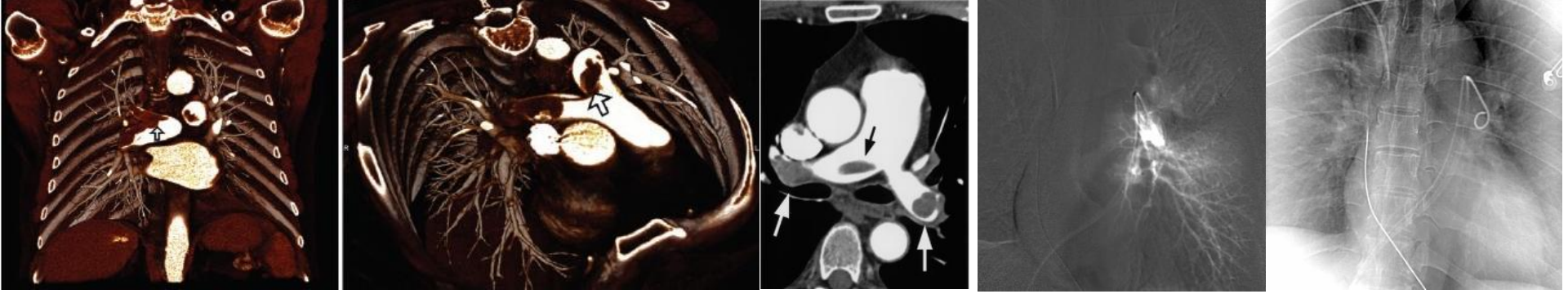
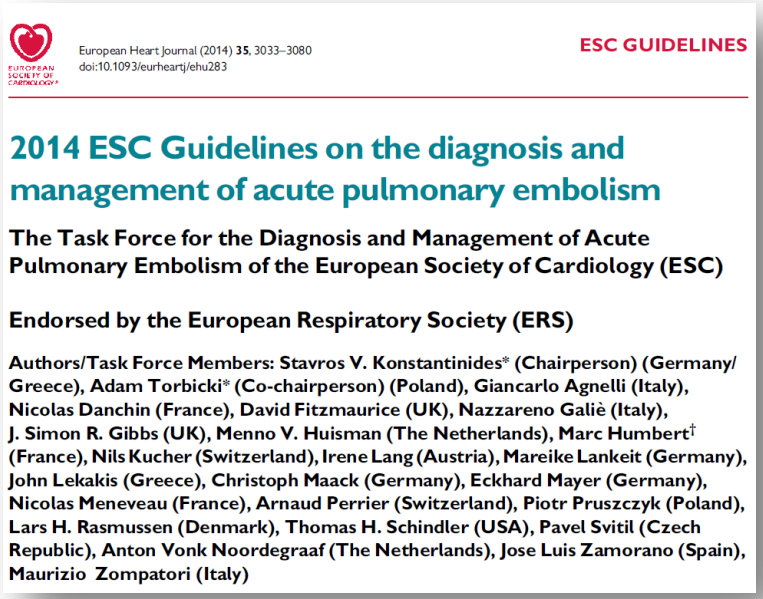


Plicní embolie – diagnostika a prognostická stratifikace

Martin Hutyra

1. interní klinika - kardiologická, Lékařská fakulta Univerzity Palackého a FN Olomouc



European Heart Journal (2014) **35**, 3033–3080
doi:10.1093/eurheartj/ehu283

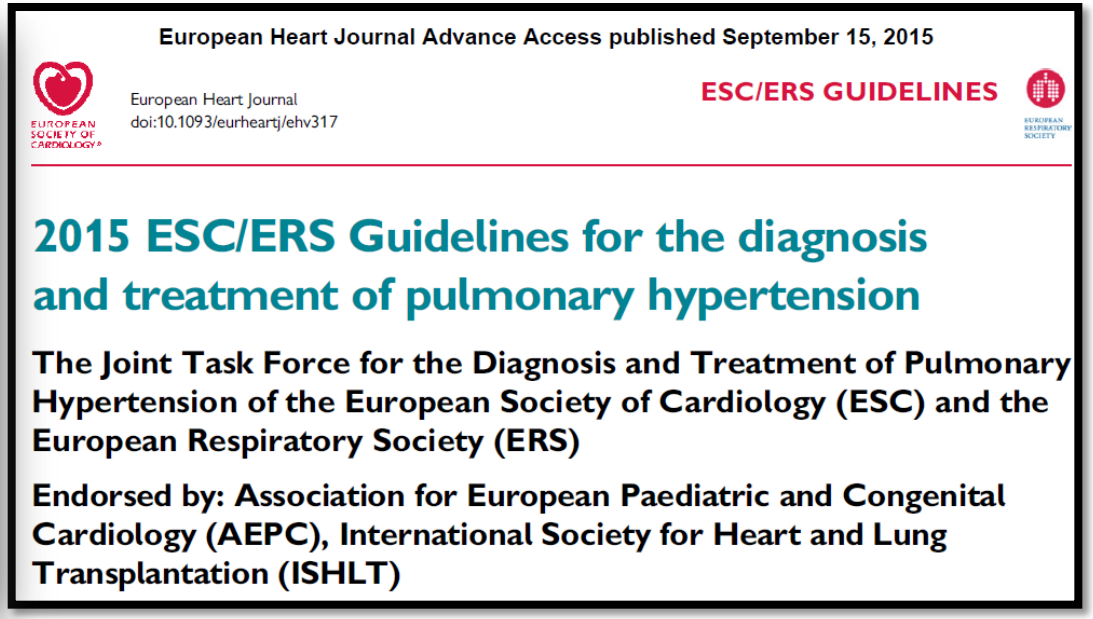
ESC GUIDELINES

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

The Task Force for the Diagnosis and Management of Acute Pulmonary Embolism of the European Society of Cardiology (ESC)

Endorsed by the European Respiratory Society (ERS)

Authors/Task Force Members: Stavros V. Konstantinides* (Chairperson) (Germany/Greece), Adam Torbicki* (Co-chairperson) (Poland), Giancarlo Agnelli (Italy), Nicolas Danchin (France), David Fitzmaurice (UK), Nazzareno Galiè (Italy), J. Simon R. Gibbs (UK), Menno V. Huisman (The Netherlands), Marc Humbert† (France), Nils Kucher (Switzerland), Irene Lang (Austria), Mareike Lankeit (Germany), John Lekakis (Greece), Christoph Maack (Germany), Eckhard Mayer (Germany), Nicolas Meneveau (France), Arnaud Perrier (Switzerland), Piotr Pruszczyk (Poland), Lars H. Rasmussen (Denmark), Thomas H. Schindler (USA), Pavel Svitil (Czech Republic), Anton Vonk Noordegraaf (The Netherlands), Jose Luis Zamorano (Spain), Maurizio Zompatori (Italy)



European Heart Journal Advance Access published September 15, 2015

European Heart Journal
doi:10.1093/eurheartj/ehv317

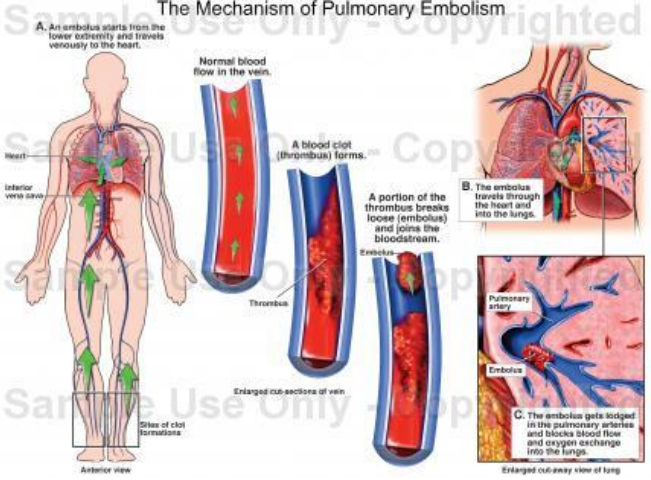
ESC/ERS GUIDELINES

2015 ESC/ERS Guidelines for the diagnosis and treatment of pulmonary hypertension

The Joint Task Force for the Diagnosis and Treatment of Pulmonary Hypertension of the European Society of Cardiology (ESC) and the European Respiratory Society (ERS)

Endorsed by: Association for European Paediatric and Congenital Cardiology (AEPC), International Society for Heart and Lung Transplantation (ISHLT)

Epidemiologie



Prevalence 0,4% populace

Incidence 100-200/100 000/1 rok

Autopsie 2356 (79% všech zemřelých z populace 200 tis.) s nálezem PE u 25% a u 18% jako hlavní příčina smrti

