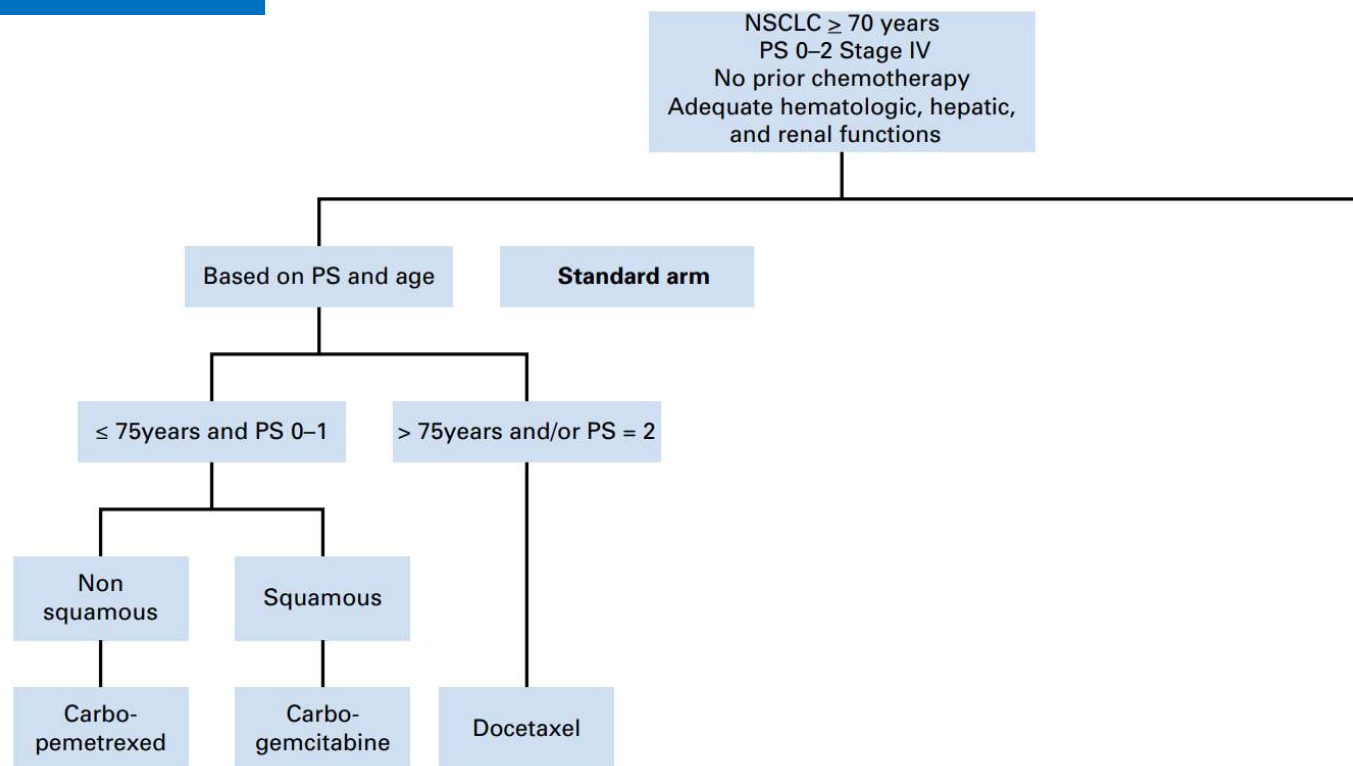
“Fitness” Assessment

Treatment
Options

Treatment
Preferences

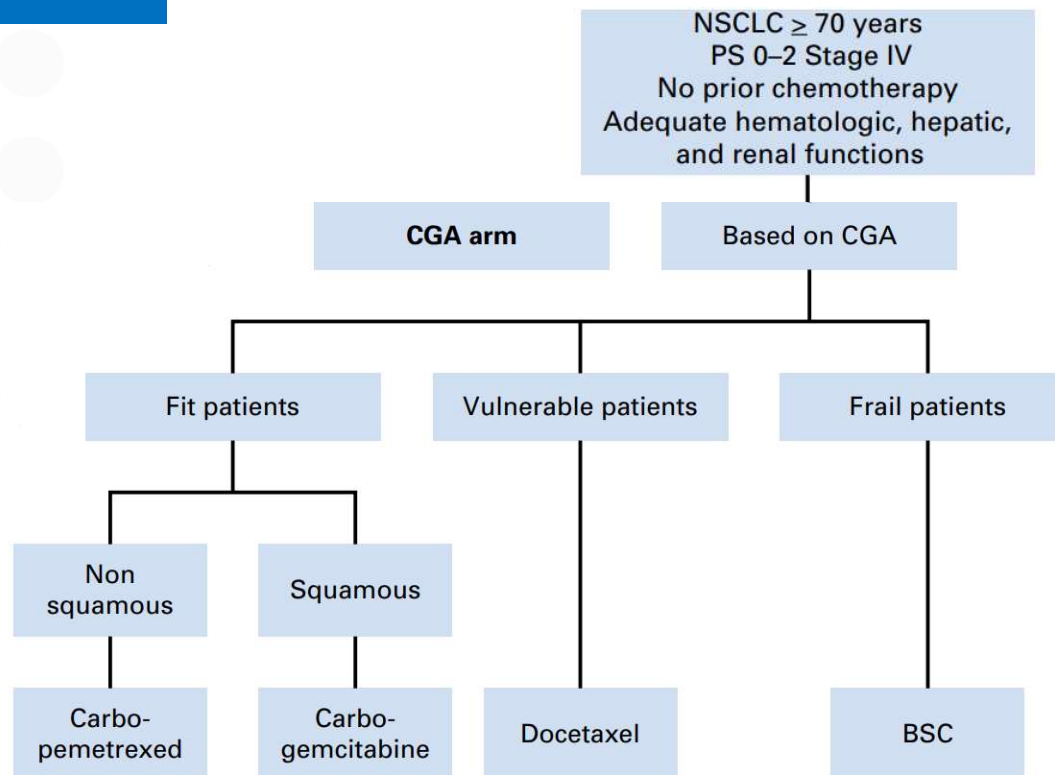
“Fitness” Assessment

Use of a Comprehensive Geriatric Assessment for the Management of Elderly Patients With Advanced Non–Small-Cell Lung Cancer: The Phase III Randomized ESOGIA-GFPC-GECP 08-02 Study



“Fitness” Assessment

