

¿Cómo sé qué pacientes
pueden morir?

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SEMI
SOCIEDAD ESPAÑOLA DE MEDICINA INTERNA

GRUPO DE TROMBOEMBOLISMO

IV FORUM MULTIDISCIPLINAR de la Enfermedad Tromboembólica

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Plan de Calidad del Sistema Nacional de Salud

FUENTE
Fundación para el Estudio de la Enfermedad Tromboembólica en España

Capítulo Español de Flebología

SOCIEDAD ESPAÑOLA DE NEUMOLOGÍA Y CIRUGÍA TUBERCULOSA (SENECT)

SETH

Outcomes in Pulmonary Embolism

100%

Sudden Death

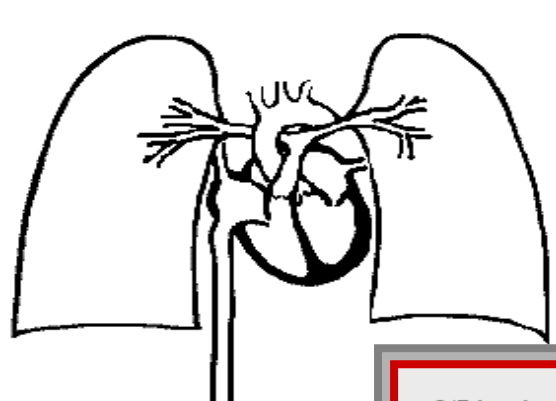
Eur Respir J 2007; 30: 1111–1116
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	Sens _{mort}	Sens _{EPm}	VPP _{mort}	VPP _{EPm}
I Shock	30.5	32	13	5.0
Tas < 100	14.4	15.7	12.2	4.9
Tas				

• ¿Qué otros marcadores me ayudarían?

- Inmov > 4 días: OR: 2.0
- Cancer: OR: 3.3
- Edad > 70 años: OR: 1.8
- Creatinina: OR: 2.5
- Peso < 65: OR: 1.8



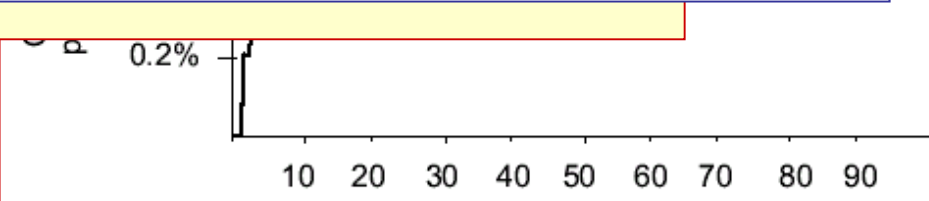
CHAPTER 4. RISK CLASS-SPECIFIC MEDICAL OUTCOMES IN THE DERIVATION AND VALIDATION SAMPLES

