

XXXIII CONGRESSO NAZIONALE AIRO

# AIRO2023

BOLOGNA,  
27-29 OTTOBRE 2023

PALAZZO DEI CONGRESSI

Radioterapia Oncologica: l'evoluzione al servizio dei pazienti

**QUANDO L'INDICE TERAPEUTICO  
È AI LIMITI: GESTIONE E COMUNICAZIONE.**

**TUMORI TESTA-COLLO**

*Dott.ssa Clelia Di Carlo  
Ospedale G. Mazzini, Teramo*



Associazione Italiana  
Radioterapia e Oncologia clinica

*No conflict of interest to declare*

Cancer Treatment Reviews 45 (2016) 58–67

Contents lists available at ScienceDirect

Cancer Treatment Reviews

journal homepage: [www.elsevierhealth.com/journals/ctrv](http://www.elsevierhealth.com/journals/ctrv)



ELSEVIER



Anti-Tumour Treatment

Optimize and refine therapeutic index in radiation therapy: Overview of a century



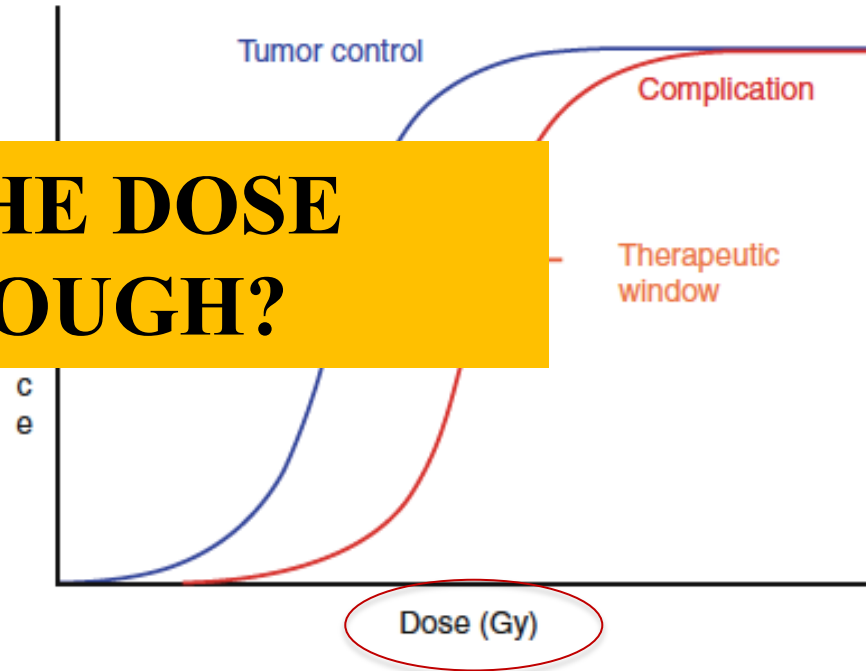
Cyrus Chargari<sup>a,b,c,d</sup>, Nicolas Magne<sup>e,f,\*</sup>, Jean-Baptiste Guy<sup>a,b,c</sup>, Karyn A. Goodman<sup>g</sup>, Eric Deutsch<sup>a,b,c</sup>

# IS THE DOSE ENOUGH?

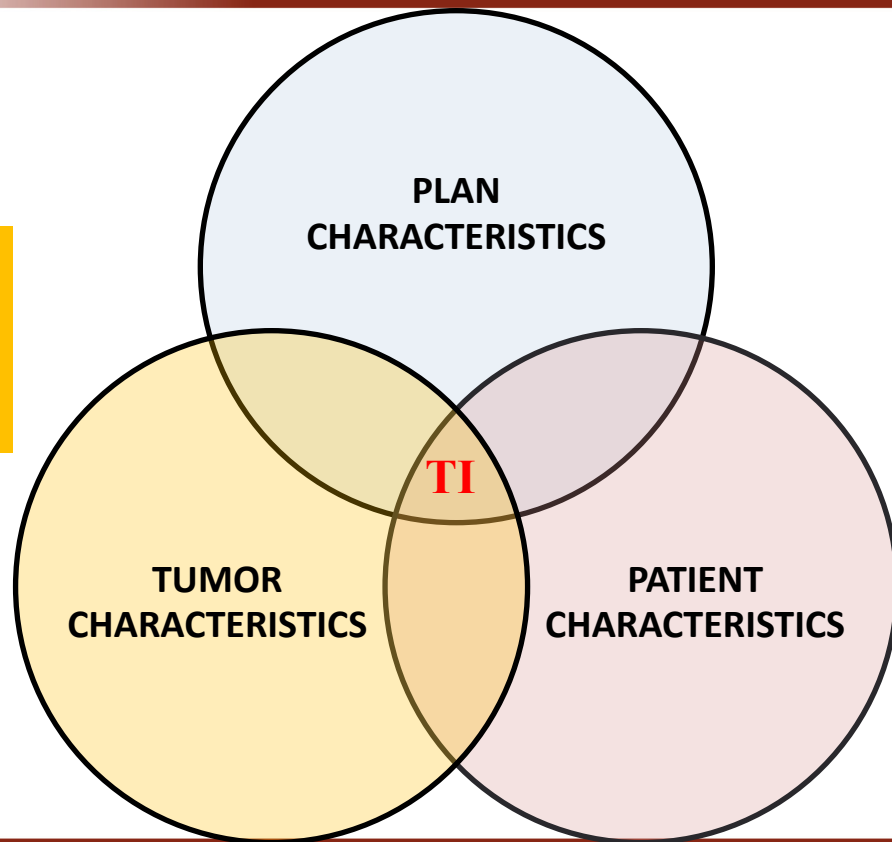
«In 1936, Holthusen [1] defined the therapeutic index as the probability of achieving tumor control and of developing normal tissue complications (NTCP) after radiotherapy *as a function of radiation dose*».

