Pulmonary embolism

Martin Radvan

Thrombembolic disease

- Deep vein thrombosis
- Pulmonary embolism

Thrombembolic disease

- Imobilization
- Major surgery
- Trauma
- Age
- Heart failure
- Pregnancy
- Genetic factors

Thrombembolic disease

- Incidence: 100-200/100 000
- EU – 1500000/year; 60% in hospital
- 3rd most common cause of CV death
- Acute vs longtherm therapy
- Prophylaxis

Thrombembolic disease

- Acute therapy (10d)
- Consequent therapy (3-6m)
- Chronic therapy (prophylaxis after 6m)
- Idiopathic TED: 20-30% recidiv./10 years

- Onkologic patients – LMWH, *edoxaban*

Marik PE, Cavallazzi R. Extended anticoagulant and aspirin treatment for the secondary prevention of thromboembolic disease: a systematic review and meta-analysis. PLoS One. 2015;10:e0143252

Case report

- Marie K., 85 years
- On emergency for breathing problems, vomiting
- BP 90/60mmHg, HR 130-180/min
- Atrial fibrilation
- Blood saturation 70%
- Breathing rate 30/min

Case report – clinical findings

- Marie K., 85 years
- Somnolence
- Dehydratation, but elevated jugular veins
- clear breathing
- no murmur
- both legs swelling, more on the right side

Case report - history

- Marie K., 85 years
- HFpEF, chronic moderate pulmonary hypertension (PASP 55mmHg, EF LK 60%
- Permanent atrial fibrilation on ASA
- Parkinsons syndrome
- Hypomobility
- Diabetes, obesity
- Arterial hypertensionon

Case report - labs

- Leu 14,4.10^9/l, Hb 120 g/l, PLT 225.109/l
- urea 4,35mmol/l, kreat 97mmol/l
- CRP 153 mg/l
- troponin T 0,099ng/ml (norma do 0,029)
- D-dimery 25,75mg/l (norma do 0,5)
- INR 1,4, fibrinogen 5,16 g/l, aptt-r 1,16

What would you do?

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- ECG

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What would you do?