TABLE 4. RISK CLASS-SPECIFIC MEDICAL OUTCOMES IN THE DERIVATION AND VALIDATION SAMPLES

Medical Outcomes	Derivation Sample, % (95% CI) (n = 10,354)	Internal Validation Sample, % (95% CI) (n = 5,177)	External Validation Sample, % (95% CI) (n = 221)	p Value [§]	p Value
30-day mortality					
Class I	1.1 (0.7–1.7)	1.6 (0.9–2.6)	0 (0–6.6)	0.32	0.66
Class II	3.1 (2.5–4.0)	3.5 (2.5–4.7)	1.7 (0–8.9)	0.63	0.72
Class III	7.1 (5.7–8.7)	7.1 (5.7–8.7)	3.2 (0.4–11.2)	0.51	0.43
Class IV	11.4 (9.3–13.8)	11.4 (9.3–13.8)	4.0 (0.1–20.4)	0.44	0.36
Class V	23.9 (21.4–26.5)	23.9 (21.4–26.5)	10.0 (1.2–31.7)	0.69	0.19
Inpatient mortality					
Class I	0.8 (0.5–1.3)	1.1 (0.5–1.9)	0 (0–6.6)	0.42	1.00
Class II	1.8 (1.3–2.4)	1.9 (1.2–2.9)	Not available [†]	0.75	—
Class III	4.2 (3.4–5.1)	4.7 (3.6–6.1)	Not available [†]	0.49	—
Class IV	5.9 (4.8–7.1)	7.0 (5.3–9.0)	Not available [†]	0.31	—
Class V	15.8 (14.3–17.4)	17.2 (15.1–19.6)	Not available [†]	0.29	—
Nonfatal cardiogenic shock or cardiorespiratory arrest [†]					
Class I	0.6 (0.3–1.0)	1.0 (0.5–1.8)	Not available [†]	0.24	—
Class II	1.3 (0.9–1.9)	1.2 (0.6–2.0)	Not available [†]	0.77	—
Class III	2.1 (1.6–2.8)	2.0 (1.3–3.0)	Not available [†]	0.86	—
Class IV	1.9 (1.3–2.7)	2.1 (1.2–3.3)	Not available [†]	0.82	—
Class V	4.6 (3.8–5.6)	5.3 (4.0–6.8)	Not available [†]	0.40	—

91 VPP: 7.86%

Mortalidad global: 8.65%



Prognostic Role of Echocardiography Among Patients With Acute Pulmonary Embolism and a Systolic Arterial Pressure of 90 mm Hg or Higher

Nils Kucher, MD; Elisa Rossi, BS; Marisa De Rosa, PhD; Samuel Z. Goldhaber, MD

Background: The prognostic role of echocardiographic right ventricular (RV) dysfunction for predicting mortality in patients with acute pulmonary embolism

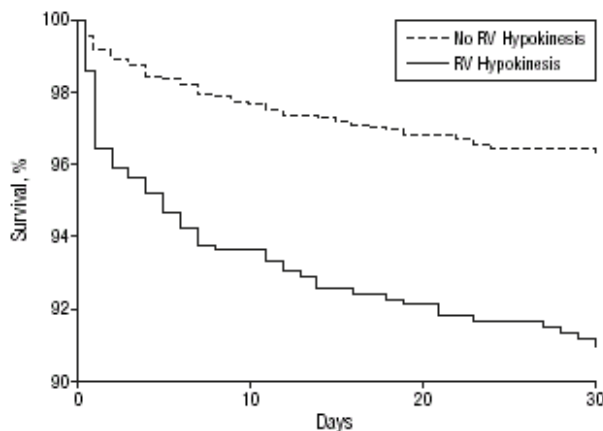


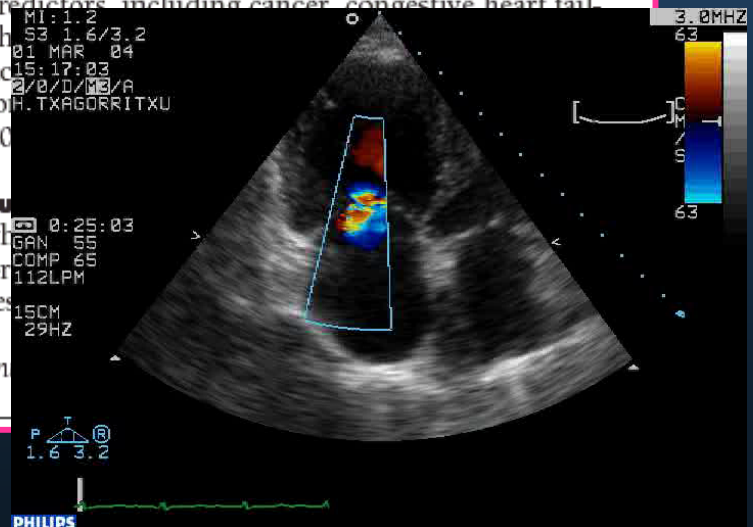
Figure 1. Survival rate through 30 days in 1035 patients with pulmonary embolism with a systolic arterial pressure of 90 mm Hg or higher at presentation, according to the presence or absence of right ventricular (RV) hypokinesis on the baseline echocardiogram, adjusted for cancer, congestive heart failure, chronic lung disease, age, and systolic arterial pressure.