$$TI = TCP / NTCP$$

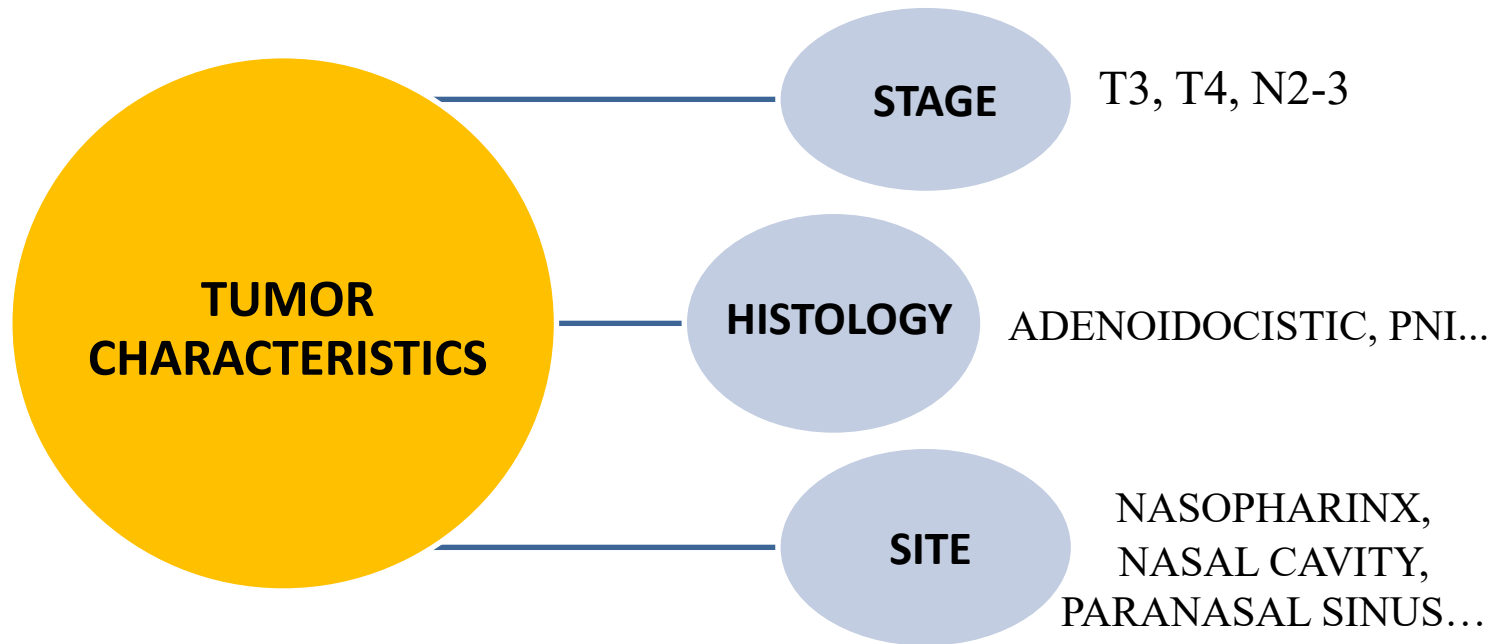
## THERAPEUTIC INDEX



## DOSE IS NOT ENOUGH!







# RECURRENCE HEAD AND NECK CANCER



Article

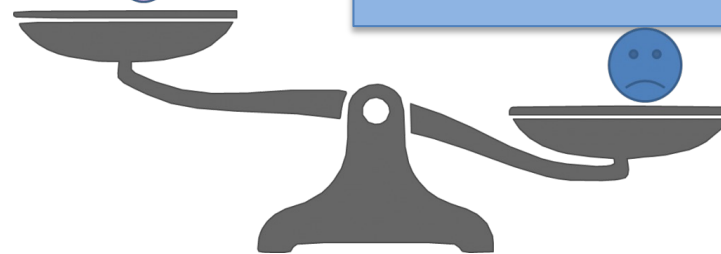
**Re-Irradiation for Head and Neck Cancer: Cumulative Dose to Organs at Risk and Late Side Effects**

Anna Embring <sup>1,2,\*</sup>, Eva Onjukka <sup>2,3</sup>, Claes Mercke <sup>1,2</sup>, Ingmar Lax <sup>2,3</sup>, Anders Berglund <sup>4</sup>, Sara Bomedal <sup>3</sup>, Berit Wennberg <sup>3</sup>, Emmy Dalqvist <sup>3</sup> and Signe Friesland <sup>1,2</sup>

HyTEC Organ-Specific Paper: Head and Neck

**Head and Neck Tumor Control Probability: Radiation Dose—Volume Effects in Stereotactic Body Radiation Therapy for Locally Recurrent Previously-Irradiated Head and Neck Cancer: Report of the AAPM Working Group**

- OS
- LC



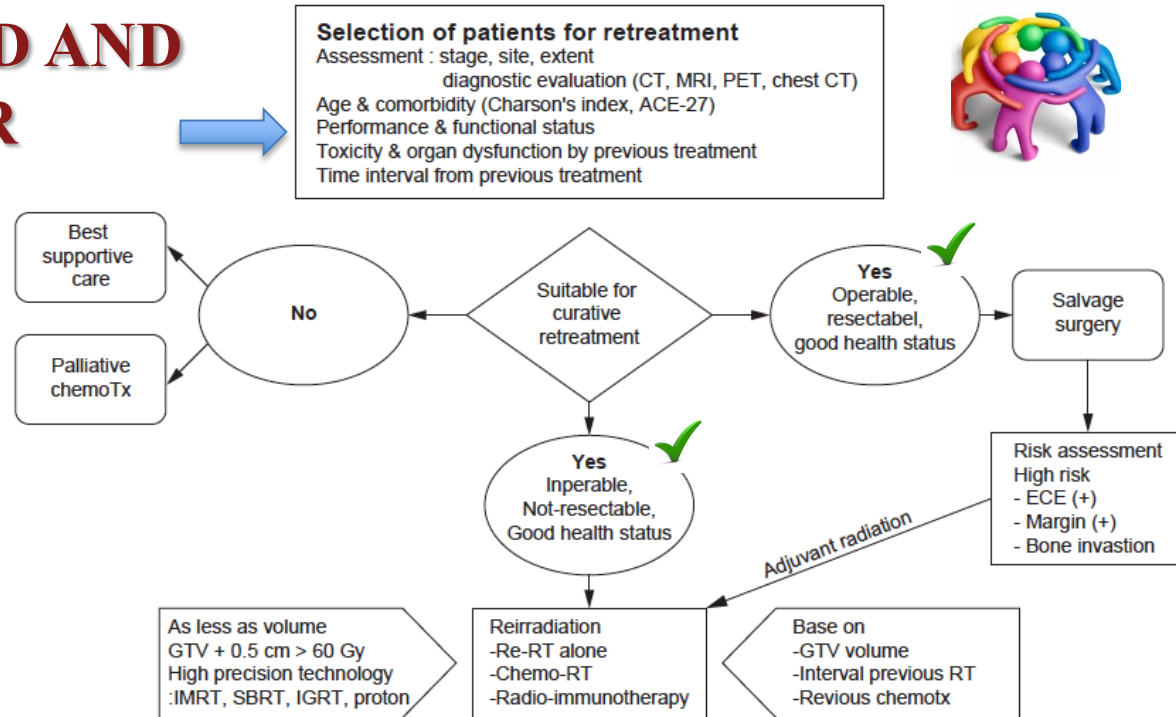
Increased risk of:

- Osteoradionecrosis
- *Carotid bloodout*
- Mielopathy
- Soft tissue necrosis
- Fibrosis

- Time interval
- Volume of reirradiation
- Overlapping
- Cumulative dose...

# RECURRENCE HEAD AND NECK CANCER

- ✓ Selection of patients
- ✓ Multidisciplinary discussion
- ✓ Patient information



