

# PROGNOSTIC SIGNIFICANCE OF CONCOMITANT DEEP VEIN THROMBOSIS IN PATIENTS PRESENTING WITH ACUTE SYMPTOMATIC PULMONARY EMBOLISM\*



The RIETE investigators

\*JAMA (submitted)

# Background

- DVT and PE: same disease with different prognosis
- Different prevalences of DVT in PE-proven patients
- Correlation between changes in clot burden and the risk of recurrence

**Douketis J. JAMA 1998**  
**Van Rossum AB. Br J Radiol 1998**  
**Hull RD. Am J Med 2005**

# Background

## **Deep Venous Thrombosis in Patients With Acute Pulmonary Embolism\***

**Prevalence, Risk Factors, and Clinical Significance**

- Prospective multicenter outcome study
- Post hoc analysis
- DVT detected in 60% of 281 patients
- DVT did not predict recurrence or death

# Background

## DVT and recurrent VTE

Table 6—Three-Month Risk of Recurrent VTE Event and/or Death in Patients With and Without DVT Among 281 Patients With CTPA-Proven PE\*

Variables	Patients With CUS-Detectable DVT (n = 169)	Patients Without CUS-Detectable DVT (n = 112)	p Value
Three-month risk of death	8 (4.7)†	3 (2.7)‡	0.6§
Three-month risk of recurrent VTE event	5 (3.0)†	1 (0.9)‡	0.4§
Three-month risk of recurrent VTE event or death	11 (6.5)†	3 (2.7)‡	0.15

# Objectives

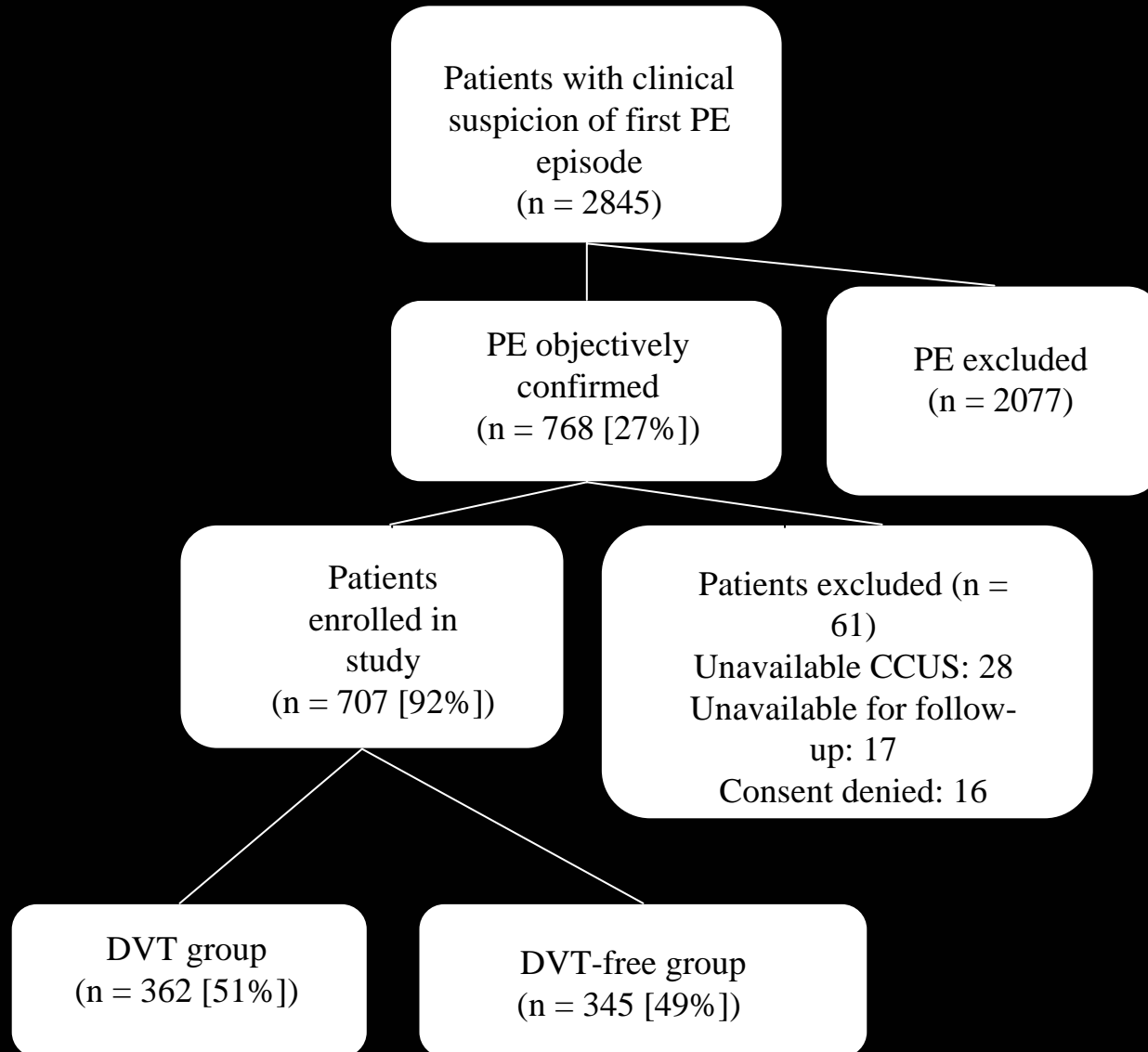
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To prospectively determine the risk of all-cause mortality during the first 3 months of treatment according to the presence or absence of concomitant DVT in patients with objectively confirmed PE