ness. Cancer was less often present (14.1% vs 22.5%, $P = .001$). The 30-day survival rates in patients with and without RV hypokinesis were 83.7% (95% confidence interval [CI], 79.3%-87.0%) and 90.6% (95% CI, 88.0%-92.6%), respectively (log-rank P value $< .001$). The univariate hazard ratio of RV hypokinesis for predicting 30-day mortality was 2.11 (95% CI, 1.41-3.16; $P < .001$). Right ventricular hypokinesis remained an independent predictor of 30-day mortality (hazard ratio, 1.94; 95% CI, 1.23-3.06) after adjusting for univariately significant predictors, including cancer, congestive heart failure, chronic lung disease, age, and systolic arterial pressure. The hazard ratio for mortality was greater than 10

Conclusion

Pulmonary embolism with a systolic arterial pressure of 90 mm Hg or higher at presentation is associated with a higher mortality rate than in patients without RV hypokinesis.

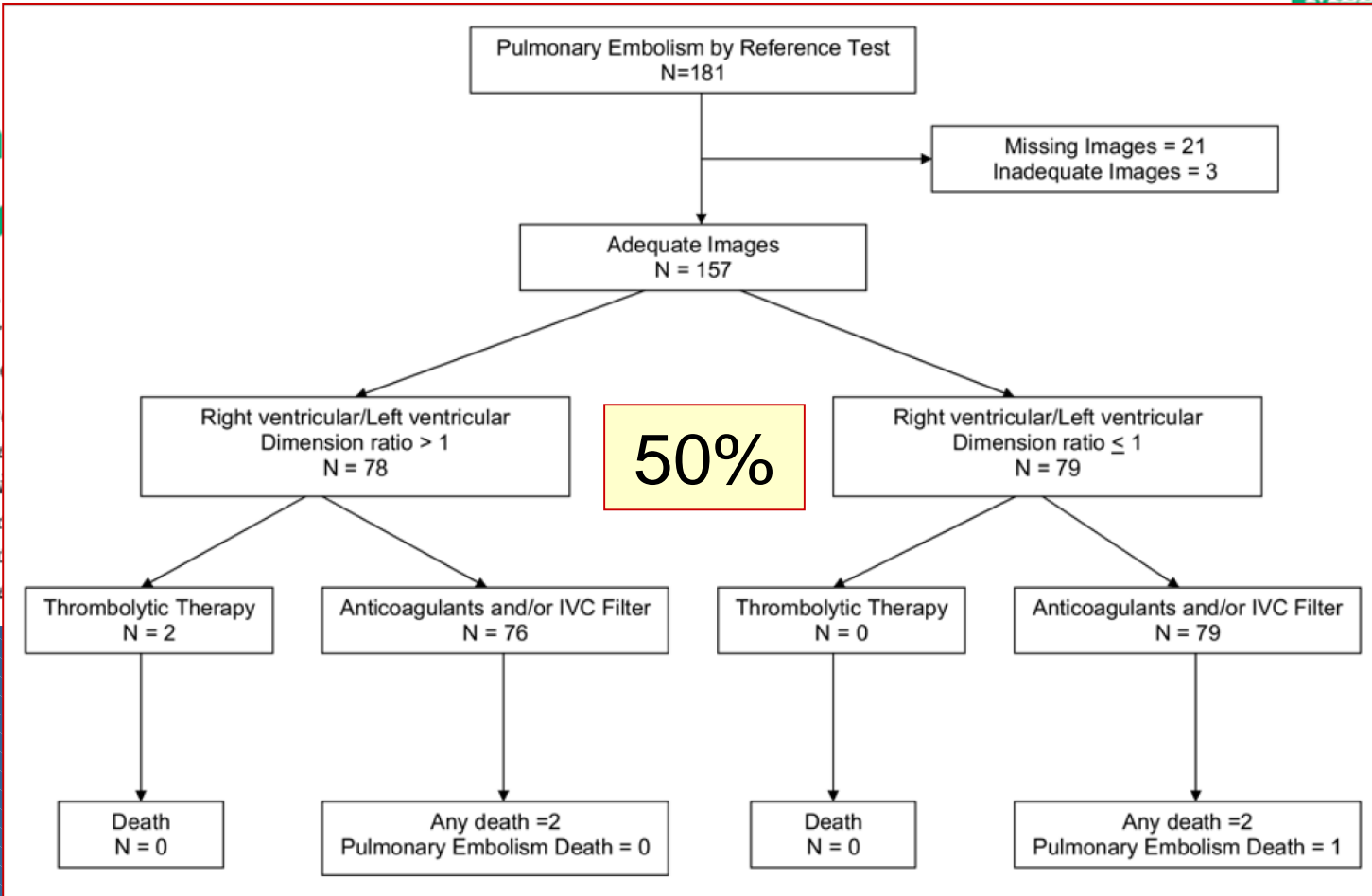
Arch Intern Med. 2008;168:112-118.



