ΠΝΕΥΜΟΝΙΚΗ ΕΜΒΟΛΗ ΣΤΟ ΤΕΠ

ΜΠΟΥΛΙΑ ΣΤΑΥΡΟΥΛΑ
ΕΠΙΜΕΛΗΤΡΙΑ Α'
ΠΝΕΥΜΟΝΟΛΟΓΙΚΗ ΚΛΙΝΙΚΗ
Γ.Ν.Α. «Ο ΕΥΑΓΓΕΛΙΣΜΟΣ»

1ο Εκπαιδευτικό Συμπόσιο
με θέμα «**Επείγοντα στην Πνευμονολογία**»
Α’ Κλινική Εντατικής Θεραπείας ΕΚΠΑ, Γ.Ν.Α. “Ο Ευαγγελισμός”
26-27 Μαΐου 2017

Δεν υπάρχει σύγκρουση συμφερόντων με τις παρακάτω χορηγούς εταιρείες:

ASPEN

ASTRAZENECA

BAYER

CHIESI

ELPEN

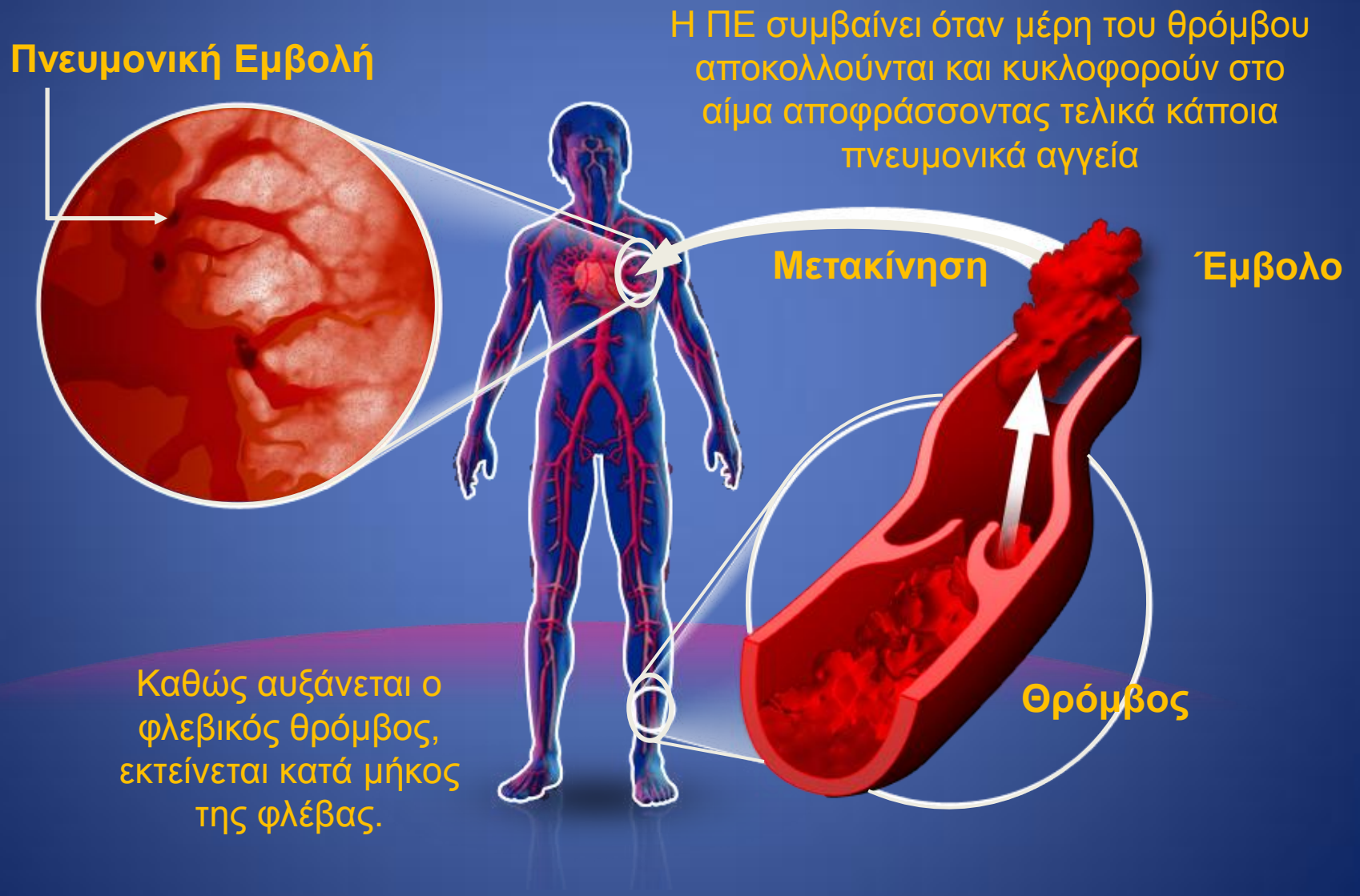
GLAXOSMITHKLINE

MENARINI HELLAS

NOVARTIS

PFIZER

ΦΘΕ (ΦΛΕΒΙΚΗ ΘΡΟΜΒΟΕΜΒΟΛΗ): ΕΝ ΤΩ ΒΑΘΕΙ ΦΛΕΒΙΚΗ ΘΡΟΜΒΩΣΗ ΚΑΙ ΠΝΕΥΜΟΝΙΚΗ ΕΜΒΟΛΗ



ΕΠΙΔΗΜΙΟΛΟΓΙΑ

- 75-269/100.000/ΧΡΟΝΟ (Raskob et al. Arterioscler Thromb Vasc Biol 2014)
- 700/100.000/ΧΡΟΝΟ ΣΕ ΗΛΙΚΙΕΣ >70 ΕΤΩΝ
- ΔΙΠΛΑΣΙΑΣΜΟΣ ΚΙΝΔΥΝΟΥ ΓΙΑ ΚΑΘΕ ΔΕΚΑΕΤΙΑ>40 ΧΡΟΝΙΑ
- 3^{Η} ΣΕ ΣΥΧΝΟΤΗΤΑ ΚΑΡΔΙΑΓΓΕΙΑΚΗ ΝΟΣΟΣ

ΠΑΡΑΓΟΝΤΕΣ ΚΙΝΔΥΝΟΥ

Web Table 1 **Predisposing factors for VTE (data modified from refs. 9, 15)**

Strong risk factors (odds ratio >10)
Fracture of lower limb
Hospitalization for heart failure or atrial fibrillation/flutter (within previous 3 months)
Hip or knee replacement
Major trauma
Myocardial infarction (within previous 3 months)
Previous venous thromboembolism
Spinal cord injury
Moderate risk factors (odds ratio 2–9)
Arthroscopic knee surgery
Auto–immune diseases
Blood transfusion
Central venous lines
Chemotherapy
Congestive heart or respiratory failure
Erythropoiesis-stimulating agents
Hormone replacement therapy (depends on formulation)
In vitro fertilization
Infection (specifically pneumonia, urinary tract infection and HIV)
Inflammatory bowel disease
Cancer (highest risk in metastatic disease)
Oral contraceptive therapy
Paralytic stroke
Postpartum period
Superficial vein thrombosis
Thrombophilia
Weak risk factors (odds ratio <2)
Bed rest >3 days
Diabetes mellitus
Hypertension
Immobility due to sitting (e.g. prolonged car or air travel)
Increasing age
Laparoscopic surgery (e.g. cholecystectomy)
Obesity
Pregnancy
Varicose veins

ΚΛΙΝΙΚΗ ΕΙΚΟΝΑ

- ΣΥΜΠΤΩΜΑΤΑ

Table 3 Clinical characteristics of patients with suspected PE in the emergency department (adapted from Pollack et al. (2011)).[82]

Feature	PE confirmed (n = 1880)	PE not confirmed (n = 528)
Dyspnoea	50%	51%
Pleuritic chest pain	39%	28%
Cough	23%	23%
Substernal chest pain	15%	17%
Fever	10%	10%
Haemoptysis	8%	4%
Syncope	6%	6%
Unilateral leg pain	6%	5%
Signs of DVT (unilateral extremity swelling)	24%	18%

DVT deep vein thrombosis.

- ΤΥΧΑΙΟ ΕΥΡΗΜΑ
  - ΑΣΘΕΝΕΙΣ ΜΕ Ca
  - ΑΣΘΕΝΕΙΣ ΜΕ DVT

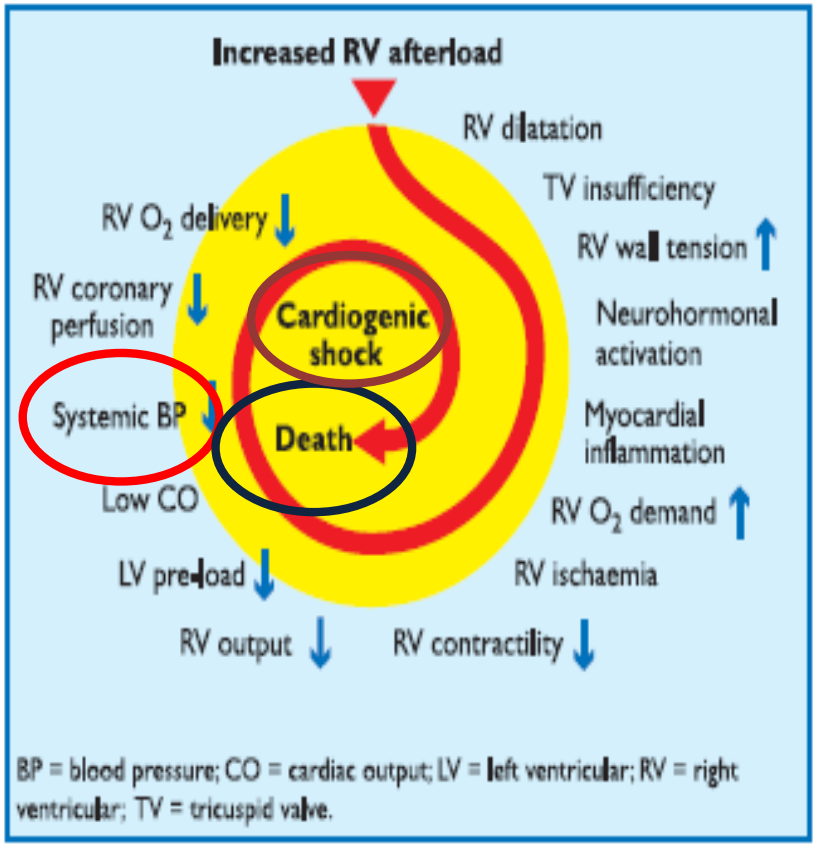


Figure 1 Key factors contributing to haemodynamic collapse in acute pulmonary embolism