Use of a Comprehensive Geriatric Assessment for the Management of Elderly Patients With Advanced Non–Small-Cell Lung Cancer: The Phase III Randomized ESOGIA-GFPC-GECP 08-02 Study



“Fitness” Assessment

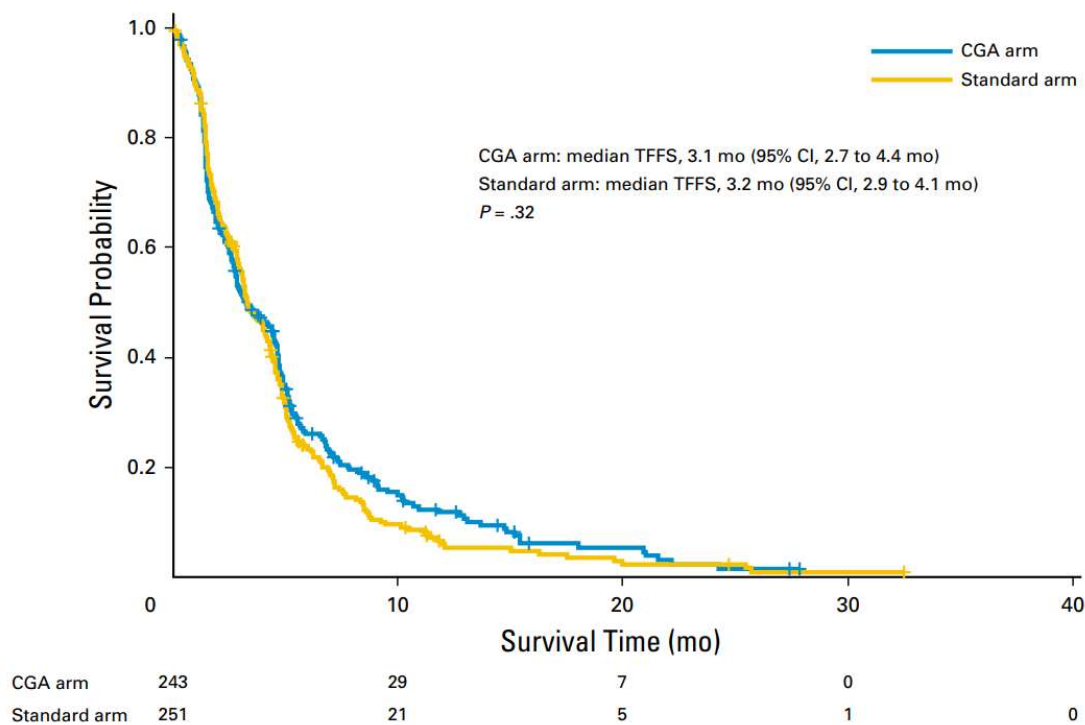
Use of a Comprehensive Geriatric Assessment for the Management of Elderly Patients With Advanced Non–Small-Cell Lung Cancer: The Phase III Randomized ESO GIA- GFPC-GECP 08-02 Study

