ESCALAS CLÍNICAS PRONÓSTICAS

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Caso clínico

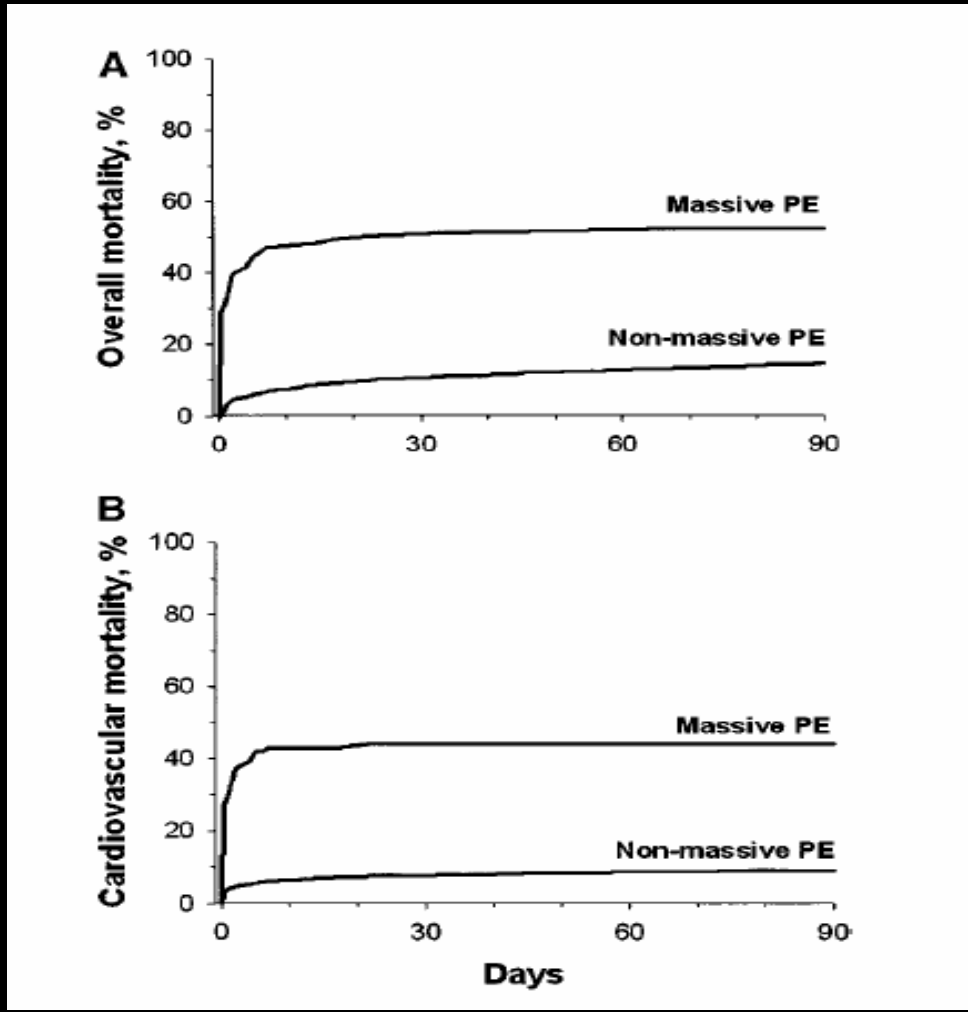
- Varón de 68 años que acude al Servicio de Urgencias por disnea y dolor torácico de instauración brusca. Sin antecedentes de interés. Es diagnosticado de TEP aguda sintomática mediante angioTC tórax multidetector

- Exploración física: TA 70/43 FC 102 FR 20 Tº 36 SatO2 basal 90%. No ingurgitación yugular. ACP: Normal. EE: No signos TVP

Herramientas pronósticas

- Troponina
- BNP
- NT-proBNP
- hsTnT
- H-FABP
- Sodio
- Ecocardiograma
- angioTC