ΗΚΓ

- ΦΥΣΙΟΛΟΓΙΚΟ
- ΦΛΕΒΟΚΟΜΒΙΚΗ ΤΑΧΥΚΑΡΔΙΑ (40% ΑΣΘΕΝΩΝ)
- ΚΟΛΠΙΚΗ ΜΑΡΜΑΡΥΓΗ
- ΑΡΝΗΤΙΚΑ Τ ΣΤΙΣ V_1-V_4
- QR V_1
- $S_1Q_3T_3$
- RBBB (πλήρες η ατελές)

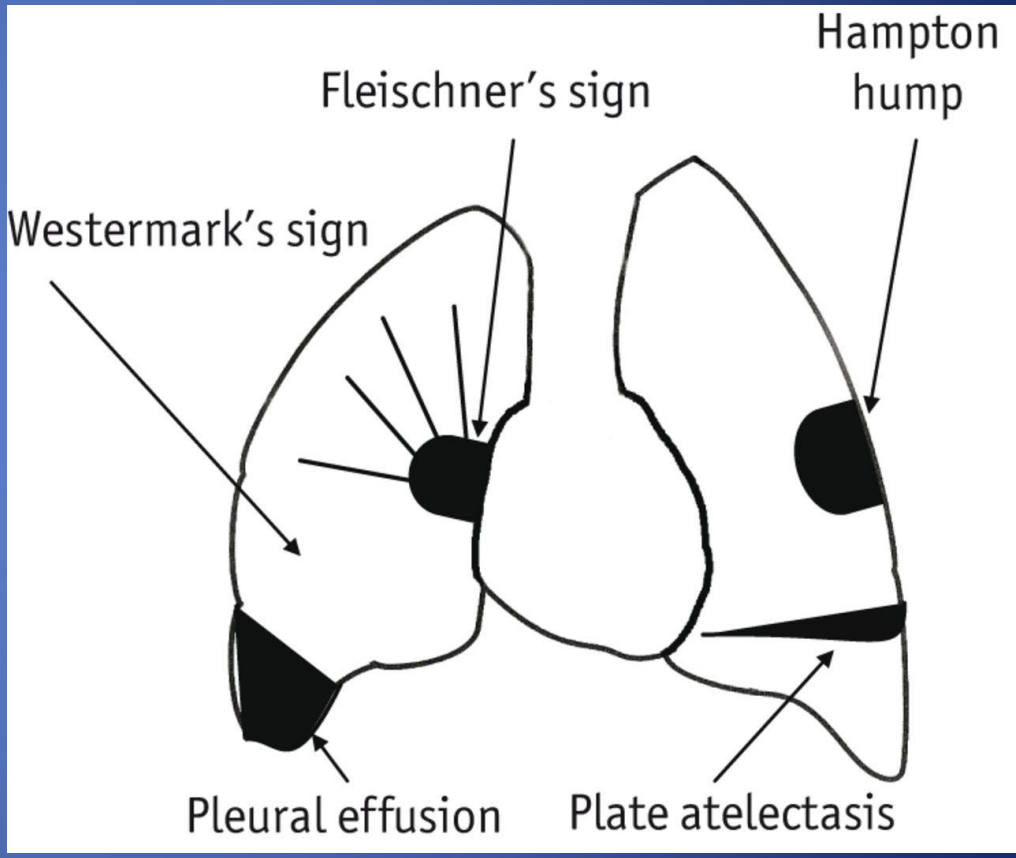
STRAIN RV

ΑΕΡΙΑ ΑΙΜΑΤΟΣ

- ΥΠΟΞΥΓΟΝΑΙΜΙΑ (60%)
- ↑ PA-aO_2 (80%)
- ΥΠΟΚΑΠΝΙΑ
- ΑΝΑΠΝΕΥΣΤΙΚΗ ΑΛΚΑΛΩΣΗ

ΑΚΤΙΝΟΓΡΑΦΙΑ ΘΩΡΑΚΟΣ

- ΜΗ ΕΙΔΙΚΑ ΕΥΡΗΜΑΤΑ
- ΑΠΟΚΛΕΙΣΜΟΣ ΑΛΛΩΝ ΑΙΤΙΩΝ ΔΥΣΠΝΟΙΑΣ-ΠΟΝΟΥ
- ΑΠΑΡΑΙΤΗΤΗ ΓΙΑ ΣΠΙΝΘΗΡΟΓΡΑΦΗΜΑ V/Q



Clinical prediction rules for PE

Items	Clinical decision rule points	
Wells rule	**Original version[75]**	**Simplified version[107]**
Previous PE or DVT	1.5	1
Heart rate ≥100 b.p.m.	1.5	1
Surgery or immobilization within the past four weeks	1.5	1
Haemoptysis	1	1
Active cancer	1	1
Clinical signs of DVT	3	1
Alternative diagnosis less likely than PE	3	1
Clinical probability		
Three-level score		
Low	0–1	N/A
Intermediate	2–6	N/A
High	≥7	N/A
Two-level score		
PE unlikely	0–4	0–1
PE likely	≥5	≥2
Revised Geneva score	**Original version[73]**	**Simplified version[108]**
Previous PE or DVT	3	1
Heart rate 75–94 b.p.m. ≥95 b.p.m.	 3 5	 1 2
Surgery or fracture within the past month	2	1
Haemoptysis	2	1
Active cancer	2	1
Unilateral lower limb pain	3	1
Pain on lower limb deep venous palpation and unilateral oedema	4	1
Age >65 years	1	1
Clinical probability		
Three-level score		
Low	0–3	0–1
Intermediate	4–10	2–4
High	≥11	≥5
Two-level score		
PE unlikely	0–5	0–2
PE likely	≥6	≥3

eats per minute; DVT = deep vein thrombosis; PE = pulmonary embolism.

ΔΙΑΓΝΩΣΗ

ΕΚΤΙΜΗΣΗ ΚΛΙΝΙΚΗΣ (PRE-TEST) ΠΙΘΑΝΟΤΗΤΑΣ ΓΙΑ ΠΕ

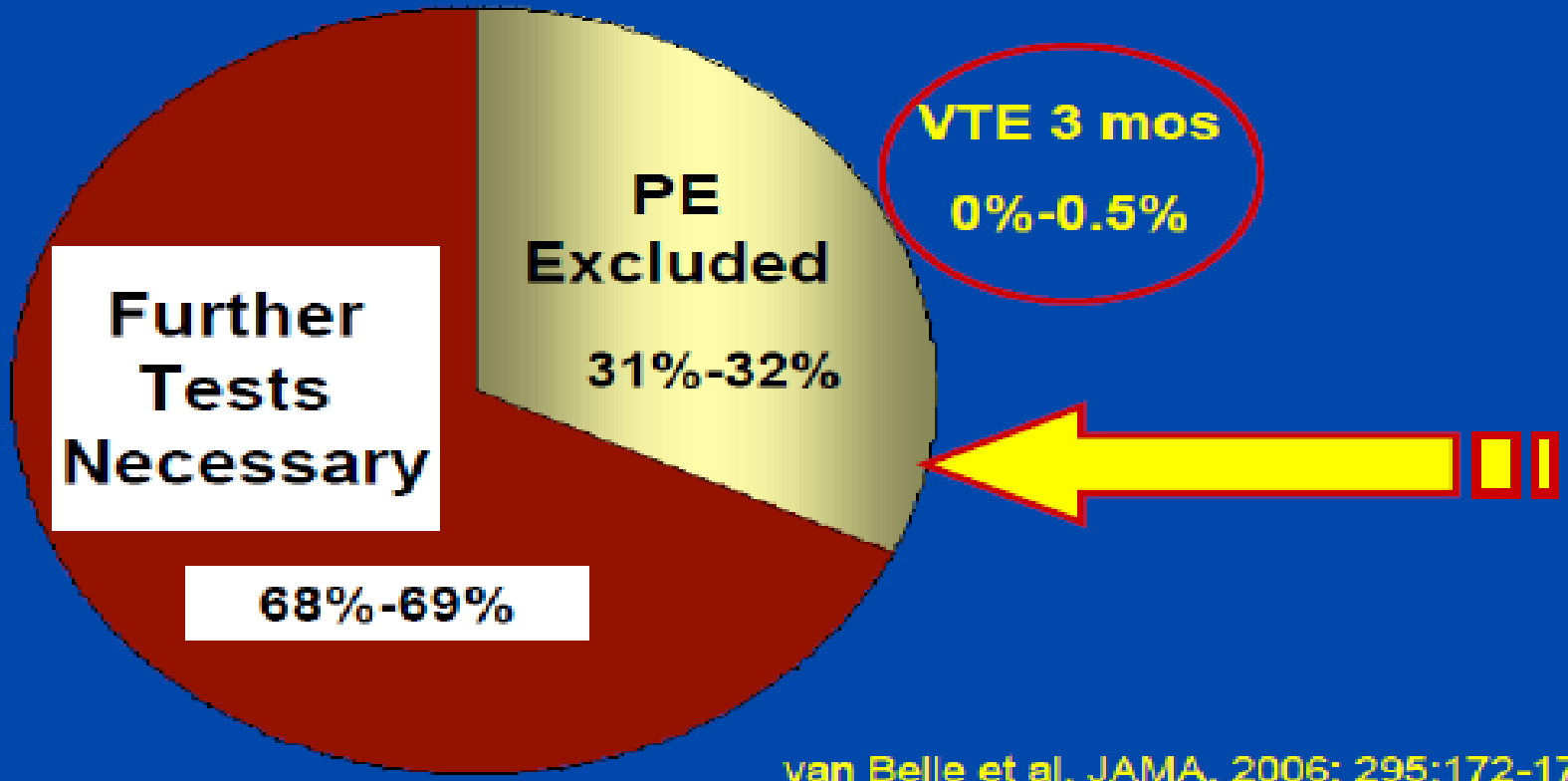
ΔΙΑΓΝΩΣΗ

ΕΚΤΙΜΗΣΗ ΚΛΙΝΙΚΗΣ ΠΙΘΑΝΟΤΗΤΑΣ

WELLS/GENEVA	ΠΙΘΑΝΟΤΗΤΑ ΠΕ
LOW	10%
MODERATE	30%
HIGH	65%
UNLIKELY	12%
LIKELY	50%

ΔΙΑΓΝΩΣΗ D-DIMERS

Normal D-dimer (Rapid ELISA) plus
Low/Mod or Unlikely Clin Prob
in Emergency Department



van Belle et al. JAMA. 2006; 295:172-179
Perrier et al. Am J Med. 2004; 116:291-299

ΜΟΝΟ ΑΡΝΗΤΙΚΗ ΠΡΟΓΝΩΣΤΙΚΗ ΑΞΙΑ

ΔΙΑΓΝΩΣΗ D-DIMERS-ΗΛΙΚΙΑ

- Cohort μελέτη 3,346 ασθενείς με υποψία ΠΕ
- D-DIMERS< ΗΛΙΚΙΑ Χ10 μg/L για ασθενείς >50ετών

RESULTS Of the 3346 patients with suspected PE included, the prevalence of PE was 19%. Among the 2898 patients with a nonhigh or an unlikely clinical probability, 817 patients (28.2%) had a D-dimer level lower than 500 μg/L (95% CI, 26.6%-29.9%) and 337 patients (11.6%) had a D-dimer between 500 μg/L and their age-adjusted cutoff (95% CI, 10.5%-12.9%). The 3-month failure rate in patients with a D-dimer level higher than 500 μg/L but below the age-adjusted cutoff was 1 of 331 patients (0.3% [95% CI, 0.1%-1.7%]). Among the 766 patients 75 years or older, of whom 673 had a nonhigh clinical probability, using the age-adjusted cutoff instead of the 500 μg/L cutoff increased the proportion of patients in whom PE could be excluded on the basis of D-dimer from 43 of 673 patients (6.4% [95% CI, 4.8%-8.5%) to 200 of 673 patients (29.7% [95% CI, 26.4%-33.3%), without any additional false-negative findings.