Table 1. Definition of Fit, Vulnerable, and Frail Patients in the CGA Arm

Geriatric Parameters	Fit: All Criteria	Vulnerable: One of the Bold Criteria	Frail: One of the Bold Criteria
PS	0 or 1	2	0-2
ADL (0-6)	6	6	≤ 5
IADL (0-4)	0	1	≥ 2
Schultz-Larsen MMSE (0-11)	≥ 9		
Folstein MMSE (0-30)		> 23	≤ 23
Geriatric syndrome	No	No	Yes
Charlson comorbidity index	0-1	2-3	≥ 4 (≥ 3 if > 80 years)
GDS5 (0-5)	0-1	2-3	4-5

“Fitness” Assessment

Use of a Comprehensive Geriatric Assessment for the Management of Elderly Patients With Advanced Non-Small-Cell Lung Cancer: The Phase III Randomized ESOGIA-GFPC-GECP 08-02 Study



“Fitness” Assessment

Use of a Comprehensive Geriatric Assessment for the Management of Elderly Patients With Advanced Non–Small-Cell Lung Cancer: The Phase III Randomized ESOGIA-GFPC-GECP 08-02 Study

Table 3. Treatments and Outcomes

Treatment and Outcome	Standard Arm (n = 251)	CGA Arm (n = 243)	P (Log-Rank Test)
Treatment allocation, No. (%)			< .001
Monotherapy	163 (64.9)	76 (31.3)	
Doublet	88 (35.1)	111 (45.7)	
BSC		56 (23.0)	
Median OS, months			.87
All	6.4	6.1	
Doublet	8.6	10.0	
Monotherapy	5.7	4.9	
BSC	—	2.8	

“Fitness” Assessment

Prediction of Chemotherapy Toxicity

Prediction of Chemotherapy Toxicity

Predicting Chemotherapy Toxicity in Older Adults With
Cancer: A Prospective Multicenter Study

Table 2. Patient Characteristics (N = 500)

Characteristic	No. of Patients	% Patients
Age, years		
65-69	175	35
70-74	127	25
75-79	105	21
80-84	73	15
85-91	20	4
Sex		
Female	281	56
Male	219	44
Cancer type		
Breast	57	11
Lung	143	29
GI	135	27
GYN	87	17
GU	50	10
Other	28	6
Cancer stage		
I	23	5
II	59	12
III	109	22
Limited	2	0
IV/extensive	307	61

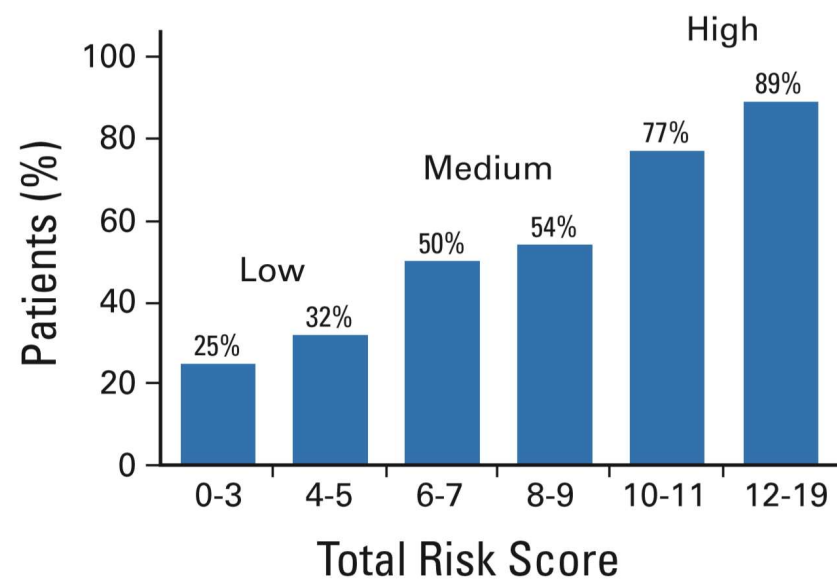
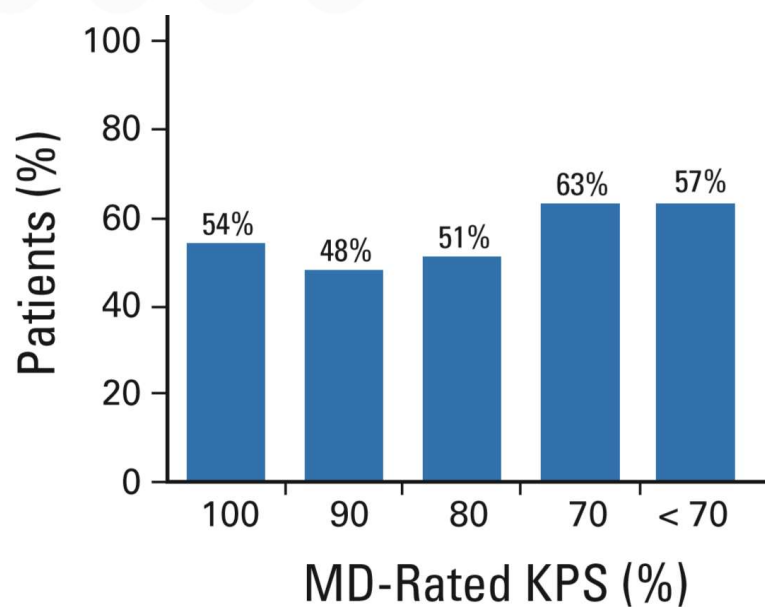
Prediction of Chemotherapy Toxicity