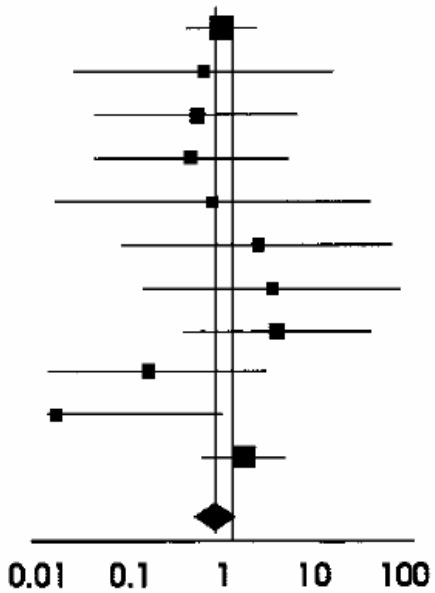
Pacientes de alto riesgo



Goldhaber SZ. Lancet 1999

Trombolisis y muerte por todas las causas

Study	Thrombolysis	Heparin	OR	95% CI
UPET, 1973	10/82	14/78	0.63	0.26 - 1.53
Tibbutt et al, 1974	0/13	1/17	0.41	0.02 - 10.83
Ly et al, 1978	1/14	2/11	0.35	0.03 - 4.42
Dotter et al, 1979	1/15	3/16	0.31	0.03 - 3.36
Marini et al, 1988	0/20	0/10	0.51	0.01 - 27.68
PIOPED, 1990	1/9	0/4	1.59	0.05 - 47.52
Levine et al, 1990	1/33	0/25	2.35	0.09 - 60.24
Dalla-Volta et al, 1992	3/20	1/16	2.65	0.25 - 28.24
Goldhaber et al, 1993	0/46	4/55	0.12	0.01 - 2.35
Jerjes-Sanchez et al, 1995	0/4	4/4	0.01	0.00 - 0.77
Konstantinides et al, 2002	8/118	7/138	1.36	0.48 - 3.87
Total	**25/374**	**36/374**	**0.67**	**0.40 - 1.12**



Wan S. Circulation 2004

Herramientas pronósticas

Table 5 Risk stratification according to expected pulmonary embolism-related early mortality rate

PE-related early MORTALITY RISK		RISK MARKERS			Potential treatment implications
		CLINICAL (shock or hypotension)	RV dysfunction	Myocardial injury	
HIGH >15%		+	(+)[a]	(+)[a]	Thrombolysis or embolectomy
NON HIGH	Intermediate 3–15%	–	+	+	Hospital admission
			+	–	
			–	+	
	Low <1%	–	–	–	Early discharge or home treatment

[a]In the presence of shock or hypotension it is not necessary to confirm RV dysfunction/injury to classify as high risk of PE-related early mortality.
PE = pulmonary embolism; RV = right ventricle.

