Please go to pollEv.com/ravi1214 For your responses

Geriatric Oncology

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85 year old patient with breast cancer

Frailty





- Medical Conditions"
 - HTN
 - Hyperlipidemia
 - COPD
 - DM
 - Hypothyroid
 - Chronic arthritis
 - Dementia
 - CAD
 - CRI
 - H/O Fall and hip fracture

- Nurse NP/PA Physical therapist Pharmacist Nutritionist Social worker Other specialists
 - Medications



Geriatrician

- Lisinopril
- Donepezil
- Insulin
- Atorvastatin
- Synthroid
- Tylenol#3
- Allopurinol
- Albuterol Inhaler

Geriatric Oncology

- Geriatric oncology has been defined as multidimensional and multidisciplinary approach for the care of older patients with cancer
- Treatment and management of cancer in older adults is one of the very challenging issues in medical oncology

What is QoL

 WHO: 'A state of complete physical, mental, and social well-being not merely the absence of disease' and 'an individual's perception of their position in life.

Historical Perspective

Ancient time

- Progressive loss of resilience was believed to be the unescapable consequence of aging
- The Latin playwright Publius Terentius wrote Senectus Ipsa Est Morbus ("Old age is in itself sickness")
- In 20th century it was realized that aging was a complex situation
 - Resulting from a combination of different physical, emotional, social, and cultural domains and deserved the attention of researchers
- Term Gerontology was introduced by Ilya Iliych Mechnicov in 1903

Historical Perspective



Pre-Historic time:

Age was considered just a prognostic and predictive variable

most clinical trials excluded patients older than 65 or 70

Reduced doses of chemotherapy for older individuals

Second period:

Collect reliable information on the risks and benefits of cancer treatment in older adults

Combined conference by the National Institute on Aging and the National Cancer Institute in the early 1980s

worldwide call went out to study cancer in the older patient

Third Period: Practical realization of the principles developed

Cooperative multi-institutional research in cancer and aging

Comprehensive Geriatric Assessment toolkit

Multidisciplinary diagnostic and treatment process developed

1887	 The National Institutes of Health, founded in 1887 		
1907	 The American Association of Cancer Research 		
1937	The National Cancer Institute		
1942	 The American Geriatrics Society 		
1945	 The Gerontological Society of America 		
1964	• The American Society of Clinical Oncology (ASCO)		
1975	 The European Society for Medical Oncology 		
2000	 The International Society of Geriatric Oncology 		
2014	 National Comprehensive Cancer Network (NCCN) Clinical Practice Guidelines in Oncology: Senior Adult Oncology 		

What is Older?

- WHO 60 years or more
- Retirement many countries 65-67 years
- In politics = 70-75 years (Used to be)
- Geriatrics 65 years
- In Geriatric sense 80 years or older have more chances to have a pathology

Elderly population

- Increased life expectancy
 - Better treatment of infection
 - Improvement in managing chronic disease
 - Technological advances
- Growing older adult population
 - >65 year 56 million (Yr. 2020) to 73 million (year 2030)
 - >85 years 2% (year 2020) to 5% (year 2060)
 - 1 out of 5 American would be more than 65 years





U.S. Department of Commerce U.S. CENSUS BUREAU census.gov Source: National Population Projections, 2017 www.census.gov/programs-surveys /popproj.html

March 2018: United States Census Bureau

Percent of New Cases by Age Group: Cancer of Any Site



SEER 21 2014–2018, All Races, Both Sexes. https://seer.cancer.gov/statfacts/html/all.html

Age specific death rate from cancers



Age-specific (Crude) SEER US incidence rates of all cancer sites combined, all ages, all races, both sexes 2000–2010.

Multiple comorbid conditions in older population



Barnett, The Lancet 2012

Case

- 80 year old female was diagnosed with renal cell carcinoma with multiple bony metastatic lesions
- She had some flank pain but otherwise remains asymptomatic

Case Cont..

