

# **FEBRILE NEUTROPENIA: MOST RECENT GUIDELINES**

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# **The Multinational Association for Supportive Care in Cancer Risk Index: A Multinational Scoring System for Identifying Low-Risk Febrile Neutropenic Cancer Patients**

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and James Talcott for the Study Section on Infections of Multinational Association for Supportive Care in Cancer

***« The risk index accurately identifies patients at low risk for complications  
and may be used to select patients for testing therapeutic strategies  
that may be more convenient or cost-effective. »***

# PRAGMATIC EXCLUSION CRITERIA FOR PREDICTION OF A LOW RISK OF COMPLICATIONS

Kern et al.	Freifeld et al.
Allogenic transplantation	Hemodynamic instability
Renal failure	Abdominal pain
Shock	Nausea and/or vomiting
Respiratory insufficiency	Diarrhea
IV supportive therapy	Neurological or mental changes
HIV	Catheter-related infection
Catheter-related infections	New pulmonary infiltrates
CNS infections	Renal failure
Risk of death within 48h	Liver insufficiency

# THE MASCC RISK-INDEX SCORE

**A MASCC score value  $\geq 21$  identifies low-risk patients with a positive predictive value of 91%, a specificity of 68%, and a sensitivity of 71%**

Characteristic	Weight
Burden of febrile neutropenia with no or mild symptoms*	5
No hypotension (systolic blood pressure > 90mmHg)	5
No chronic obstructive pulmonary disease †	4
Solid tumor or hematologic malignancy with no previous fungal infections‡	4
No dehydration requiring parenteral fluids	3
Burden of febrile neutropenia with moderate symptoms*	3
Outpatient status	3
Age < 60 years	2

NOTE: The maximum value of the score is 26.

Abbreviation: MASCC, Multinational Association for Supportive Care in Cancer.

\*Burden of febrile neutropenia: Refers to the general clinical status of the patient as influenced by the febrile neutropenic episode. It should be evaluated on the following scale: no or mild symptoms (score of 5); moderate symptoms (score of 3); severe symptoms or moribund (score of 0). Scores of 3 and 5 are not cumulative.

†Chronic obstructive pulmonary disease: Means active chronic bronchitis, emphysema, decrease in forced expiratory volumes, need for oxygen therapy and/or steroids and/or bronchodilators requiring a treatment at the presentation of the febrile neutropenic episode.

‡Previous fungal infection: Means demonstrated fungal infection or empirically treated suspected fungal infection.

# THE BURDEN OF ILLNESS

**The inclusion of this covariate might be considered as a weakness of the model; indeed, its assessment is certainly associated to some subjectivity. Nevertheless, no other set of covariates could satisfactorily be substituted to it, and thus it represents, although not completely objective, a strong prognostic factor in our model.**

# The Multinational Association for Supportive Care in Cancer (MASCC) risk index score: 10 years of use for identifying low-risk febrile neutropenic cancer patients