Torbicki A. Eur Heart J 2008

Estratificación de pacientes con TEP

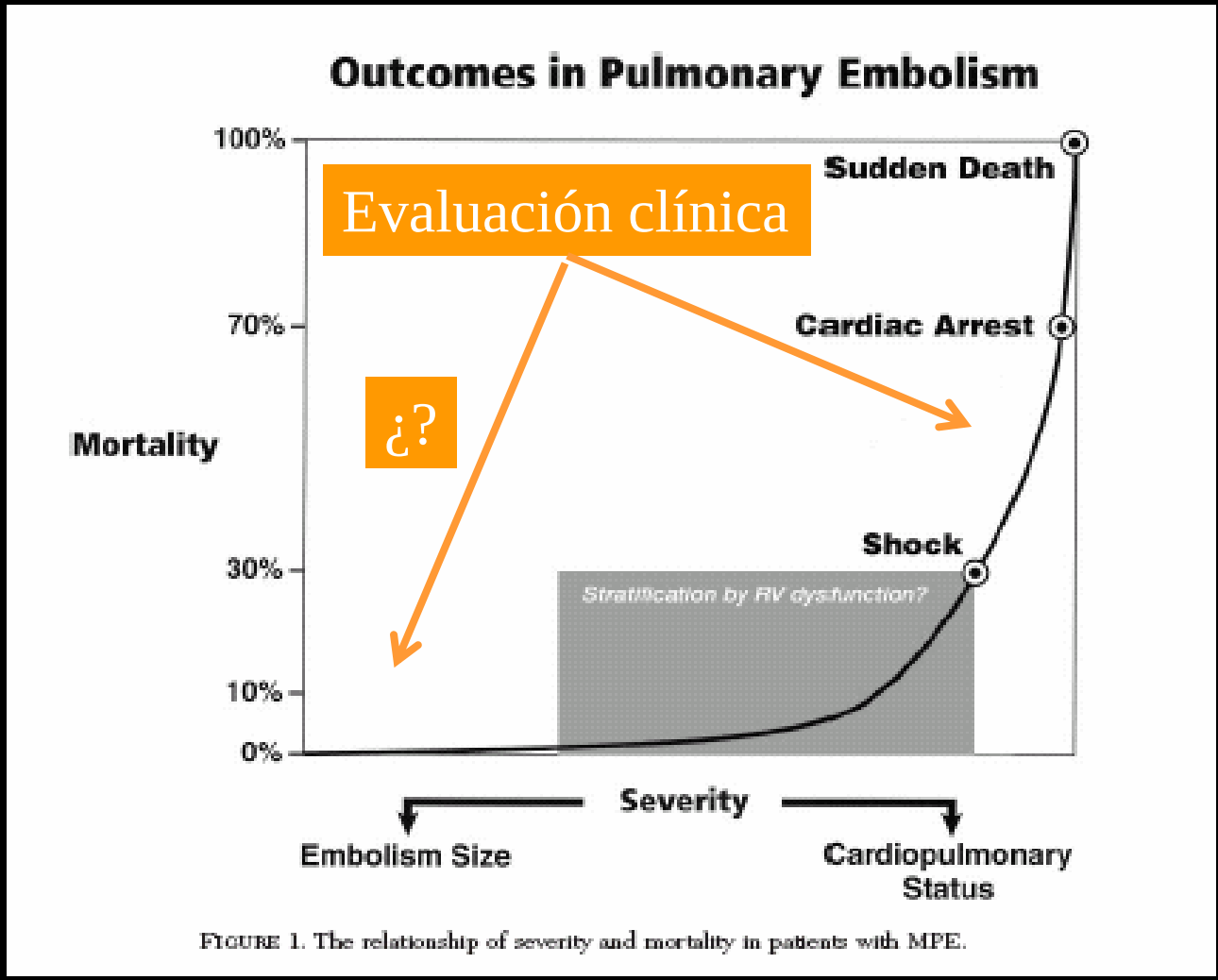


FIGURE 1. The relationship of severity and mortality in patients with MPE.

Wood KE. Chest 2002

Editorial

Prognostication of Pulmonary Embolism

Not Just a Matter of the Heart

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Am J Respir Crit Care Med Vol 182. pp 1–2, 2010
Internet address: www.atsjournals.org

Tratamiento domiciliario

Severity of pulmonary embolism

The severity of PE should be understood as an individual estimate of PE-related early mortality risk rather than the anatomical burden and the shape and distribution of intrapulmonary emboli. Therefore, current guidelines suggest replacing potentially misleading terms such as 'massive', 'submassive' and 'non-massive' with the estimated level of the risk of PE-related early death.