Yeon Sil Kim, 2017



# AIRO2023

## TUMOR MICROENVIRONMENT

Received: 4 February 2022 | Revised: 26 February 2022 | Accepted: 18 April 2022

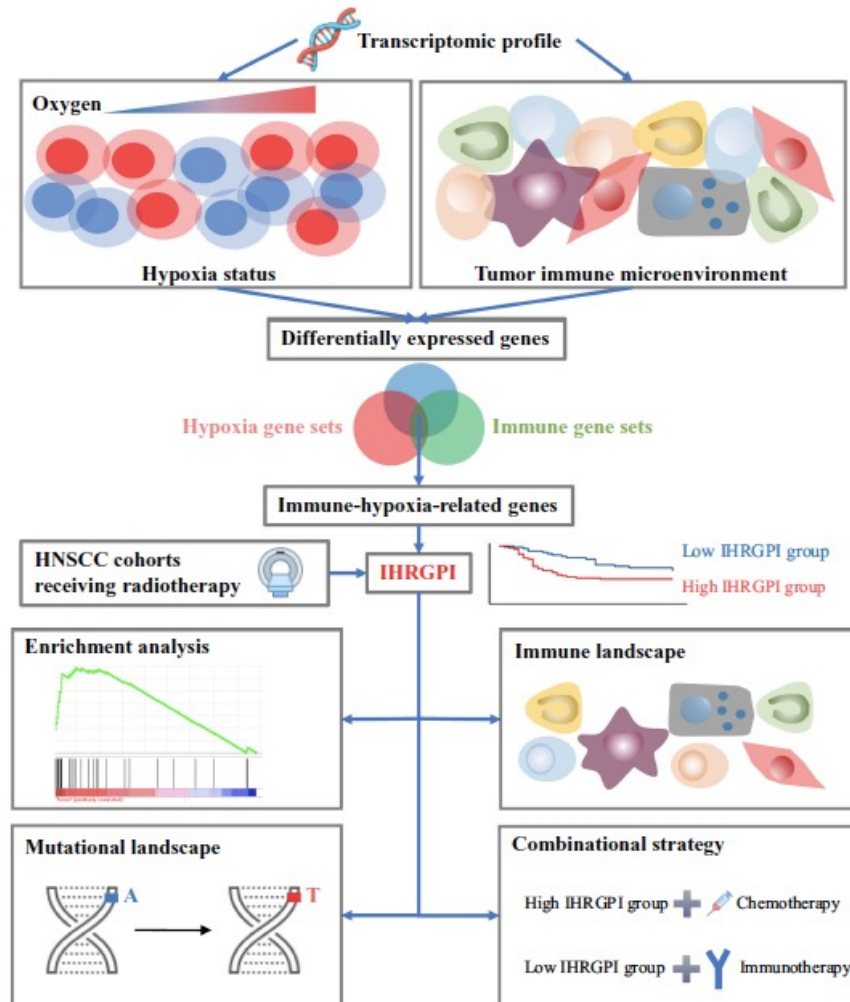
Cancer Medicine Open Access WILEY

RESEARCH ARTICLE

### Development of a prediction model for radiotherapy response among patients with head and neck squamous cell carcinoma based on the tumor immune microenvironment and hypoxia signature

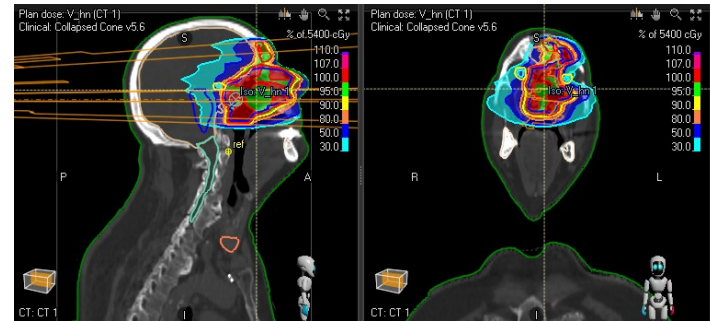
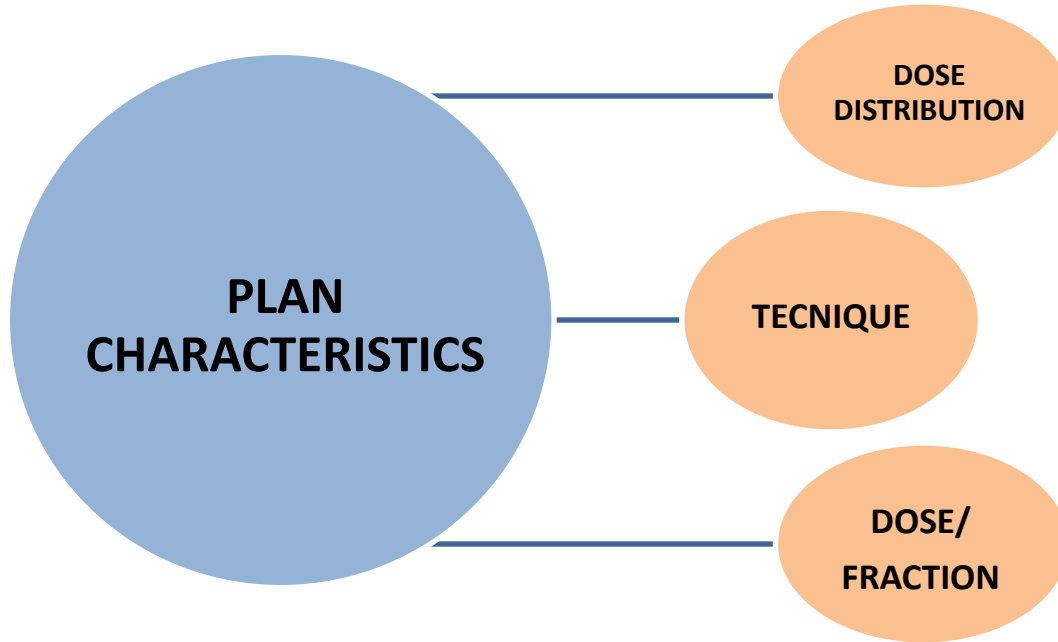
Guang-Li Zhu | Kai-Bin Yang | Cheng Xu | Rui-Jia Feng | Wen-Fei Li | Jun Ma

### IHRGPI: immune-hypoxia-related gene prognostic index





## PLAN CHARACTERISTICS





## DOSE PRIORITIZATION

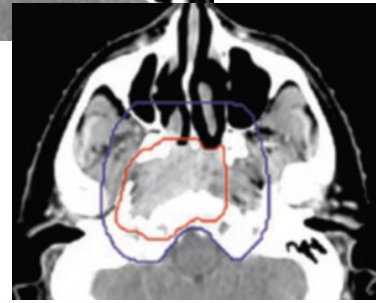
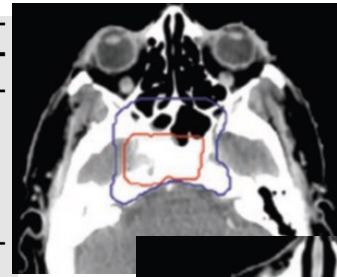
### International Guideline on Dose Prioritization and Acceptance Criteria in Radiation Therapy Planning for Nasopharyngeal Carcinoma