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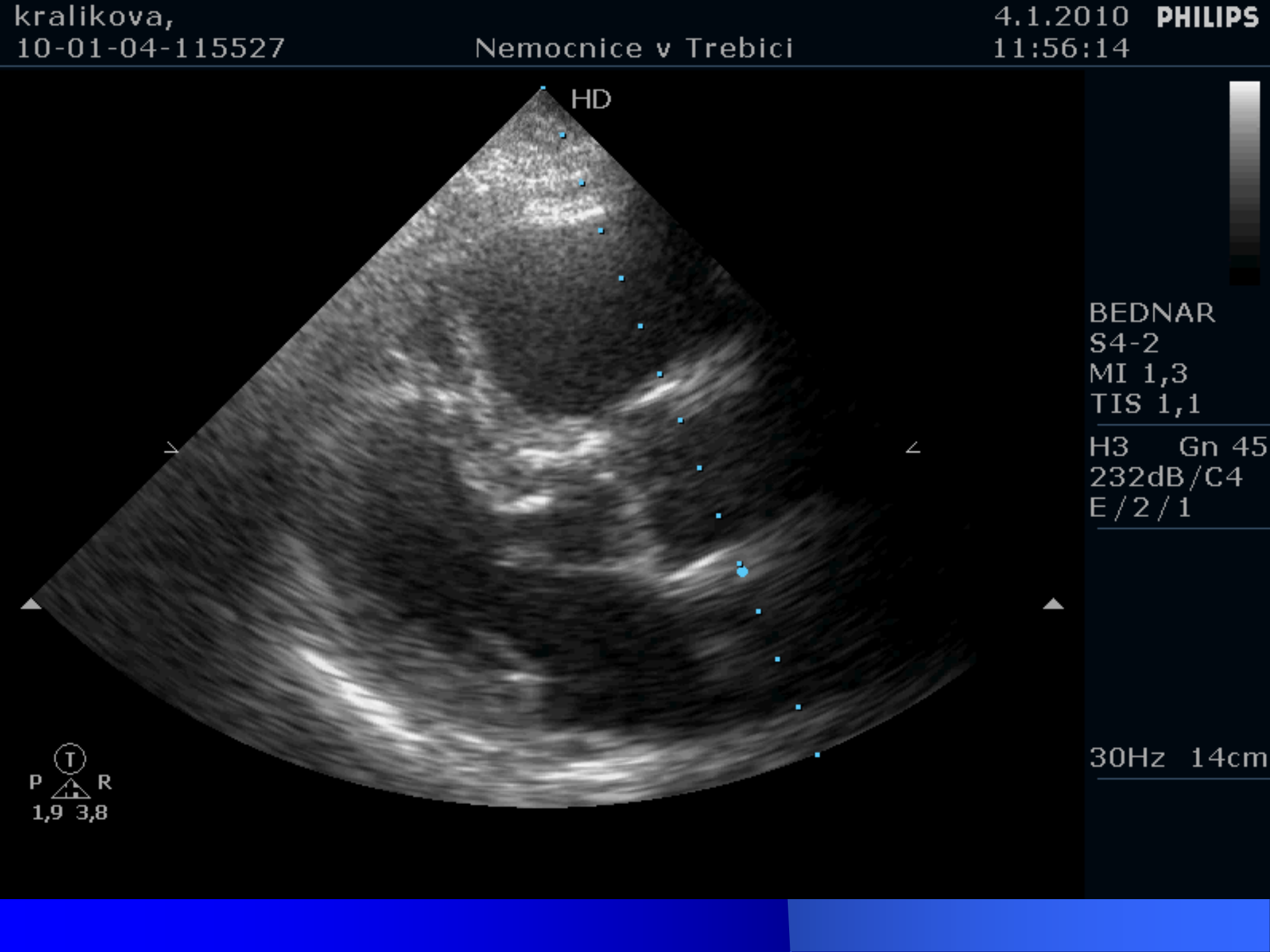
- echocardiography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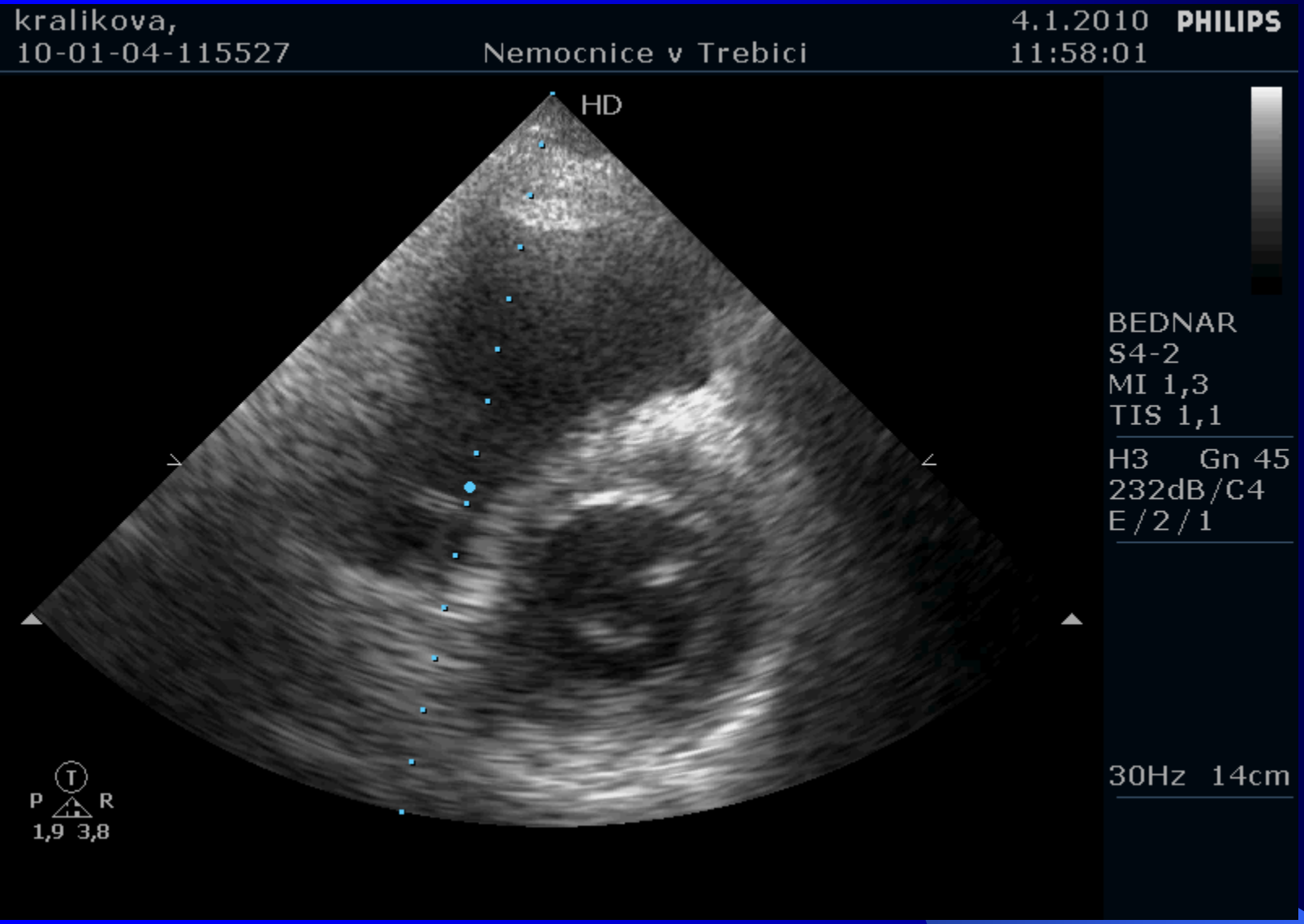