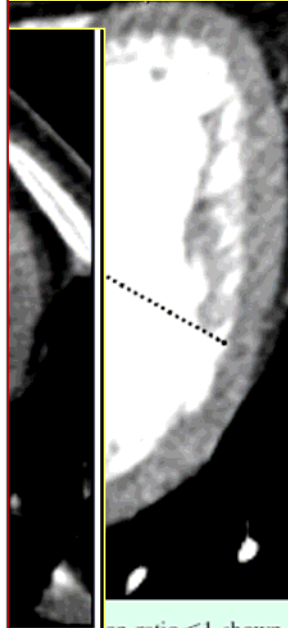
CLINICAL RESEARCH STUDY

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50%



on ratio <1 shown
d multidetector CT
is shown by dotted
tricle is shown at
own on
transverse image of contrast-enhanced multidetector CT angio-
gram. Minor axis of right ventricle is shown by dotted line at
top, and minor axis of LV is shown at bottom. Flattening of the
interventricular septum is shown.

on ratio <1 shown
d multidetector CT
is shown by dotted
tricle is shown at

Embolitic Event

Prognostic Value of Troponins in Acute Pulmonary Embolism

A Meta-Analysis

Cecilia Becattini, MD; Maria Cristina Vedovati, MD; Giancarlo Agnelli, MD

Background—Whe

Positive LR (95% CI)

Accuracy of Cardiac Biomarkers for the Prediction of In-Hospital Death in Pulmonary Embolism

Reference	n	Biomarker	Assay	Cut-Off Level	Test +, %	NPV, %	PPV, %
Konstantinides et al ¹¹	106	cTnI	Centaur (Bayer)	0.07 ng/mL	41	98	14
Konstantinides et al ¹¹	106	cTnT	Elecsys (Roche Pharmaceuticals)	0.04 ng/mL	37	97	12
Giannitsis et al ¹²	56	cTnT	TropT (Roche Pharmaceuticals)	0.10 ng/mL	32	97	44
Janata et al ²⁴	106	cTnT	Elecsys (Roche Pharmaceuticals)	0.09 ng/mL	11	99	34
Pruszczyk et al ¹³	64	cTnT	Elecsys (Roche Pharmaceuticals)	0.01 ng/mL	50	100	25
ten Wolde et al ²⁵	110	BNP	Shionoria (CIS Bio International)	21.7 pmol/L	33	99	17
Kucher et al ¹⁸	73	NT-proBNP	Elecsys (Roche Pharmaceuticals)	500 pg/mL	58	100	12
Kucher et al ¹⁷	73	BNP	Triage (Biosite Technologies)	50 pg/mL	58	100	12
Pruszczyk et al ²⁶	79	NT-proBNP	Elecsys (Roche Pharmaceuticals)	153 to 334* pg/mL	66	100	23

NPV indicates negative predictive value; PPV, positive predictive value.