JAMA The Journal of the American Medical Association

RIGHINI et al 2014

ΔΙΑΓΝΩΣΗ
CTPA

- ΕΞΕΤΑΣΗ ΕΚΛΟΓΗΣ :ευαισθησία 83%
  :ειδικότητα 96%

WELLS	NPV	PPV
LOW	96%	58%
INTERMEDIATE	89%	92%
HIGH	60%	96%

ΔΙΑΓΝΩΣΗ-CTPA

- ΑΡΝΗΤΙΚΗ CTPA & ↑ ΚΛΙΝΙΚΗ ΠΙΘΑΝΟΤΗΤΑ
- ΘΕΤΙΚΗ CTPA & ↓ ΚΛΙΝΙΚΗ ΠΙΘΑΝΟΤΗΤΑ

ΕΛΛΕΙΜΑ ΜΟΝΗΡΟΥΣ ΥΠΟΤΜΗΜΑΤΙΚΟΥ ΚΛΑΔΟΥ

- 4,7 (SDCT) Vs 9.4 % (MDCT) χωρίς αύξηση του κινδύνου VTE στην 3μηνη παρακολούθηση. (Carrier 2010)
- Ασυμφωνία μεταξύ των ακτινοδιαγνωστών (Hutchinson 2015)
  - Μονήρες έλλειμμα 46%
  - Τμηματικό έλλειμμα 27%/υποτμηματικό 60%
- triplex φλεβών για κεντρική DVT
- θεραπεία ανάλογα με κλινική πιθανότητα & αιμορραγικό κίνδυνο

ΤΥΧΑΙΟ ΕΥΡΗΜΑ 1-2% ΤΩΝ CT

- Σε Ca, PAF, KA+AF
- Θεραπεία σε ασθενείς με CA και ελλείμματα κεντρικών κλάδων

ΔΙΑΓΝΩΣΗ
ΣΠΙΝΘΗΡΟΓΡΑΦΗΜΑ V/Q

- ΠΛΕΟΝΕΚΤΗΜΑΤΑ
  - Λιγότερη ακτινοβολία
  - Λιγότερες αλλεργικές αντιδράσεις

ΑΡΑ

  - Νέοι, γυναίκες
  - Κύηση
  - Αλλεργίες
  - Σοβαρή ΝΑ
  - ΣΤΕΡΗ

- ΜΕΙΟΝΕΚΤΗΜΑΤΑ
  - ↑ % μη διαγνωστικών test (ηλικία >75 έτη)
  - Φυσιολογική Α/Α θώρακα
- ΕΡΜΗΝΕΙΑ ΑΠΟΤΕΛΕΣΜΑΤΟΣ
  - ΚΦ=>αποκλεισμός ΠΕ
  - Υψηλή Πιθ=ΠΕ
  - Μη διαγνωστική=>
    - Περαιτέρω έλεγχος
    - Συναξιολόγηση κλ. πιθανότητας

ΔΙΑΓΝΩΣΗ

- SPECT
  - ΜΕΙΩΣΗ ΜΗ ΔΙΑΓΝΩΣΤΙΚΩΝ ΑΠΟΤΕΛΕΣΜΑΤΩΝ
- ΑΓΓΕΙΟΓΡΑΦΙΑ ΠΝΕΥΜΟΝΙΚΩΝ ΑΓΓΕΙΩΝ (DSA)
  - ΠΕΡΙΦΕΡΙΚΕΣ ΑΡΤΗΡΙΕΣ Vs ΚΕΝΤΡΙΚΩΝ ΚΛΑΔΩΝ
  - ΘΡΟΜΒΟΙ 1-2 mm ΣΕ ΥΠΟΤΜΗΜΑΤΙΚΕΣ ΑΡΤΗΡΙΕΣ
  - ΘΝΗΤΟΤΗΤΑ 0,5% ΑΙΜΟΡΡΑΓΙΑ ΣΕ ΘΡΟΜΒΟΛΥΣΗ
  - ΚΑΘΟΔΗΓΗΣΗ ΔΙΑΔΕΡΜΙΚΩΝ ΚΑΘΕΤΗΡΩΝ
- MRA
  - ↓ ΕΙΔΙΚΟΤΗΤΑ
  - ↑ % ΜΗ ΔΙΑΓΝΩΣΤΙΚΗ αλλά….. (Temme et al.
  - ΜΗ ΔΙΑΘΕΣΙΜΗ ΣΤΟ ΤΕΠ circulation 2015)

ΔΙΑΓΝΩΣΗ
ΥΠΕΡΗΧΟΣ ΚΑΡΔΙΑΣ

- ΕΝΔΕΙΞΕΙΣ
  - Σε αιμοδυναμικά ασταθή ασθενή για ΔΔ και έναρξη θεραπείας.
  - Σε αιμοδυναμικά σταθερό ασθενή εκτίμηση του κινδύνου πρώιμης θνητότητας.

ΔΙΑΓΝΩΣΗ
ΥΠΕΡΗΧΟΣ ΚΑΡΔΙΑΣ

- ΕΥΡΗΜΑΤΑ ΔΥΣΛΕΙΤΟΥΡΓΙΑΣ ΔΕΞΙΑΣ ΚΟΙΛΙΑΣ (>25%)
  - Διάταση δεξιάς κοιλίας (D-Shape)
  - Αύξηση RV/LV διάμετρο
  - Παράδοξη κινητικότητα ΜΚΔ-υποκινησία τοιχωμάτων
  - ↓ TAPSE
  - Σημείο McConnell
  - Πνευμονική υπέρταση
  - Θρόμβοι δεξιών κοιλοτήτων
  - Ανοικτό ωοειδές τρήμα

ΔΙΑΓΝΩΣΗ
TRIPLEX ΦΛΕΒΩΝ ΚΑΤΩ ΑΚΡΩΝ

- ΕΙΔΙΚΟΤΗΤΑ 95%
- ΕΥΑΙΣΘΗΣΙΑ >90%

ΓΙΑ ΣΥΜΠΤΩΜΑΤΙΚΗ DVT

- 30-50% ΤΩΝ ΑΣΘΕΝΩΝ ΜΕ ΠΕ ΕΧΟΥΝ DVT
- DVT ΣΕ ΚΕΝΤΡΙΚΟΥΣ ΚΛΑΔΟΥΣ ΣΕ ΑΣΘΕΝΗ ΥΠΟΠΤΟ ΓΙΑ ΠΕ → ΕΝΑΡΞΗ ΘΕΡΑΠΕΙΑΣ ΧΩΡΙΣ ΠΕΡΑΙΤΕΡΩ ΕΛΕΓΧΟ (Le Gal et al. Thromb Har 2006)

ΔΙΑΓΝΩΣΗ

Table 6 **Validated diagnostic criteria (based on non-invasive tests) for diagnosing PE in patients without shock or hypotension according to clinical probability**

Diagnostic criterion	Clinical probability of PE				
	Low	Intermediate	High	PE unlikely	PE likely
Exclusion of PE					
D-dimer					
Negative result, highly sensitive assay	+	+	–	+	–
Negative result, moderately sensitive assay	+	±	–	+	–
Chest CT angiography					
Normal multidetector CT alone	+	+	±	+	±
V/Q scan					
Normal perfusion lung scan	+	+	+	+	+
Non-diagnostic lung scan[a] and negative proximal CUS	+	±	–	+	–
Confirmation of PE					
Chest CT angiogram showing at least segmental PE	+	+	+	+	+
High probability V/Q scan	+	+	+	+	+
CUS showing proximal DVT	+	+	+	+	+

+/green = valid diagnostic criterion (no further testing required); –/red = invalid criterion (further testing mandatory); ±/yellow = controversial criterion (further testing to be considered).

[a]Low or intermediate probability lung scan according to the PIOPED classification.

CT = computed tomographic; CUS = proximal lower limb venous ultrasonography; DVT = deep vein thrombosis; PE = pulmonary embolism; PIOPED = Prospective Investigation of Pulmonary Embolism Diagnosis; V/Q scan = ventilation–perfusion scintigram.