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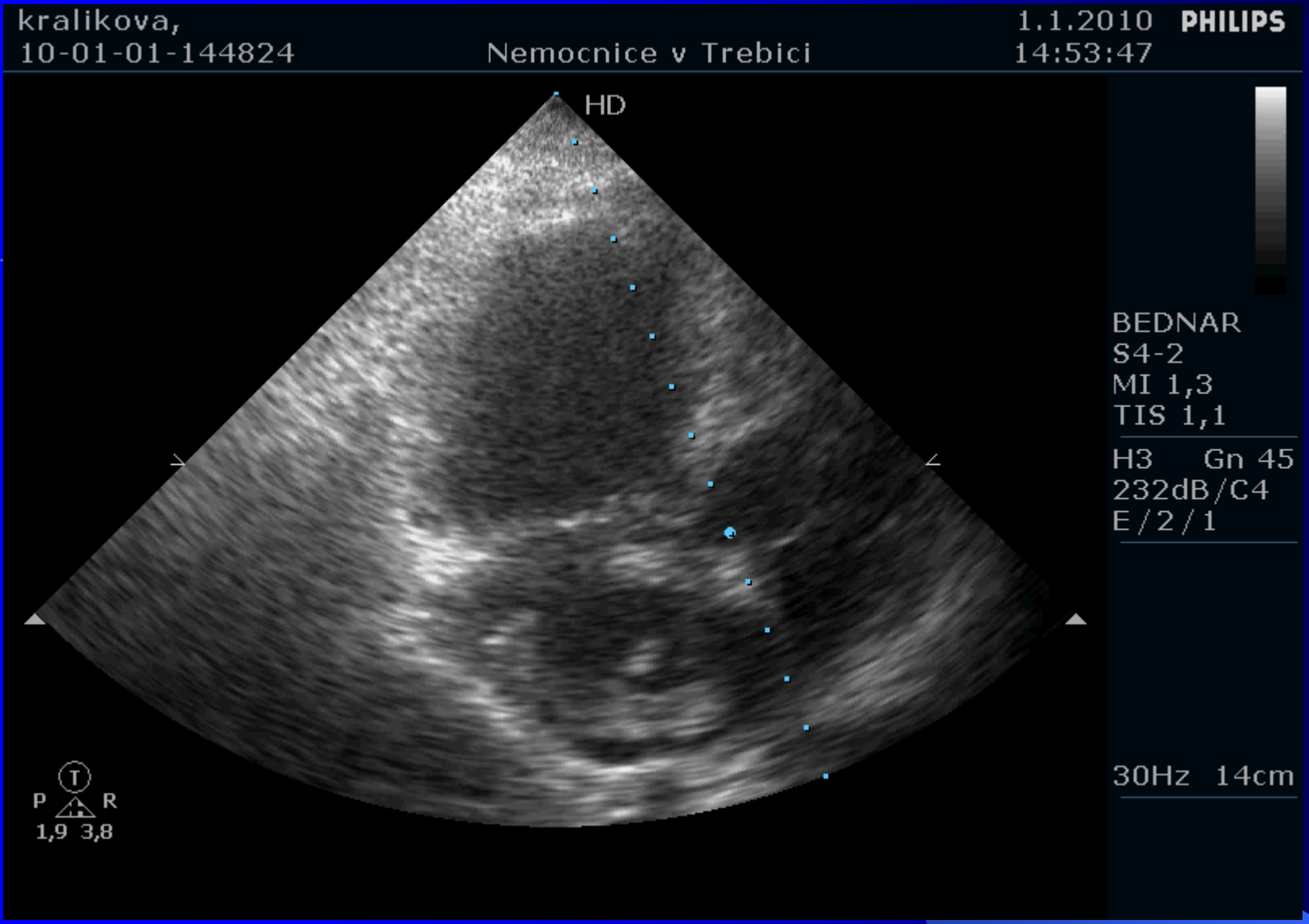
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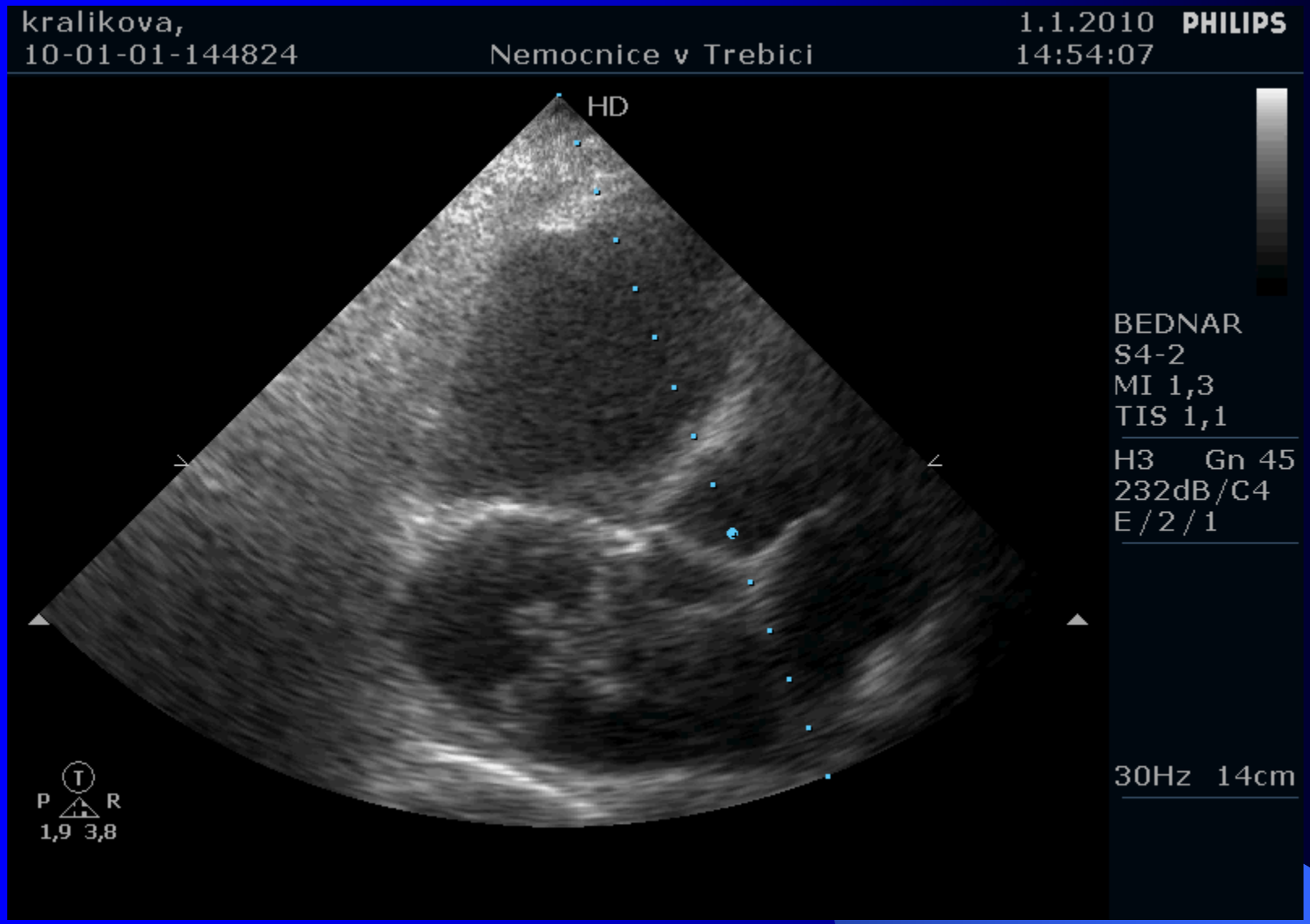
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