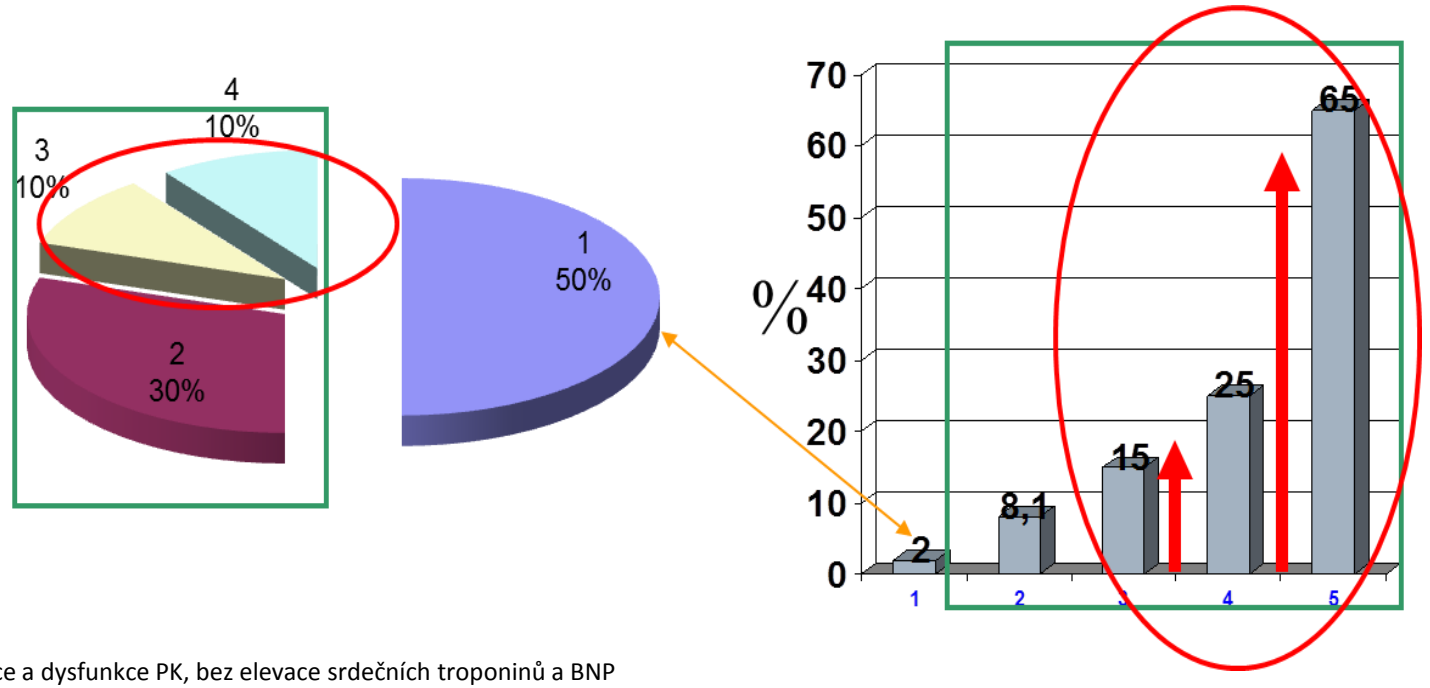
Závislost výskytu na věku a rizikových faktorech

Jen 30-45% pacientů, kteří zemřeli v důsledku plicní embolie bylo adekvátně léčeno

Až 80% pacientů s rizikovými faktory tromboembolie je špatně diagnostikováno

Noboa S, Mottier D, Oger E; on behalf of EPI-GETBO Study Group. Estimation of a potentially preventable fraction of venous thromboembolism: a community-based prospective study. J Thromb Haemost 2006; 4: 2720-2.
Oger E. Incidence of venous thromboembolism in a community-based study in western France. Thromb Haemost 2000;83:657-60
Modam B, Sharon E, Jelin W. Factors contributing to the incorrect diagnosis of pulmonary embolism. Chest 1972;62:388-93
Morpurgo M, Schmid C. Clinico-pathological correlations in pulmonary embolism. A prospective evaluation. Prog Respir Res 1980;13:8-15
Pineda LA, Hathwar VS, Grant BJ. Clinical suspicion of fatal pulmonary embolism. Chest 2001;120:791-5

Prognóza



1. **Normotenze** bez dilatace a dysfunkce PK, bez elevace srdečních troponinů a BNP
2. **Normotenze s dilatací nebo dysfunkcí PK, plicní hypertenzí**, (elevace srdečních troponinů a BNP)
3. **Systémová hypotenze bez klinických známek šokové cirkulace** (pokles TKs<90 mmHg nebo pokles TKs>40 mmHg, bez nutnosti použití vazopresorů s výjimkou dobutaminu do maximální dávky 5 µg/kg/min)
4. **Kardiogenní obstrukční šok** s orgánovou hypoperfuzí a multiorgánovým selháním
5. Nutnost **iniciální kardiopulmonální resuscitace** a **náhlá srdeční smrt**

Kasper W, Konstantinides S, Geibel A, et al. Management strategies and determinants of outcome in acute pulmonary embolism: results of a multicenter registry. J Am Coll Cardiol 1997;30:1165–71
Goldhaber SZ, Visani L, DeRosa M. for ICOPER. Acute pulmonary embolism: clinical outcomes in the International Cooperative Pulmonary Embolism Registry (ICOPER). Lancet 1999; 353: 1386-9

Klinická pravděpodobnost

Items	Clinical decision rule points	
Wells rule	**Original version[41]**	**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[43]**	**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

Geneva skóre:

klinická pravděpodobnost

nízká 0-3 body

střední 4-10

vysoká ≥ 11

Predisponující faktory	
Věk nad 65 let	+1
Předchozí TEN	+3
Chirurgický výkon nebo trauma do 1 měsíce	+2
Malignita	+2
Symptomy	
Bolesti končetiny	+3
Hemoptýza	+2
Fyzikální vyšetření	
Srdeční frekvence	
75-95/min.	+3
>95/min.	+2
Asymetrický otok nebo bolestivost končetiny	+4

Wellsovo skóre:

klinická pravděpodobnost

nízká 0-1 body

střední 2-6, vysoká ≥ 7

plicní embolie nepravděpodobná 0-4

pravděpodobná ≥ 5

Predisponující faktory	
Předchozí TEN	+1,5
Recentní chirurgický výkon nebo imobilizace	+1,5
Malignita	+1,0
Symptomy	
Hemoptýza	+1,0
Fyzikální vyšetření	
Tepová frekvence > 100/min.	+1,5
Klinické známky hluboké žilní trombózy	+3,0
Klinické hodnocení	
Jiná diagnóza je méně pravděpodobná než PE	+3,0

Annals of Internal Medicine
Established in 1927 by the American College of Physicians

Performance of 4 Clinical Decision Rules in the Diagnostic Management of Acute Pulmonary Embolism

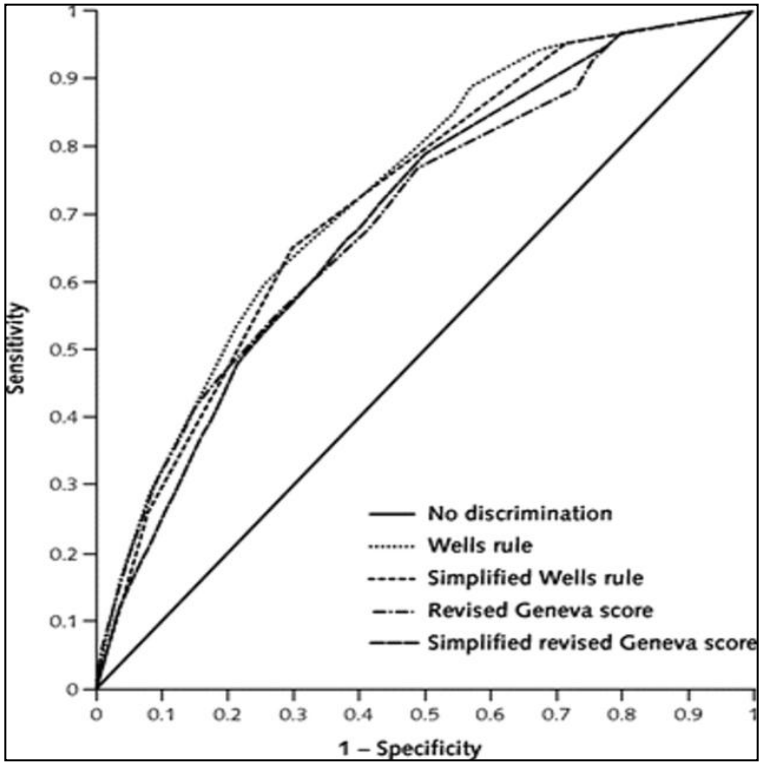
A Prospective Cohort Study from the Promethius Study Group

Ann Intern Med. 2011;154(11):709-718.

Table 4. Accuracy Indexes of the Clinical Decision Rules in Combination With a Normal D-Dimer Result in Patients With a Suspected Event*

Variable	Original Wells Rule (n = 796)	Simplified Wells Rule (n = 803)	RGS (n = 796)	Simplified RGS (n = 795)
Sensitivity†				
Number/number	190/191	191/192	188/189	187/188
Percentage (95% CI)	99.5 (97–100)	99.5 (97–100)	99.5 (97–100)	99.5 (97–100)
Specificity‡				
Number/number	183/605	177/611	184/607	189/607
Percentage (95% CI)	30 (27–34)	29 (25–33)	30 (27–34)	31 (28–34)
Negative predictive value§				
Number/number	183/184	177/178	184/185	189/190
Percentage (95% CI)	99.5 (97–100)	99.4 (97–100)	99.5 (97–100)	99.5 (97–100)

RGS = revised Geneva rule.
* Patients with a clinical decision rule indicating that PE was unlikely but in whom the D-dimer result was missing (protocol violation) were not included in this analysis; this number differed among the 4 clinical decision rules. Sensitivities did not differ among the 4 clinical decision rules in combination with D-dimer test. Specificity differed significantly between the Wells rule and the simplified Wells rule (P = 0.031) and the simplified Wells rule and the simplified RGS (P = 0.017). Other differences in specificity were not statistically significant.
† The number of patients correctly identified as having pulmonary embolism by the combination of clinical decision rules and D-dimer testing divided by the total number of patients with proven pulmonary embolism identified by computed tomography at the time of initial evaluation or venous thromboembolism at 3-mo follow-up.
‡ The number of patients correctly identified as not having pulmonary embolism by the combination of clinical decision rules and D-dimer testing divided by the total number of patients in whom pulmonary embolism was excluded by computed tomography at the time of initial evaluation or venous thromboembolism at 3-mo follow-up.
§ The number of patients correctly identified as not having pulmonary embolism by the combination of clinical decision rules and D-dimer testing divided by the total number of patients with the combination of clinical decision rule and D-dimer testing indicating that pulmonary embolism was excluded (i.e., pulmonary embolism and deep venous thrombosis).



Receiver-operating characteristic curves of the 4 clinical decision rules:
Area under the receiver-operating characteristic curves were 0.73 (95% CI, 0.69 to 0.77) for the Wells rule, 0.72 (CI, 0.68 to 0.76) for the simplified Wells rule, 0.70 (CI 0.65 to 0.74) for the revised Geneva score, and 0.69 (CI, 0.65 to 0.74) for the simplified revised Geneva score.