- Past Medical/Surgical History: Hypertension, Osteoporosis, Hyperlipidemia, S/P lumpectomy for Breast Cancer 1998
- Medications: Atenolol, Simvastatin, Vitamin D and Aspirin 81mg

• Allergies: no drug allergies

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Vulnerability and Frailty in Older Medicare Beneficiaries



COVID Pandemic Unmasked the Vulnerabilities

- Adherence to complex often risky treatment plans
- Anxiety and depression because of social isolation and fear of infection
- Concerns about rationing of care
- Malnutrition from inadequate support for food acquisition and preparation

Chronological age vs. functional age



It is the functional age that determines management in older cancer patients

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THE LANCET Oncology

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Series

Elderly patients with metastatic renal cell carcinoma: position paper from the International Society of Geriatric Oncology

Ravindran Kanesvaran MD ª A 🖾, Olivia Le Saux MD ^d, Prof Robert Motzer MD ^b, Toni K Choueiri MD ^c, Florian Scotté PhD ^e, Joaquim Bellmunt MD ^{c, f}, Vincent Launay-Vacher PharmD ^g



Figure: Algorithm for the management of elderly patients with mRCC

CGA=comprehensive geriatric assessment. mRCC=metastatic renal cell carcinoma.

Trajectory of functional status



Frailty

- Frailty is due to multifunction reduction of reserve capacity
- Frail patients are vulnerable to adverse events
 - Toxicity
 - Complications
 - Functional decline
 - Death



Broken Chair

By Daniel Berset in 1997 at the request of Humanity & Inclusion

Place des Nations, in front of the United Nations headquarters in Geneva

Frailty

- Does not mean disqualification from further care or treatments
- Frailty should be used to include not exclude
- Entry point
- Why patient is frail
- What interventions are needed

Belloni G, Cesari M. Frailty and Intrinsic Capacity: Two Distinct but Related Constructs. *Front Med (Lausanne)*. 2019;6:133. Published 2019 Jun 18. doi:10.3389/fmed.2019.00133

Geriatric Screening tools

- Recommended by SIOG
 - G8 (most common)
 - TRST
 - VES-13
- G-8 screening
 - Includes 8 items
 - 7from MNA
 - 1 related to age category (<80; 80-85; >85)
 - Score of 14 or less is considered abnormal

JOURNAL OF CLINICAL ONCOLOGY

ORIGINAL REPORT

Performance of Two Geriatric Screening Tools in Older Patients With Cancer

Cindy Kenis, Lore Decoster, Katrien Van Puyvelde, Jacques De Grève, Godelieve Conings, Koen Milisen, Johan Flamaing, Jean-Pierre Lobelle, and Hans Wildiers



Screening older cancer patients: first evaluation of the G-8 geriatric screening tool

C. A. Bellera^{1,2*}, M. Rainfray^{3,4}, S. Mathoulin-Pélissier^{1,2,5}, C. Mertens^{4,6}, F. Delva¹, M. Fonck⁶ & P. L. Soubeyran⁶

¹Clinical Research and Clinical Epidemiology Unit, Institut Bergonié, Regional Comprehensive Cancer Centre, Bordeaux; ²INSERM CIC-EC7, ISPED, Bordeaux University, Bordeaux; ³SFR Public Health, Bordeaux University, Bordeaux; ⁴Department of Clinical Gerontology, Bordeaux University Hospital, Bordeaux; ⁵INSERM U897 - Epidemiology and Biostatistics, ISPED, Bordeaux University, Bordeaux; ⁶Department of Medical Oncology, Institut Bergonié, Regional Comprehensive Cancer Centre, Bordeaux, France



Figure 1. Receiver operating curve (sensitivity versus 1-specificity) for the G-8 screening tool against the reference exam consisting of seven comprehensive geriatric assessment questionnaires (at least one abnormal score versus none).