Predicting Chemotherapy Toxicity in Older Adults With
Cancer: A Prospective Multicenter Study

CARG Grade 3-5 Toxicity Variable	Score
Age \geq 72 years	2
GI/genitourinary cancers	3
Standard dose chemotherapy	3
Polychemotherapy	2
Anemia (male $<$ 11 g/dL; female $<$ 10 mg/dL)	3
Creatinine clearance $<$ 34 mL/min (Jelliffe equation, ideal body weight)	3
Falls in the last 6 months (more than one)	3
Hearing impairment (fair/worse)	2
Limited ability to walk one block (somewhat limited/limited a lot)	2
Requires assistance with medications (some help/unable)	1
Decreased social activities (limited at least sometimes)	1

Prediction of Chemotherapy Toxicity

Predicting Chemotherapy Toxicity in Older Adults With
Cancer: A Prospective Multicenter Study



Prediction of Chemotherapy Toxicity

Predicting Chemotherapy Toxicity in Older Adults With
Cancer: A Prospective Multicenter Study

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Decreased social activities (limited at least sometimes)	1

Prediction of Chemotherapy Toxicity

Predicting the Risk of Chemotherapy
Toxicity in Older Patients: 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

Prediction of Chemotherapy Toxicity

Predicting the Risk of Chemotherapy
Toxicity in Older Patients: The Chemotherapy
Risk Assessment Scale for High-Age Patients
(CRASH) Score

Sample	CRASH score (points / % with severe toxicity)			Risk Category
	Heme subscore	Non-Heme subscore	Combined score	
Derivation (n=347)	0-1: 7%	0-2: 33%	0-3: 50%	Low
	2-3: 23%	3-4: 46%	4-6: 58%	Int-Low
	4-5: 54%	5-6: 67%	7-9: 77%	Int-High
	Greater than 5: 100%	Greater than 6: 93%	Greater than 9: 79%	High
Validation	0-1: 12%	0-2: 42%	0-3: 61%	
	2-3: 35%	3-4: 59%	4-6: 72%	
	4-5: 45%	5-6: 66%	7-9: 77%	
	Greater than 5: 50%	Greater than 6: 100%	Greater than 9: 100%	

“Fitness”
Assessment

Geriatric
Interventions

Prediction of
Chemotherapy
Toxicity

Prediction of
Surgical
Toxicity

Geriatric Interventions

Assessment Options

Process Options

1. Both ADL/IADL
2. IADL
3. Gait speed
4. ADL

1. Physical Therapy
2. Occupational Therapy
3. Home Safety Evaluation
4. Refer to social work
5. Evaluate Fall Risk
6. Exercise

1. Mini Mental State Examination
2. Montreal Cognitive Assessment
3. Blessed OMC

1. Involve caregiver
2. Assess/minimize medications
3. Delirium prevention
4. Refer to social work
5. Assess capacity and ability to consent to treatment
6. Identify health care proxy
7. Cognitive testing/neuropsychology referral

1. Caregiver burden/support
2. Medical Outcomes Study Survey
3. Social Support from Medical History

1. Refer to social work
2. Transportation Assistance
3. Nursing/Home Health
4. Caregiver Management
5. Home Safety Evaluation
6. Support groups
7. Refer to Psychiatry/Psychology
8. Spiritual Care

“Fitness”
Assessment

Geriatric
Interventions

Prediction of
Chemotherapy
Toxicity

Prediction of
Surgical
Toxicity



ASCO 2020

Geri Onc Research

Geriatric Assessment-driven Intervention (GAIN) on chemotherapy toxicity in older adults with cancer: a randomized controlled trial

Daneng Li, Can-Lan Sun, Heeyoung Kim, Vincent Chung, Marianna Koczywas, Marwan Fakih, Joseph Chao, Leana Chien, Kemeberly Charles, Simone Fernandes Dos Santos Hughes, Monica Trent, Elsa Roberts, Enrique Soto Perez De Celis, Reena Jayani, Vani Katheria, Jeanine Moreno, Cindy Kelly, Mina Sedrak, Arti Hurria, William Dale

City of Hope, Duarte, CA

This work was supported by the Unihealth Foundation, the Hearst Foundation, and City of Hope's Center for Cancer and Aging.