European Heart Journal Advance Access published August 29, 2014
European Heart Journal
doi:10.1093/eurheartj/ehu283
ESC GUIDELINES

Terminologie

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

The Task Force for the Diagnosis and Management of Acute Pulmonary Embolism of the European Society of Cardiology (ESC)

Endorsed by the European Respiratory Society (ERS)

	Hemodynamická nestabilita [(a)]	Echokardiografické markery dilatace, dysfunkce PK a PH*	Kardiomarkery	Léčebná strategie
Masivní (high risk, mortalita >15%)	+	+	+	Trombolýza nebo embolektomie
Submasivní (medium risk)	-	+/-	+/-	Antikoagulace nebo trombolýza
Neriziková (mortalita <3%)	-	-	-	Antikoagulace

Early mortality risk		Risk parameters and scores			
		Shock or hypotension	PESI class III-V or sPESI >I[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]	

Task Force Members: Guidelines on the diagnosis and management. European Heart Journal (2008) 29, 2276–2315

Widimský J. et al. Doporučení diagnostiky, léčby a prevence plicní embolie. Verze 2007. Doporučení České kardiologické společnosti. Vnitř. lék. 2008, 54, Suppl. 1, S25-72

European Heart Journal Advance Access published August 29, 2014
European Heart Journal
doi:10.1093/eurheartj/ehu283
ESC GUIDELINES

PESI – prognostická stratifikace

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

The Task Force for the Diagnosis and Management of Acute Pulmonary Embolism of the European Society of Cardiology (ESC)

Endorsed by the European Respiratory Society (ERS)

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]	
	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%)

Diagnostika a riziková stratifikac

European Heart Journal Advance Access published August 29, 2014

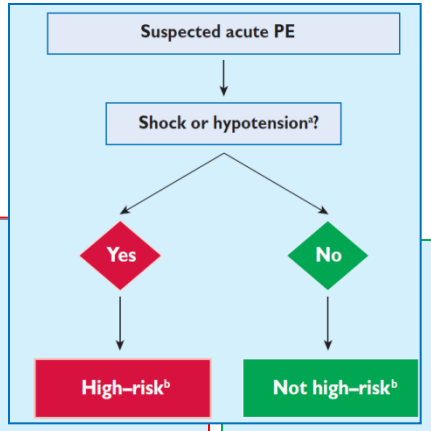
European Heart Journal
doi:10.1093/eurheartj/ehu283

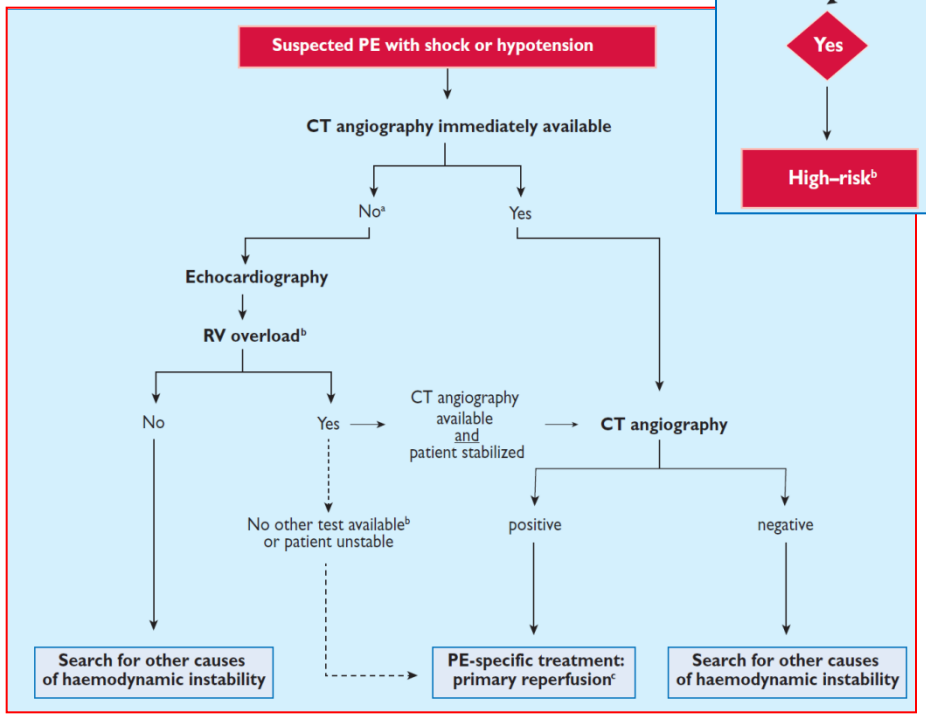
ESC GUIDELINES

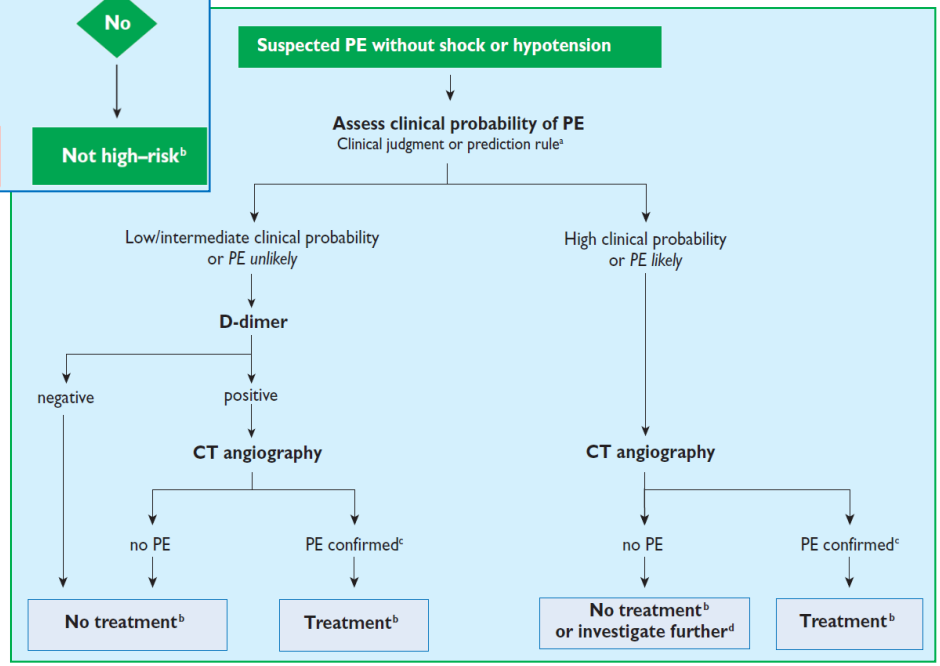
2014 ESC Guidelines on the diagnosis and management of acute pulmonary embolism

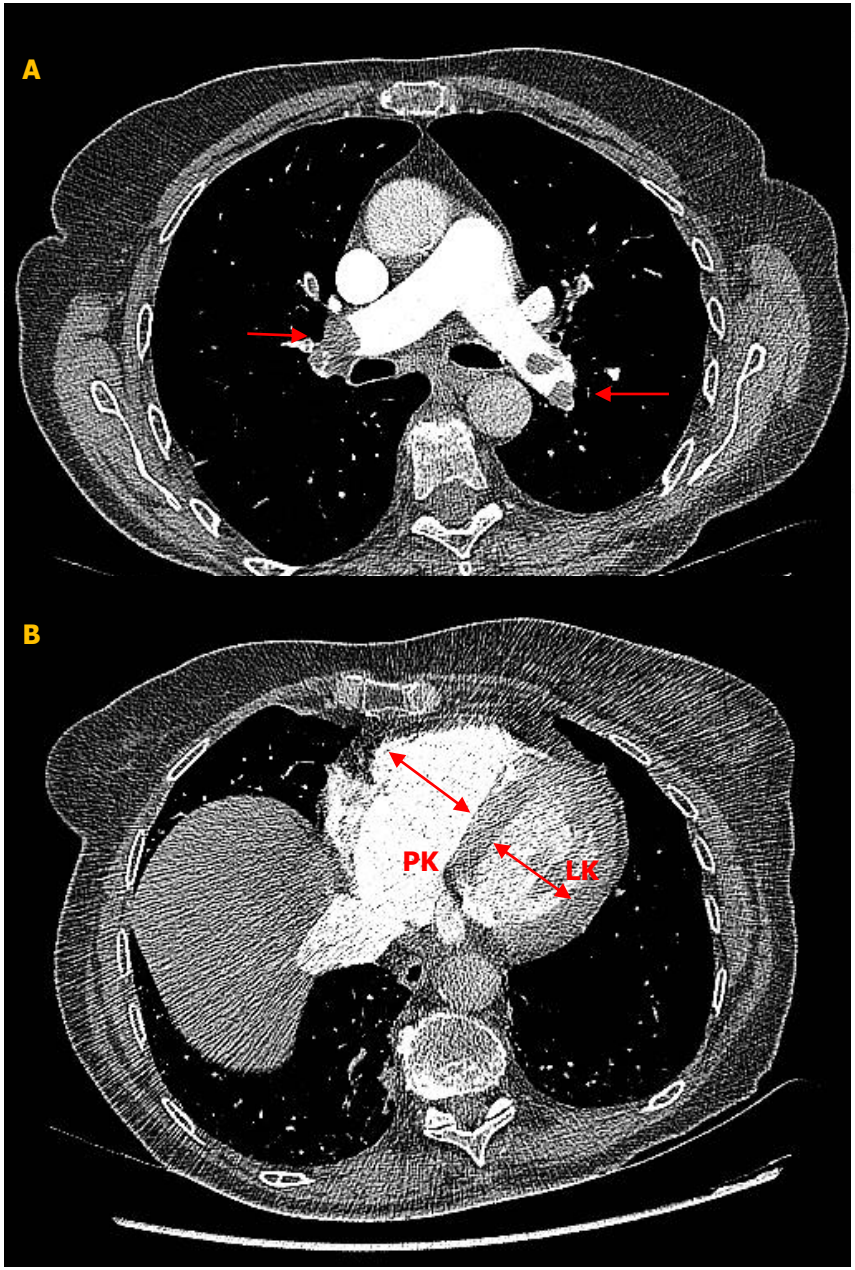
The Task Force for the Diagnosis and Management of Acute Pulmonary Embolism of the European Society of Cardiology (ESC)