ΔΙΑΓΝΩΣΤΙΚΕΣ ΣΤΡΑΤΗΓΙΚΕΣ

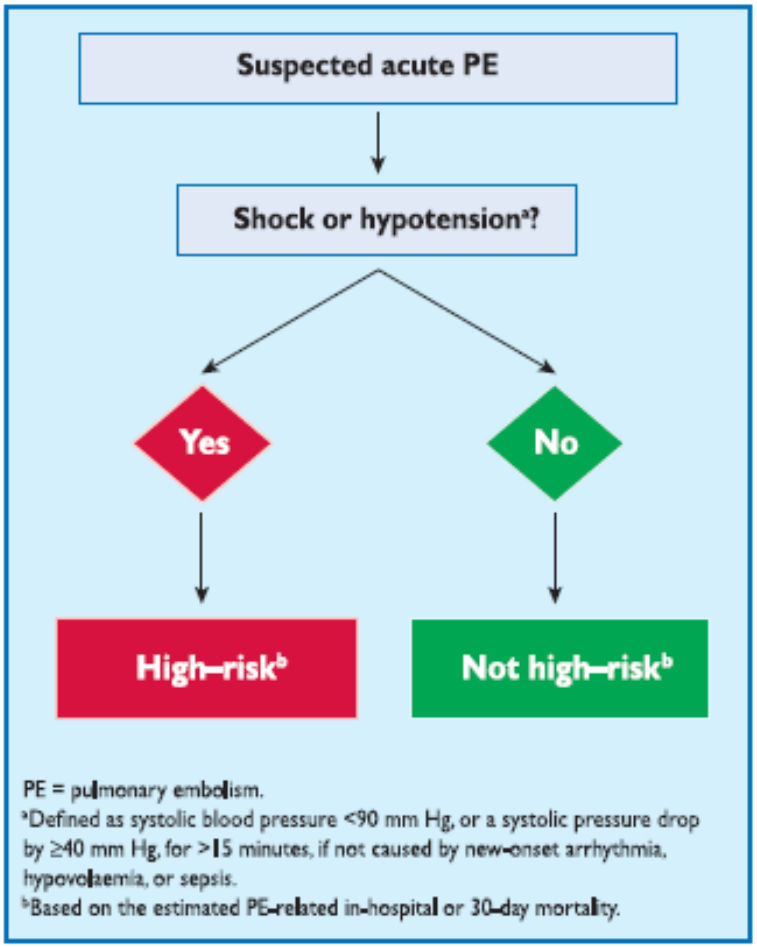
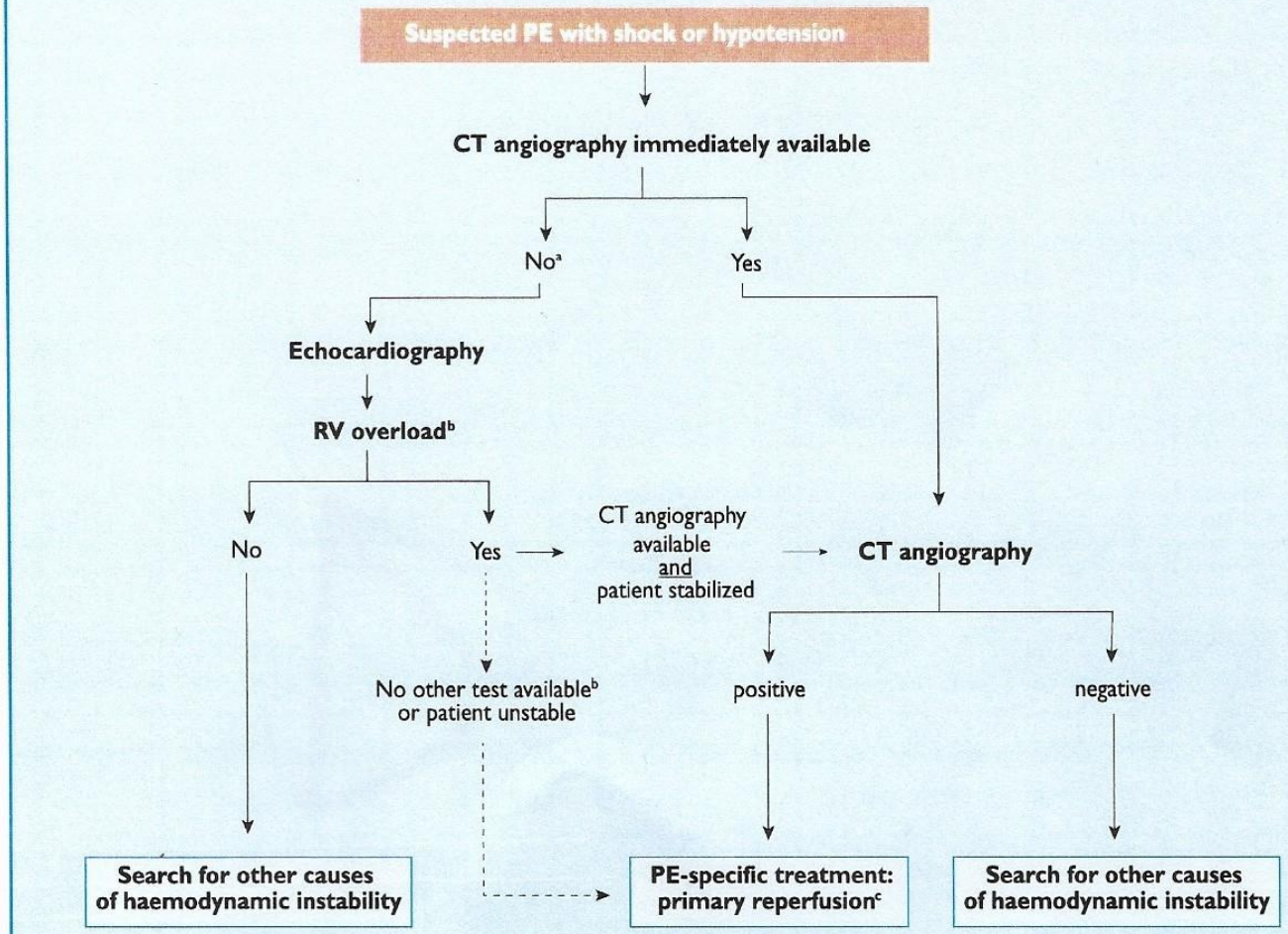


Figure 2 Initial risk stratification of acute PE.

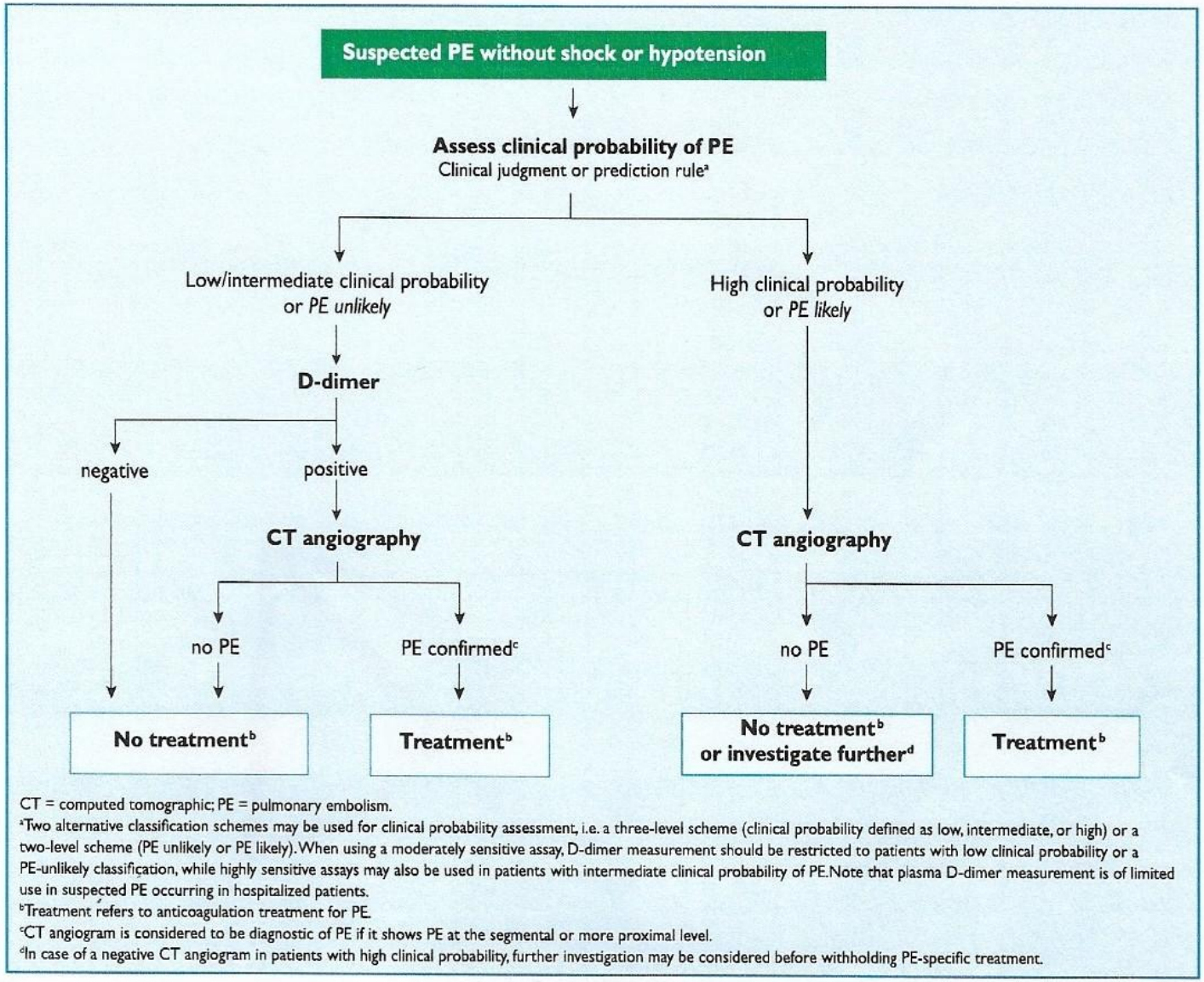
ΔΙΑΓΝΩΣΤΙΚΕΣ ΣΤΡΑΤΗΓΙΚΕΣ



CT = computed tomographic; PE = pulmonary embolism; RV = right ventricular.
[a]Includes the cases in which the patient's condition is so critical that it only allows bedside diagnostic tests.
[b]Apart from the diagnosis of RV dysfunction, bedside transthoracic echocardiography may, in some cases, directly confirm PE by visualizing mobile thrombi in the right heart chambers. Ancillary bedside imaging tests include transoesophageal echocardiography, which may detect emboli in the pulmonary artery and its main branches, and bilateral compression venous ultrasonography, which may confirm deep vein thrombosis and thus be of help in emergency management decisions.
[c]Thrombolysis; alternatively, surgical embolectomy or catheter-directed treatment (Section 5).

Figure 3 Proposed diagnostic algorithm for patients with suspected high-risk PE, i.e. presenting with shock or hypotension.

ΔΙΑΓΝΩΣΤΙΚΕΣ ΣΤΡΑΤΗΓΙΚΕΣ



CT = computed tomographic; PE = pulmonary embolism.

[a]Two alternative classification schemes may be used for clinical probability assessment, i.e. a three-level scheme (clinical probability defined as low, intermediate, or high) or a two-level scheme (PE unlikely or PE likely). When using a moderately sensitive assay, D-dimer measurement should be restricted to patients with low clinical probability or a PE-unlikely classification, while highly sensitive assays may also be used in patients with intermediate clinical probability of PE. Note that plasma D-dimer measurement is of limited use in suspected PE occurring in hospitalized patients.

[b]Treatment refers to anticoagulation treatment for PE.

[c]CT angiogram is considered to be diagnostic of PE if it shows PE at the segmental or more proximal level.

[d]In case of a negative CT angiogram in patients with high clinical probability, further investigation may be considered before withholding PE-specific treatment.

Figure 4 Proposed diagnostic algorithm for patients with suspected not high-risk pulmonary embolism.