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ANNUAL MEETING

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PRESENTED BY: Daneng Li, MD

Confidential and Proprietary Information

November 11, 2020

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National Healthcare
Cancer Institute



Study Design

City of Hope

Eligibility

- Age ≥65
- Solid tumor
- All stages
- Starting a new chemotherapy
- English, Spanish or Chinese speakers

Baseline Geriatric Assessment (Pre-Chemotherapy)

RANDOMIZATION (2:1)
n = 600

GAIN_{ARM}

Usual Care
+
Geriatric
Assessment-Driven
Interventions
n = 398

SOC_{ARM}

Standard of Care
n = 202

Followed until End of Chemotherapy or
6 mo Post Initiation of Chemotherapy
(whichever comes first)

Geriatric Assessment

• Primary endpoints:

- Incidence of grade 3-5 chemo toxicity (NCI CTCAE 4.0)

• Secondary endpoints:

- Advance directive completion
- Unplanned hospitalizations
- Emergency room visits
- Average length of stay (ALOS)

NCT02517034

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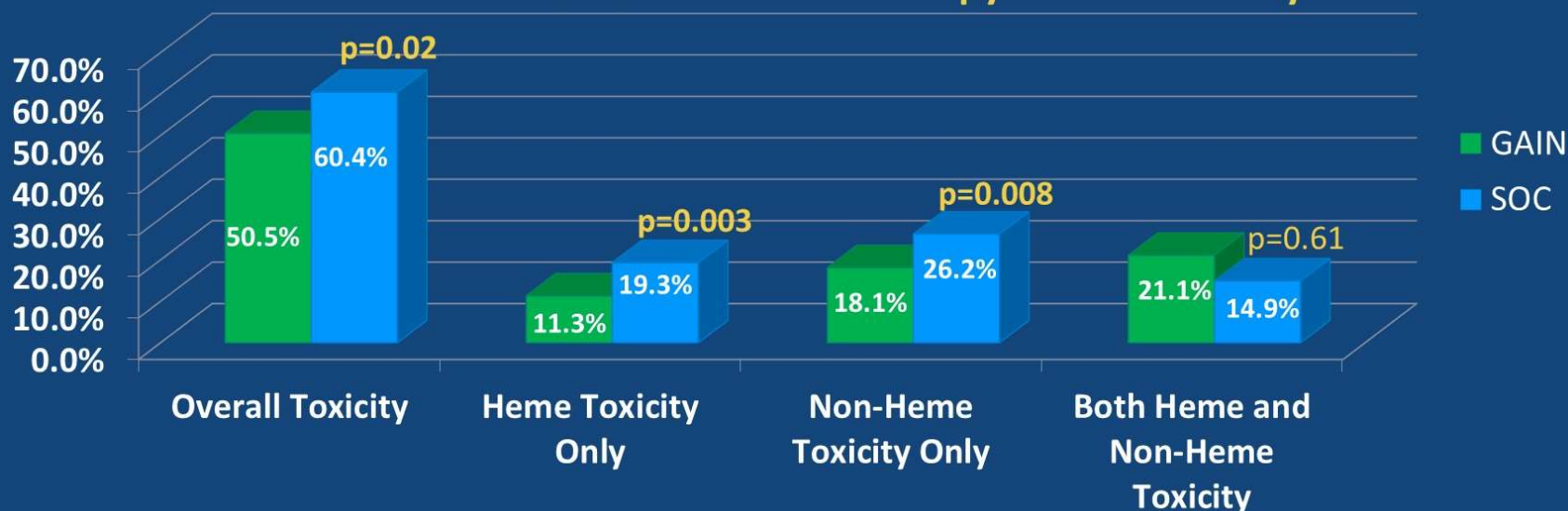
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4