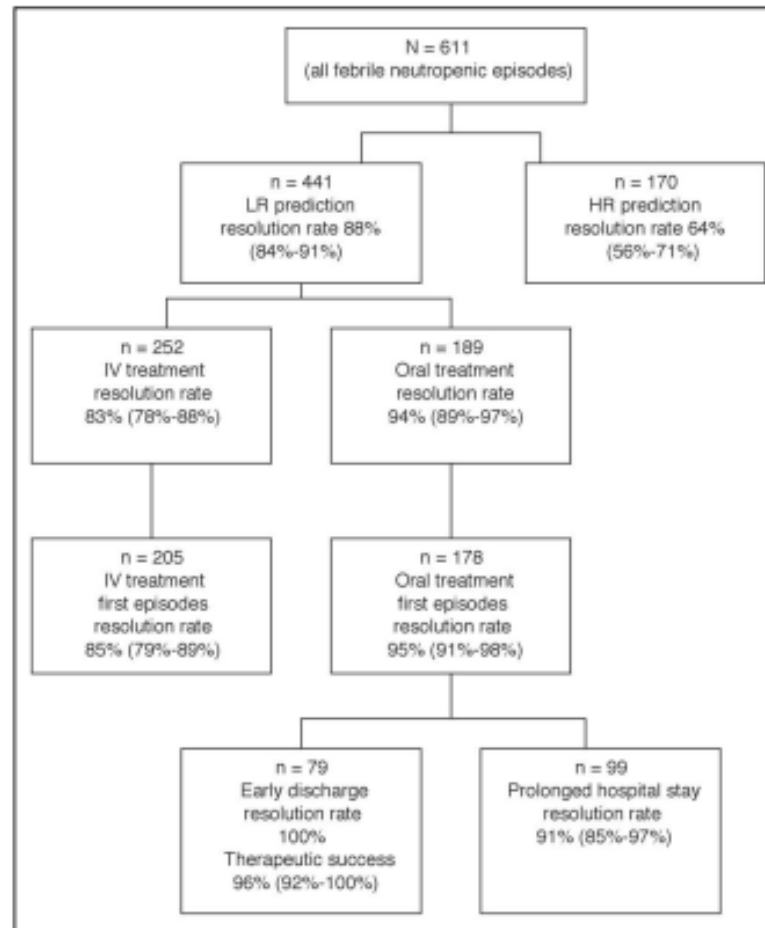
## Validation studies

Reference	N of episodes	Patients with hematological malignancy (%)	Predicted at low risk (%)	Se (%)	Sp (%)	PPV (%)	NPV (%)
Paesmans [30]	1,003	55	72	79	56	88	40
Stratum of hematological tumors	549	100	70	77	51	84	40
Stratum of solid tumor patients	454	0	74	81	64	93	38
Uys [13]	80	30	73	95	95	98	86
Cherif [14]	279	100	38	59	87	85	64
Klastersky [30]	611	43	72	78	54	88	36
Innes [29]	100	6	90	92	40	97	20
Baskaran [15]	116	100	71	93	67	83	85
Hui [16]	227	20	70	81	60	86	52
Carmona-Bayonas [17] <sup>a</sup>	169	0	?	94	36	NA	NA

# OVERALL RESULTS FOR RATE OF RESOLUTION WITHOUT SERIOUS COMPLICATION

## Outpatient Oral Antibiotics for Febrile Neutropenic Cancer Patients Using a Score Predictive for Complications

*Jean Klastersky, Marianne Paesmans, Aspasia Georgala, Frédérique Muanza, Barbara Plehiers, Laurent Dubreucq, Yassine Lalami, Michel Aoun, and Martine Barette*



# PREDICTIVE VALUE OF THE MASCC SCORE

## Review of recent publications (12)

<u>Dates</u>	N° patients (n)
2014: 3	n ≤ 100: 3
2015: 2	100-500: 7
2016: 1	n ≥ 500: 2
2017: 2	
2018: 0	
2019: 3	
2020: 0	
2021: 1	



# PREDICTIVE VALUE OF THE MASCC SCORE

## Review of recent publications (12)

Prospective: 8

Retrospective: 4

- 2 evaluated MASCC score that was attributed at admission → acceptable
- 2 recalculated a posteriori the MASCC score → not acceptable
  - 1 found MASCC score predictive at  $\leq 18$  but not  $\leq 21$
  - 1 found MASCC score not predictive

# PREDICTIVE VALUE OF THE MASCC SCORE

## Review of recent publications (12)

**All 10 eligible studies found a positive correlation between MASCC score and outcome**

### Outcomes

Bloodstream infection	1
Duration of hospitalisation	1
Mortality	2
Severe complications (ICU)	3
Outpatient ambulatory care	2
Low risk of complications	1