Anne W. Lee, FRCR,\* Wai Tong Ng, FRCR,† Jian Ji Pan, MD,‡

International Journal of  
Radiation Oncology  
biology • physics

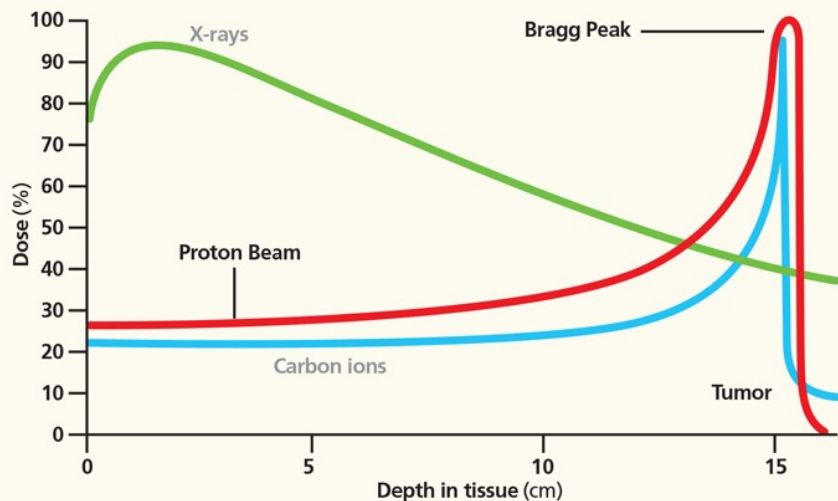


Organ	Priority	Acceptance criteria							
		OAR		Desirable dose		Acceptable dose			
		n/N, % agree (of those who voted)	Disagree, (alternative priority) - No. voting/ N	Specification	Dose	n/N, % agree (of those who voted)	Dose	n/N, % agree (of those who voted)	GRADE of recommendation
Brain stem	1	17/17, 100		D0.03 cm <sup>3</sup>	≤54 Gy	18/20, 90	≤60 Gy*	19/21, 90	High/Moderate
Spinal cord	1	17/17, 100		D0.03 cm <sup>3</sup>	≤45 Gy	20/20, 100	≤50 Gy	20/21, 95	High
Optic chiasm	1	16/17, 94	(3) - 1/17	D0.03 cm <sup>3</sup>	≤54 Gy	14/15, 93	≤60 Gy	14/17, 82	High/Moderate
GTV-T & GTV-N	2	10/16, 63	(1) - 6/16	Min	≥68.6 Gy (98% dose)	14/18, 78	66.5 Gy (95% dose)	16/20, 80	Moderate
PTV dose prescription	2	15/17, 88	(1) - 1/17 (4) - 1/17	Prescription dose	PTV70, 63, 60, 56 = 35# PTV 69.96, 63,	14/21, 81			



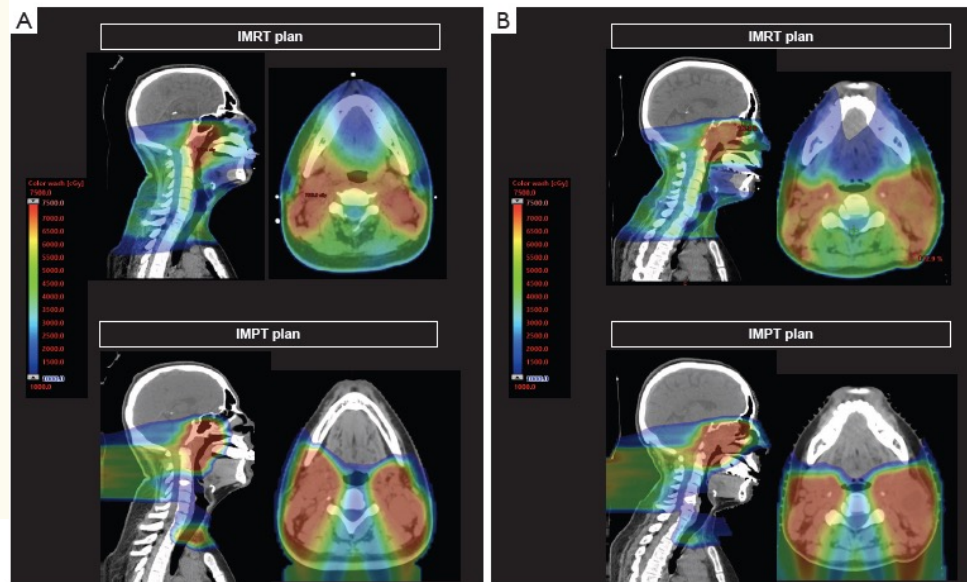


## ADROTHERAPY



### A narrative review of intensity-modulated proton therapy for head and neck cancer

Nader Mohamed, Xingzhe Li, Nancy Y. Lee

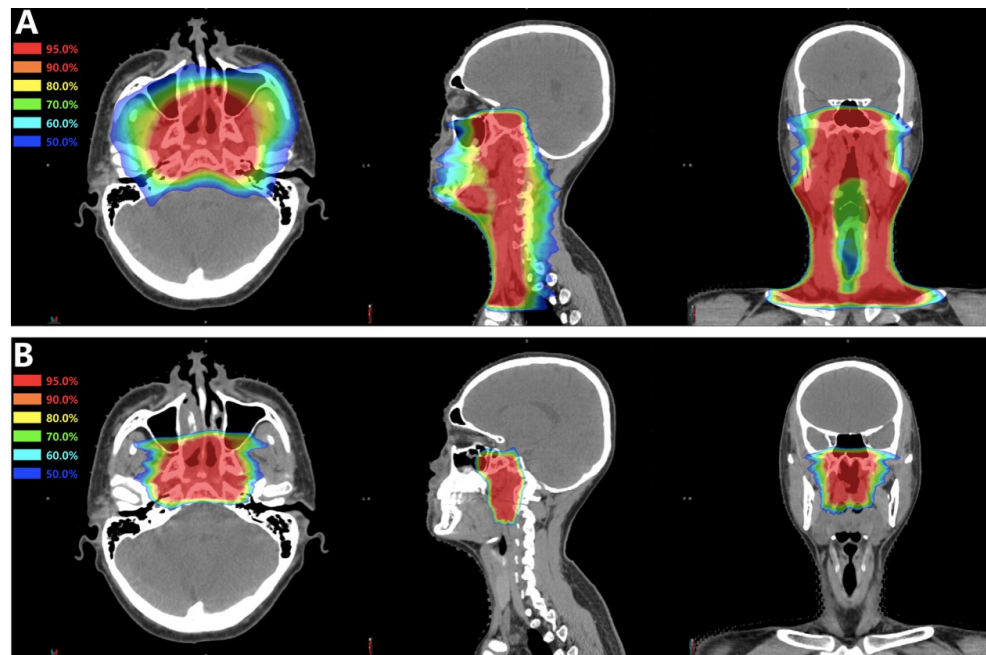


## Mixed Photon and Carbon-Ion Beam Radiotherapy in the Management of Non-Metastatic Nasopharyngeal Carcinoma

Jiyi Hu<sup>1,2,3†</sup>, Qingting Huang<sup>1,2,3†</sup>, Jing Gao<sup>1,2,3</sup>, Weixu Hu<sup>1,2,3</sup>, Jing Yang<sup>1,2,3</sup>,  
Xiyin Guan<sup>1,2,3</sup>, Xianxin Qiu<sup>1,2,3</sup>, Wenna Zhang<sup>1,2,3</sup>, Lin Kong<sup>2,3,4\*</sup> and Jiade J. Lu<sup>1,2,3\*</sup>

Mixed-beam approach in locally advanced nasopharyngeal carcinoma: IMRT followed by proton therapy boost versus IMRT-only. Evaluation of toxicity and efficacy