*Age and gender adjusted cut-off levels according to the manufacturer.

Prognostic Significance of Troponin Elevation and Right Ventricular Enlargement in Acute Pulmonary Embolism

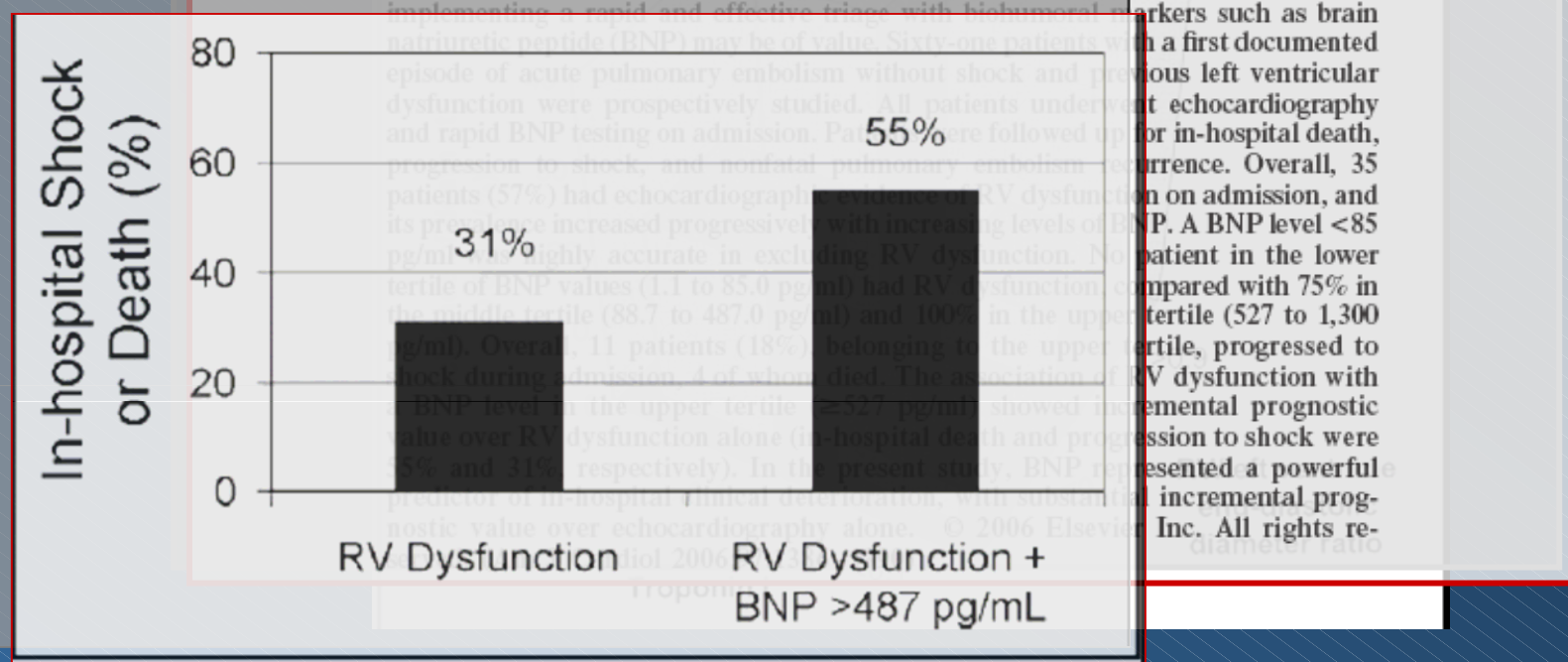
Tudor Scridon, MD, Cristiana Scridon, MD, Hicham Skali, MD, Alberto Alvarez, MD, Samuel Z. Goldhaber, MD, and Scott D. Solomon, MD*