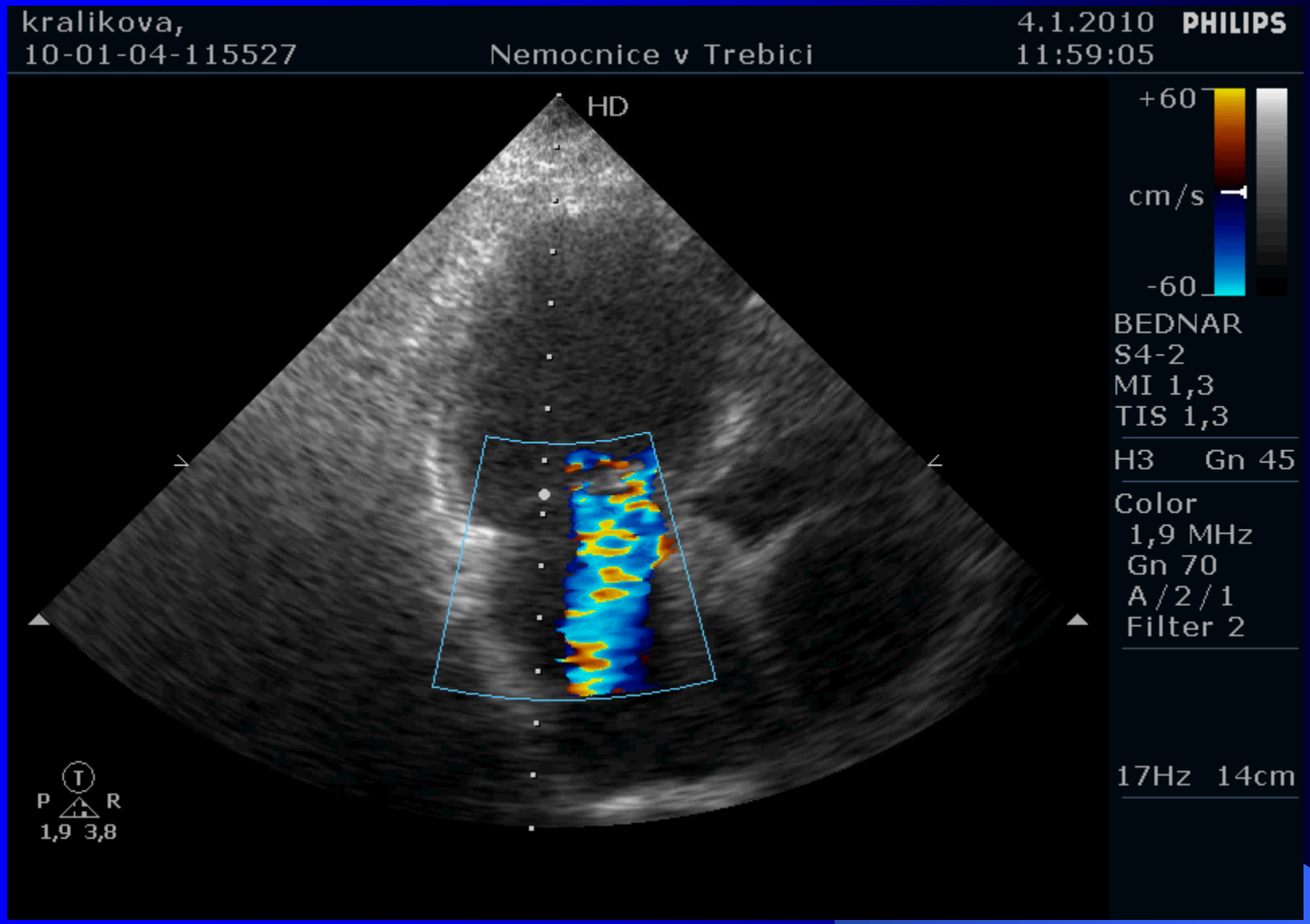
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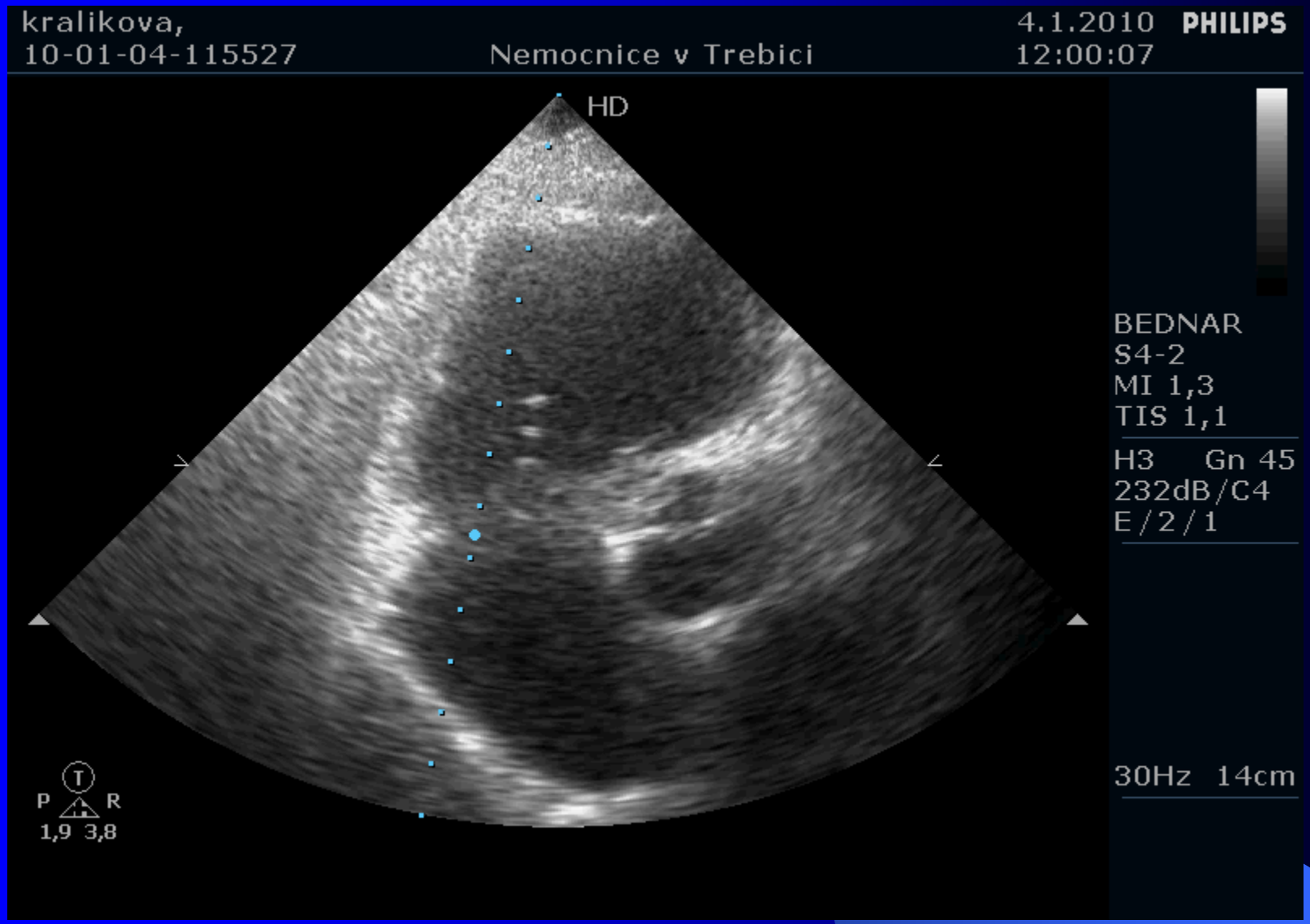
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Pulmonary embolism