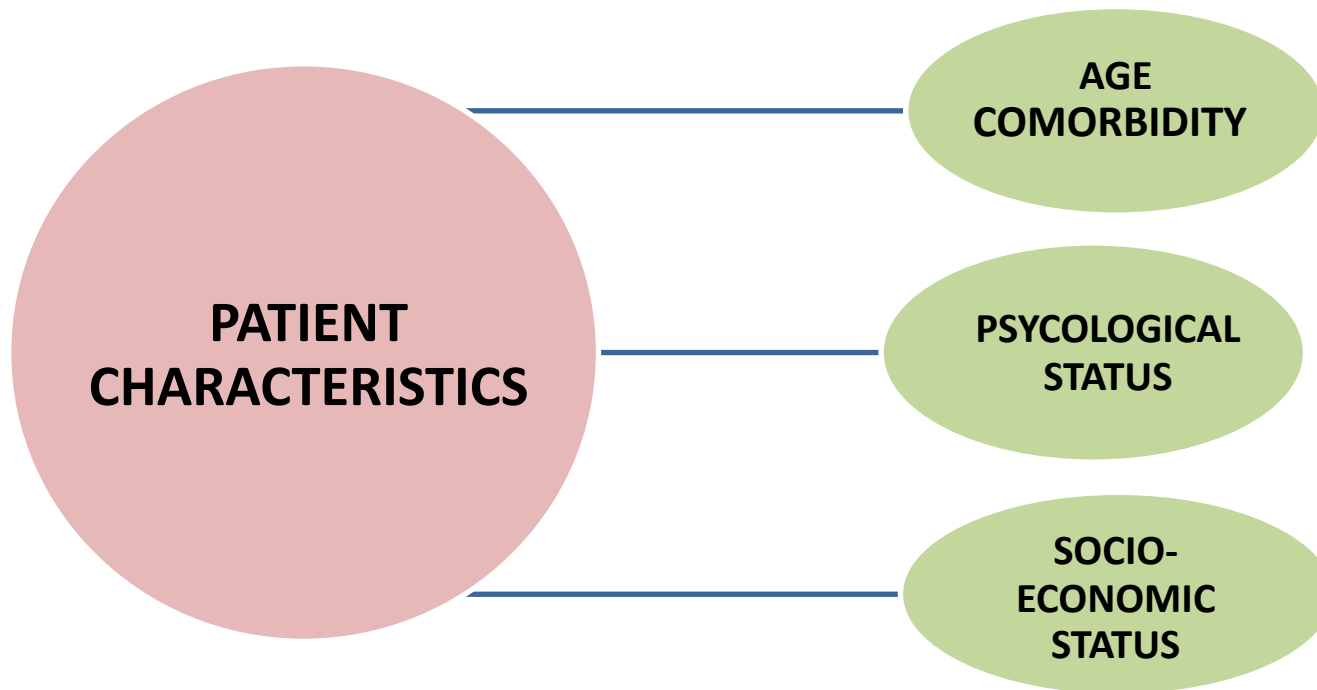
Daniela Alterio, Emma D'Ippolito, Barbara Vischioni, Piero Fossati, Sara Gandini, Maria Bonora, Sara Ronchi, Viviana Vitolo, Edoardo Mastella, Giuseppe Magro, Pierfrancesco Franco, Umberto Ricardi, Marco Krengli, Giovanni Ivaldi, Annamaria Ferrari, Giuseppe Fanetti, Stefania Comi, Marta Tagliabue, Elena Verri, Rosalinda Ricotti, Delia Ciardo, Barbara Alicja Jereczek-Fossa, Francesca Valvo & Roberto Orecchia







## PATIENT CHARACTERISTICS





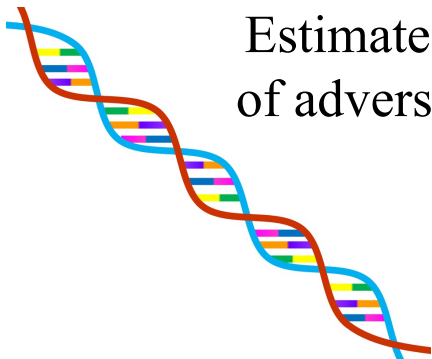
# AIRO2023

## RADIO-GENOMIC

Single-nucleotide  
polymorphism-based



Estimate the risk  
of adverse effects



Radioterapia Oncologica:  
l'evoluzione al servizio dei pazienti

Yang *et al. J Transl Med* (2020) 18:224  
<https://doi.org/10.1186/s12967-020-02390-0>

Journal of  
Translational Medicine

RESEARCH

Open Access



### Genome-wide association study identifies genetic susceptibility loci and pathways of radiation-induced acute oral mucositis

Da-Wei Yang<sup>1,2†</sup>, Tong-Min Wang<sup>1†</sup>, Jiang-Bo Zhang<sup>1</sup>, Xi-Zhao Li<sup>1</sup>, Yong-Qiao He<sup>1</sup>, Ruowen Xiao<sup>1</sup>, Wen-Qiong Xue<sup>1</sup>, Xiao-Hui Zheng<sup>1</sup>, Pei-Fen Zhang<sup>1</sup>, Shao-Dan Zhang<sup>1</sup>, Ye-Zhu Hu<sup>1</sup>, Guo-Ping Shen<sup>3</sup>, Mingyuan Chen<sup>1,4</sup>, Ying Sun<sup>1,5</sup> and Wei-Hua Jia<sup>1,2,6\*</sup>

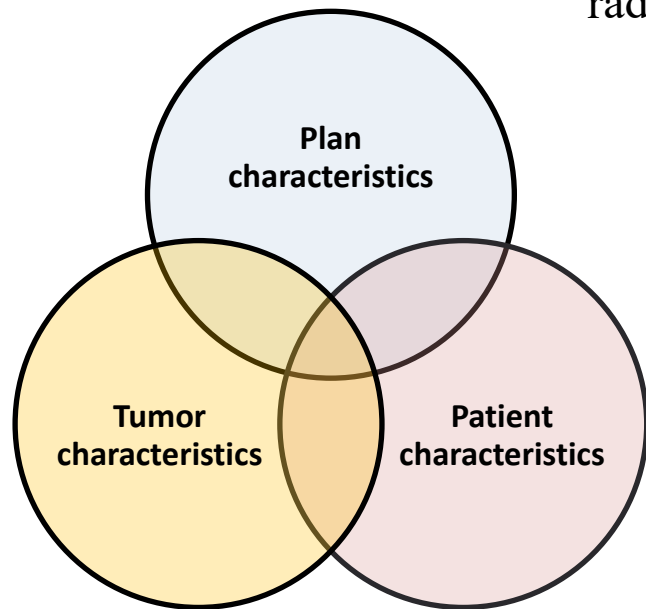
A genome-wide association study of radiotherapy induced toxicity in head and neck cancer patients identifies a susceptibility locus associated with mucositis

Line M. H. Schack <sup>1,2,8</sup>, Elnaz Naderi<sup>3,4</sup>, Laura Fachal <sup>5,6</sup>, Leila Dorling<sup>7</sup>, Craig Luccarini<sup>5</sup>, Alison M. Dunning<sup>5</sup>, The Head and Neck Group of the Radiogenomics Consortium\*, The Danish Head and Neck Cancer Group (DAHANCA)\*, Enya H. W. Ong<sup>8</sup>, Melvin L. K. Chua <sup>9,10</sup>, Johannes A. Langendijk<sup>3</sup>, Behrooz Z. Alizadeh <sup>3,4</sup>, Jens Overgaard <sup>1</sup>, Jesper Grau Eriksen<sup>1,2</sup>, Christian Nicolaj Andreassen<sup>1,2</sup> and Jan Alsner<sup>1</sup>



## NTCP MODELS

NTCP models are prediction models used in the field of radiotherapy to estimate the risk of radiation-induced complications.