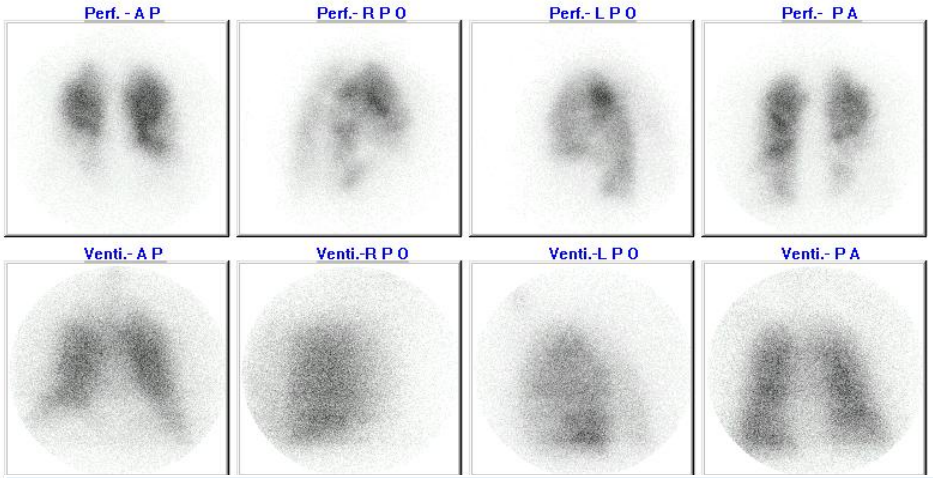
Endorsed by the European Respiratory Society (ERS)











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		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]	

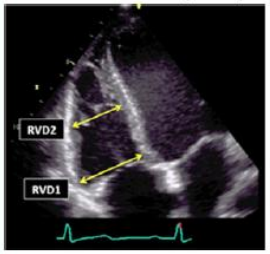
European Heart Journal – Cardiovascular Imaging (2015) **16**, 233–271
doi:10.1093/ehjci/jev014

POSITION PAPER

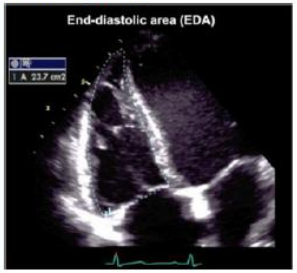
Recommendations for Cardiac Chamber Quantification by Echocardiography in Adults: An Update from the American Society of Echocardiography and the European Association of Cardiovascular Imaging

Rozměry DUTINY pravé komory

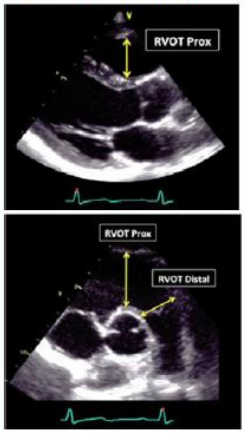
RV linear dimensions (inflow)*



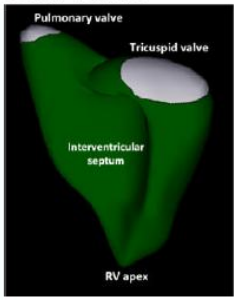
RV areas (inflow)



RV linear dimensions (outflow)*



3DE RV volumes



RV wall thickness

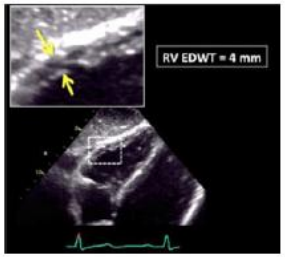
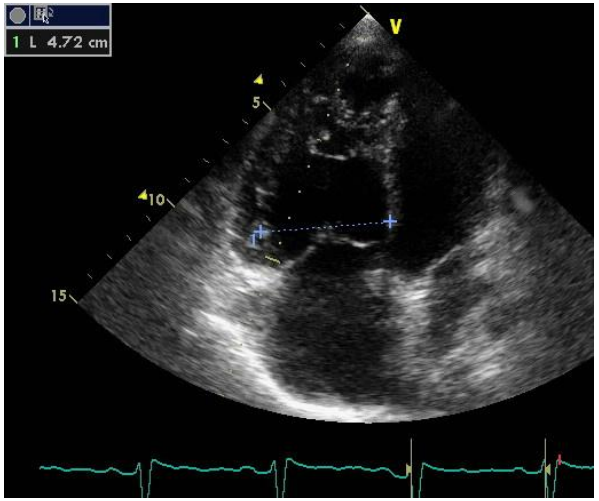


Table 8 Normal values for RV chamber size

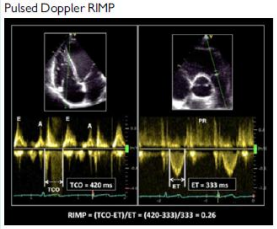
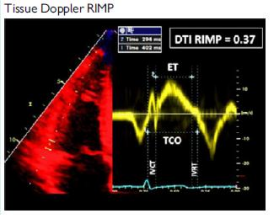
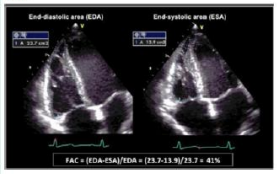
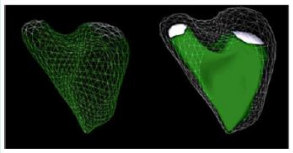
Parameter	Mean ± SD	Normal range
RV basal diameter (mm)	33 ± 4	25–41
RV mid diameter (mm)	27 ± 4	19–35
RV longitudinal diameter (mm)	71 ± 6	59–83
RVOT PLAX diameter (mm)	25 ± 2.5	20–30
RVOT proximal diameter (mm)	28 ± 3.5	21–35
RVOT distal diameter (mm)	22 ± 2.5	17–27
RV wall thickness (mm)	3 ± 1	1–5
RVOT EDA (cm^2)		
Men	17 ± 3.5	10–24
Women	14 ± 3	8–20
RV EDA indexed to BSA (cm^2/m^2)		
Men	8.8 ± 1.9	5–12.6
Women	8.0 ± 1.75	4.5–11.5
RV ESA (cm^2)		
Men	9 ± 3	3–15
Women	7 ± 2	3–11
RV ESA indexed to BSA (cm^2/m^2)		
Men	4.7 ± 1.35	2.0–7.4
Women	4.0 ± 1.2	1.6–6.4
RV EDV indexed to BSA (mL/m^2)		
Men	61 ± 13	35–87
Women	53 ± 10.5	32–74
RV ESV indexed to BSA (mL/m^2)		
Men	27 ± 8.5	10–44
Women	22 ± 7	8–36

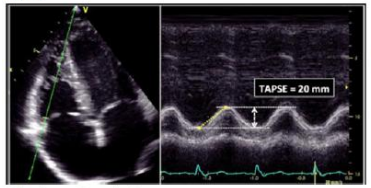
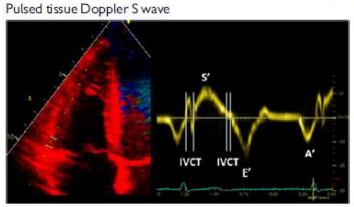
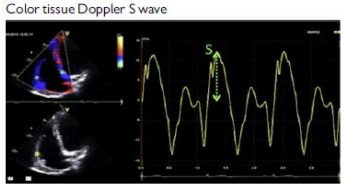
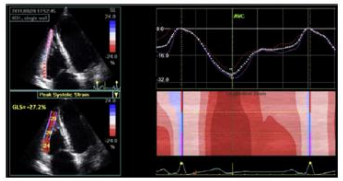


European Heart Journal – Cardiovascular Imaging (2015) **16**, 233–271
doi:10.1093/ehjci/jev014

POSITION PAPER

Recommendations for Cardiac Chamber Quantification by Echocardiography in Adults: An Update from the American Society of Echocardiography and the European Association of Cardiovascular Imaging

Echocardiographic imaging	Recommended methods	Advantages	Limitations
RV global function Pulsed Doppler RIMP 	RIMP (Tei index) by pulsed Doppler: RIMP = (TCO − ET)/ET	• Prognostic value • Less affected by heart rate	• Requires matching for R-R intervals when measurements are performed on separate recordings • Unreliable when RA pressure is elevated
Tissue Doppler RIMP 	RIMP by tissue Doppler: RIMP = (IVRT + IVCT)/ET = (TCO − ET)/ET	• Less affected by heart rate • Single-beat recording with no need for R-R interval matching	• Unreliable when RA pressure is elevated
RV global systolic function FAC 	RV FAC in RV-focused apical four-chamber view: RV FAC (%) = 100 × (EDA − ESA)/EDA	• Established prognostic value • Reflects both longitudinal and radial components of RV contraction • Correlates with RV EF by CMR	• Neglects the contribution of RV outflow tract to overall systolic function • Only fair inter-observer reproducibility
EF 	Fractional RV volume change by 3D TTE: RV EF (%) = 100 × (EDV − ESV)/EDV	• Includes RV outflow tract contribution to overall function • Correlates with RV EF by CMR	• Dependent on adequate image quality • Load dependency • Requires offline analysis and experience • Prognostic value not established