- High risk (massive) – shock, sBP < 90mmHg, bradycardia
- Intermediate risk (submassive) – without hypotension, but evidence of right ventricle dysfunction, cardiomarkers
- Low risk (small) – all other

Table 1: The Original Pulmonary Embolism Severity Index (PESI) and the simplified PESI (s-PESI) Clinical Risk Scores

Parameter	PESI	s-PESI
Age	Age in years	1 point (if >80 y
Male sex	+10 points	-
Cancer diagnosis	+30 points	1 point
Chronic heart failure	+10 points	1 point
Chronic pulmonary disease	+10 points	
Pulse rate ≥110 beats per minute	+20 points	1 point
Systolic blood pressure <100 mmHg	+30 points	1 point
Respiratory rate ≥30 breaths per minute	+20 points	-
Temperature <36°C	+20 points	-
Altered mental status	+60 points	-
Arterial oxyhemoglobin saturation <90 %	+20 points	1 point
Risk stratification		
Class I: ≤65 points	Very low 30-day mortality risk (0–1.5 %)	
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 (4–11.4 %)	
Class V: >125 points	Very high mortality risk (10–24.5 %)	
Simplified PESI Score		
0 points = 30-day mortality risk 1 % (95 % CI 0–2.1 %)		
≥ 1 point(s) = 30-day mortality risk 10.9 % (95 % CI 8.5–13.2 %)		