ΕΚΤΙΜΗΣΗ ΒΑΡΥΤΗΤΑΣ

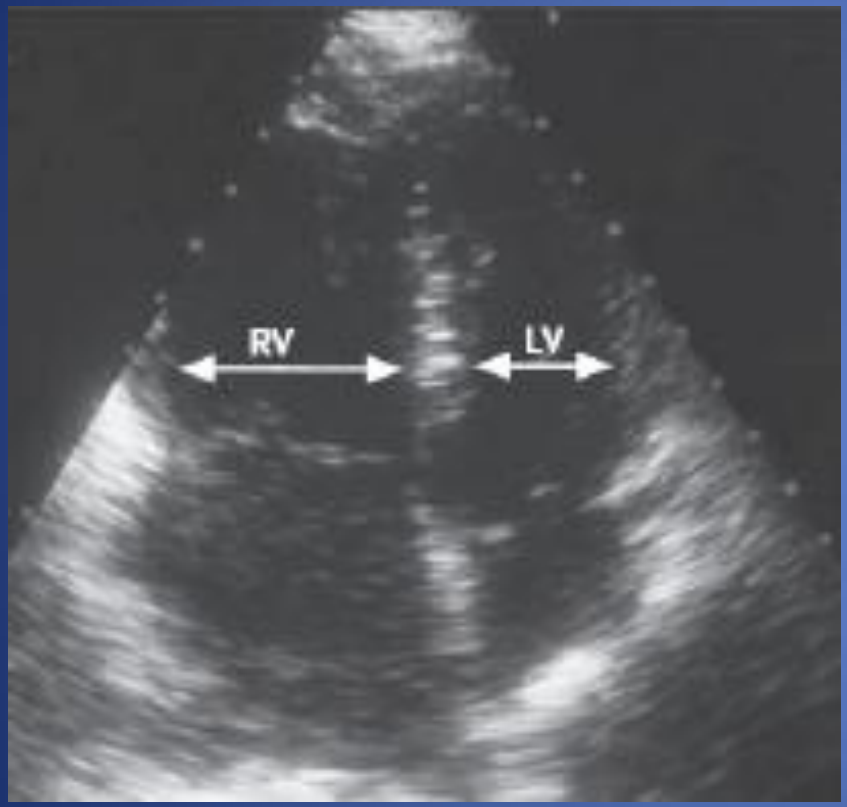
1. ΚΛΙΝΙΚΕΣ ΠΑΡΑΜΕΤΡΟΙ

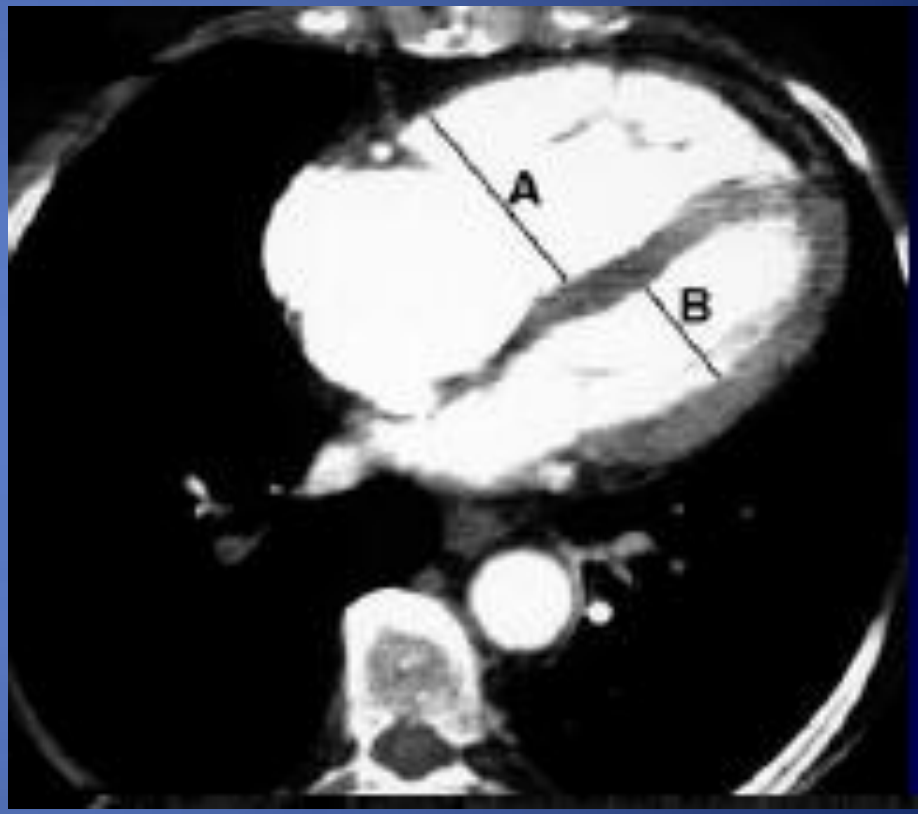
Parameter	Original version[214]	Simplified version[218]
Age	Age in years	1 point (if age >80 years)
Male sex	+10 points	–
Cancer	+30 points	1 point
Chronic heart failure	+10 points	1 point
Chronic pulmonary disease	+10 points	
Pulse rate ≥110 b.p.m.	+20 points	1 point
Systolic blood pressure <100 mm Hg	+30 points	1 point
Respiratory rate >30 breaths per minute	+20 points	–
Temperature <36 °C	+20 points	–
Altered mental status	+60 points	–
Arterial oxyhaemoglobin saturation <90%	+20 points	1 point
	Risk strata[a]	
Η βαθμολογία PESI προσδιορίζει τον κίνδυνο θνησιμότητας 30 ημερών για την ΠΕ	**Class I:≤65 points** very low 30-day mortality risk (0–1.6%) **Class II: 66–85 points** low mortality risk (1.7–3.5%) **Class III: 86–105 points** moderate mortality risk (3.2–7.1%) **Class IV: 106–125 points** high mortality risk (4.0–11.4%) **Class V: >125 points** very high mortality risk (10.0–24.5%)	**0 points**= 30-day mortality risk 1.0% (95% CI 0.0%–2.1%) **≥1 point(s)**= 30-day mortality risk 10.9% (95% CI 8.5%–13.2%)

2014 ESC Guidelines on the diagnosis and management of acute pulmonary embolism

ΕΚΤΙΜΗΣΗ ΒΑΡΥΤΗΤΑΣ

2. ΑΠΕΙΚΟΝΙΣΤΙΚΕΣ ΠΑΡΑΜΕΤΡΟΙ





ΕΧΟ ΔΥΣΛΕΙΤΟΥΡΓΙΑ ΔΕΞΙΑΣ ΚΟΙΛΙΑΣ

CTPA RV/LV ≥ 0.9-1.0

ΕΚΤΙΜΗΣΗ ΒΑΡΥΤΗΤΑΣ

3. ΑΙΜΑΤΟΛΟΓΙΚΕΣ ΠΑΡΑΜΕΤΡΟΙ

Table 8 **Imaging and laboratory tests[a] for prediction of early[b] mortality in acute PE**

Test or biomarker	Cut-off value	Sensitivity, % (95% CI)	Specificity, % (95% CI)	NPV, % (95% CI)	PPV, % (95% CI)	OR or HR (95% CI)	No. patients	Study design (reference)	Remarks
Echocardiography	Various criteria of RV dysfunction	74 (61–84)	54 (51–56)	98 (96–99)	8 (6–10)	2.4 (1.3–4.3)	1249	Meta-analysis[226]	RV dysfunction on echocardiography or CT was one of the inclusion criteria in two randomized trials investigating thrombolysis in normotensive patients with PE.[252,253]
CT angiography	RV/LV ≥1.0	46 (27–66)	59 (54–64)	93 (89–96)	8 (5–14)	1.5 (0.7–3.4)	383	Meta-analysis[226]	
	RV/LV ≥0.9	84 (65–94)	35 (30–39)	97 (94–99)	7 (5–10)	2.8 (0.9–8.2)	457	Prospective cohort[228]	
BNP	75–100 pg/mL	85 (64–95)	56 (50–62)	98 (94–99)	14 (9–21)	6.5 (2.0–21)	261	Meta-analysis[232]	The optimal cut-off value for PE has not been defined.
NT-proBNP	600 pg/mL	86 (69–95)	50 (46–54)	99 (97–100)	7 (5–19)	6.3 (2.2–18.3)	688	Prospective cohort[234e]	NT-proBNP <500 pg/mL was one of the inclusion criteria in a single-armed management trial investigating home treatment of PE.[237]
Troponin I	Different assays/ cut-off values[c]	NR	NR	NR	NR	4.0 (2.2–7.2)	1303	Meta-analysis[239]	A positive cardiac troponin test was one of the inclusion criteria in a randomized trial investigating thrombolysis in normotensive patients with PE.[253]
Troponin T	Different assays/cut-off values[c]	NR	NR	NR	NR	8.0 (3.8–16.7)	682	Meta-analysis[239]	
	14 pg/mL[d]	87 (71–95)	42 (38–47)	98 (95–99)	9 (6–12)	5.0 (1.7–14.4)	526	Prospective cohort[76e]	
H-FABP	6 ng/mL	89 (52–99)	82 (74–89)	99 (94–99)	28 (13–47)	36.6 (4.3–304)	126	Prospective cohort[244e]	

BNP = brain natriuretic peptide; CT = computed tomographic; H-FABP = heart-type fatty acid-binding protein; HR = hazard ratio; LV = left ventricular; NPV = negative predictive value; NR = not reported in the reference cited; NT-proBNP = N-terminal pro-brain natriuretic peptide; OR = odds ratio; PE = pulmonary embolism; PPV = positive predictive value; RV = right ventricular.

[a]The Table shows the results of meta-analyses or, in the absence thereof, of the largest prospective cohort studies.

[b]In most studies, 'early' refers to the in-hospital period or the first 30 days after the index event.

[c]In the studies included in this meta-analysis, cut-off values for the cardiac troponin tests used corresponded to the 99thpercentile of healthy subjects with a coefficient variation of <10%.

[d]High-sensitivity assay.

[e]These studies included only normotensive patients and used a combined outcome (all-cause death or major cardiovascular complications).

ΕΚΤΙΜΗΣΗ ΒΑΡΥΤΗΤΑΣ

Table 9 Classification of patients with acute PE based on early mortality risk

Early mortality risk		Risk parameters and scores			
		Shock or hypotension	PESI class III-V or sPESI ≥1[a]	Signs of RV dysfunction on an imaging test[b]	Cardiac laboratory biomarkers[c]
High		+	(+)[d]	+	(+)[d]
Intermediate	Intermediate–high	–	+	Both positive	
	Intermediate–low	–	+	Either one (or none) positive[e]	
Low		–	–	Assessment optional; if assessed, both negative[e]	

PE = pulmonary embolism; PESI = Pulmonary embolism severity index; RV = right ventricular; sPESI = simplified Pulmonary embolism severity index.

[a]PESI Class III to V indicates moderate to very high 30-day mortality risk; sPESI ≥1 point(s) indicate high 30-day mortality risk.

[b]Echocardiographic criteria of RV dysfunction include RV dilation and/or an increased end-diastolic RV–LV diameter ratio (in most studies, the reported threshold value was 0.9 or 1.0); hypokinesia of the free RV wall; increased velocity of the tricuspid regurgitation jet; or combinations of the above. On computed tomographic (CT) angiography (four-chamber views of the heart), RV dysfunction is defined as an increased end-diastolic RV/LV (left ventricular) diameter ratio (with a threshold of 0.9 or 1.0).