The troponin
monary embolism (PE)
troponin and right ventricular
after PE the
marker. © 2005 Elsevier Inc. All rights reserved. (Am J Cardiol 2005; 95:303-305)

Usefulness of Bedside Testing for Brain Natriuretic Peptide to Identify Right Ventricular Dysfunction and Outcome in Normotensive Patients With Acute Pulmonary Embolism

Filippo Pieralli, MD^{a,*}, Iacopo Olivotto, MD^b, Simone Vanni, MD^a, Alberto Conti, MD^a, Alberto Camaiti, MD^a, Giacomo Targioni, MD^c, Stefano Grifoni, MD^a, and Giancarlo Berni, MD^a

Echocardiographic right ventricular (RV) dysfunction is a well-established prognostic indicator in patients with acute pulmonary embolism. However, the possibility of





REGULAR ARTICLE

D-dimer level is associated with the extent of pulmonary embolism

W. Ghanima^{a,d,e,*}, M. Abdelnoor^a, L. Holmen^b, B.E. Nielsen^b, S. Ross^a

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^c Ullevål Univ
^d Ullevål Univ
^e Medical Clin

Table 3. Multivariate logistic regression analysis of D-dimer and other risk factors for mortality at 90 days

Body weight in kg
>70 (ref)
50–70
<50
Known cancer
PE without DVT
Immobility
Previous surgery
Abnormal creatinine levels, >1.2 mg/dL
Hemoglobin <12 g/dL
D-dimer, increase of 1000 ng/mL
D-dimer levels
Negative
Positive