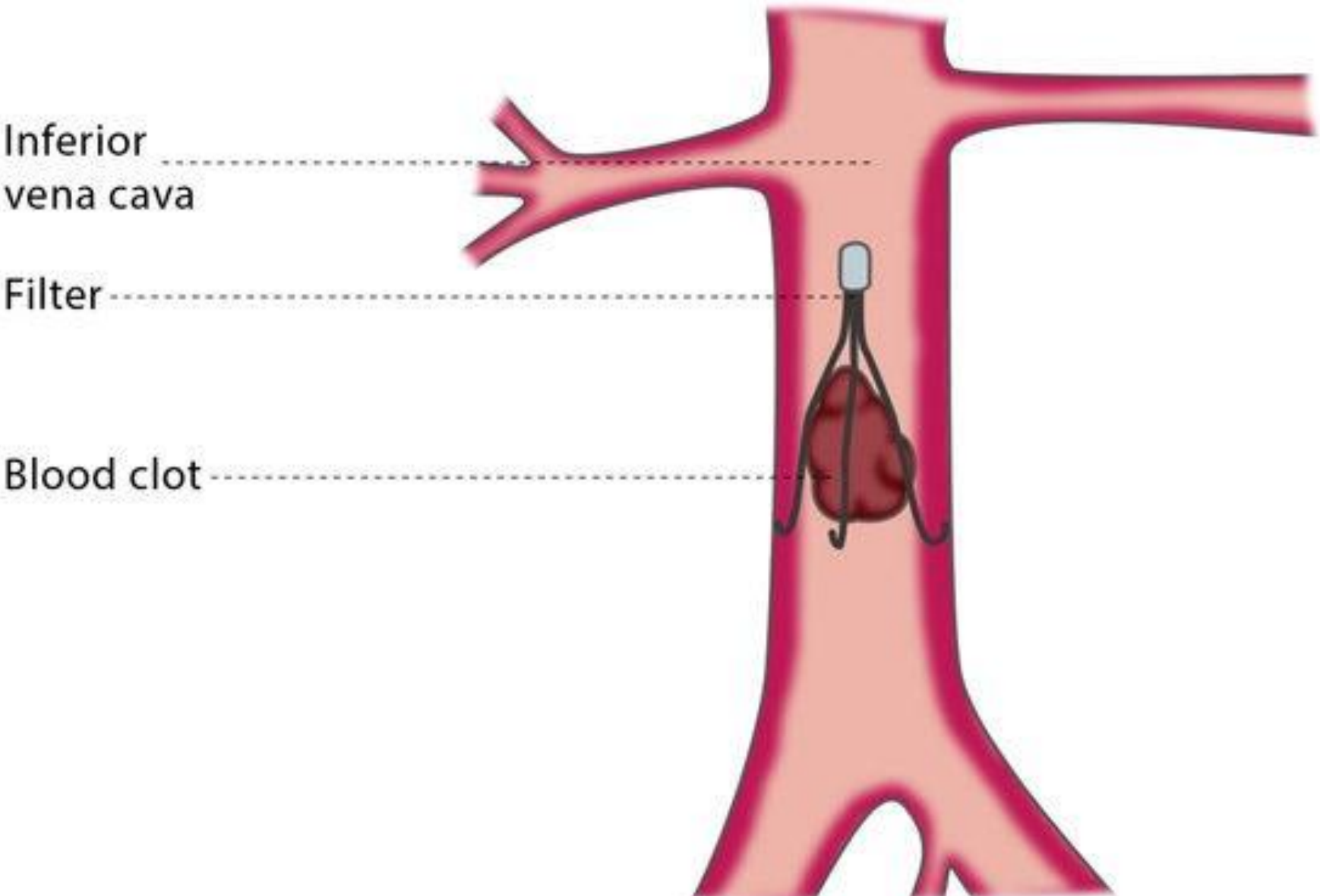
Modified from Aujesky et al., 2005[2] and Jiménez et al., 2010.[3]