Results: Primary Endpoint

Incidence of Grade 3-5 Chemotherapy-Related Toxicity

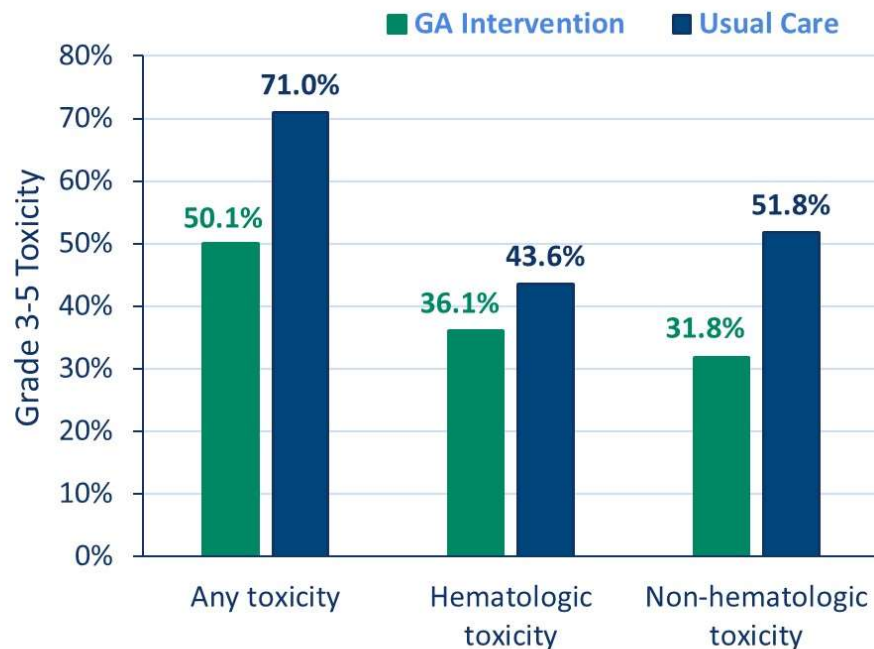


The GAIN arm had a statistically significant reduction of 9.9% (95% CI: 1.6-18.2%, **p=0.02**) in chemo-related toxicity compared to the SOC arm

A Geriatric Assessment (GA) intervention to reduce treatment toxicity in older patients with advanced cancer: A University of Rochester Cancer Center NCI Community Oncology Research Program cluster randomized controlled trial (CRCT)

Supriya G. Mohile, Mostafa Mohamed, Eva Culakova, Huiwen Xu, Kah Poh Loh, Allison Magnuson, Marie Flannery, Erika Ramsdale, Richard Dunne, Nikesha Gilmore, Spencer Obrecht, Amita Patil, Sandy Plumb, Lisa M. Lowenstein, Michelle Janelins, Karen Mustian, Judy Hopkins, Rakesh Gaur, Jeffrey Berenberg, William Dale

Any Grade 3-5 CTCAE Toxicity in 3 Months



- Any Grade 3-5 Toxicity

Adjusted Risk Ratio: 0.74

95% CI: (0.63-0.87), $P < 0.01$

Clustering effect: $P = 0.15$

- Any Grade 3-5 Hematologic Toxicity

Adjusted Risk Ratio: 0.85

95% CI: (0.69-1.05), $P = 0.13$

Clustering effect: $P = 0.30$

- Any Grade 3-5 Non-hematologic Toxicity

Adjusted Risk Ratio: 0.73

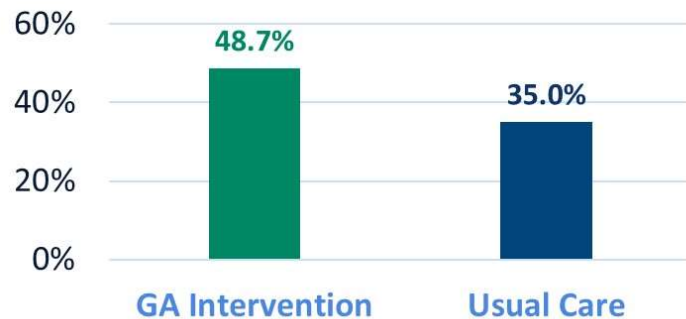
95% CI: (0.53-0.996), $P = 0.047$

Clustering effect: $P < 0.01$

Treatment Intensity

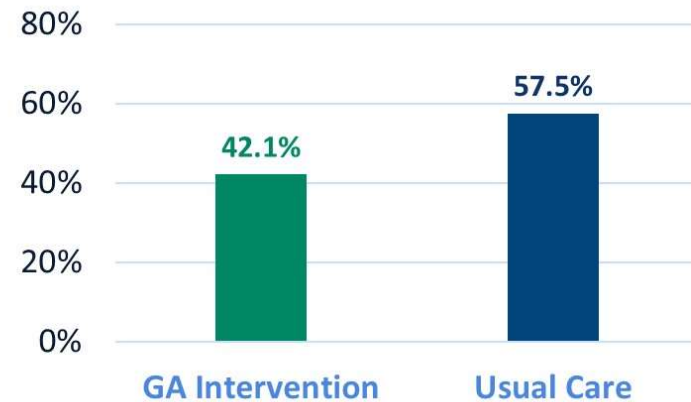
- Adjusted Risk Ratio=1.37
95% CI: (1.06-1.76), P=0.016
Clustering effect: P=0.03

Reduced Dose Intensity at Cycle 1



- Adjusted Risk Ratio=0.85
95% CI: (0.67-1.08), P=0.190
Clustering effect: P<0.01