500–2499 ng/mL (ref)
2500–4999 ng/mL
≥5000 ng/mL

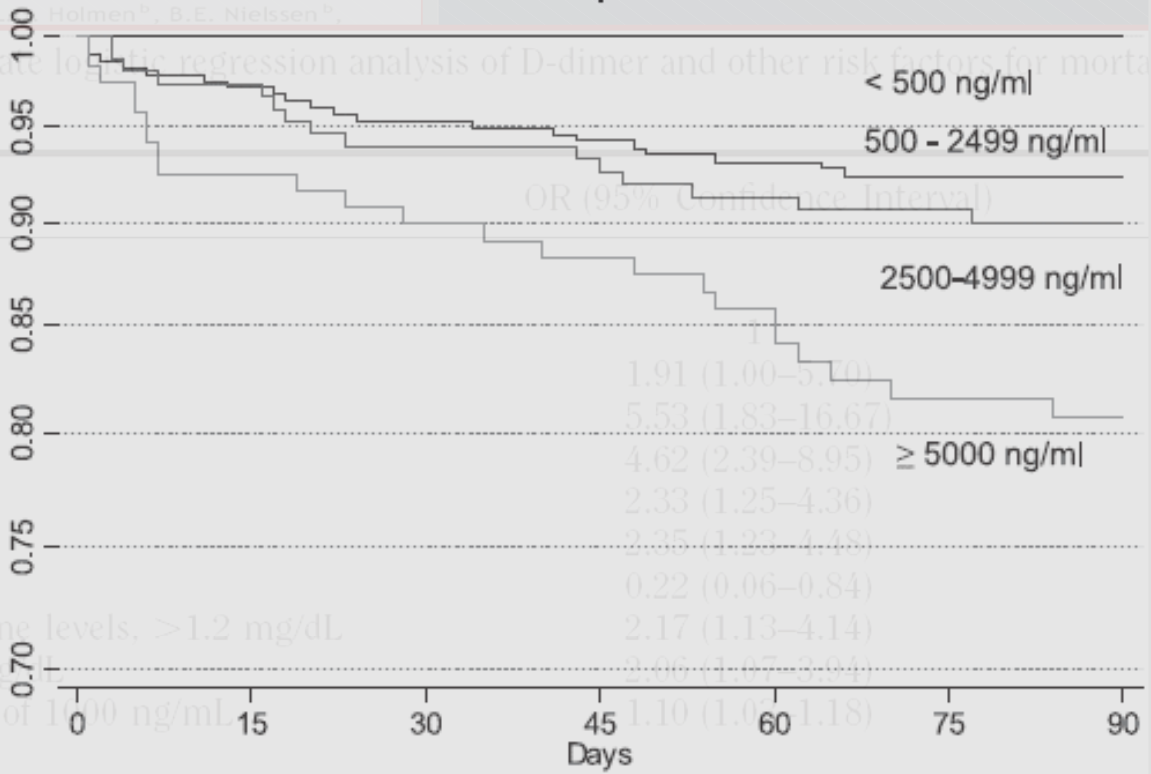


Figure 1. Overall survival rates according to D-dimer values. Kaplan-Meier $p = .0011$.

OR (95% Confidence Interval)	p
1.91 (1.00–5.70)	.032
5.53 (1.83–16.67)	<.0001
4.62 (2.39–8.95)	.008
2.33 (1.25–4.36)	.009
2.25 (1.23–4.48)	.026
0.22 (0.06–0.84)	.019
2.17 (1.13–4.14)	.03
1.10 (1.00–1.18)	.026
1.10 (1.00–1.18)	.032

patients with PE and D-dimer ≥ 5000 ng/mL showed a higher risk to die of fatal PE (OR 4.4, 95% CI 0.5–33.0) than to die

CUARTIL 4 * MORTALIDAD A 15 DÍAS (p<0,001)