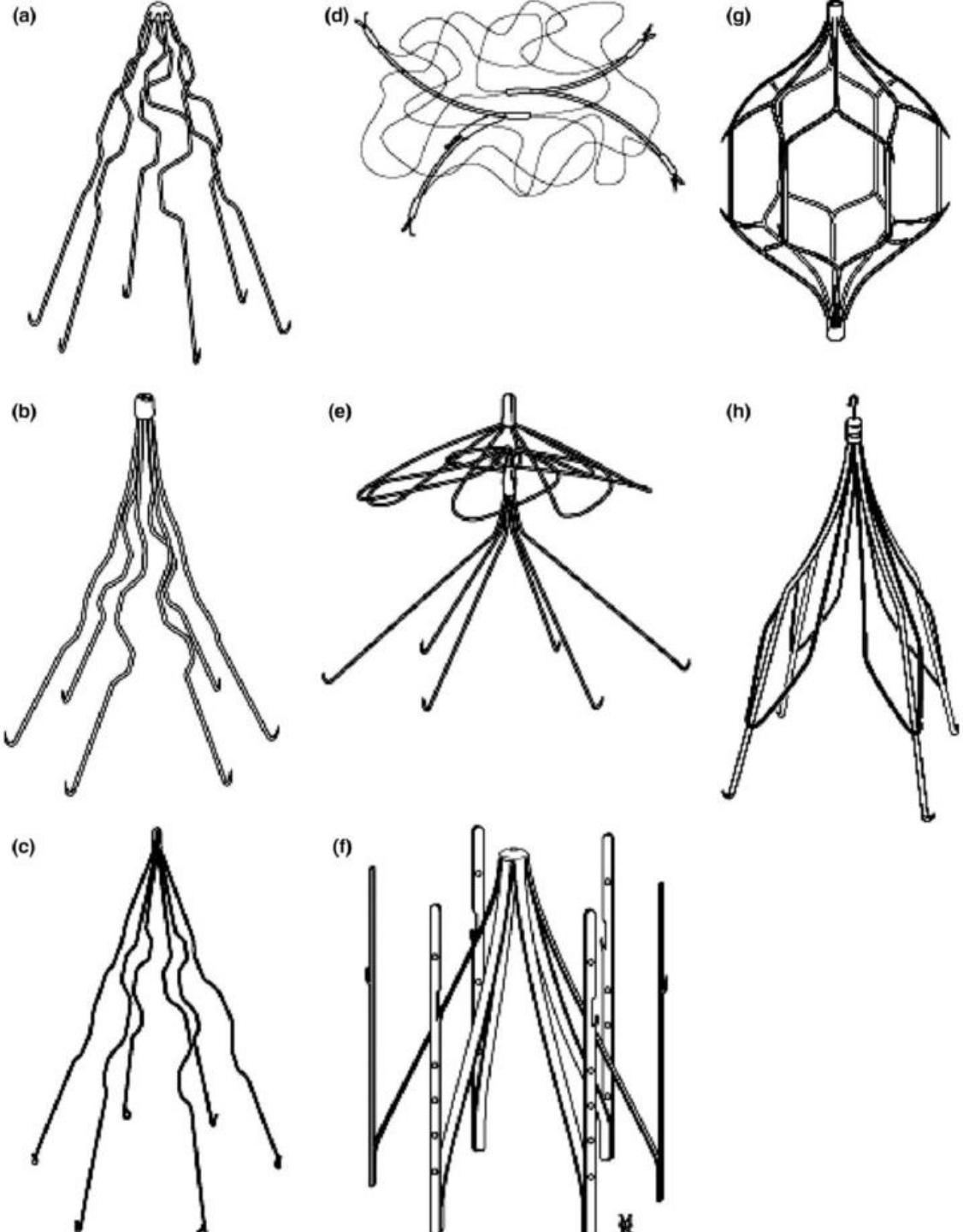
Therapy

- Thrombolysis for massive in absence of contraindications
- Embolectomy
- Anticoagulation