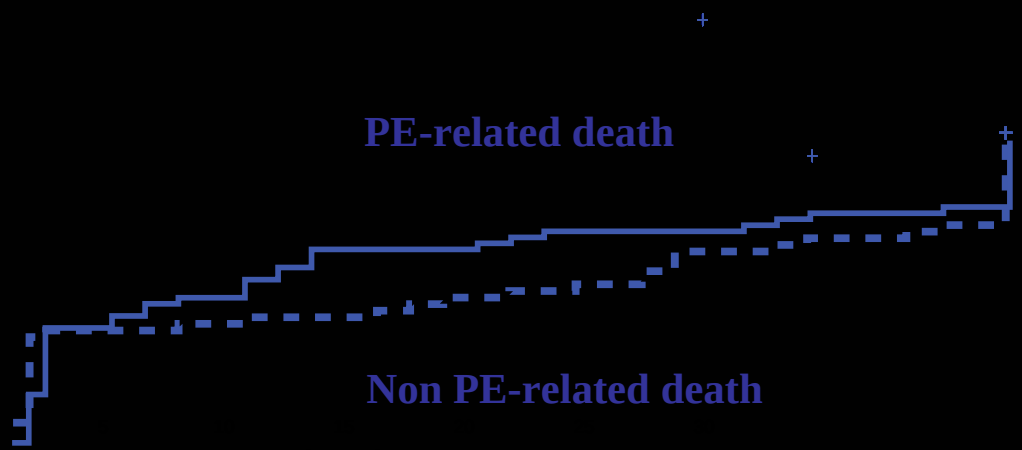
Torbicki A, Eur Heart J 2008

Causas de muerte

- MAPPET[1]: 10% mortalidad hospitalaria; 94% por TEP
- ICOPER[2]: 11% muertes a 2 semanas; 45% por TEP
- PIOPED[3]: 10% muertes por TEP; 90% en las 2 primeras semanas
- RIETE[4]: 61% de muertes precoces por TEP

[1]Konstantinides S. Circulation 1997
[2]Goldhaber SZ. Lancet 1999
[3]Carson JL. N Engl J Med 1992
[4]Conget F. Thromb Haemost 2008

Etiología y causa de muerte en 1,291 pacientes con TEP



Jiménez D, Am J Med (submitted)

Causa de muerte y valor pronóstico de cTnI and sPESI

1,291 pacientes de un centro 1/2003-12/2009.

	cTnI	PESI simplificado
VPN Mortalidad por todas las causas	91.3% (88.9-93.6)	98.8% (97.4-100)
VPN Mortalidad por TEP	96.5% (95.0-98.1)	99.6% (98.8-100)

Jiménez, Am J Med (submitted)

Pulmonary Embolism Severity Index

Table 1 Points assigned to prognostic variables in the prognostic model

Prognostic variables	Points assigned
Demographics	
Age (years)	Age
Male sex	+10
Comorbid conditions	
Cancer	+30
Heart failure	+10
Chronic lung disease	+10
Clinical findings	
Pulse ≥110 per minute	+20
Systolic blood pressure <100 mmHg	+30
Respiratory rate ≥30 per minute	+20
Temperature < 36°C	+20
Altered mental status[a]	+60
Arterial oxygen saturation <90%[b]	+20

A total point score for a given patient is obtained by summing the patient's age in years and the points for each applicable prognostic variable. The five following risk classes are defined based on patients' total point score: Class I, very low risk (<65 points); Class II, low risk (66–85 points); Class III, intermediate risk (86–105 points); Class IV, high risk (106–125 points); and Class V, very high risk (>125 points).

[a]Altered mental status was defined as disorientation, lethargy, stupor, or coma.

[b]Arterial oxygen saturation was defined with and without the administration of supplemental oxygen.

Aujesky D, AJRCCM 2005

Escala PESI

Table 2—*Validation Cohort 30-Day Mortality and Adverse Events Within Risk Strata Derived From the PESI and the Geneva Prediction Rule