Dose modification at 3 months Related to Toxicity



Integrated Geriatric Assessment and Treatment (INTEGRATE) in older people with cancer planned for systemic anti-cancer therapy

Wee-Kheng Soo, Madeleine King, Alun Pope, Phillip Parente, Pēteris Dārziņš, Ian D. Davis
Eastern Health and Monash University, Australia

Clinical Trials Registry ANZCTR.org.au, [ACTRN12614000399695](https://www.anzctr.org.au/Trial/Registration/TrialRegistration.aspx?ACTRN12614000399695)

easternhealth



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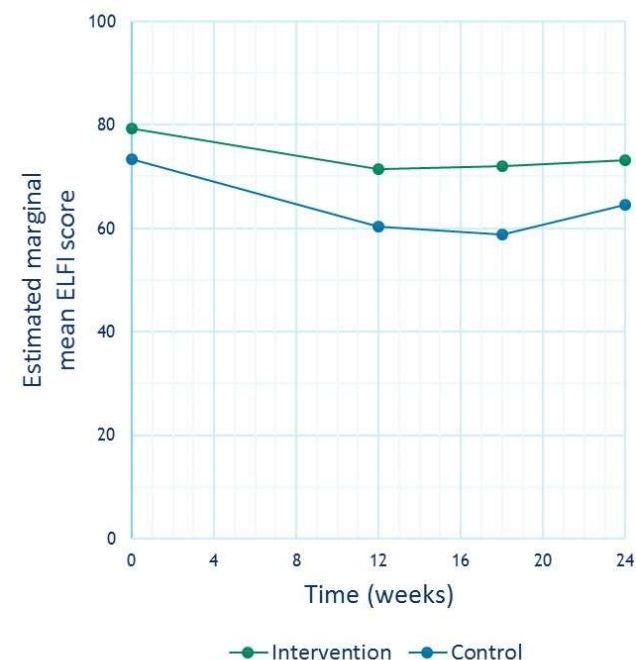
Abstract number 12011

 @KhengSoo1

1

Primary outcome: Health-related Quality of Life

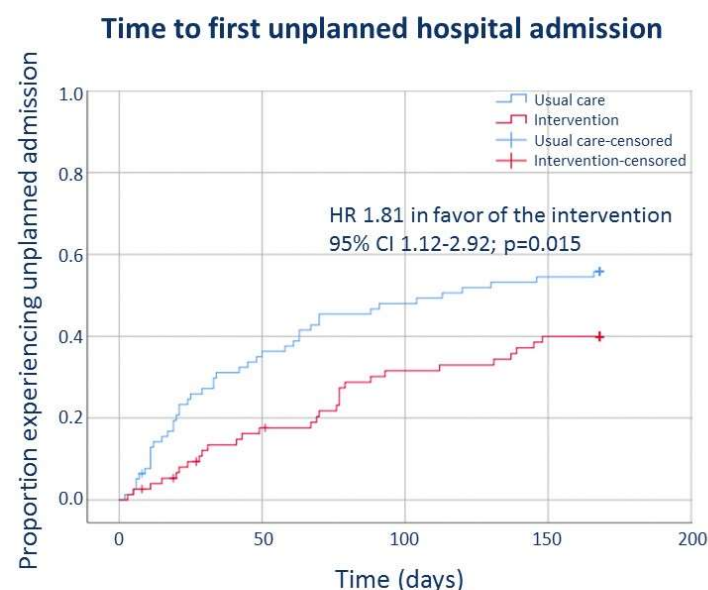
ELderly Functional Index (ELFI) Estimated Marginal Mean Score				
Week	Intervention	Usual Care	Difference (95% CI)	<i>p</i>
12	71.4	60.3	11.1 (3.5-18.7)	0.004
18	72.0	58.7	13.4 (5.5-21.2)	0.001
24	73.1	64.6	8.5 (0.5-16.5)	0.037



Secondary outcomes: Hospitalization

- **39% less emergency presentations**
 - Incidence rate ratio (IRR)* 0.61 (95% CI 0.46-0.77, $p=0.007$)
 - -1.3 emergency presentations per person-year
- **41% less unplanned hospital admissions**
 - IRR* 0.59 (95% CI 0.41-0.86, $p<0.001$)
 - -1.2 admissions per person-year
- **24% less unplanned hospital overnight bed-days**
 - IRR* 0.76 (95% CI 0.68-0.85, $p<0.001$)
 - -7.0 days per person-year

* Adjusted for age, gender, ECOG-PS, cancer type and treatment intent



Results

Intention-to-treat (ITT) analyses

Clinical Outcomes	Usual Care	Intervention	P
Postoperative hospital stay	8.21 days	7.23 days	0.374
Rates of postoperative ICU use	32.4%	23.2%	0.231
Rates of readmission within 90-days	25.0%	21.7%	0.652