Echocardiographic imaging	Recommended methods	Advantages	Limitations
RV longitudinal systolic function TAPSE 	• Tricuspid annular longitudinal excursion by M-mode (mm), measured between end-diastole and peak systole • Proper alignment of M-mode cursor with the direction of RV longitudinal excursion should be achieved from the apical approach.	• Established prognostic value • Validated against radionuclide EF	• Angle dependency • Partially representative of RV global function*
Pulsed tissue Doppler S wave 	• Peak systolic velocity of tricuspid annulus by pulsed-wave DTI (cm/sec), obtained from the apical approach, in the view that achieves parallel alignment of Doppler beam with RV free wall longitudinal excursion	• Easy to perform • Reproducible • Validated against radionuclide EF • Established prognostic value	• Angle dependent • Not fully representative of RV global function, particularly after thoracotomy, pulmonary thromboendarterectomy or heart transplantation
Color tissue Doppler S wave 	• Peak systolic velocity of tricuspid annulus by color DTI (cm/sec)	• Sampling is performed after image acquisition • Allows multisite sampling on the same beat	• Angle dependent • Not fully representative of RV global function, particularly after thoracotomy, pulmonary thrombendarterectomy or heart transplantation • Lower absolute values and reference ranges than pulsed DTI S′ wave • Requires offline analysis
GLS 	• Peak value of 2D longitudinal speckle tracking derived strain, averaged over the three segments of the RV free wall in RV-focused apical four-chamber view (%)	• Angle independent • Established prognostic value	• Vendor dependent

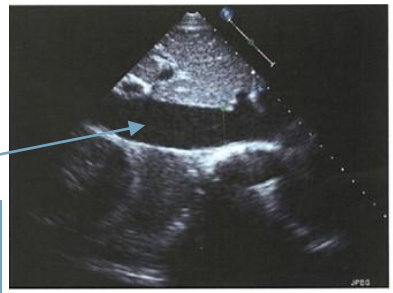
Maximální gradient regurgitace na pulmonální chlopni (PR) predikuje střední tlak v plicnici **(MAP)** .
Endiastolický gradient pulmonální regurgitace predikuje diastolický tlak v plicnici **(DAP)** .

Dolní dutá žíla **(IVC)** , její rozměr a stupeň inspiračního kolapsu predikují tlak v pravé síni **(RAP resp. CVT)**:
IVC <1.2 cm a kolaps 100% = RAP 0 mmHg

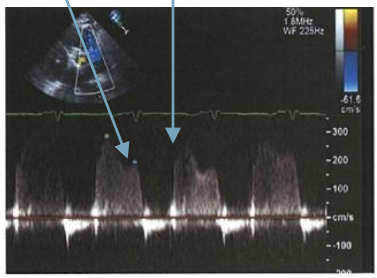
IVC 1.2-1.7 cm s >50% kolapsem = RAP 0-5 mmHg

IVC >1.7 cm s >50% kolapsem = RAP 6-10 mmHg; <50% kolapsem = RAP 10-15 mmHg

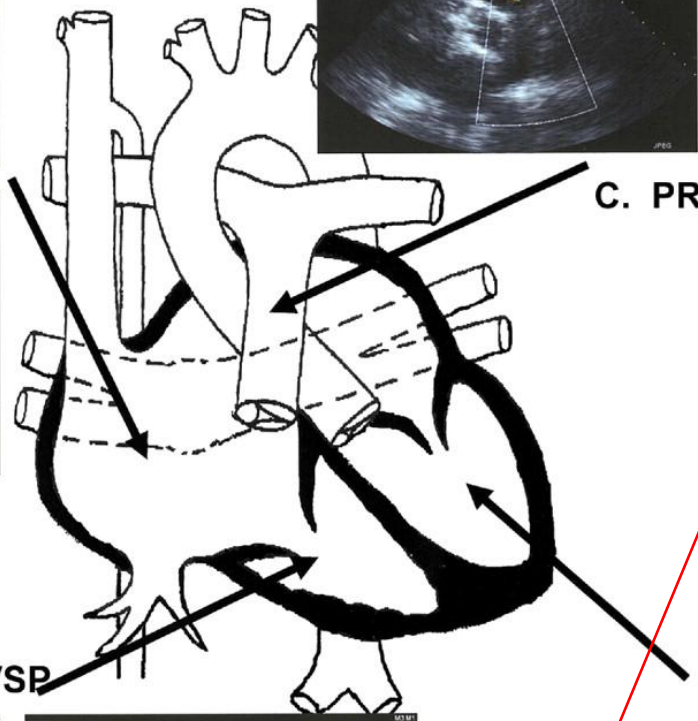
IVC >1.7 cm s 0% kolapsem = RAP >15 mmHg



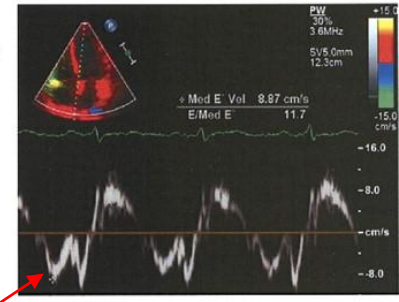
A. IVCCI--RAP



C. PR Vel.--PAPm, PAPd

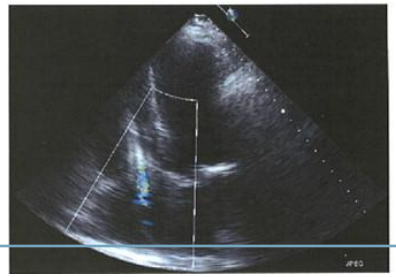


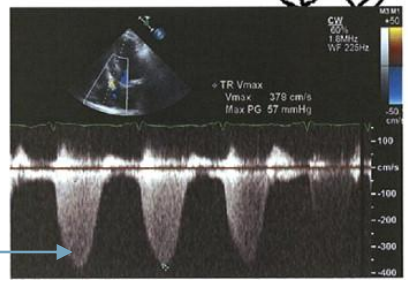
B. TR Vel.--RVSP



D. E/E'--PCWP

Vrcholová systolická rychlost jetu trikuspidální regurgitace **(TR)** predikuje systolický tlak v plicnici **(SAP)**:

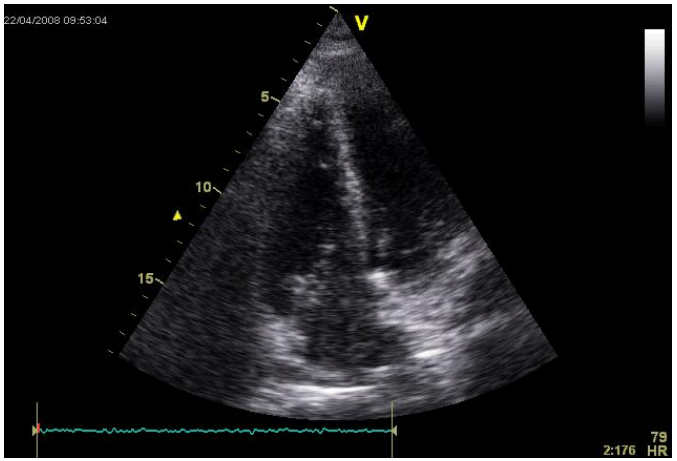


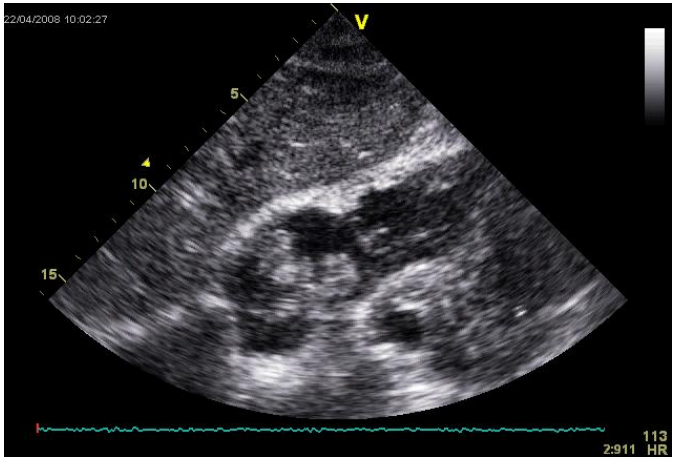


Poměr vrcholové systolické rychlosti časného mitrálního toku (E)/časná diastolická rychlost mitrálního anulu Em **(E/Em)** <8 nebo >15 přesně predikuje PCWP <15 mmHg resp. >15 mm Hg.

Kirkpatrick JN et al. Echocardiography in Heart Failure: Applications, Utility, and New Horizons. J Am Coll Cardiol 2007;50:381–96