Radiotherapy and Oncology 148 (2020) 151–156



Contents lists available at [ScienceDirect](#)

Radiotherapy and Oncology

journal homepage: [www.thegreenjournal.com](http://www.thegreenjournal.com)



Technical Note

Key challenges in normal tissue complication probability model development and validation: towards a comprehensive strategy

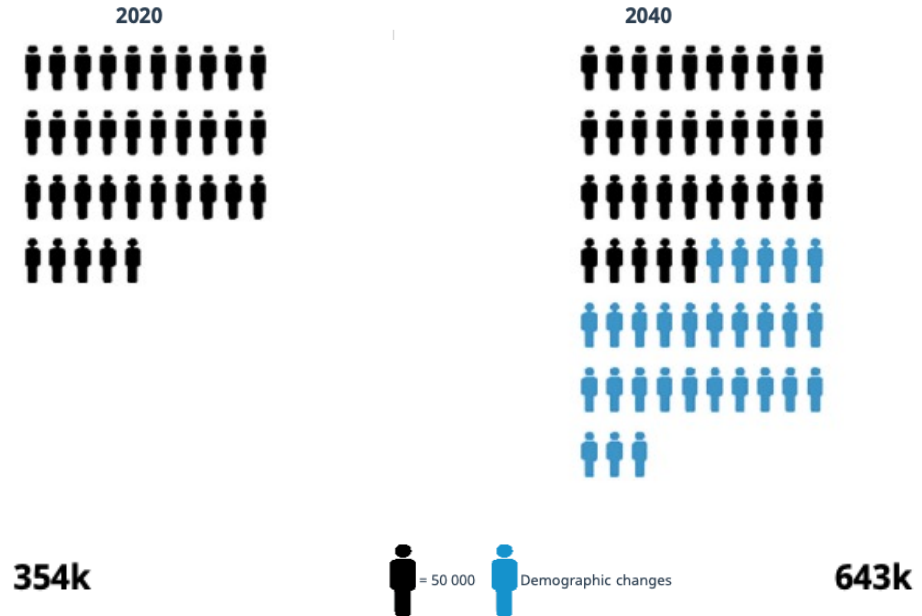
Lisa Van den Bosch <sup>a,\*</sup>, Ewoud Schuit <sup>b</sup>, Hans Paul van der Laan <sup>a</sup>, Johannes B. Reitsma <sup>b</sup>, Karel G.M. Moons <sup>b</sup>, Roel J.H.M. Steenbakkers <sup>a</sup>, Frank J.P. Hoebers <sup>c</sup>, Johannes A. Langendijk <sup>a</sup>, Arjen van der Schaaf <sup>a</sup>



Estimated number of new cases from 2020 to 2040, Both sexes, age [65-85+]  
Lip, oral cavity + Salivary glands + Oropharynx + Nasopharynx + Hypopharynx + Larynx  
World

## ELDERLY PATIENTS

- 38% occurred in elderly patients (> 65)
- The number of H&N elderly patients new diagnoses **will double** from that of 2020 by 2040
- Older patients have typically been *underrepresented* in HNC and HNSCC clinical trials







### Health-Related Quality of Life, Psychosocial Distress and Unmet Needs in Older Patients With Head and Neck Cancer

Lachlan McDowell<sup>1,2\*</sup>, Danny Rischin<sup>2,3</sup>, Karla Gough<sup>4,5</sup> and Christina Henson<sup>6</sup>

- The vast majority of older patients place a *high value on being cured* of their cancer (p<0.05)
- Older patients also prioritized the **“keeping appearances unchanged”**
- Survival (**“living as long as possible”**) was less important with increasing age

**TABLE 1** | Chicago priorities scale.

#### Oncological Outcome

“being cured of my cancer”

“living as long as possible”

#### Treatment-related outcome

“keeping my natural voice”

“being able to chew normally”

“being able to swallow all foods and liquids”

“having no pain”

“keeping my appearance unchanged”

“returning to my regular activities as soon as possible”

“having a normal amount of energy for me”

“keeping my normal sense of taste and smell”

“being understood easily”

“having a comfortably moist mouth”



# AIRO2023

## GERIATRIC SCORE (G8)

Clinical Oncology 33 (2021) e203–e210

Contents lists available at ScienceDirect

Clinical Oncology

journal homepage: [www.clinicaloncologyonline.net](http://www.clinicaloncologyonline.net)



ELSEVIER


Original Article

Impaired Geriatric 8 Score is Associated with Worse Survival after Radiotherapy in Older Patients with Cancer

- G8 was associated with overall survival in older patients with cancer irradiated with **curative intent**.
- Survival: 87% for high G8 scores and 55% for low G8 scores (P value < 0.0001).

**Table 1 – Geriatric 8 (G8) screening tool for the assessment of older patients with cancer.**

Items	Possible answers	Score
Loss of appetite? Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties?	0: severe anorexia 1: moderate anorexia 2: no anorexia	
Loss of weight during the last months	0: weight loss > 3 kg 1: does not know 2: weight loss between 1 and 3 kg 3: no weight loss	
Mobility	1: able to get out bed/ chair but not to go out 2: goes out	
Neuropsychological problem	0: severe dementia or depression 1: moderate dementia or depression 2: no psychological problem	
Body mass index	0: BMI < 18.5 1: BMI between 18.5 and <21 2: BMI 21 to <23 BMI ≥ 23	
Takes >3 prescription drugs per day	0: yes 1: no	
In comparison with other people of the same age, how do they consider their health status	0: not as good 0.5: does not know 1: as good 2: better	
Age	0: > 85 1: 80–85 2: <80	
Total score	0–17	

**cancers** 

Review  
**Head and Neck Squamous Cell Carcinoma in Elderly Patients: Role of Radiotherapy and Chemotherapy**

Morena Fasano <sup>1,†</sup>, Ida D'Onofrio <sup>2,†</sup>, Maria Paola Belfiore <sup>1</sup>, Antonio Angrisani <sup>1</sup>, Valentina Caliendo <sup>1</sup>, Carminia Maria Della Corte <sup>1</sup>, Mario Pirozzi <sup>1</sup>, Sergio Facchini <sup>1</sup>, Marianna Caterino <sup>1</sup>, Cesare Guida <sup>2</sup>, Valerio Nardone <sup>1,\*</sup>, Alfonso Reginelli <sup>1,‡</sup> and Salvatore Cappabianca <sup>1,‡</sup>

Contents lists available at ScienceDirect  
**Oral Oncology**  
journal homepage: [www.elsevier.com/locate/oraloncology](http://www.elsevier.com/locate/oraloncology)

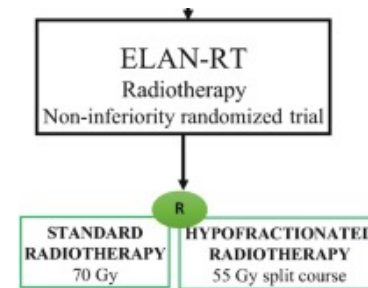
**Elderly patients affected by head and neck squamous cell carcinoma unfit for standard curative treatment: Is de-intensified, hypofractionated radiotherapy a feasible strategy?**

Pierluigi Bonomo, Isacco Desideri\*, Mauro Loi, Monica Lo Russo, Emanuela Olmetto, Virginia Maragna, Giulio Francolini, Camilla Delli Paoli, Roberta Grassi, Donato Pezzulla, Daniela Greto, Icro Meattini, Lorenzo Livi

- 20 Gy/ 5 fx
- 30 Gy/ 10 fx
- 40 Gy/ 16 fx
- 50 Gy/ 16 fx

**Cancer/Radiothérapie**  
Volume 24, Issue 8, December 2020, Pages 812-819

Original article  
**Split-course hypofractionated radiotherapy for aged and frail patients with head and neck cancers. A retrospective study of 75 cases**



### Split-Course Accelerated Hypofractionated Radiotherapy (SCAHR): A Safe and Effective Option for Head and Neck Cancer in the Elderly or Infirm

TREVOR J. BLEDSOE<sup>1</sup>, ANISHA R. NOBLE<sup>2</sup>, CHANDANA A. REDDY<sup>3</sup>,  
BRIAN B. BURKEY<sup>4</sup>, JOHN F. GRESKOVICH<sup>3</sup>, TOBENNA NWIZU<sup>5</sup>,  
DAVID J. ADELSTEIN<sup>5</sup>, JERROLD P. SAXTON<sup>3</sup> and SHLOMO A. KOYFMAN<sup>3</sup>