# Methods

- Prospective cohort study
- Suspected PE confirmed by objective testing
- Lower limb CCUS within 48 hours of diagnosis
- Standard treatment for all patients
- Outcomes: All-cause death, PE-related death; and recurrent PE, new DVT or recurrent DVT confirmed by objective testing
- Outcomes assessed by a blinded committee

# Flow diagram of patients assessed for study eligibility



# Results: patient demographics

	DVT group (n = 362)	DVT-free group (n = 345)	<i>P</i> value
<b>Clinical characteristics,</b>			
Age > 65 years	195 (70%)	170 (62%)	0.06
Male gender	137 (49%)	113 (41%)	0.07
<b>Risk factors for VTE,</b>			
Cancer	75 (27%)	48 (17%)	0.01
Surgery	26 (9%)	29 (11%)	0.67
Immobility for > 4 days	58 (21%)	33 (12%)	0.006
Previous VTE	29 (10%)	35 (13%)	0.33
<b>Comorbid diseases,</b>			
Chronic lung disease	32 (11%)	34 (12%)	0.82
Congestive heart failure	38 (14%)	36 (13%)	0.83



# Results: patient demographics

	DVT group (n = 362)	DVT-free group (n = 345)	P value
<b>Clinical presentation at admission,</b>			
Syncope	28 (10%)	45 (16%)	0.03
Chest pain	104 (37%)	160 (58%)	<0.001
Dyspnea	187 (67%)	199 (73%)	0.14
DVT symptoms	129 (46%)	9 (3%)	<0.0001
Heart rate $\geq$ 100 bpm	102 (36%)	106 (39%)	0.52
PO2 < 60 mm Hg	96 (34%)	116 (42%)	0.07
SBP < 90 mm Hg	11 (4%)	9 (3%)	0.68
<b>Treatment,</b>			
Fibrinolysis	10 (4%)	7 (3%)	0.62
IVC filter	10 (4%)	1 (0.3%)	0.009
<b>Quality of oral anticoagulation</b>			
High	187 (67%)	191 (70%)	0.5
Low	93 (33%)	83 (30%)	

# Results: outcome events

Event	DVT group (n = 362)	DVT-free group (n = 345)
	N (%)	N (%)
<b>Recurrences</b>	<b>26 (7)</b>	<b>6 (2)</b>
Recurrent distal DVT	0	1
Recurrent proximal DVT	7	0
Recurrent PE	19	5
<b>Death</b>	<b>55 (15)</b>	<b>22 (6)</b>
Fatal pulmonary embolism	24	5
Fatal bleeding	2	2
Others	29	15

# Results: multivariate analysis

Variable	Univariate		Multivariate	
	OR	<i>P</i>	OR	<i>P</i>
Cancer	3.7 (2.4-5.8)	<0.001	3.7 (2.3-4-1)	0.115
Immobility	1.6 (1.0-2.5)	0.06	2.0 (1.2-3.2)	0.007
DVT	2.5 (1.5-4.1)	<0.001	2.0 (1.2-3.4)	0.005