<u>Screening Tools – G8</u> for Frailty in older cancer patients

Table 2. G8 Screening Tool					
Item	Score				
 Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing, or swallowing difficulties? 	 0 = severe reduction in food intake 1 = moderate reduction in food intake 2 = normal food intake 				
2. Weight loss during the last 3 months	0 = weight loss > 3 kg 1 = does not know 2 = weight loss between 1 and 3 kg 3 = no weight loss				
3. Mobility	 0 = bed or chair bound 1 = able to get out of bed/chair but does not go out 2 = goes out 				
4. Neuropsychological problems	 0 = severe dementia or depression 1 = mild dementia or depression 2 = no psychological problems 				
5. BMI (weight in kg/height in m ²)	$\begin{array}{l} 0 = BMI < 19 \\ 1 = 19 \le BMI < 21 \\ 2 = 21 \le BMI < 23 \\ 3 = BMI \ge 23 \end{array}$				
6. Takes more than 3 medications per day	0 = yes 1 = no				
7. In comparison with other people of the same age, how does the patient consider his/her health status?	0.0 = not as good 0.5 = does not know 1.0 = as good 2.0 = better				
8. Age	0 = > 85 years 1 = 80-85 years 2 = < 80 years				
Abbreviation: BMI, body mass index.					

JOURNAL OF CLINICAL ONCOLOGY

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

Hans Wildiers, Pieter Heeren, Johan Flamaing, Cindy Kenis, and Koen Milisen, University Hospitals Leuven, 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

GA can be valuable

- Detect the impairment not identified in routine history or physical
- Predict severe treatment-related toxicity
- Predict OS
- Influence treatment choice and intensity

ASCO Guideline for Geriatric Oncology-2018

- In patients ≥ 65 years receiving chemotherapy, geriatric assessment (GA) should be used to identify vulnerabilities
- Assessment of
 - Function
 - Comorbidity
 - Falls
 - Depression
 - Cognition
 - Nutrition
- Chemotoxicity assessment with either CARG or CRASH score
- Screening tools Geriatric-8 or Vulnerable Elders Survey-13
- Implement targeted, GA-guided interventions
- Collaborating with caregivers is essential to implementing GAguided interventions

Geriatric assessment domains to predict overall survival in older cancer patients: An analysis of functional status, comorbidities, and nutritional status as prognostic factors

Toshitaka Morishima,^{⊠ 1} Akira Sato, ¹ Kayo Nakata, ¹ and Isao Miyashiro ¹



 Meta-Analysis
 > Blood. 2015 Mar 26;125(13):2068-74. doi: 10.1182/blood-2014-12-615187.

 Epub 2015 Jan 27.

Geriatric assessment predicts survival and toxicities in elderly myeloma patients: an International Myeloma Working Group report



Frailty score predicts mortality and the risk of toxicity in elderly myeloma patients

RESEARCH ARTICLE

Impact of the comprehensive geriatric assessment on treatment decision in geriatric oncology

Sandrine Sourdet^{1,2*}, Delphine Brechemier¹, Zara Steinmeyer¹, Stephane Gerard¹ and Laurent Balardy¹

- Studied from France observed384 patients from 2011 – 2016
 - Factors associated with change in cancer treatment plan in older adults with cancer-
 - Cognition
 - Malnutrition
 - Low physical performance



BMC Cancer

Open Access

Impact of Geriatric assessment and Management on Outcome

Review > J Clin Oncol. 2021 Jul 1;39(19):2058-2067. doi: 10.1200/JCO.21.00089. Epub 2021 May 27.

Geriatric Assessment and Management in Cancer

Siri Rostoft ¹², Anita O'Donovan ³, Pierre Soubeyran ⁴, Shabbir M H Alibhai ⁵⁶, Marije E Hamaker ⁷



Prognostication and Risk Stratification

- Prognostication curative or adjuvant setting for any treatment modality
 - Multiple externally validated prognostic models estimating remaining life expectancy
 - There is tremendous heterogeneity with aging
 - 75-year-old woman top quartile 17 years
 - bottom quartile 6.8 years
- Risk stratification is mostly in setting of chemotherapy or surgery
 - Chemotoxicity prediction tools CARG and CRASH
 - Surgery prediction for 30-day mortality, serious complications, length of stay, and the need for skilled nursing home or rehabilitation <u>NSQIP Surgical Risk Calculator</u>





Chemotherapy side effects in elderly patients

Chemotherapy side effects are more intense in older age group

However, elderly patients benefit from standard chemotherapy regimens, including breast cancer and lung cancer, if carefully selected and monitored