- Split course: 30-36 Gy (3Gy /die), 3-5 weeks break, total dose  $\geq 60$  Gy
- Split course: total dose of 40-55 Gy (2.2-2.75 Gy/die), 2-3 weeks break

## PSYCHOSOCIAL DISTRESS

### Health-Related Quality of Life, Psychosocial Distress and Unmet Needs in Older Patients With Head and Neck Cancer

Lachlan McDowell<sup>1,2\*</sup>, Danny Rischin<sup>2,3</sup>, Karla Gough<sup>4,5</sup> and Christina Henson<sup>6</sup>

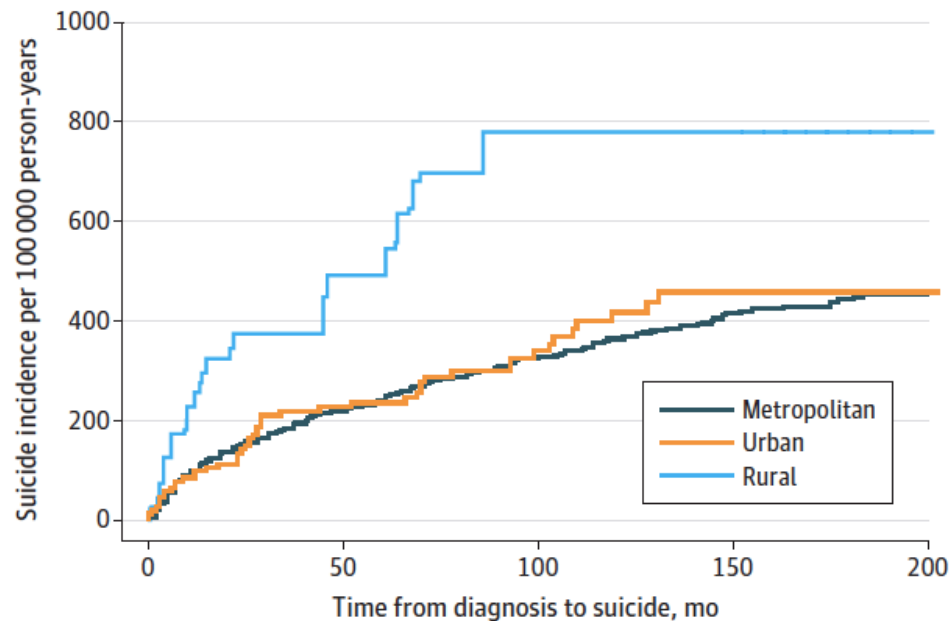
- **Social isolation** and **lack of support** have been linked to higher cancer mortality rates and poorer treatment tolerance
- Elderly patients *fare better* with regards to distress as compared to their younger counterparts
- Factors may include *mid-life responsibilities, employment, childcare, greater perceived importance of social life*





### RISK of SUICIDE

- Suicide mortality among individuals with HNC *is double* that of individuals with cancer at other sites and about **4 times** that of the general population
- **Two-fold increased** suicide incidence among HNC patients in **rural areas** compared with those in urban or metropolitan areas.

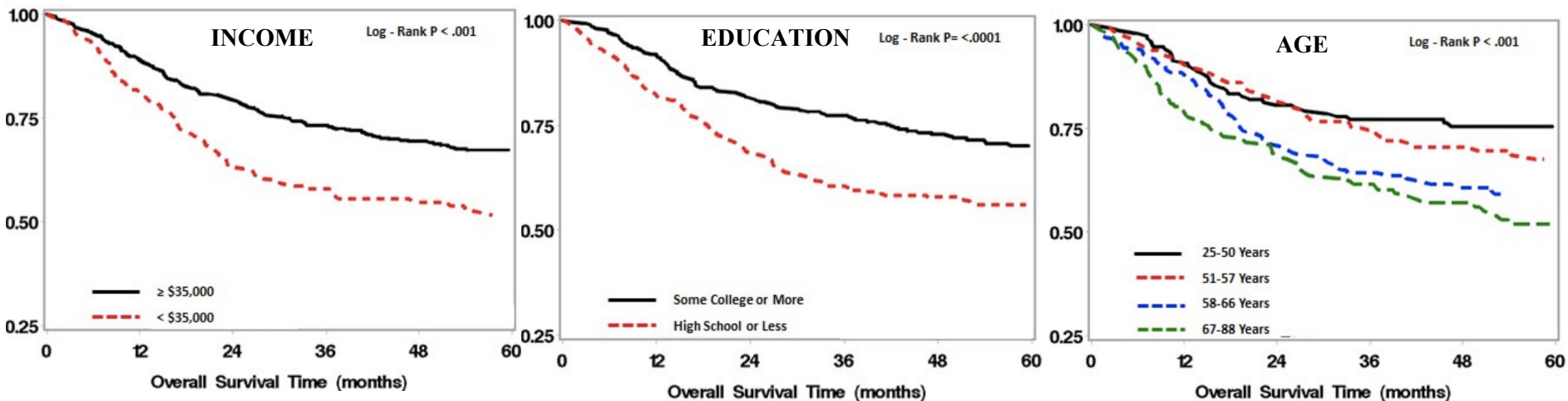


Nosayaba Osazuwa-Peters et al, JAMA Otolaryngol Head Neck Surg. 2021

## Socioeconomic and Other Demographic Disparities Predicting Survival among Head and Neck Cancer Patients

Seung Hee Choi<sup>1</sup>, Jeffrey E. Terrell<sup>2</sup>, Karen E. Fowler<sup>3</sup>, Scott A. McLean<sup>2</sup>, Tamer Ghanem<sup>4</sup>, Gregory T. Wolf<sup>2</sup>, Carol R. Bradford<sup>2</sup>, Jeremy Taylor<sup>5</sup>, Sonia A. Duffy<sup>3,6\*</sup>

«Low income, low education and advanced age predicted poor survival»