[c]Markers of myocardial injury (e.g. elevated cardiac troponin I or -T concentrations in plasma), or of heart failure as a result of (right) ventricular dysfunction (elevated natriuretic peptide concentrations in plasma).

[d]Neither calculation of the PESI (or sPESI) nor laboratory testing are considered necessary in patients with hypotension or shock.

[e]Patients in the PESI Class I–II, or with sPESI of 0, and elevated cardiac biomarkers or signs of RV dysfunction on imaging tests, are also to be classified into the intermediate-low-risk category. This might apply to situations in which imaging or biomarker results become available before calculation of the clinical severity index.

ΘΕΡΑΠΕΙΑ
ΓΕΝΙΚΑ ΜΕΤΡΑ

Α. ΑΙΜΟΔΥΝΑΜΙΚΗ ΥΠΟΣΤΗΡΙΞΗ

- ΠΡΟΣΕΚΤΙΚΗ ΧΟΡΗΓΗΣΗ ΥΓΡΩΝ
- ΑΓΓΕΙΟΣΥΣΠΑΣΤΙΚΑ (ΝΟΡΕΠΙΝΕΦΡΙΝΗ)
- ΙΝΟΤΡΟΠΑ (ΝΤΟΠΑΜΙΝΗ-ΝΤΟΜΠΟΥΤΑΜΙΝΗ)
- ΕΙΣΠΝΟΗ ΝΟ (ΔΙΑΣΤΟΛΗ ΠΝ/ΚΩΝ ΑΓΓΕΙΩΝ)

SZOLD ET AL LUNG 2006
KLINE ET AL AM HEART J 2017

- ΛΕΒΟΣΙΜΕΝΤΑΝΗ (SIMDAX)
  - ΕΚΛΕΚΤΙΚΟΣ ΑΝΑΣΤΟΛΕΑΣ ΦΩΣΦΟΔΙΕΣΤΕΡΑΣΗΣ ΙΙΙ
  - ΑΥΞΗΣΗ ΣΥΣΤΑΛΤΙΚΟΤΗΤΑΣ ΔΕ ΚΟΙΛΙΑΣ & ΔΙΑΣΤΟΛΗ ΠΝ/ΚΩΝ ΑΓΓΕΙΩΝ
  - 6-12 μg/Kg σε ≥ 10min ⟶ 0.1μg/Kg/min για 24h

KERBAUL ET AL CRIT CARE MED 2007

ΘΕΡΑΠΕΙΑ
ΓΕΝΙΚΑ ΜΕΤΡΑ

Β. ΑΝΑΠΝΕΥΣΤΙΚΗ ΥΠΟΣΤΗΡΙΞΗ

- ΧΟΡΗΓΗΣΗ O2
- ΕΠΕΜΒΑΤΙΚΟΣ ΜΗΧΑΝΙΚΟΣ ΑΕΡΙΣΜΟΣ
  - TIDAL VOLUME 6 ml/Kg lean Body Weight
  - Pplateau<30cm H2O
  - ΧΑΜΗΛΗ PEEP
- EXTRACORPOREAL CARDIOPULMONARY SUPPORT (ECMO) σε μαζική ΠΕ

Kjaergaard et al Thromb Res 2012
Leick et al Clin Res Cardiol 2012

ΘΕΡ
ΑΝΤΙ

Α. ΠΑΡΕΝΤΕΡΙΚΑ

- ΚΛΑΣΣΙΚΗ, ΜΗ ΚΛΑΣΜ

Web Table 2 **Adjustment of unfractionated heparin dosage based on the aPTT (adapted from ref. 277)**

Activated partial thromboplastin time	Change of dosage
<35 seconds (<1.2 times control)	80 U/kg bolus, increase infusion rate by 4 U/kg per hour
35–45 seconds (1.2–1.5 times control)	40 U/kg bolus, increase infusion rate by 2 U/kg per hour
46–70 seconds (1.5–2.3 times control)	no change
71–90 seconds (2.3–3.0 times control)	reduce infusion rate by 2 U/kg per hour
>90 seconds (>3.0 times control)	stop infusion for 1 h, then reduce infusion rate by 3 U/kg per hour

aPTT — activated partial thromboplastin time; U — units.

Table 10 **Low molecular weight heparin and pentasaccharide (fondaparinux) approved for the treatment of pulmonary embolism**

	Dosage	Interval
Enoxaparin	1.0 mg/kg or 1.5 mg/kg[a]	Every 12 hours Once daily[a]
Tinzaparin	175 U/kg	Once daily
Dalteparin	100 IU/kg[b] or 200 IU/kg[b]	Every 12 hours[b] Once daily[b]
Nadroparin[c]	86 IU/kg or 171 IU/kg	Every 12 hours Once daily
Fondaparinux	5 mg (body weight <50 kg); 7.5 mg (body weight 50–100 kg); 10 mg (body weight >100 kg)	Once daily

All regimens administered subcutaneously.
IU international units; LMWH low molecular weight heparin.
[a]Once-daily injection of enoxaparin at the dosage of 1.5 mg/kg is approved for inpatient (hospital) treatment of PE in the United States and in some, but not all, European countries.
[b]In cancer patients, dalteparin is given at a dose of 200 IU/kg body weight (maximum, 18 000 IU) once daily over a period of 1 month, followed by 150 IU/kg once daily for 5 months.[278] After this period, anticoagulation with a vitamin K antagonist or a LMWH should be continued indefinitely or until the cancer is considered cured.
[c]Nadroparin is approved for treatment of PE in some, but not all, European countries.

ΘΕΡΑΠΕΙΑ ΑΝΤΙΠΗΚΤΙΚΑ

Β. ΑΠΟ ΤΟΥ

- ΑΝΤΑΓΩΝΙΣ

Ταυτόχρονη έ
χορήγηση μέχ

- NOACs

Van Es Blood 2014
ACCP 2016

TABLE 1 Non-Vitamin K-Dependent Oral Anticoagulant Agents in the Treatment and Secondary Prevention of VTE

	Dosage and Interval			
	Initial Phase	Long-Term Phase	Extended Phase	Not Recommended or Contraindicated*
Rivaroxaban†	15 mg twice daily with food for 21 days	20 mg once daily with food		• CrCl <30 ml/min • Moderate or severe hepatic impairment (Child-Pugh B and C), or hepatic disease associated with coagulopathy • Concomitant use of combined P-gp and strong CYP3A4 inhibitors or inducers
Dabigatran etexilate‡	Initial therapy with parenteral anticoagulation for 5–10 days should precede administration of dabigatran etexilate	150 mg twice daily		• CrCl <30 ml/min • Concomitant treatment with P-gp inhibitors in patients with CrCl <50 ml/min • Concomitant treatment with P-gp inducers (i.e., rifampin)
Apixaban	10 mg twice daily for 7 days	5 mg twice daily	2.5 mg twice daily after at least 6 months of treatment	• CrCl <15 ml/min • Severe hepatic impairment (Child-Pugh C), or hepatic disease associated with coagulopathy • Strong dual inhibitors or inducers of CYP3A4 and P-gp
Edoxaban§	Initial therapy with parenteral anticoagulation for 5–10 days should precede administration of edoxaban	60 mg once daily 30 mg once daily can be considered in patients with ≥1 of the following factors: CrCl 15–50 ml/min; body weight ≤60 kg; concomitant use of P-gp inhibitors, cyclosporin, dronedarone, erythromycin, or ketoconazole		• CrCl <15 ml/min • Moderate or severe hepatic impairment (Child-Pugh B and C), or hepatic disease associated with coagulopathy • Concomitant treatment with rifampin

The table displays drugs and regimens on the basis of U.S. FDA approval for the treatment of acute VTE. *In addition to the specific conditions listed here, all mentioned anticoagulant agents should be avoided in patients: 1) with hemodynamically unstable acute pulmonary embolism for whom thrombolysis or pulmonary embolectomy may be required; 2) requiring dialysis; 3) at significant risk of bleeding or with active pathological bleeding; 4) treated with a concomitant anticoagulant agent; 5) with known hypersensitivity to the agent; and 6) in pregnant women or during breast feeding. Moreover, all mentioned anticoagulant agents should be administered with caution in patients with an increased bleeding risk, including those receiving concomitant treatment with NSAIDs, acetylsalicylic acid, and platelet aggregation inhibitors. †According to the EMA product information, rivaroxaban 15 mg should be considered for the long-term phase if the patient's assessed risk for bleeding outweighs the risk for recurrent venous thromboembolism. In the European Union, rivaroxaban is contraindicated in patients with CrCl <15 ml/min and should be used with caution in patients with CrCl 15-30 ml/min. ‡According to the EMA product information, dabigatran etexilate 110 mg twice daily can be considered in patients ≥80 years of age; for those under concomitant treatment with moderate P-gp inhibitors (i.e., amiodarone, quinidine, verapamil); at higher risk of bleeding, including elderly patients >75 years of age with >1 risk factor for bleeding; and with CrCl 30-50 ml/min. In the European Union, dabigatran etexilate is not recommended in patients with elevated liver enzymes >2× upper limit of normal or with liver disease expected to have any impact on survival. §Although a separate extension trial was not conducted for edoxaban, >40% of patients included in the HOKUSAI-VTE study received an extended anticoagulant treatment with edoxaban for up to 12 months.

CrCl = creatinine clearance; CYP3A4 = cytochrome P450-3A4; EMA = European Medicines Agency; FDA = Food and Drug Administration; NSAID = nonsteroidal anti-inflammatory drug(s); P-gp = P-glycoprotein; VTE = venous thromboembolism.

ΘΕΡΑΠΕΙΕΣ ΕΠΑΝΑΙΜΑΤΩΣΗΣ
ΘΡΟΜΒΟΛΥΣΗ

- ΠΟΤΕ ?
  - ΜΟΝΟ ΣΕ ΥΠΟΤΑΣΗ & SHOCK
    - Όχι σε μέσου κινδύνου ΠΕ
  - ΜΕΓΙΣΤΟ ΟΦΕΛΟΣ ΕΝΤΟΣ 48Η ΑΠΟ ΕΝΑΡΞΗ ΣΥΜΠΤΩΜΑΤΩΝ
- ΓΙΑΤΙ ?
  - ΜΕΙΩΣΗ ΘΝΗΤΟΤΗΤΑΣ
  - ΜΕΙΩΣΗ ΥΠΟΤΡΟΠΩΝ

PEITHO TRIAL NEJM 2014

ΟΜΩΣ...