1.277pacientes



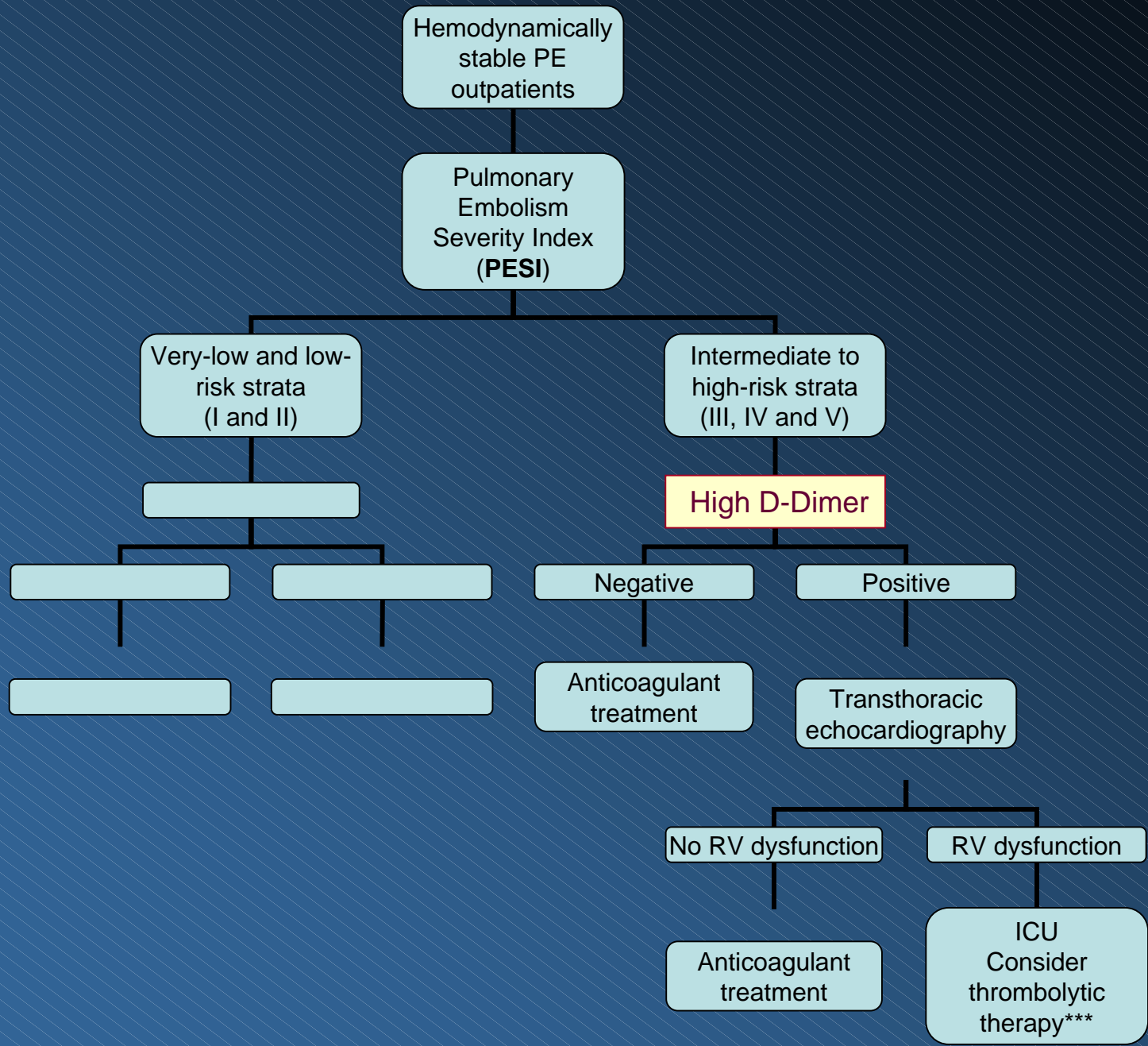
		IC	95%
Sensibilidad	41,7%	30,3%	a 53,1%
Especificidad	76,5%	74,5%	a 78,5%
Valor predictivo positivo	7,0%	4,6%	a 9,5%
Valor predictivo negativo	96,8%	95,9%	a 97,8%
Proporción de falsos positivos	23,5%	21,5%	a 25,5%
Proporción de falsos negativos	58,3%	46,9%	a 69,7%
Exactitud	75,1%	73,0%	a 77,1%
Índice J de Youden	0,2		
CPP o LR(+)	1,77	1,33	a 2,36
CPN o LR(-)	0,76	0,62	a 0,93

OR: 2.28 (1.06-4.91)

CUARTIL 4 * E P MORTAL-15 DÍAS (p=0,007)

		IC	95%
Sensibilidad	43,6%	28,0%	a 59,2%
Especificidad	76,2%	74,2%	a 78,2%
Valor predictivo positivo	4,0%	2,1%	a 5,8%
Valor predictivo negativo	98,3%	97,7%	a 99,0%
Proporción de falsos positivos	23,8%	21,8%	a 25,8%
Proporción de falsos negativos	56,4%	40,8%	a 72,0%
Exactitud	75,5%	73,5%	a 77,5%
Índice J de Youden	0,2		
CPP o LR(+)	1,83	1,27	a 2,64
CPN o LR(-)	0,74	0,56	a 0,98

OR: 3.37 (1.15-9.89)



Hemodynamically stable PE outpatients

Pulmonary Embolism Severity Index (PESI)

Very-low and low-risk strata (I and II)

Intermediate to high-risk strata (III, IV and V)

High D-Dimer

Negative

Positive

Anticoagulant treatment

Transthoracic echocardiography

No RV dysfunction

RV dysfunction

Anticoagulant treatment

ICU Consider thrombolytic therapy***