	Derivation Cohort			Validation Cohort		
Variables	Patients	Deaths†	Adverse Events†	Patients	Deaths†	Adverse Events†
PESI[7]	n = 10,354	n = 953		n = 599	n = 43	n = 32
I	19.4 (18.7–20.2)	1.1 (0.7–1.7)		12.3 (9.7–15.0)‡	0	4.0 (0.4–8.5)
II	21.5 (20.7–22.3)	3.1 (2.5–4.0)		23.7 (20.3–27.1)	1.4 (0.5–3.3)	2.1 (0.2–4.5)
III	21.7 (20.9–22.5)	6.5 (5.5–7.6)		28.9 (25.2–32.5)‡	6.9 (3.9–13.0)	6.9 (3.1–10.7)
IV	16.4 (15.7–17.1)	10.4 (9.0–11.9)		21.5 (18.2–24.8)§	10.1 (4.9–15.3)	7.0 (2.6–11.4)
V	21 (20.3–21.8)	24.5 (22.7–26.9)		13.5 (10.8–16.3)‡	19.7 (11.1–28.4)	6.2 (0.9–11.4)
Geneva score[8]	n = 268		n = 27			
Low risk	67.1 (61.3–72.6)		2.2 (0.9–5.6)	83.8 (80.9–86.8)‖	5.6 (3.6–7.6)	4.2 (2.4–5.9)
High risk	32.9 (27.5–38.7)		26.1 (18.0–36.2)	16.2 (13.2–19.1)	15.5 (8.3–22.7)	11.3 (5.0–17.6)¶

*Data are presented as % (95% CI).

†Per risk stratum.

‡$p < 0.0001$, PESI derivation sample vs validation cohort.

§$p < 0.01$, PESI derivation sample vs validation cohort.

‖$p < 0.0001$, Geneva derivation sample vs validation cohort.

¶$p = 0.02$, Geneva derivation sample vs validation cohort.

Jiménez D. Chest 2007

Escala PESI

- Validada en distintas poblaciones (exacta y generalizable)
- Transportable
- Reproducible
- Utilizada en ensayo clínico OPTE

Donze J. Thromb Haemost 2008

ORIGINAL INVESTIGATION

Simplification of the Pulmonary Embolism Severity Index for Prognostication in Patients With Acute Symptomatic Pulmonary Embolism

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RIETE Investigators

RIETE Steering Committee

Coordinator of the RIETE Registry: Manuel Monreal, MD, PhD (Spain). *RIETE Steering Committee Members:* Hervè Decousus, MD, PhD (France), Paolo Prandoni, MD, PhD (Italy), and Benjamin Brenner, MD (Israel). *RIETE National Coordinators:* Raquel Barba, MD, PhD (Spain), Pierpaolo Di Micco, MD, PhD (Italy), and Karine Rivron-Guillot, MD (France). *RIETE Registry Coordinating Center:* S & H Medical Science Service, Madrid, Spain.