ΑΥΞΗΜΕΝΟΣ ΚΙΝΔΥΝΟΣ ΜΕΙΖΟΝΟΣ ΑΙΜΟΡΡΑΓΙΑΣ
ΑΥΞΗΜΕΝΟΣ ΚΙΝΔΥΝΟΣ ΘΑΝΑΤΗΦΟΡΟΥ & ΕΝΔΟΚΡΑΝΙΑΣ ΑΙΜΟΡΡΑΓΙΑΣ

ΘΕΡΑΠΕΙΕΣ ΕΠΑΝΑΙΜΑΤΩΣΗΣ

ΘΡΟΜΒΟΛΥΣΗ

Web Table 3 **Approved thrombolytic regimens for pulmonary embolism**

Streptokinase	250 000 IU as a loading dose over 30 minutes, followed by 100 000 IU/h over 12–24 hours
	Accelerated regimen: 1.5 million IU over 2 hours
Urokinase	4400 IU/kg as a loading dose over 10 min, followed by 4400 IU/kg per hour over 12–24 hours
	Accelerated regimen: 3 million IU over 2 hours
rtPA	100 mg over 2 hours; or
	0.6 mg/kg over 15 minutes (maximum dose 50 mg)

IU = international units; rtPA = recombinant tissue plasminogen activator.

Web Table 4 **Contraindications to thrombolytic therapy (adapted from ref. 312)**

Absolute contraindications:[a]

- Haemorrhagic stroke or stroke of unknown origin at any time
- Ischaemic stroke in the preceding 6 months
- Central nervous system damage or neoplasms
- Recent major trauma/surgery/head injury in the preceding 3 weeks
- Gastrointestinal bleeding within the last month
- Known bleeding risk

Relative contraindications

- Transient ischaemic attack in the preceding 6 months
- Oral anticoagulant therapy
- Pregnancy, or within one week postpartum
- Non-compressible puncture site
- Traumatic resuscitation
- Refractory hypertension (systolic blood pressure > 180 mm Hg)
- Advanced liver disease
- Infective endocarditis
- Active peptic ulcer

[a]Absolute contraindications to thrombolysis might become relative in a patient with immediately life-threatening high-risk PE.

ΘΕΡΑΠΕΙΕΣ ΕΠΑΝΑΙΜΑΤΩΣΗΣ
ΔΙΑΔΕΡΜΙΚΟΙ ΚΑΘΕΤΗΡΕΣ

Web Table 5 **Techniques and devices for percutaneous catheter-directed treatment of pulmonary embolism (adapted from ref. 169 and 334)**

Catheter interventions without local thrombolysis		Catheter interventions with local thrombolysis	
Technique	**Device examples**	**Technique**	**Device examples**
Thrombus fragmentation	Pigtail catheter fragmentation Balloon angioplasty using peripheral balloon catheters	Catheter-directed thrombolysis (continuous infusion with or without bolus)	UniFuse® (AngioDynamics, Latham, NY, US) Cragg-McNamara® (ev3 Endovascular, Plymouth, MN, USA)
Rheolytic thrombectomy	AngioJet 6 F PE® (Bayer, Germany)	Ultrasound-assisted catheter-directed thrombolysis (continuous infusion with or without bolus)	EkoSonic® (EKOS, Bothell, WA, USA)
Suction embolectomy	Manual aspiration using sheath with detachable haemostatic valve (Argon Medical Devices, Athens, TX, USA)	Pharmacomechanical thrombolysis	AngioJet 6 F PE® Power Pulse™ thrombolysis and thrombectomy (Bayer, Germany)
Rotational thrombectomy	Aspirex® thrombectomy (Straub Medical, Switzerland)		
Combined techniques	Pigtail fragmentation (5F) plus AngioJet 6 F PE® thrombectomy (Bayer, Germany)	Combined techniques	Pigtail fragmentation (5F) plus AngioJet 6 F PE® Power Pulse™ thrombolysis and thrombectomy (Bayer, Germany)

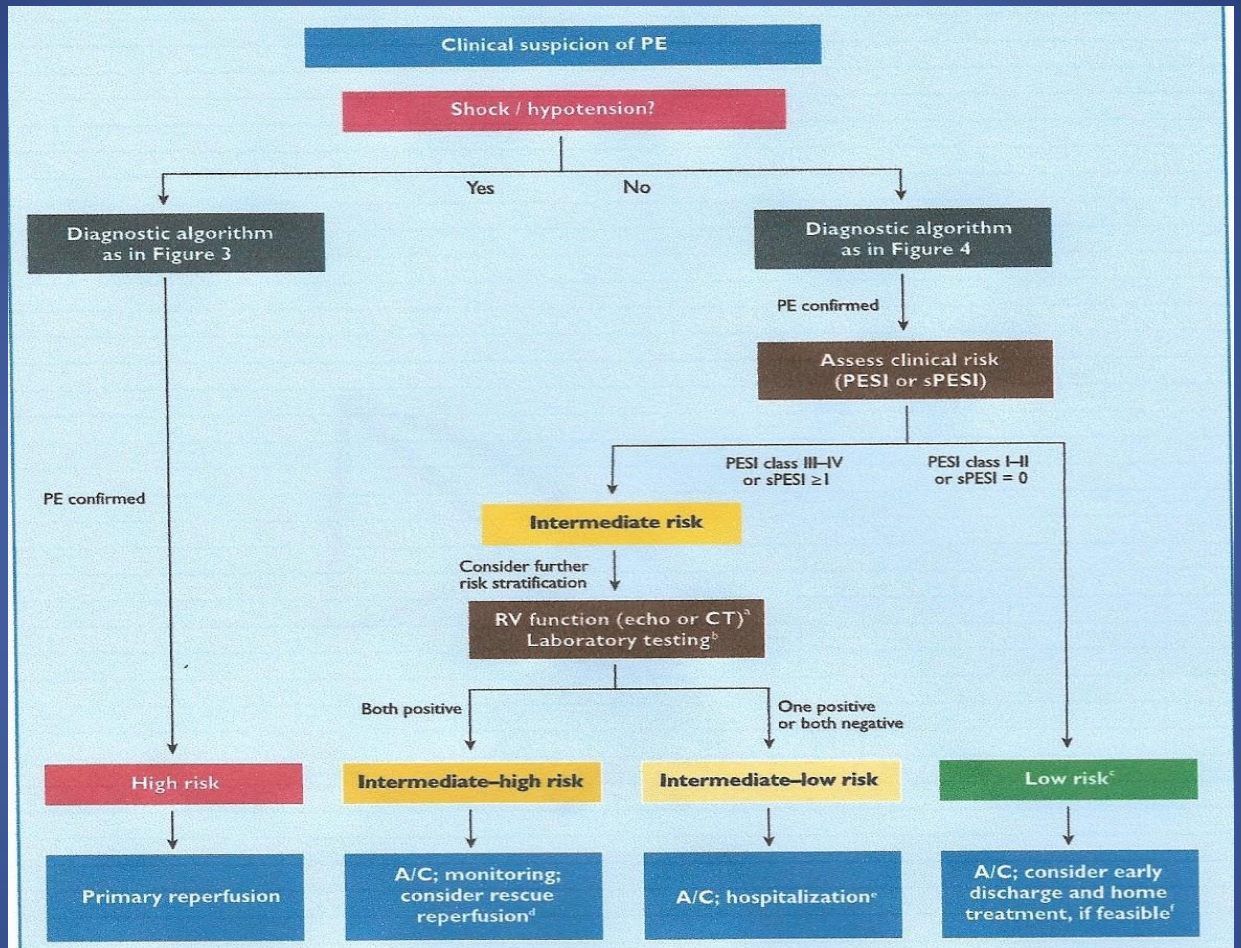
ΘΕΡΑΠΕΙΑ
ΧΕΙΡΟΥΡΓΙΚΗ ΑΝΤΙΜΕΤΩΠΙΣΗ

- ΕΜΒΟΛΕΚΤΟΜΗ
  - θνητότητα 6%
- ΠΝΕΥΜΟΝΙΚΗ ΕΝΔΑΡΤΗΡΕΚΤΟΜΗ (οξεία ΠΕ σε ΣΤΕΡΗ)

ΘΕΡΑΠΕΙΑ
ΦΙΛΤΡΟ ΚΚΦ

- ΕΝΔΕΙΞΕΙΣ
  - Απόλυτη αντένδειξη χορήγησης αντιπηκτικών
  - Μείζονα αιμορραγία
  - Υποτροπιάζουσα ΠΕ υπό αντιπηκτικά
- ΕΠΙΠΛΟΚΕΣ
  - Ρήξη τοιχώματος ΚΚΦ
  - Μετακίνηση φίλτρου (Δεξιές κοιλότητες)
  - Υποτροπιάζουσα DVT (20%)
  - Μεταθρομβωτικό σύνδρομο (40%)
  - Απόφραξη ΚΚΦ (22% στην 5 ετία/33% στην 9ετία)

ΘΕΡΑΠΕΥΤΙΚΕΣ ΣΤΡΑΤΗΓΙΚΕΣ



A/C = anticoagulation; CT = computed tomographic pulmonary angiography; PE = pulmonary embolism; PESI = pulmonary embolism severity index; RV = right ventricular; sPESI = simplified pulmonary embolism severity index.

[a]If echocardiography has already been performed during diagnostic work-up for PE and detected RV dysfunction, or if the CT already performed for diagnostic work-up has shown RV enlargement (RV/LV (left ventricular) ratio ≥0.9), a cardiac troponin test should be performed except for cases in which primary reperfusion is not a therapeutic option (e.g. due to severe comorbidity or limited life expectancy of the patient).

[b]Markers of myocardial injury (e.g. elevated cardiac troponin I or T concentrations in plasma), or of heart failure as a result of (right) ventricular dysfunction (elevated natriuretic peptide concentrations in plasma). If a laboratory test for a cardiac biomarker has already been performed during initial diagnostic work-up (e.g. in the chest pain unit) and was positive, then an echocardiogram should be considered to assess RV function, or RV size should be (re)assessed on CT.

[c]Patients in the PESI Class I–II, or with sPESI of 0, and elevated cardiac biomarkers or signs of RV dysfunction on imaging tests, are also to be classified into the intermediate–low risk category. This might apply to situations in which imaging or biomarker results become available before calculation of the clinical severity index. These patients are probably not candidates for home treatment.

[d]Thrombolysis, if (and as soon as) clinical signs of haemodynamic decompensation appear; surgical pulmonary embolectomy or percutaneous catheter-directed treatment may be considered as alternative options to systemic thrombolysis, particularly if the bleeding risk is high.

[e]Monitoring should be considered for patients with confirmed PE and a positive troponin test, even if there is no evidence of RV dysfunction on echocardiography or CT.

[f]The simplified version of the PESI has not been validated in prospective home treatment trials; inclusion criteria other than the PESI were used in two single-armed (non-randomized) management studies.

ΟΔΗΓΙΕΣ

Recommendations for acute phase treatment

Recommendations	Class[a]	Level[b]	Ref[c]
PE with shock or hypotension (high-risk)			
It is recommended that intravenous anticoagulation with UFH be initiated without delay in patients with high-risk PE.	I	C	
Thrombolytic therapy is recommended.	I	B	168
Surgical pulmonary embolectomy is recommended for patients in whom thrombolysis is contraindicated or has failed.[d]	I	C	313
Percutaneous catheter-directed treatment should be considered as an alternative to surgical pulmonary embolectomy for patients in whom full-dose systemic thrombolysis is contraindicated or has failed.[d]	IIa	C	

PE — pulmonary embolism; UFH — unfractionated heparin
[a]Class of recommendation.
[b]Level of evidence.
[c]References.
[d]If appropriate expertise and resources are available on site.