# Results: multivariate analysis

- IVC/Lysis

HR 2.19; 95% CI, 1.30 to 3.69;  $P = 0.003$

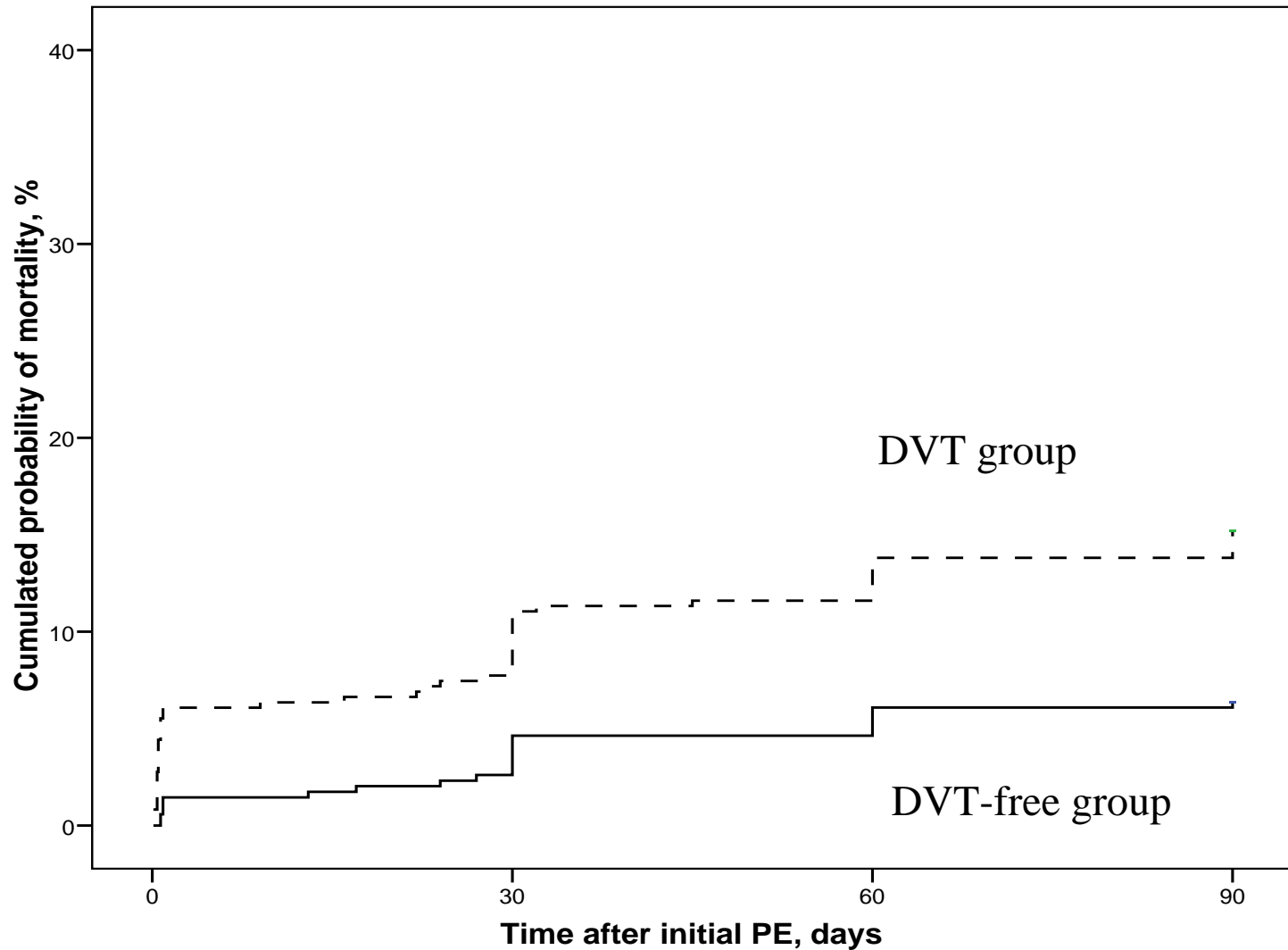
- Negative CT scans or nonconclusive lung scans