Members of the RIETE Group

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Simplified PESI

Age > 80

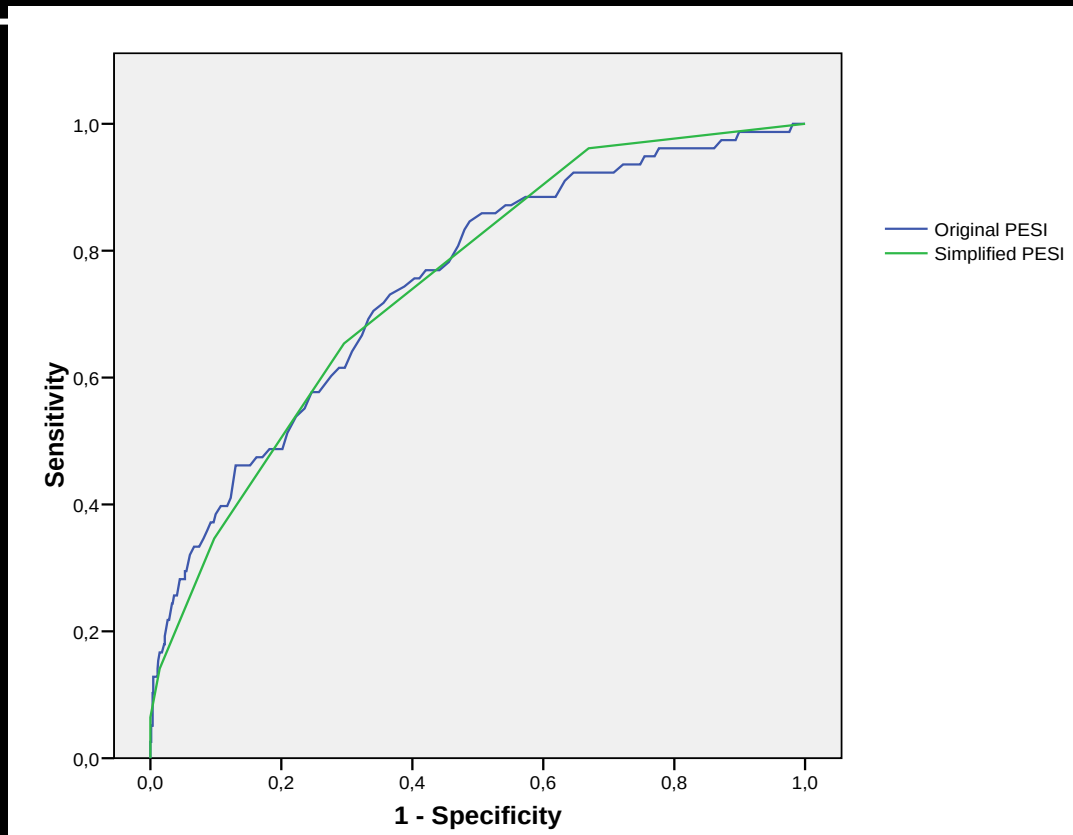
Cancer

Cardiopulmonary disease

HB ≥ 110/min

SBP < 100 mm Hg

O_2 saturation < 90%



Jiménez D. Arch Intern Med 2010

Registro RIETE

- 7,106 pacientes
- Identificados de bajo riesgo: 36.2%
- Valor predictivo negativo: 98.9% (IC 95%: 98.5-99.3%)

Jiménez D. Arch Intern Med 2010

Comparación con el índice de shock

1,206 pacientes de un centro 1/2003-12/2009.

	PESI simplificado	Índice shock
Bajo riesgo	31%	85%
VPN	98.4%	91.7%
VPN*	97.8%	96.7%

*ETEV recurrente no fatal o sangrado mayor no fatal

Sam A. Eur Respir J (press)

Comparación con biomarcadores

331 pacientes normotensos estudio PROTECT.

	BNP	PESI simplificado
Bajo riesgo	84.6%	41.1%
VPN	96.8%	99.3%
VPN*	91.8%	92.7%

*Muerte, recurrencia, sangrado mayor o escalada de tratamiento

PROTECT investigators, unpublished

Alta precoz

304 pacientes PESI III de un centro 1/2003-12/2009.

	PESI	PESI simplificado
Reclasificados	27.3%	12.5%
VPN	98.8%	100%

Jiménez, unpublished

Validación externa/refinamiento puntos de corte

11,266 pacientes RIETE 04/2010.

	PESI	PESI simplificado
Bajo riesgo	36%	28%
VPN	98.86%	98.87%

Villalba, unpublished

Validación externa/refinamiento puntos de corte

11,266 pacientes RIETE 04/2010.

Edad (años)	PESI simplificado bajo riesgo Mortalidad (%)
<20	0
20-29	0
30-39	0
40-49	0.3
50-59	0.7
60-69	0.4
70-79	1.9
>80	5.8

Villalba, unpublished

Comparación con el modelo ESC

526 pacientes de un centro 1/2003-10/2010.