# PREDICTIVE VALUE OF THE MASCC SCORE

## Review of recent publications (12)

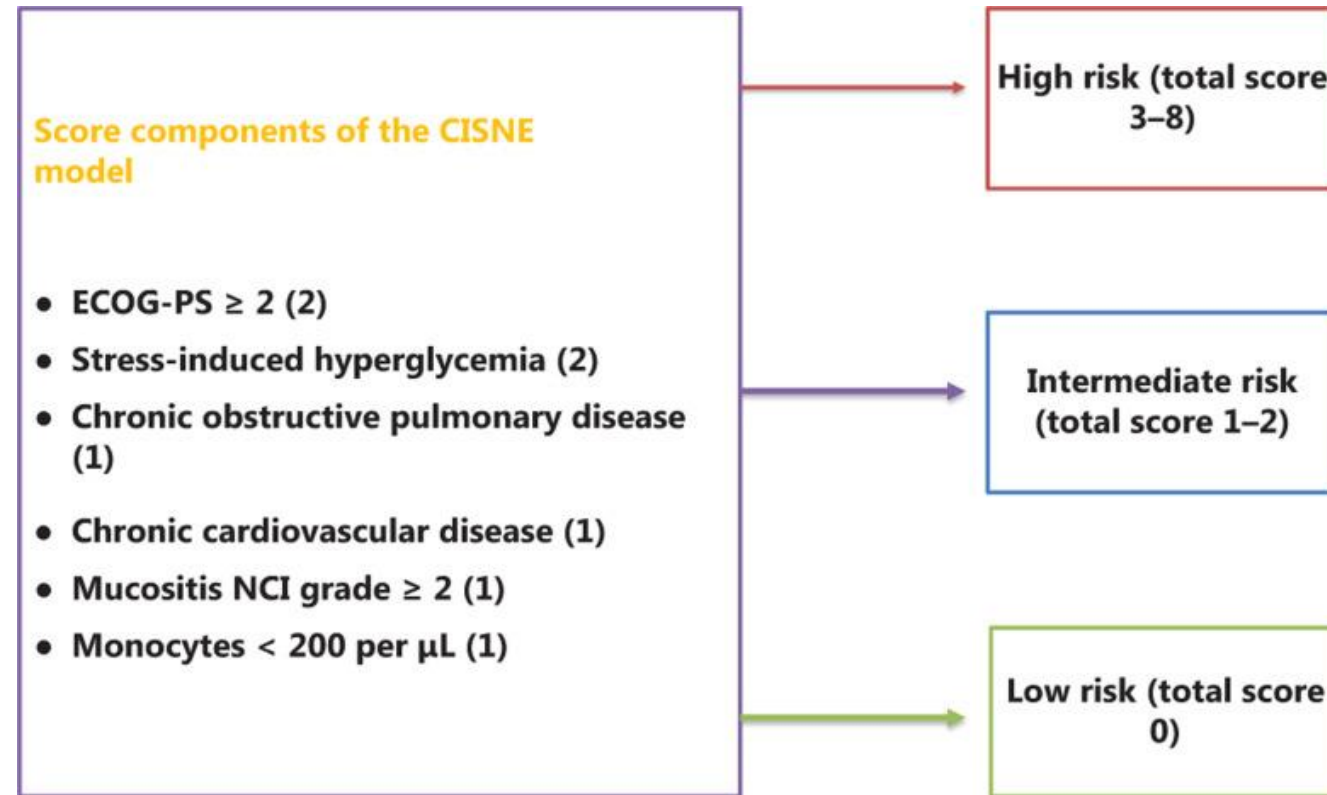
**Other factors besides the MASCC score  
found to be significantly predictive of poor outcome**

Hypotension  
Dehydration  
High temperature  
Known source of fever  
Time to antibiotics  
Tachypnea  
Tachycardia  
Mucositis  
Unable to eat  
Thrombocytopenia  
Hypoproteinemia  
Lung infiltrates  
Metastatic disease

## Prediction of Serious Complications in Patients With Seemingly Stable Febrile Neutropenia: Validation of the Clinical Index of Stable Febrile Neutropenia in a Prospective Cohort of Patients From the FINITE Study