- Caval filters

Inferior vena cava (IVC) filter




(a)
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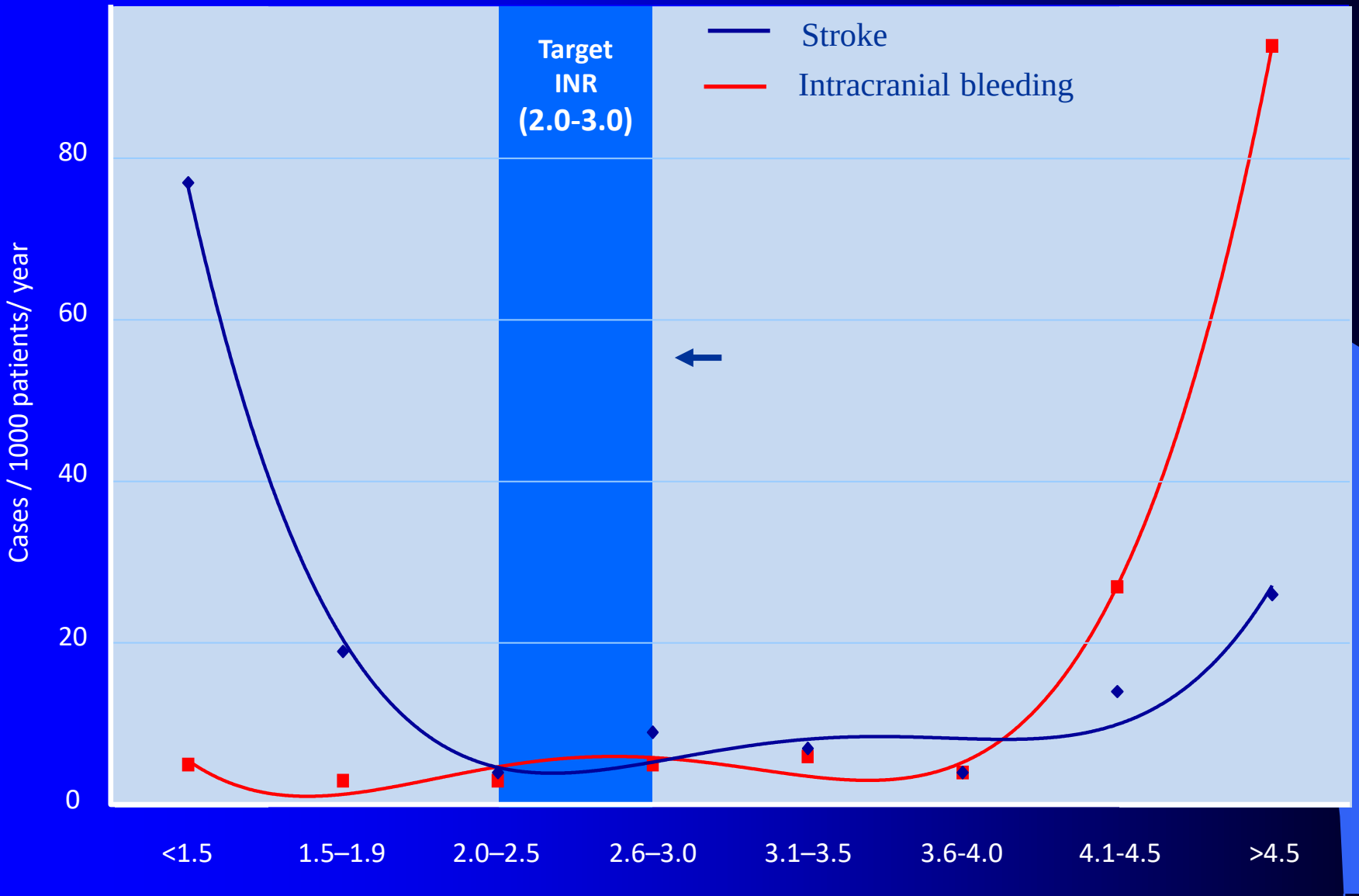
(g)
(b)
(e)
(h)
(c)
(f)

Anticoagulation

- Heparin
- LMWH
- Warfarin
- Dabigatran
- Rivaroxaban, apixaban, edoxaban

Warfarin and risk balance



Warfarin vs DOACs

- Same effect
- 50% decrease of intracranial bleeding
- Easier for patients
- No diet, no blood controls, almost no drug-drug interactions

Risk factors for extended anticoagulation

- Idiopathic x secondary
- Proxymal x distal
- Pulmonary embolism x deep vein thrombosis
- Residual thrombosis
- D-dimer test
- Pregnancy, hormonal therapy, cancer…

Závěr

- Pulmonary embolism is common
- Prophylaxis for in hospital patients
- Mortality is low, when the diagnosis is known
- Bed side diagnosis is feasible in criticaly ill patients
- Risk stratification
- Long therm therapy

Thx for attention