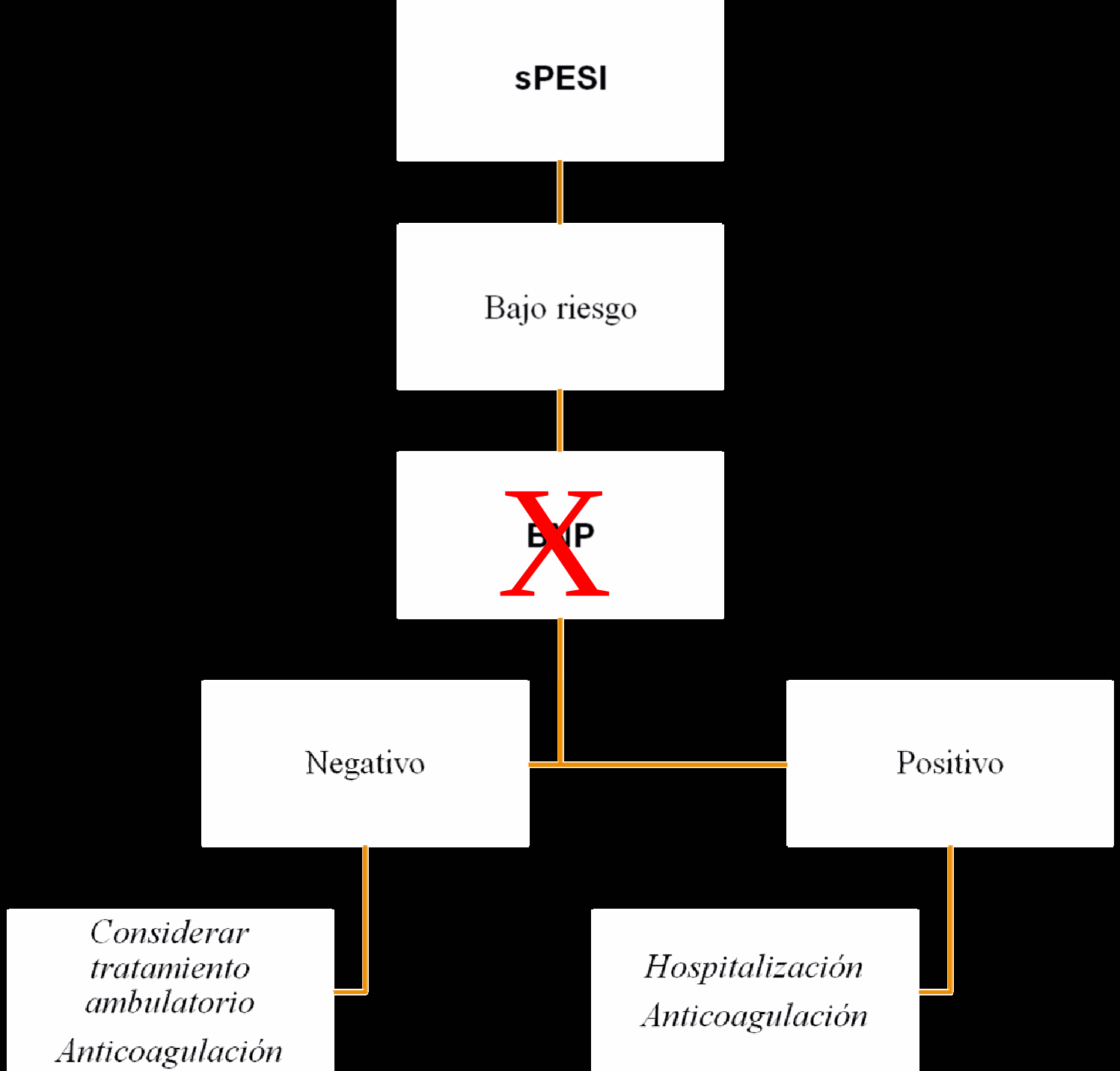
	PESI simplificado	ESC
Bajo riesgo	32%	39%
VPN	100%	97.0
VPN*	100%	99.5%