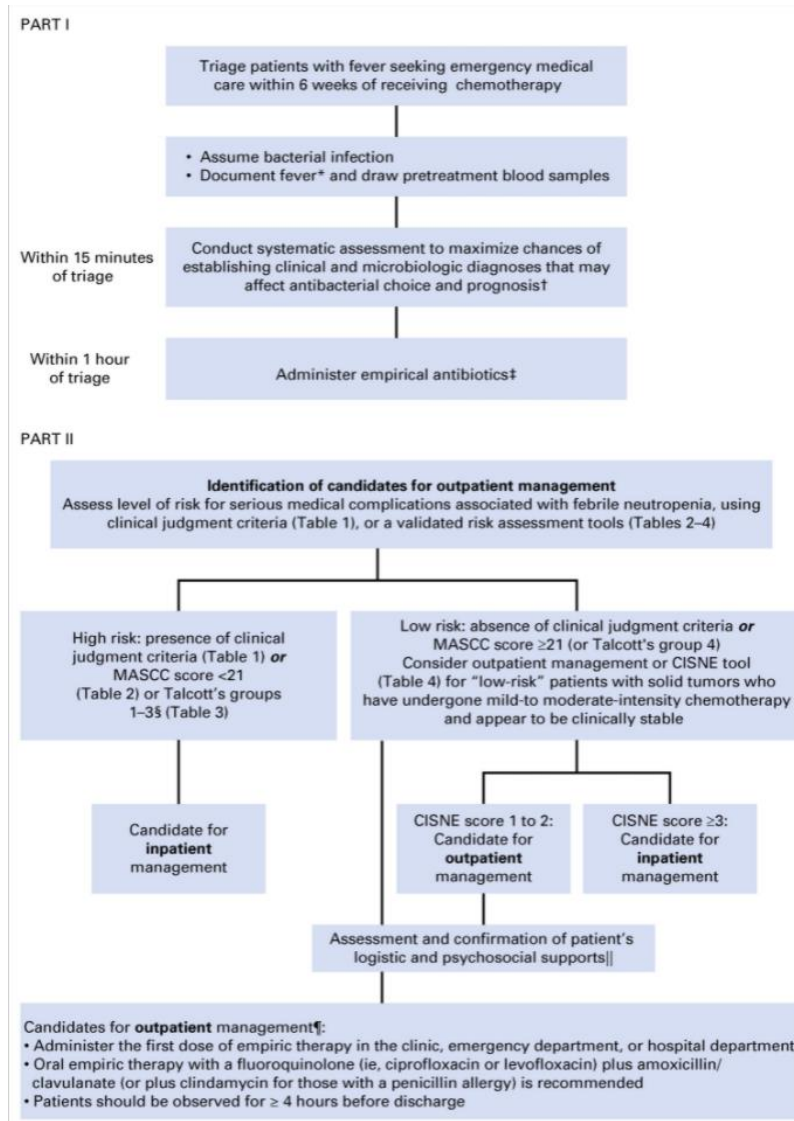
*Alberto Carmona-Bayonas, Paula Jiménez-Fonseca, Juan Virizuela Echaburu, Maite Antonio, Carme Font, Mercè Biosca, Avinash Ramchandani, Jerónimo Martínez, Jorge Hernando Cubero, Javier Espinosa, Eva Martínez de Castro, Ismael Ghanem, Carmen Beato, Ana Blasco, Marcelo Garrido, Yaiza Bonilla, Rebeca Mondéjar, María Ángeles Arcusa Lanza, Isabel Aragón Manrique, Aránzazu Manzano, Elena Sevillano, Eduardo Castañón, Mercé Cardona, Elena Gallardo Martín, Quionia Pérez Armillas, Fernando Sánchez Lasheras, and Francisco Ayala de la Peña*

# Clinical Index of Stable Febrile Neutropenia (CISNE) Model



The Clinical Index of Stable Febrile Neutropenia (CISNE) scoring system. The components of the CISNE have a maximum score of 8 (2 + 2 + 1 + 1 + 1 + 1). Patients with a score of 0 are at low risk for complications, patients with a score of 1–2 are at intermediate risk for complications, and patients with a score of 3–8 are at high risk for complications.

# Outpatient management of fever and neutropenia in adults treated for malignancy: American Society of Clinical Oncology and Infectious Diseases Society of America clinical practice guideline update



# Outpatient management of fever and neutropenia in adults treated for malignancy: American Society of Clinical Oncology and Infectious Diseases Society of America clinical practice guideline update

The Clinical Index of Stable Febrile Neutropenia (CISNE) may be used as an additional tool to determine the risk of major complications among the group of patients with solid tumors who have undergone mild- to moderate-intensity chemotherapy and who appear to be clinically stable, assuming close proximity to an appropriate medical facility that can provide 24-hour access.

Type of recommendation: evidence-based, benefit outweigh harms; Evidence quality: intermediate; Strength of recommendation: moderate


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SPECIAL ARTICLE

## **The time has come for new models in febrile neutropenia: a practical demonstration of the inadequacy of the MASCC score**

**A. Carmona-Bayonas<sup>1</sup>  · P. Jiménez-Fonseca<sup>2</sup> · J. Virizuela Echaburu<sup>3</sup> ·  
M. Sánchez Cánovas<sup>1</sup> · F. Ayala de la Peña<sup>1</sup>**



# The CISNE model application

The probability of serious complications is:

ECOG performance status $\geq 2$	<input type="checkbox"/> No	
Chronic obstructive pulmonary disease	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <span>i</span>
Chronic cardiovascular disease	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <span>i</span>
Mucositis NCI grade $\geq 2$	<input type="checkbox"/> No	<input type="checkbox"/> Yes <span>i</span>
Monocytes $< 200/\text{mm}^3$	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Stress-induced hyperglycemia	<input type="checkbox"/> No	<input type="checkbox"/> Yes <span>i</span>

Developed by the Supportive Care Working Group of the Spanish Society of Medical Oncology (SEOM). Acknowledgement [Ilicom S.L.](#)





Essentially, all models are wrong, but some are useful.

(George E. P. Box)

[otes.com](http://otes.com)

**THANK YOU FOR YOUR ATTENTION!**