Tranzientní tromby



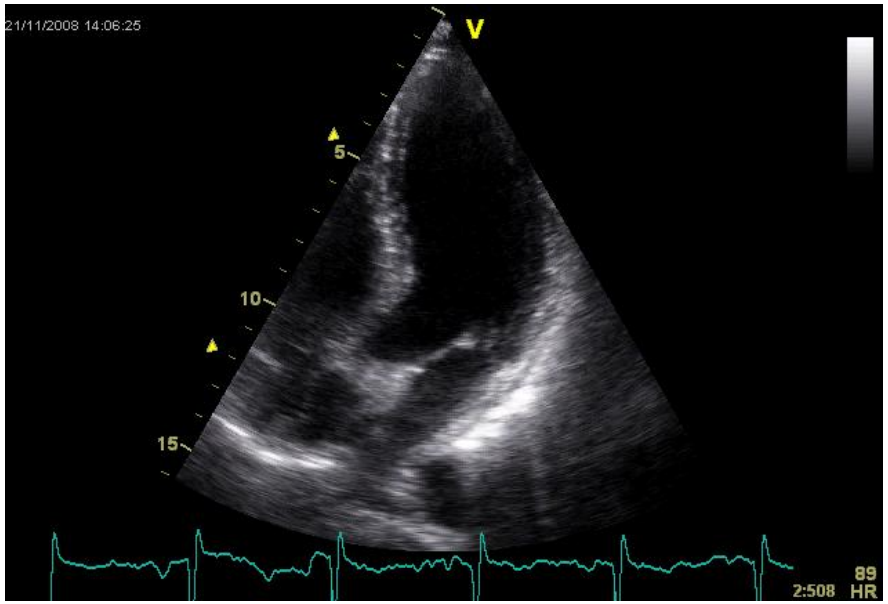


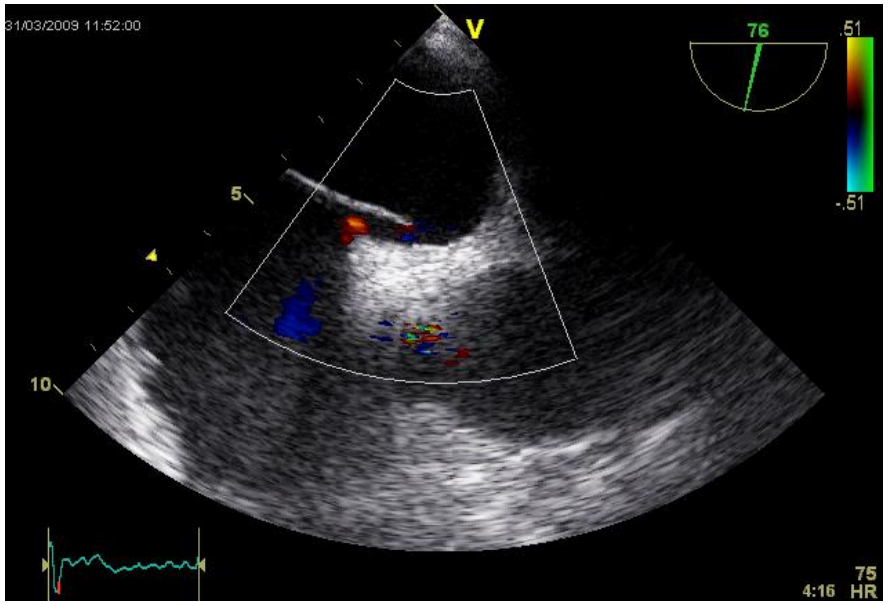
Přítomny až u 4 (18)% nemocných s plicní embolií

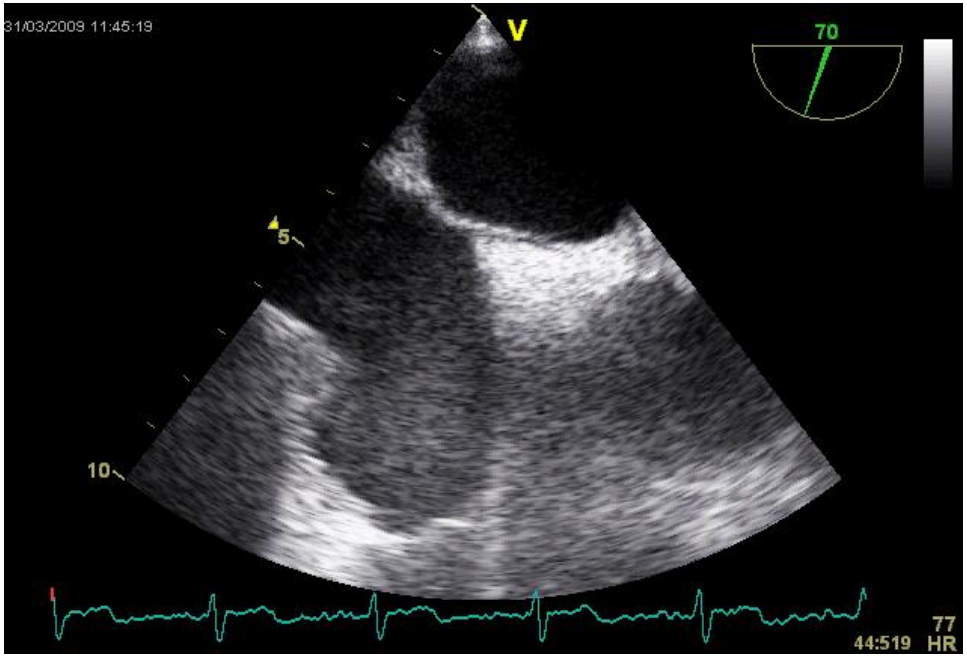
Závažný nález indikující trombolýzu

Při kontraindikaci (při PFO z rizikem vzniku paradoxní embolizace) k embolektomii

Casazza F, Bongarzoni A. Prevalence and prognostic significance of right-sided cardiac mobile thrombi in acute massive pulmonary embolism. Am J Cardiol 1997; 79:1433-5
Chartier L, Bera J. et al. Free-Floating Thrombi in the right Heart: Diagnosis, management and prognostic indexes in 38 consecutive patients. Circulation 1999; 99: 2779-83


21/11/2008 14:06:25
V
5
10
15
89
2:508 HR


31/03/2009 11:52:00
V
76
.51
-.51
5
10
75
4:16 HR


31/03/2009 11:45:19
V
70
5
10
77
44:519 HR

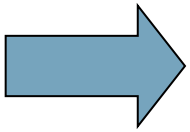
PFO s pravo-levým zkratem jako zdroj paradoxní embolizace

Nemocní s PFO a plicní embolií mají:

Vyšší riziko mortality (33% vs. 14%)

Vyšší výskyt ischemické CMP (13% vs. 2%)

Vyšší incidenci periferní arteriální embolizace (15% vs. 0%)



Indikace trombolytické léčby

Konstantinides S, Geibel A, Kasper W, et al. Patent foramen ovale is an important predictor of adverse outcome in patients with major pulmonary embolism. Circulation 1998; 97: 1946-51.
Jardin F, Dubourg O, Bourdarais JP. Echocardiographic pattern of acute cor pulmonale. Chest 1997; 111:209-17
Widimský J. et al. Doporučení diagnostiky, léčby a prevence plicní embolie. Verze 2007. Doporučení České kardiologické společnosti. Vnitř. lék. 2008, 54, Suppl. 1, S25-72

European Heart Journal Advance Access published August 29, 2014

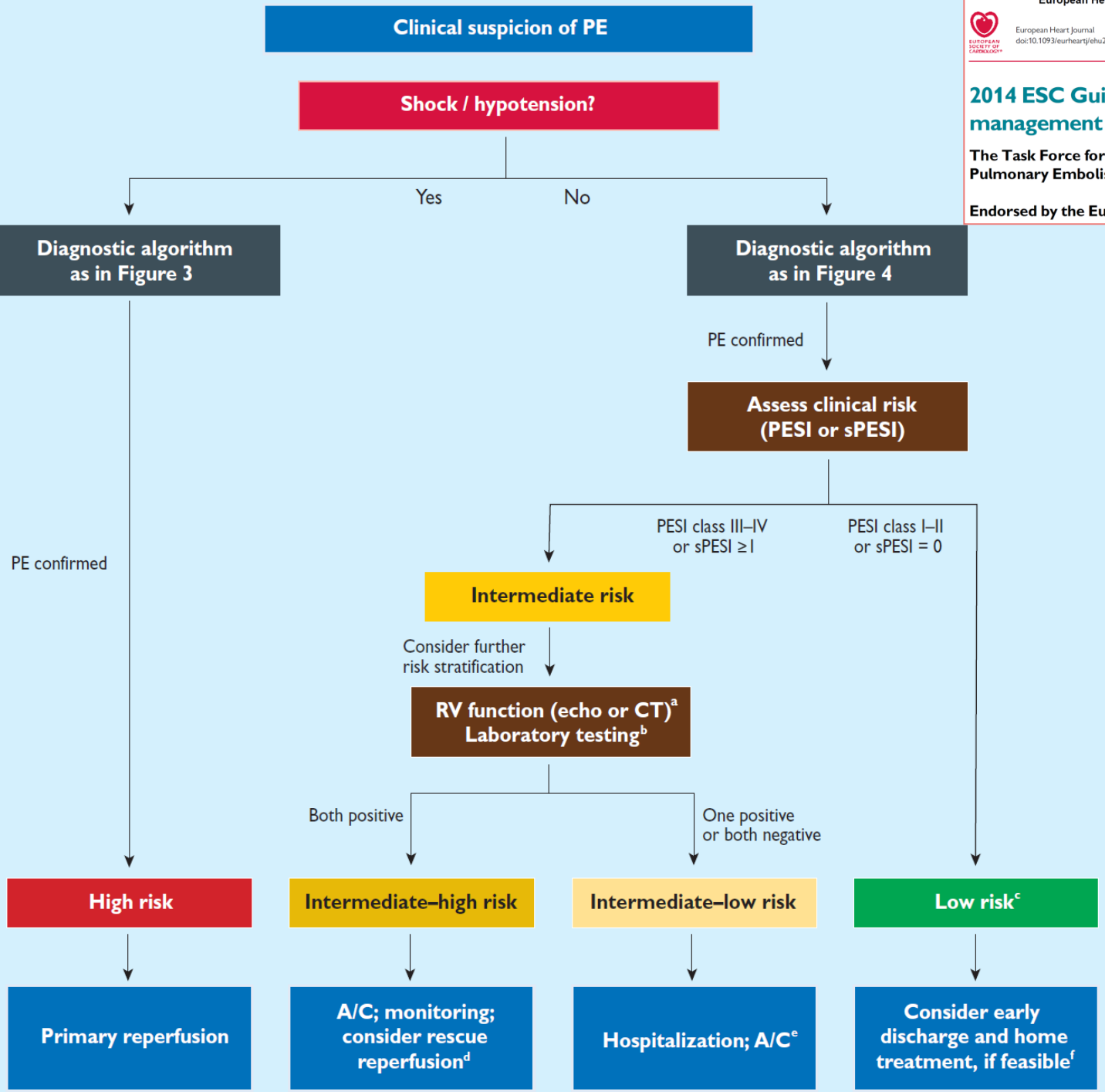
European Heart Journal
doi:10.1093/eurheartj/ehu283