Per protocol (PP) analyses

Clinical Outcomes	Usual Care	Intervention	P
Postoperative hospital stay	8.21 days	5.90 days	0.024
Rates of postoperative ICU use	32.4%	13.3%	0.049
Rates of readmission within 90-days	25.0%	16.7%	0.362



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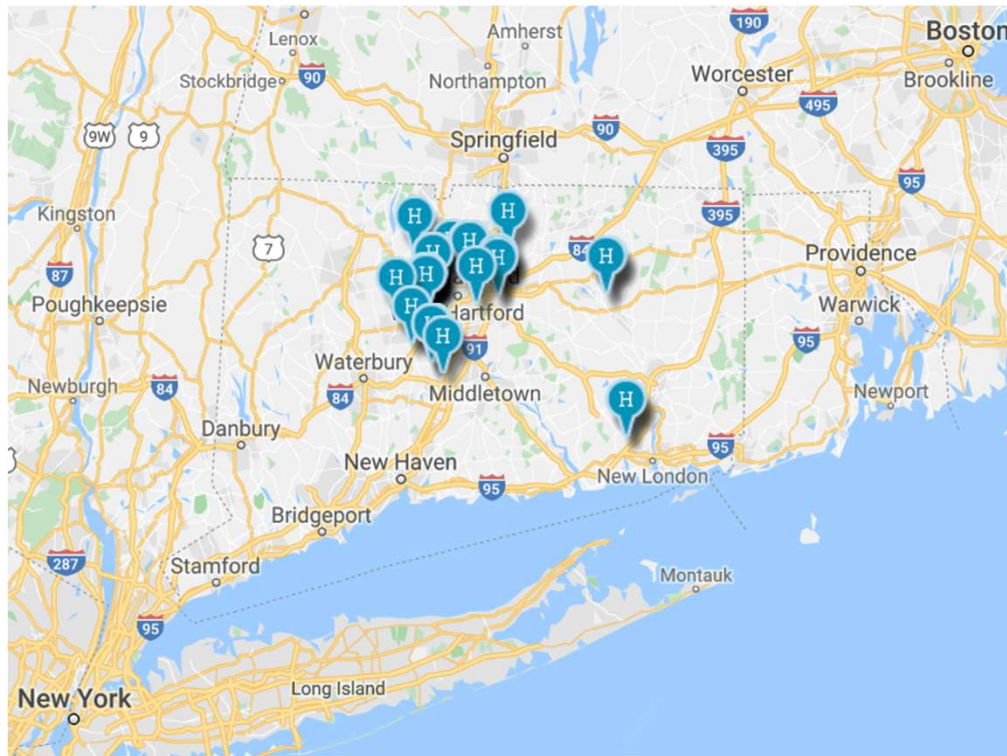
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PRESENTED BY: RYAN NIPP  @RyanNipp

<https://www.massgeneral.org/cancer/outcomes-research/>

18

COACH Team Present & Future





The Age Factor in Cancer Care

How asking for a geriatric assessment can improve your treatment

by Cheryl Platzman Weinstock, February 13, 2020 |

Fifteen years ago, Jane Morello, 78, was diagnosed with stage 3 breast cancer. She had her lymph nodes removed, followed by chemotherapy, radiation and a five-year course of medication.

Last July, Morello was diagnosed with [pancreatic cancer](#). “This is very tough. Breast cancer was a lot easier,” she says.

But Morello considers herself lucky to be in the hands of a geriatric oncologist who, before recommending treatment, ordered an age-related assessment.

The multidisciplinary exam screens for a variety of problems that the “eyeball test” misses, says her doctor, Rawad Elias at Hartford Healthcare Cancer Institute in Connecticut. “For Jane, I wanted to know how fit she really is so I can tell how we can treat her,” he says.

International Society of Geriatric Oncology Consensus on Geriatric Assessment in Older Patients With Cancer

Hans Wildiers, Pieter Heeren, Martine Puts, Eva Topinkova, Maryska L.G. Janssen-Heijnen, Martine Extermann, Claire Falandry, Andrew Artz, Etienne Brain, Giuseppe Colloca, Johan Flamaing, Theodora Karnakis, Cindy Kenis, Riccardo A. Audisio, Supriya Mohile, Lazzaro Repetto, Barbara Van Leeuwen, Koen Milisen, and Arti Hurria

NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®)

Older Adult Oncology

Version 1.2019 — January 8, 2019

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. Janelsins, Alok A. Khorana, Heidi D. Klepin, Stuart M. Lichtman, Karen M. Mustian, William P. Tew, and Arti Hurria





Hartford HealthCare

Cancer Institute