## ...AND WHAT ABOUT THE CAREGIVER?



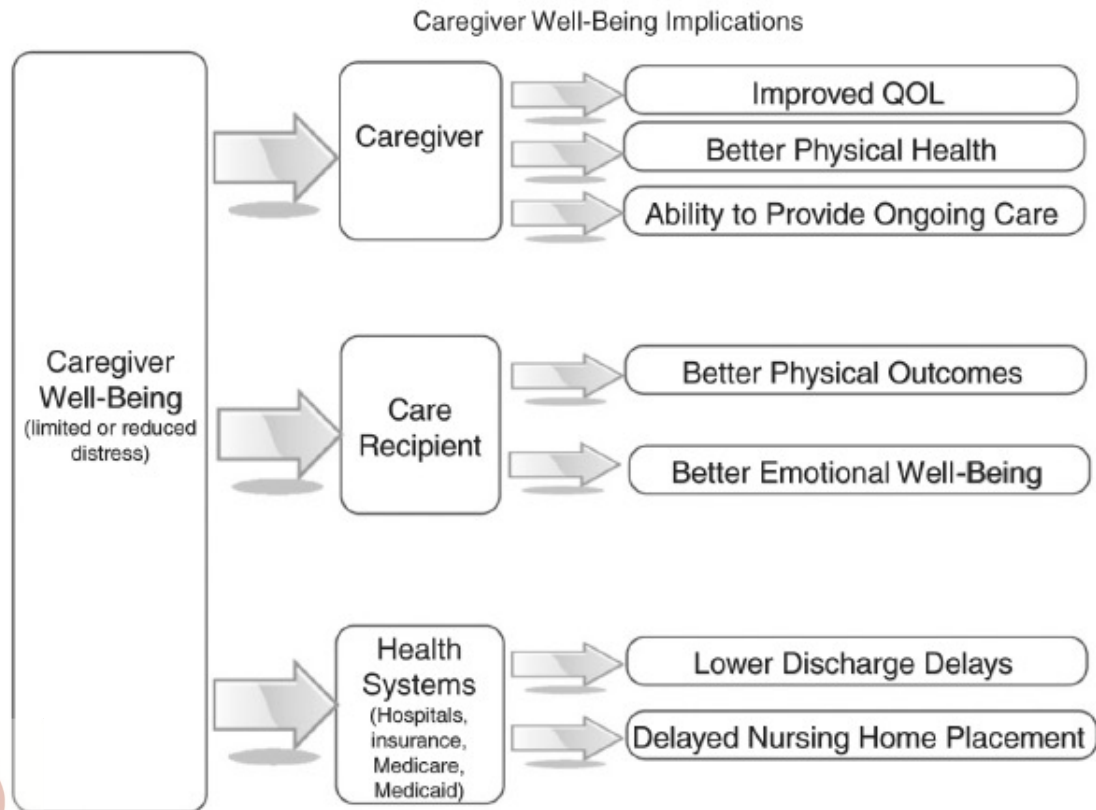
Medical	Domestic	Personal	Social/emotional
Medication administration	Household tasks including laundry, meal preparation	Maintenance of finances and legal matters	Emotional support for the patient
Management of symptoms (cancer pain, nausea, etc)	Home safety to ensure few barriers for patient mobility	Physical assistance with mobility (wheelchair, walker)	Recreational activities of patient (visits to parks, restaurants, etc)
Monitoring for disease-related and treatment-related side effects	Transportation for appointments, etc	Activities of daily living (bathing, eating, etc)	Maintenance of religious observances and customs
Wound care (eg, postsurgical care)	Shopping for necessities (eg, groceries)	Assistance with medical decision making (eg, pursue additional treatment)	Cultivation of relationships with friends and family
Catheter or line care (eg, PICC, nephrostomy, gastrostomy)	Home maintenance and upkeep (eg, home repairs)	Communication with the medical team (eg, bringing a side effect of concern to the medical team's attention)	

*Adashek JJ, Subbiah IM. ESMO Open 2020*

## CAREGIVER

20-30% of HNSCC caregivers  
experience emotional distress

«Roughly **one-third** of caregivers viewed the socialemotional QOL, and **almost half** viewed the physical QOL of their patients **more negatively** than patients themselves».



M.L. Longacre et al. Oral Oncol. 2012 January  
Kassir et al. BMC Cancer (2021) 21:1127



## COMMUNICATION

Oral Oncology 84 (2018) 76–81

Contents lists available at [ScienceDirect](#)

Oral Oncology

journal homepage: [www.elsevier.com/locate/oraloncology](http://www.elsevier.com/locate/oraloncology)



ELSEVIER



Communication of prognosis in head and neck cancer patients; a descriptive qualitative analysis

Emilie A.C. Dronkers\*, Arta Hoesseini, Maarten F. de Boer, Marinella P.J. Offerman

*Department of Otorhinolaryngology and Head and Neck Oncology, Erasmus University Medical Center Cancer Institute, Rotterdam, The Netherlands*

Patients tend to remember only **20–50%** of the information provided by their physician

## COMMUNICATION



*Review Article*

### **Communication Needs of Cancer Patients and/or Caregivers: A Critical Literature Review**

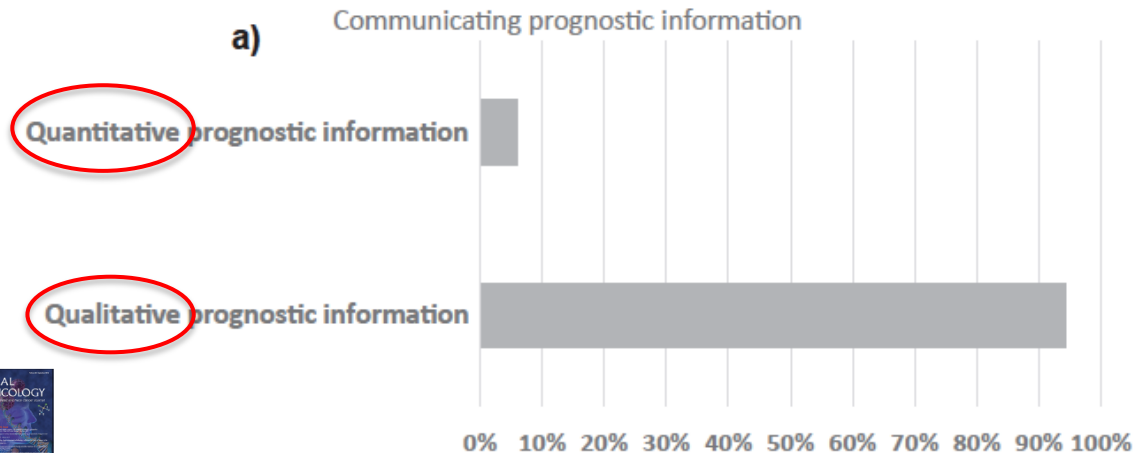
The communication needs of cancer patients and caregivers shifting from a “**one-size-fits-all**” approach to a “**personalised**” approach

**ONE SIZE  
DOES NOT  
FIT ALL**

*Quantitative* information allows patients to make fully informed decisions in contrast to providing solely *qualitative* information.

**BUT:**

The mean time used for discussing a **quantitative** prognosis accounting for **4.4%** of the consultations



Oral Oncology 84 (2018) 76–81

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Oral Oncology

journal homepage: [www.elsevier.com/locate/oraloncology](http://www.elsevier.com/locate/oraloncology)



Communication of prognosis in head and neck cancer patients; a descriptive qualitative analysis

Emilie A.C. Dronkers\*, Arta Hoesseini, Maarten F. de Boer, Marinella P.J. Offerman  
Department of Otorhinolaryngology and Head and Neck Oncology, Erasmus University Medical Center Cancer Institute, Rotterdam, The Netherlands

*«On average, clinicians interrupt patients' initial concerns after just 23 seconds»*

## COMMUNICATION



**WHO:** *multidisciplinary* approach is recommended

**WHAT:** the communication *vary with the stage* of the disease

**WHEN:** *prior* to treatment and at *every* stage thereafter

**HOW:** Patients and caregivers generally need *honesty, empathy, patience*, balance between *truth* and *hope*

*Li et al. Journl of oncology, 2020*

## Prognostication and Communication in Oncology

Thomas W. LeBlanc, MD, MA, MHS<sup>1</sup>; Jonathan M. Marron, MD, MPH<sup>2</sup>; Sabha Ganai, MD, PhD<sup>3</sup>; Molly M. McGinnis<sup>4</sup>;  
Rebecca A. Spence, JD, MPH<sup>4</sup>; Laura Tenner, MD<sup>5</sup>; William D. Tap, MD<sup>6</sup>; and Fay J. Hlubocky, PhD, MA<sup>7</sup>

Hope is a multidimensional, motivational concept.

*«Hope is not a state of being during the ignorance of a dismal prognosis but rather an essential active coping mechanism in the knowing of one».*

*thank  
you*