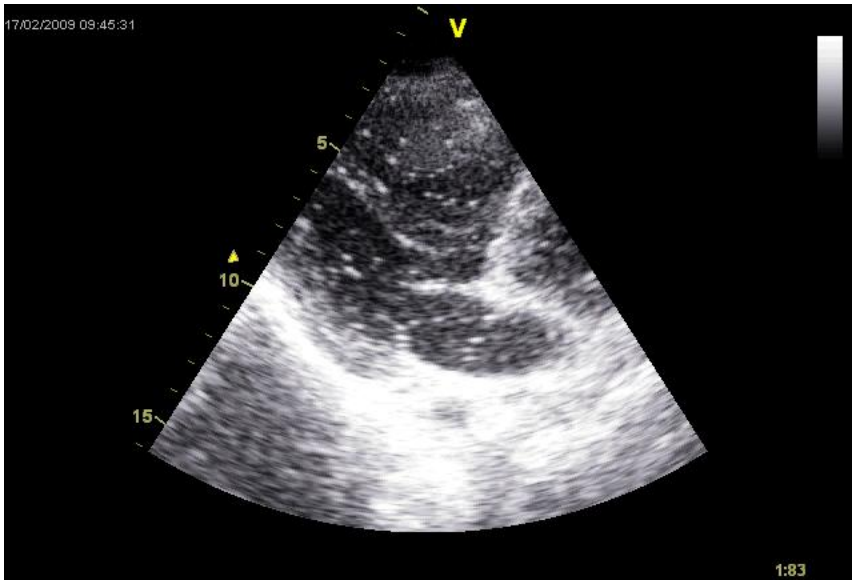
ESC GUIDELINES

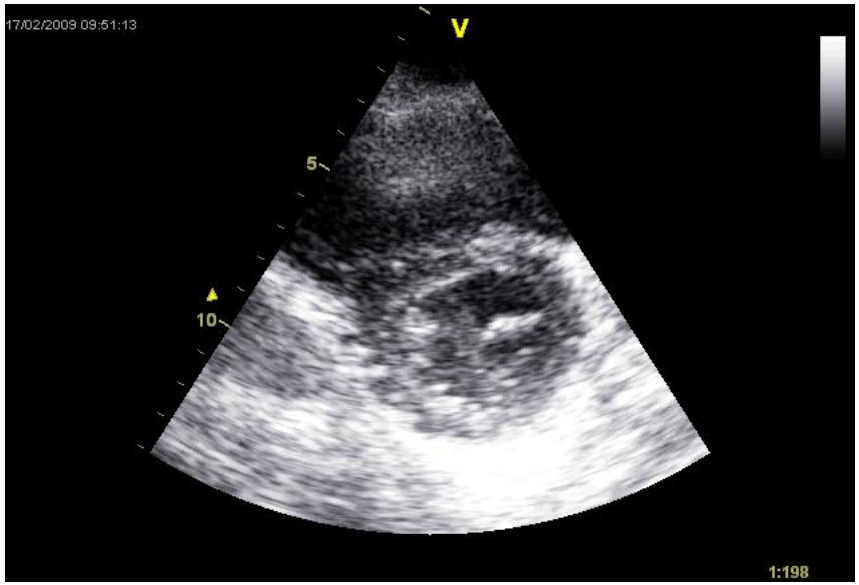
2014 ESC Guidelines on the diagnosis and management of acute pulmonary embolism

The Task Force for the Diagnosis and Management of Acute Pulmonary Embolism of the European Society of Cardiology (ESC)

Endorsed by the European Respiratory Society (ERS)