HR 2.15; 95% CI, 1.29 to 3.58;  $P = 0.03$

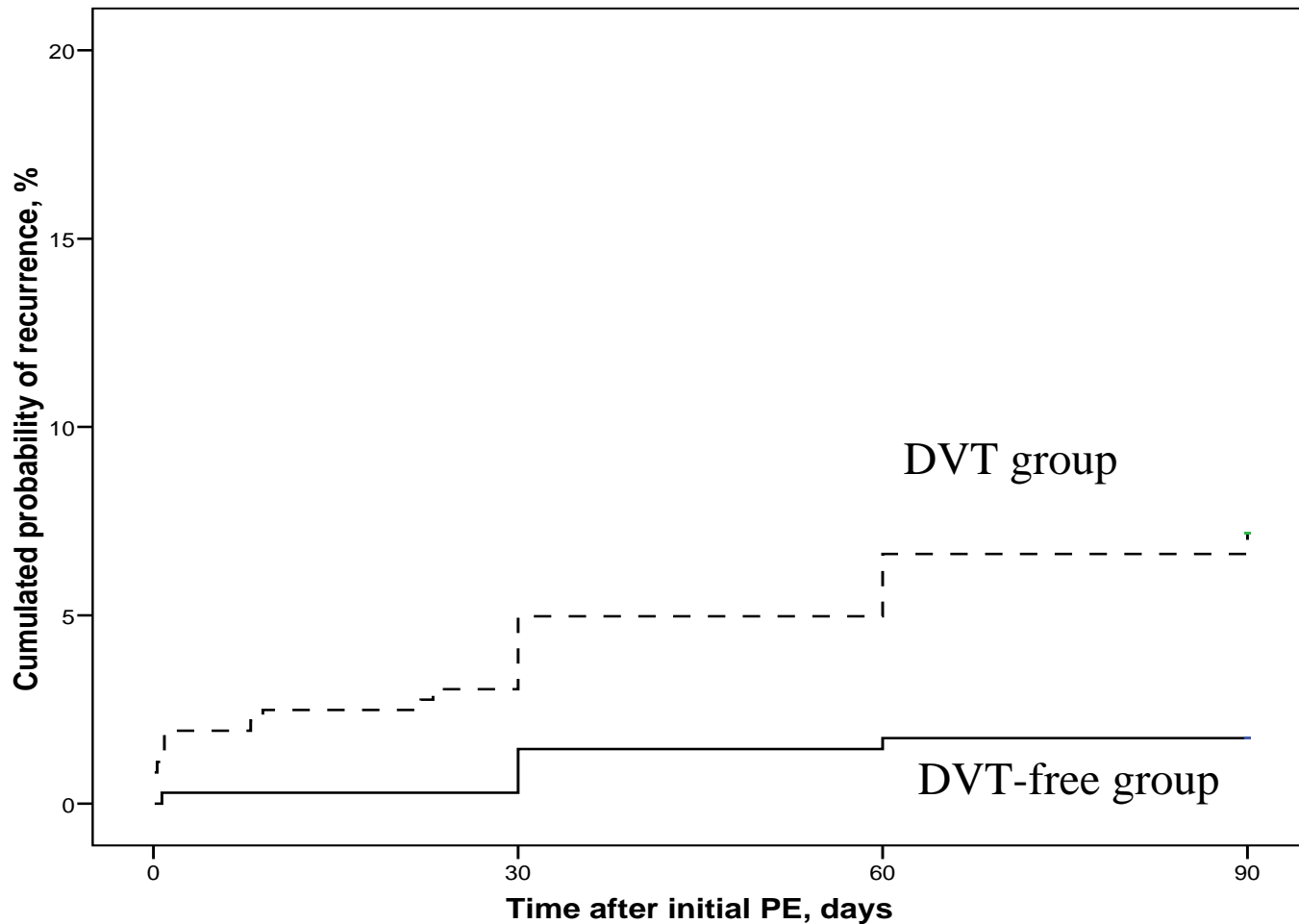
# Validation cohort: RIETE registry

- 4,476 consecutive outpatients with CCUS testing
- DVT in 62.6%
- All-cause mortality: 15.5%
- Adjusted HR 1.66, 95% CI: 1.28 to 2.15;  $P < 0.001$

# Results: cumulative probability of death



# Results: cumulative probability of recurrent VTE



# Why this difference with the French study?

## ESSEP study

- Diagnostic outcome study
- Multicenter
- Certain exclusion criteria
- Striking low mortality rate  
3.9%

## Our study

- Prospective cohort study
- Tertiary care hospital
- No exclusion criteria
- Higher mortality rate  
11.4%

RIETE Registry: 10.5%  
ICOPER: 17.4%



# Conclusions

- Half of the PE-proven patients have DVT diagnosed by CUS
- Less than half of these patients have lower limb signs or symptoms
- Our findings show a striking predictive correlation between clot-burden assessed by CUS and subsequent clinical outcome in patients with PE

# Lower limb ultrasound testing plus transthoracic echocardiography