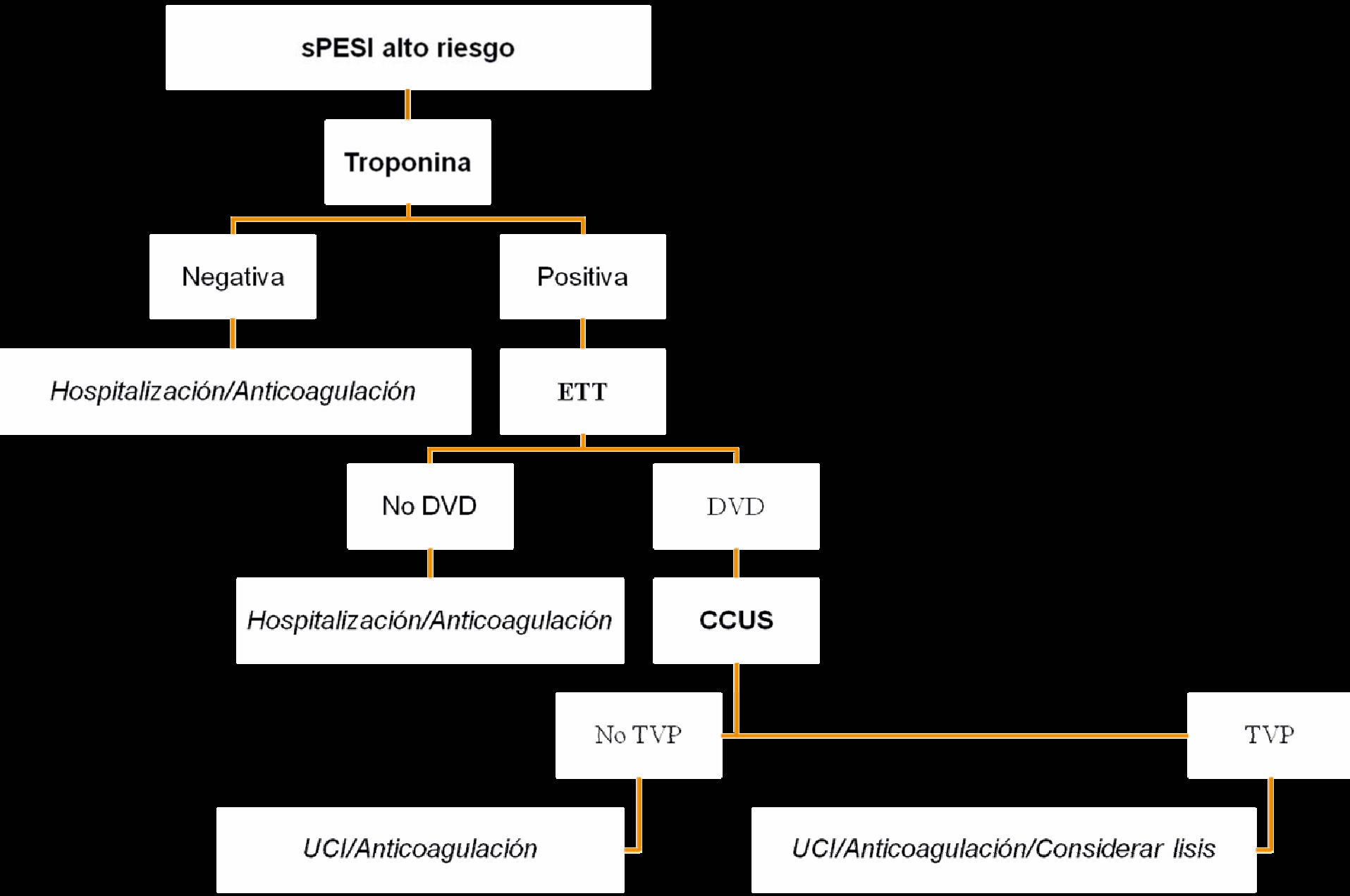
*Muerte por TEP

Jimenez, unpublished

Sumario

- Las escalas clínicas son suficientes para pronosticar a más de la mitad de los pacientes con TEP
- La escala PESI simplificada es clínicamente útil, sencilla de usar y al menos igual de eficaz que la escala PESI
- En marcha un ensayo clínico en el ámbito del tratamiento ambulatorio de la TEP


sPESI
Bajo riesgo
BNP
Negativo
Positivo
Considerar tratamiento ambulatorio
Anticoagulación
Hospitalización
Anticoagulación


sPESI alto riesgo
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ETT
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Hospitalización/Anticoagulación
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