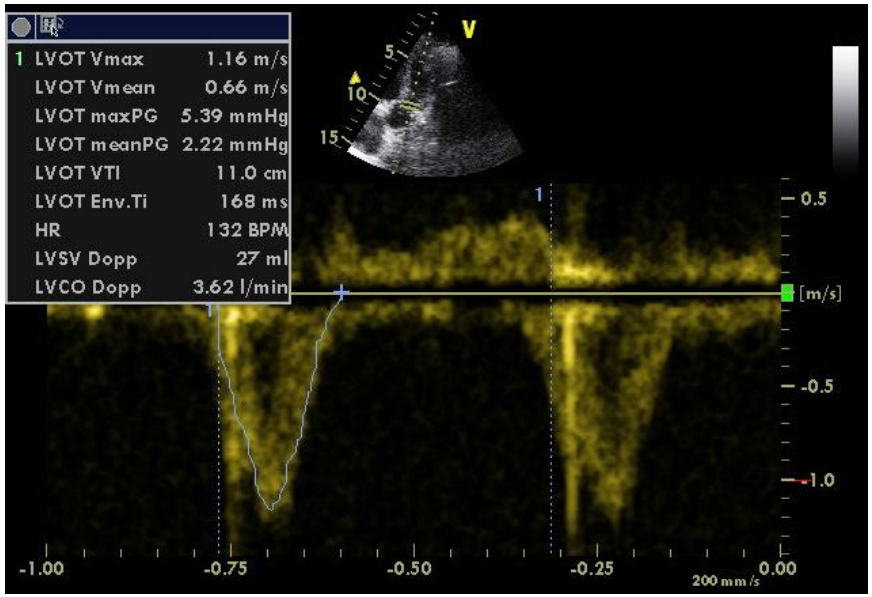


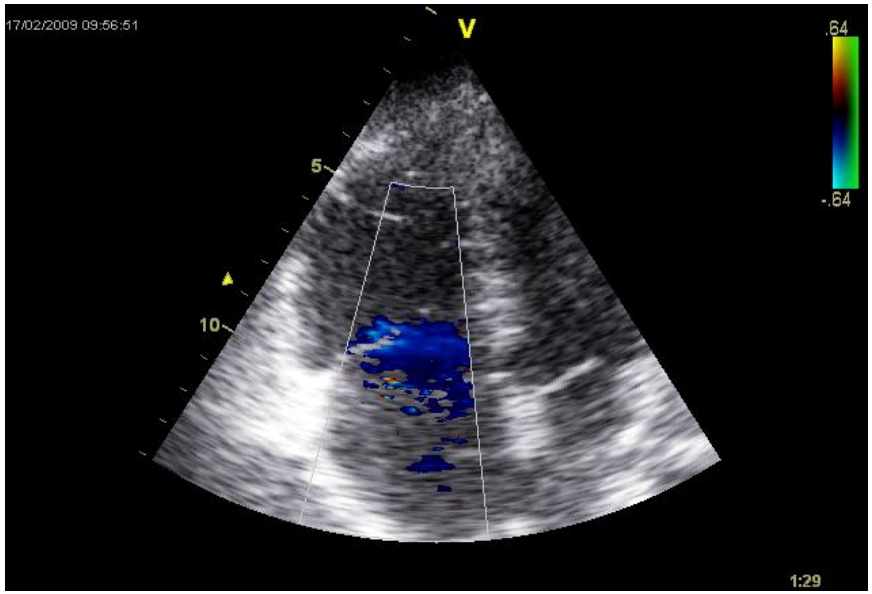


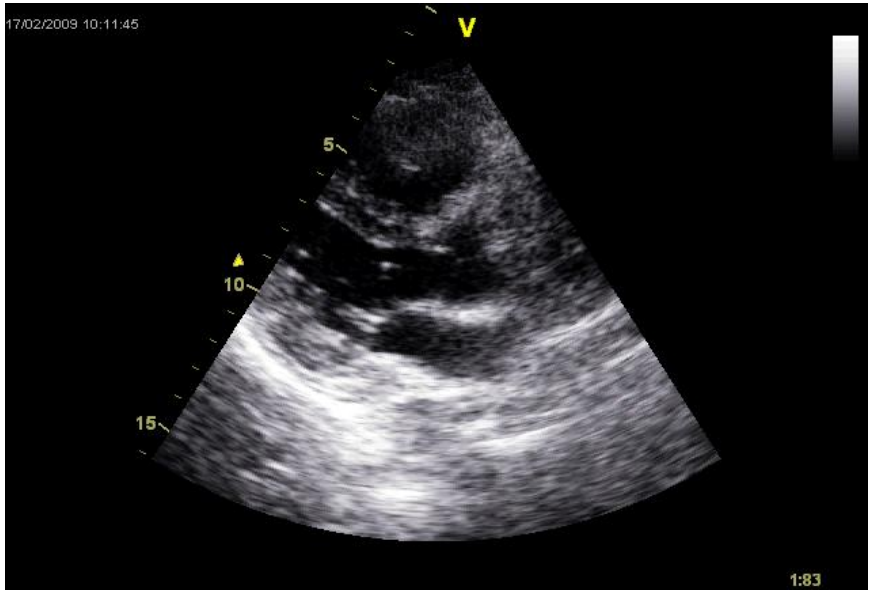


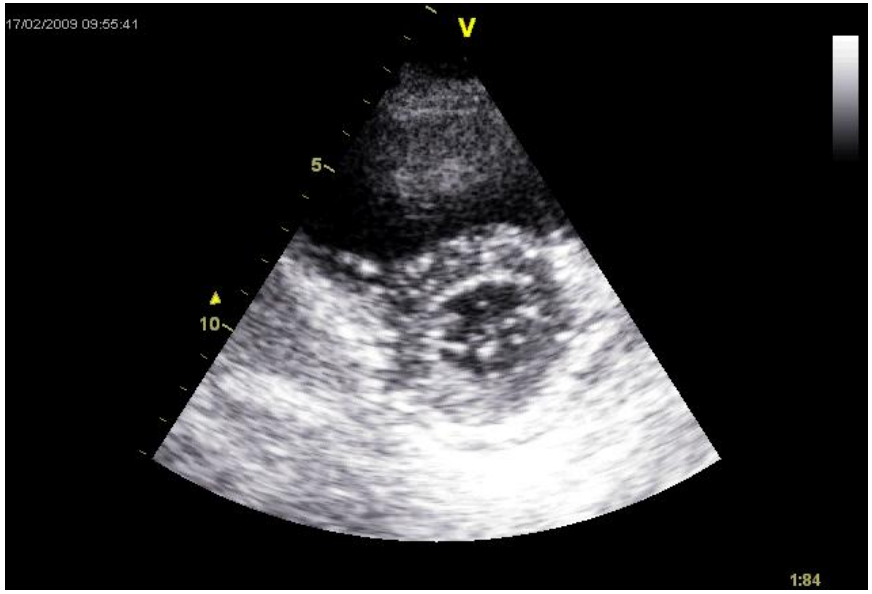
ECMO Maquet

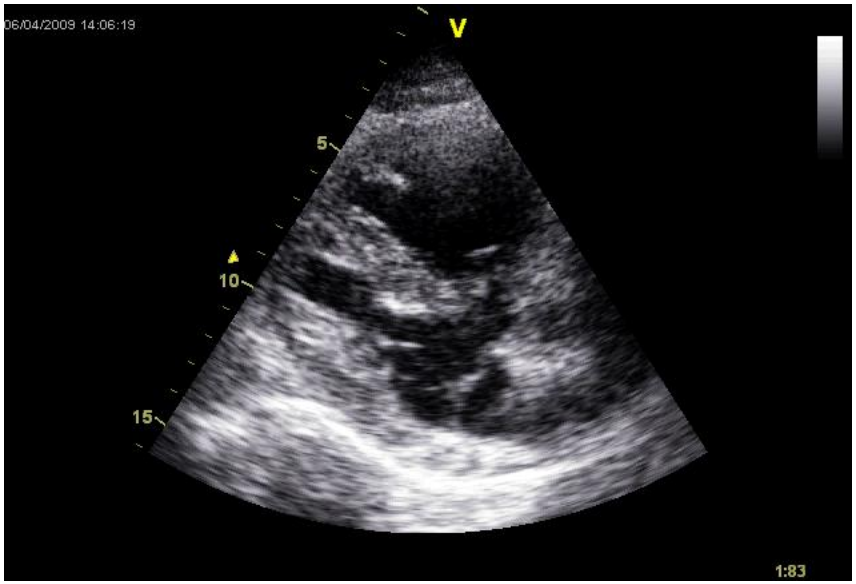
LUCAS CPR Chest Compression System

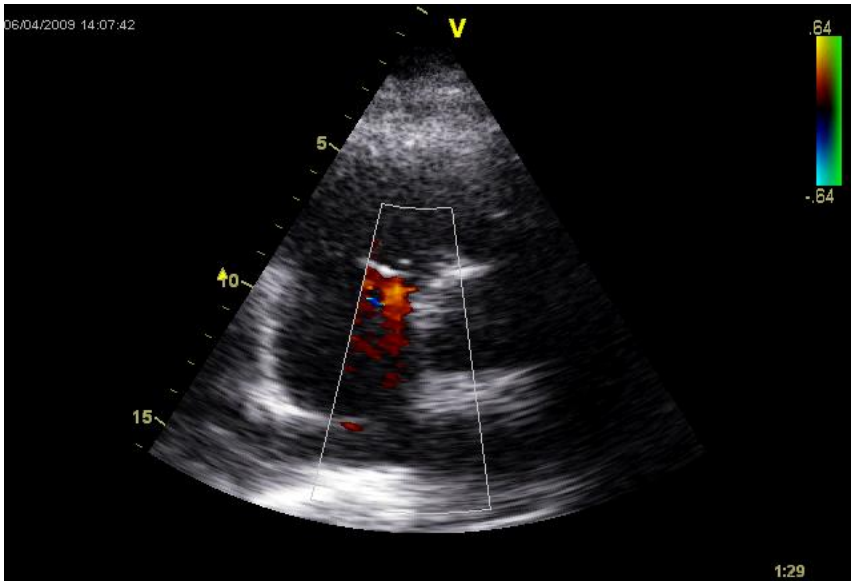

1 LVOT Vmax 1.16 m/s
LVOT Vmean 0.66 m/s
LVOT maxPG 5.39 mmHg
LVOT meanPG 2.22 mmHg
LVOT VTI 11.0 cm
LVOT Env.Ti 168 ms
HR 132 BPM
LVSV Dopp 27 ml
LVCO Dopp 3.62 l/min
V
5
10
15
0.5
[m/s]
-0.5
-1.0
-1.00
-0.75
-0.50
-0.25
0.00
200 mm/s

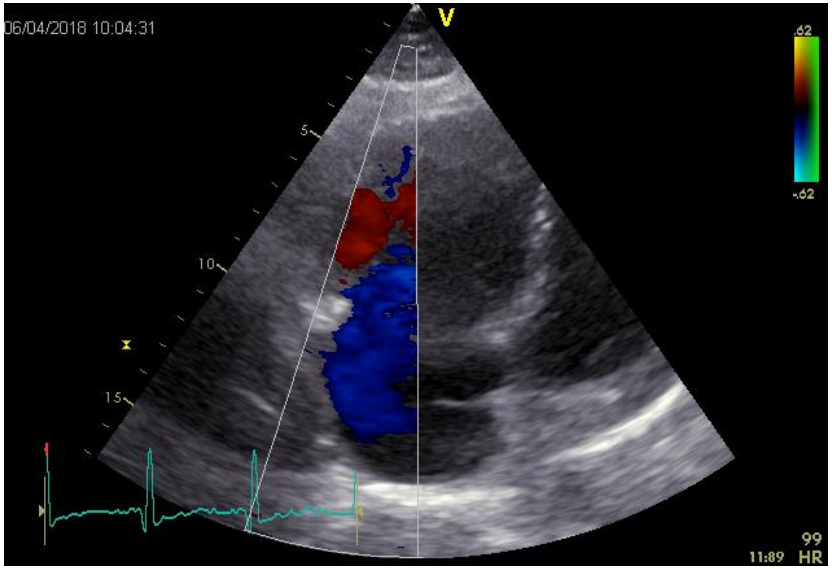

17/02/2009 09:56:51
V
.64
-.64
5
10
1:29

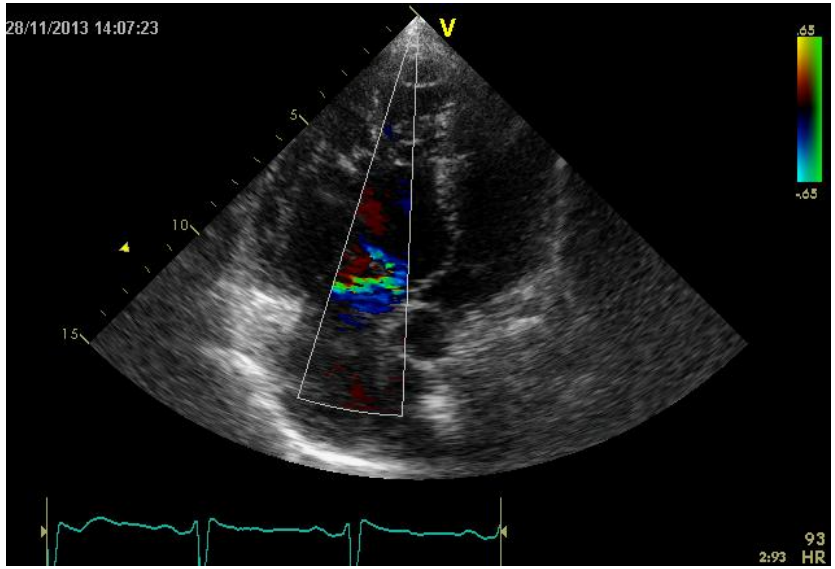

17/02/2009 10:11:45
V
5
10
15
1:83

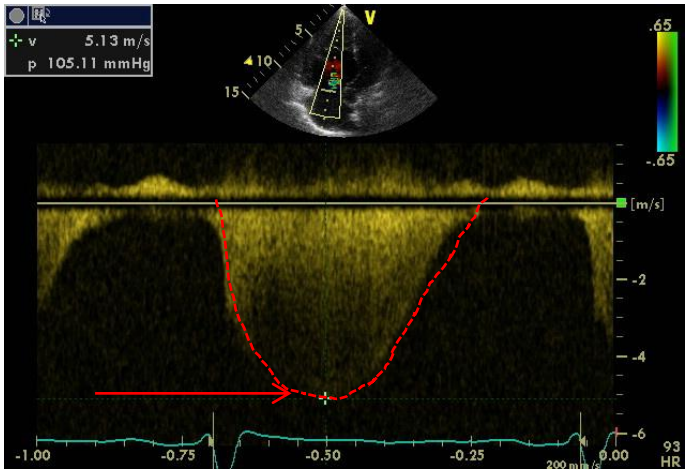

17/02/2009 09:55:41
V
5
10
1:84

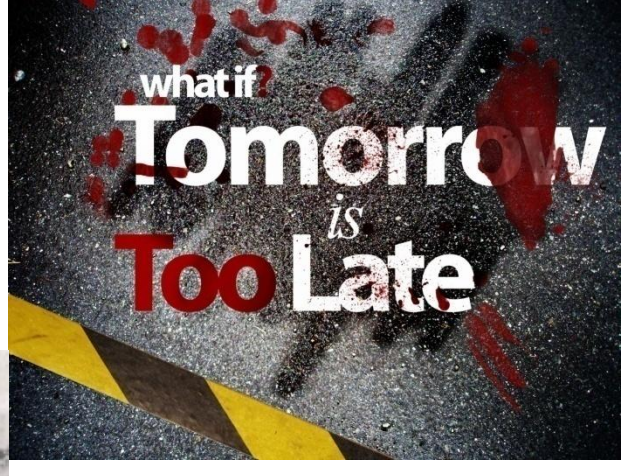

06/04/2009 14:06:19
V
5
10
15
1:83


06/04/2009 14:07:42
V
.64
-.64
5
10
15
1:29


06/04/2018 10:04:31
V
.62
-.62
5
10
15
99
11:89
HR


28/11/2013 14:07:23
V
.65
-.65
5
10
15
93
2:93
HR


v 5.13 m/s
p 105.11 mmHg
V
.65
-.65
[m/s]
-2
-4
-6
-1.00
-0.75
-0.50
-0.25
0.00
93
HR


what if
Tomorrow
is
Too Late


MAJESTIC