Two large prospective studies

- I. CARG (Cancer and Aging Research Group)
- II. CRASH (Chemotherapy Risk Assessment Scale for High-Age Patients)

JOURNAL OF CLINICAL ONCOLOGY

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

Arti Hurria, Kayo Togawa, Supriya G. Mohile, Cynthia Owusu, Heidi D. Klepin, Cary P. Gross, Stuart M. Lichtman, Ajeet Gajra, Smita Bhatia, Vani Katheria, Shira Klapper, Kurt Hansen, Rupal Ramani, Mark Lachs, F. Lennie Wong, and William P. Tew

- 500 patients with a mean age of 73 years
- Lung (29%), GI (27%), gynecologic (17%), breast (11%), genitourinary (10%), or other (6%)
- Grade 3 to 5 toxicity occurred in 53%
- A predictive model for grade 3 to 5 toxicity was developed
 - Geriatric assessment variables
 - Laboratory test values
 - Patient, tumor, and treatment characteristics

JOURNAL OF CLINICAL ONCOLOGY

Validation of a Prediction Tool for Chemotherapy Toxicity in Older Adults With Cancer

Arti Hurria, Supriya Mohile, Ajeet Gajra, Heidi Klepin, Hyman Muss, Andrew Chapman, Tao Feng, David Smith, Can-Lan Sun, Nienke De Glas, Harvey Jay Cohen, Vani Katheria, Caroline Doan, Laura Zavala, Abrahm Levi, Chie Akiba, and William P. Tew



Risk of toxicity

Fig 1. Risk strata versus toxicity percentage for the (A) development and (B) validation cohorts.

Chemotherapy side effects risk calculation in older patients – CARG (Cancer & aging research group) calculator

Variable	Value/Response	Score
Age of patient	≥ 72 vears	2
3	< 72 years	0
Cancer type	GI or GU cancer	2
	Other cancer types	0
Planned chemotherapy dose	Standard dose	2
	Dose reduced upfront	0
Planned No. of chemotherapy	Polychemotherapy	2
drugs	Monochemotherapy	0
Hemoglobin	< 11 g/dL (male), < 10 g/dL (female)	3
	\geq 11 g/dL (male), \geq 10 g/dL (female)	0
Creatinine clearance (Jeliffe,	< 34 mL/min	3
ideal weight)	≥ 34 mL/min	0
How is your hearing (with	Fair, poor, or totally deaf	2
a hearing aid, if needed)?	Excellent or good	0
No. of falls in the past	≥ 1	3
6 months	None	0
Can you take your own medicine?	With some help/unable Without help	1 0
Does your health limit you	Somewhat limited/limited a lot	2
in walking one block?	Not limited at all	0
During the past 4 weeks, how much of the time has your	Limited some of the time, most of the time, or all of the time	1
physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc)?	Limited none of the time or a little of the time	0

Table 1 Dradiation Madel and Coaring Algorithms for Chamatheramy Taviaity

Hurria A, et al., Validation of a Prediction Tool for Chemotherapy Toxicity in Older Adults With CancerJ Clin Oncol. 2016;34(20):2366-71.





Original Article 🔂 Free Access

Predicting the risk of chemotherapy toxicity in older patients: The Chemotherapy Risk Assessment Scale for High-Age Patients (CRASH) score[†]

Martine Extermann MD 🗙, Ivette Boler ARNP, Richard R. Reich PhD, Gary H. Lyman MD, Richard H. Brown MD, Joseph DeFelice MD, Richard M. Levine MD ... See all authors 🗸

First published: 09 November 2011 | https://doi.org/10.1002/cncr.26646 | Citations: 505

- Chemotherapy Risk Assessment Scale for High-Age Patients (CRASH)
- H toxicity and NH toxicity
- Predictors of H toxicity
 - Lymphocytes
 - Aspartate aminotransferase level,
 - Instrumental Activities of Daily Living score
 - Lactate dehydrogenase level
 - Diastolic blood pressure
 - Chemotox