Recommendations for acute phase treatment

Recommendations	Class[a]	Level[b]	Ref[c]
PE without shock or hypotension (intermediate-or low-risk)[e]			
Anticoagulation: combination of parenteral treatment with VKA			
Initiation of parenteral anticoagulation is recommended without delay in patients with high or intermediate clinical probability of PE while diagnostic work-up is in progress.	I	C	352
LMWH or fondaparinux is the recommended form of acute phase parenteral anticoagulation for most patients.	I	A	273, 274, 281, 353
In parallel to parenteral anticoagulation, treatment with a VKA is recommended, targeting an INR of 2.5 (range 2.0–3.0).	I	B	352, 354
Anticoagulation: new oral anticoagulants			
As an alternative to the combination of parenteral anticoagulation with a VKA, anticoagulation with rivaroxaban (15 mg twice daily for 3 weeks, followed by 20 mg once daily) is recommended.	I	B	296
As an alternative to the combination of parenteral anticoagulation with a VKA, anticoagulation with apixaban (10 mg twice daily for 7 days, followed by 5 mg twice daily) is recommended.	I	B	297
As an alternative to VKA treatment, administration of dabigatran (150 mg twice daily, or 110 mg twice daily for patients ≥80 years of age or those under concomitant verapamil treatment) is recommended following acute-phase parenteral anticoagulation.	I	B[e]	293, 294
As an alternative to VKA treatment, administration of edoxaban* is recommended following acute-phase parenteral anticoagulation.	I	B	298
New oral anticoagulants (rivaroxaban, apixaban, dabigatran, edoxaban) are not recommended in patients with severe renal impairment.[f]	III	A	293, 295–298

Reperfusion treatment			
Routine use of primary systemic thrombolysis is not recommended in patients not suffering from shock or hypotension.	III	B	253
Close monitoring is recommended in patients with intermediate-high risk PE to permit early detection of haemodynamic decompensation and timely initiation of 'rescue' reperfusion therapy.	I	B	253
Thrombolytic therapy should be considered for patients with intermediate-high-risk PE and clinical signs of haemodynamic decompensation.	IIa	B	252, 253
Surgical pulmonary embolectomy may be considered in intermediate-high-risk patients if the anticipated risk of bleeding under thrombolytic treatment is high.[g]	IIb	C	
Percutaneous catheter-directed treatment may be considered in intermediate-high-risk patients if the anticipated risk of bleeding under thrombolytic treatment is high.[g]	IIb	B	336
Early discharge and home treatment			
Patients with acute low-risk PE should be considered for early discharge and continuation of treatment at home if proper outpatient care and anticoagulant treatment can be provided.	IIa	B	217, 237, 347, 349

ΕΓΚΥΜΟΣΥΝΗ

Recommendations for pulmonary embolism in pregnancy

Recommendations	Class[a]	Level[b]	Ref[c]
Suspicion of PE in pregnancy warrants formal diagnostic assessment with validated methods.	I	C	
D-dimer measurement may be performed in order to avoid unnecessary irradiation, as a negative result has a similar clinical significance as in non-pregnant patients.	IIb	C	418, 419
Venous compression ultrasonography may be considered in order to avoid unnecessary irradiation, as a diagnosis of proximal DVT confirms PE.	IIb	C	
Perfusion scintigraphy may be considered to rule out suspected PE in pregnant women with normal chest X-ray.	IIb	C	
CT angiography should be considered if the chest X-ray is abnormal or if lung scintigraphy is not readily available.	IIa	C	
A weight-adjusted dose of LMWH is the recommended therapy during pregnancy in patients without shock or hypotension.	I	B	432, 433

CT — computed tomographic; DVT — deep vein thrombosis; LMWH — low molecular weight heparin; PE — pulmonary embolism.
[a]Class of recommendation.
[b]Level of evidence.
[c]References.

Table 14 Estimated radiation absorbed in procedures used for diagnosing PE (adapted from Bajc et al. (2009)[430] and Chunilal et al. (2009)).[431]

Test	Estimated foetal radiation exposure (mSv)	Estimated maternal radiation exposure to breast tissue (mSv)
Chest X-ray	<0.01	0.01
Perfusion lung scan with technetium-99m labelled albumin		
Low dose: 40 MBq	0.11–0.20	0.28–0.50
High dose: 200 MBq	0.20–0.60	1.20
Ventilation lung scan	0.10–0.30	<0.01
Computed tomographic angiography	0.24–0.66	10–70

mSv — millisievert; PE — pulmonary embolism

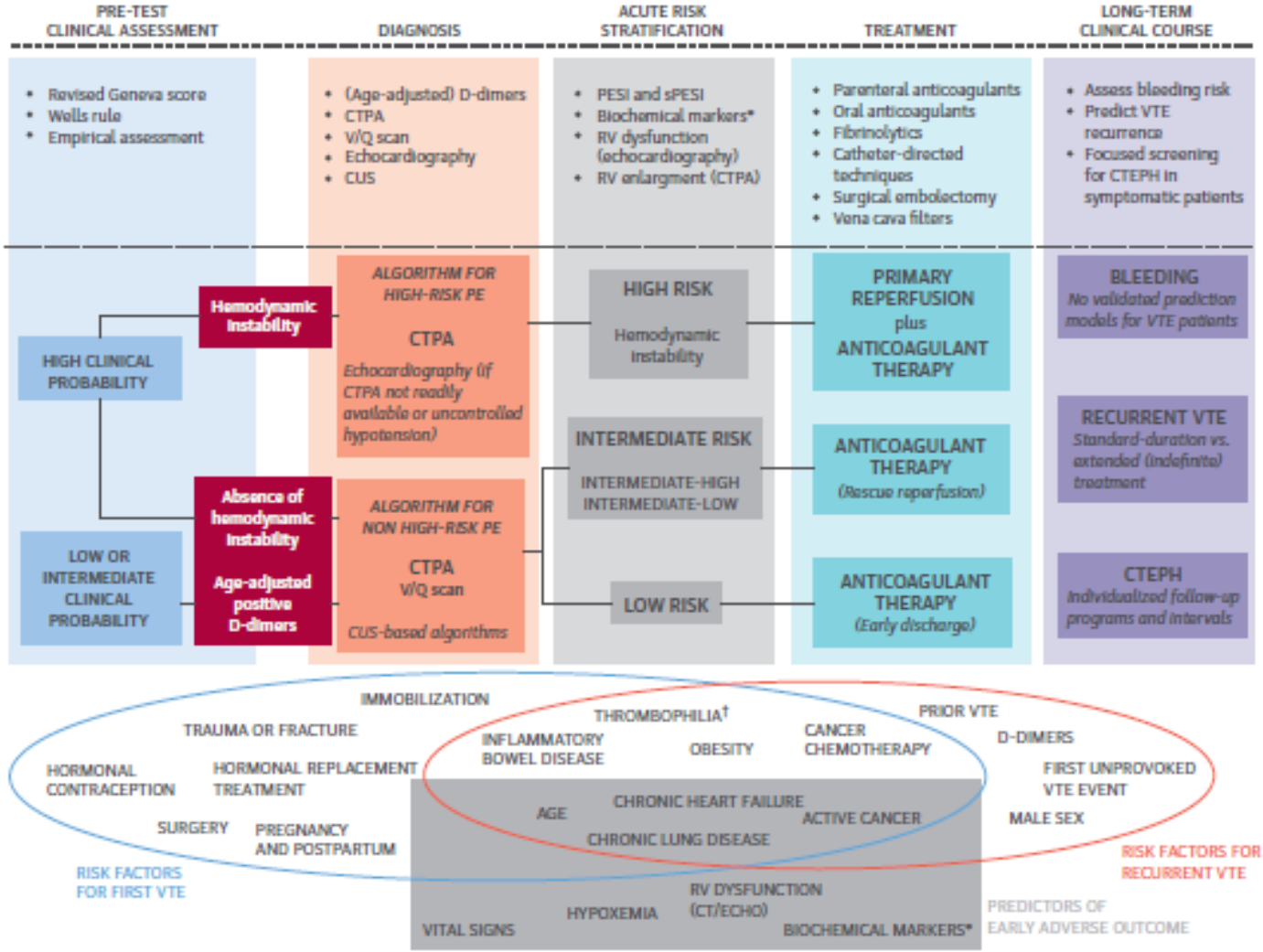
ΟΡΙΟ ΚΙΝΔΥΝΟΥ ΓΙΑ ΤΟ ΕΜΒΡΥΟ=50 mSv

~~ARIXTRA~~
~~NOACs~~
~~VKA~~

ΚΑΡΚΙΝΟΣ

- VTE X4
- 10% ΤΩΝ UNPROVOKED ΠΕ➡ CA ΕΝΤΟΣ ΕΤΟΥΣ (ΌΧΙ SCREENING)
- ΑΡΝΗΤΙΚΑ D-DIMERS=ΙΔΙΟ NPV
- ΤΥΧΑΙΟ ΕΥΡΗΜΑ ΣΕ CT➡ ΑΝΤΙΜΕΤΩΠΙΣΗ ΣΑΝ ΣΥΜΠΤΩΜΑΤΙΚΗ ΠΕ
- ΘΕΡΑΠΕΙΑ
  - LMWH
  - ΥΠΟΤΡΟΠΗ VTE ΥΠΟ VKA Η' LMWH
    - ΜΕΓΙΣΤΗ ΔΟΣΗ LMWH
    - ΦΙΛΤΡΟ ΚΚΦ

FIGURE 1 PE: Risk-Adjusted Management in the Acute Phase and Over the Long Term



*Biochemical markers include markers of myocardial injury (troponins, heart-type fatty acid-binding protein) and markers of heart failure (BNP or N-terminal-proBNP). †Only antiphospholipid syndrome and high-risk inherited thrombophilia (i.e., homozygosity for factor V Leiden, homozygosity for prothrombin G20210A mutation, double heterozygosity, antithrombin deficiency) are considered. Nevertheless, routine thrombophilia testing is not indicated in PE patients. BNP = B-type natriuretic peptide; CT = computed tomography; CTEPH = chronic thromboembolic pulmonary hypertension; CTPA = computed tomographic pulmonary angiogram; CUS = compression ultrasound; Echo = echocardiography; N-terminal-proBNP = N-terminal pro-B-type natriuretic peptide; PE = pulmonary embolism; PESI = pulmonary embolism severity index; RV = right ventricular; sPESI = simplified pulmonary embolism severity index; V/Q scan = ventilation/perfusion lung scan; VTE = venous thromboembolism.

ΕΥΧΑΡΙΣΤΩ ΠΟΛΥ