Chemotherapy Risk Assessment Scale for High-Age Patients (CRASH)

- Predictors of NH toxicity
 - Hemoglobin
 - Creatinine clearance
 - Albumin
 - Self-rated health
 - Eastern Cooperative Oncology Group performance
 - Mini-Mental Status score
 - Mini-Nutritional Assessment score
 - Chemotox

CRASH (Chemotherapy Risk Age Scale for High Risk Patients) Scoring Analysis

Chemotherapy risk (see table)	
Hematologic risk factors	
Diastolic blood pressure (greater than 72 = 1)	
IADL (less than 26 = 1)	
LDH (greater than 459 = 2)*	
Non-hematologic risk factors	
ECOG PS (1-2 = 1; 3-4 = 2)	
MMS (less than 30 = 2)	
MNA (less than 28 = 2)	
Heme score (incl. chemo risk)	
Non-heme score (incl. chemo risk)	
Combined score (count chemo risk only once)	

Individual risk

	CRASH score (points / % with severe toxicity)					
Sample	Heme subscore	Non-Heme subscore	Combined score	Risk Category		
Derivation	0-1: 7%	0-2: 33%	0-3: 50%	Low		
(n=347)	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%			

Ref: Extermann et al., ASCO 2010



<u>Oncol Lett</u>. 2019 Nov; 18(5): 4947–4955. Published online 2019 Sep 10. doi: <u>10.3892/ol.2019.10840</u>

PMCID: PMC6781512 PMID: <u>31612006</u>

Prospective comparison of the value of CRASH and CARG toxicity scores in predicting chemotherapy toxicity in geriatric oncology

45 70 Α в 40 60 40 60 Percentage of patients 35 Percentage of patients 50 30 42.9 40 25 23.8 20 30 15 17.5 20 10 7 10.6 10 5 0 ٥ Low-risk Medium-low-risk Medium-high-risk High-risk Low-risk Medium-low-risk Medium-high-risk High-risk (score 0-1) (score 2-3) (score 4-5) (score ≥6) (score 0-2) (score 3-4) (score 5-6) (score 7-8) CRASH hematologic toxicity risk (G4-5H) CRASH non-hematologic toxicity risk (G3-5NH) С 80 100 D 75 94.1 90 70 80 Percentage of patients patients 60 55.5 70 50 60 50 40 Percentage of 37.5 40 30 23.4 30 20 20 10 10 6.3 54 0 Low-risk Medium-low-risk Medium-high-risk High-risk Low-risk Intermediate-risk High-risk (score 0-5) (score 0-3) (score 6-9) (score≥10) (score 4-6) (score 7-9) (score≥10) CRASH toxicity risk (G4-5H and G3-5NH) CARG toxicity risk (G3-5H and G3-5NH)

Figure 3. Percentage of patients who experienced (A) grade 4-5 hematological toxicity, (B) grade 3-5 nonhematological toxicity (G3-5NH), (C) either toxicity according to the CRASH toxicity score, and (D) grade 3-5 hematological and nonhematological toxicity according to the CARG toxicity score. CRASH, Chemotherapy Risk Assessment Scale for High-Age Patients; CARG, Cancer Aging Research Group; G3-5, grade 3-5; H, hematological toxicity; NH, nonhematological toxicity.

Jun Zhang,¹ Xin Liao,¹ Jin Feng,¹ Tiejun Yin,¹ and Yajun Liang²

Models for Geriatric Oncology care in older cancer patients

Shared Care Model

Oncologist and Geriatrician share the care

Can be applied in different phases

It is resource Intensive

It may not be scalable due to shortage of geriatricians

Consultation Model

The consultation clinic is attended by Geriatrician or Oncologist with geriatric expertise

Mainly recommending intervention

Implementation is differed to primary oncology team

It is more feasible to be implemented

Nononcologic interventions

(1) Interventions aimed at mobility and falls

- (2) Investigations for comorbidity
- (3) Medication optimization
- (4) Delirium prevention and/or exploration of cognition
- (5) Psychologic interventions
- (6) Nutritional interventions
- (7) Social interventions

Decision Making in older cancer patients



Questions?

