Acute Dyspnea

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Disclosures for Dr. Jimenez

Research Support	Daiichi Sankyo, Sanofi
Employee	No relevant conflicts of interest to declare
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Stockholder	No relevant conflicts of interest to declare
Speakers Bureau	Bayer, BMS, Sanofi
Scientific Advisory Board	See consultant

Case presentation

- 52 year-old man; morbidly obese (BMI: 40 kg/m^2)
- Presented at ED: increasing dyspnoea over 6 weeks, now almost at rest; substernal chest discomfort
- OSA on CPAP treatment (compliant)
- COPD: ratio of forced expiratory volume in 1 second (FEV_1) to forced vital capacity (FVC), 0.59; FEV_1 , 64% of the predicted value. No previous admissions because of AECOPD
- No hypertension. No history of CAD
- History of unprovoked intermediate-risk PE four months ago; on warfarin therapy

Case presentation

Clinical findings at presentation:

- BP: 110/70 mmHg; HR: 116/min; resp. rate: 28/min; SO_2: 88% on room air, increasing to 96% with supplemental oxygen (2 liters)
- Heart examination: no murmurs
- Lung examination: breath sounds disminished
- Jugular venous distention difficult to assess (due to obesity)
- Chronic venous insufficiency of lower extremities present

Case presentation (cont'd)

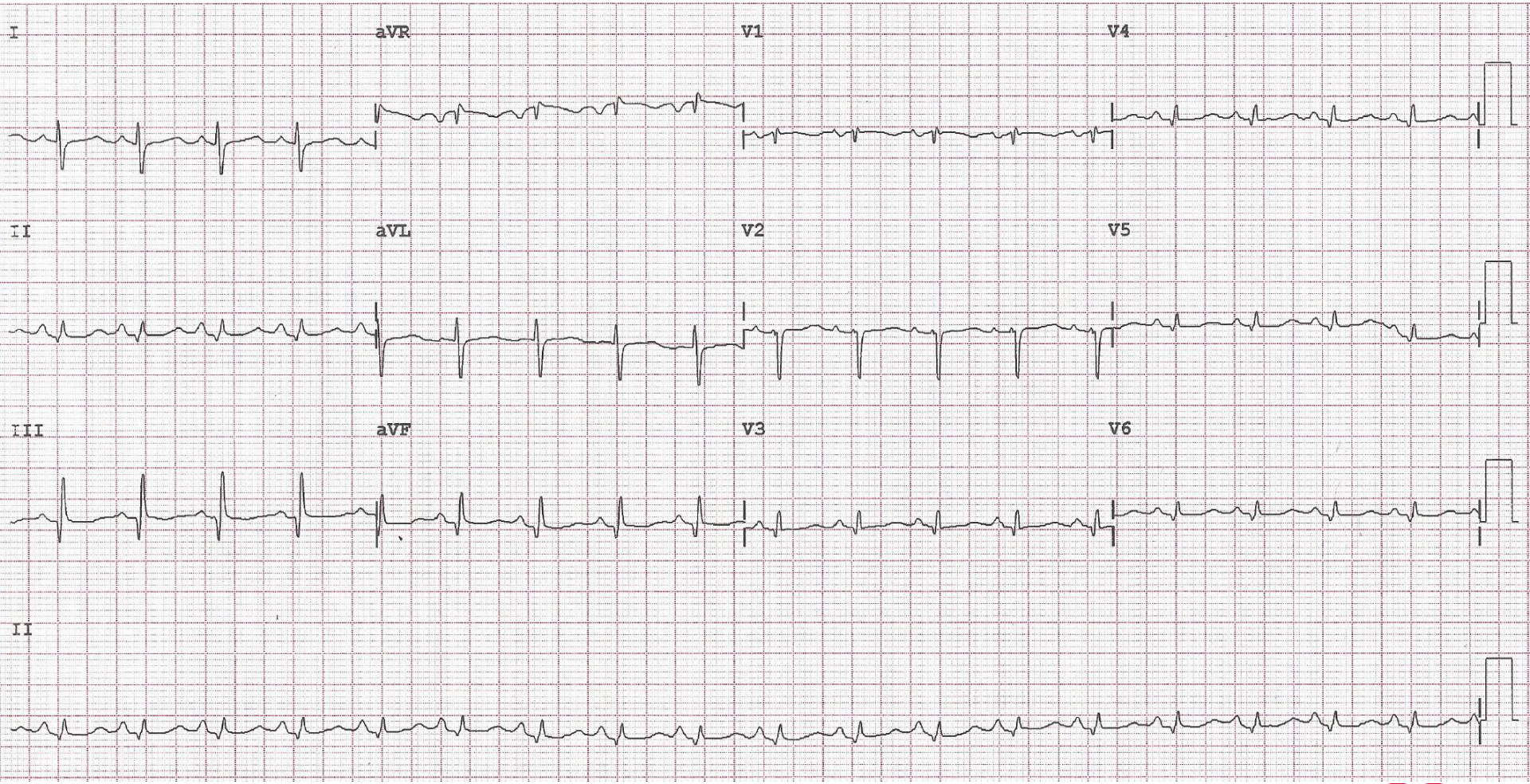
Laboratory

- Normal blood count
- Creatinine: 0,9 mg/dl
- GPT: 56 U/L; GOT: 123 U/L
- hsTnT: 0 pg/mL; BNP: 180 pg/mL
- INR: 2.7

Blood gas analysis

- pH: 7.45; $PaCO_2$: 32 mm Hg; PaO_2: 55 mm Hg; lactate normal

Case presentation (cont‘d)



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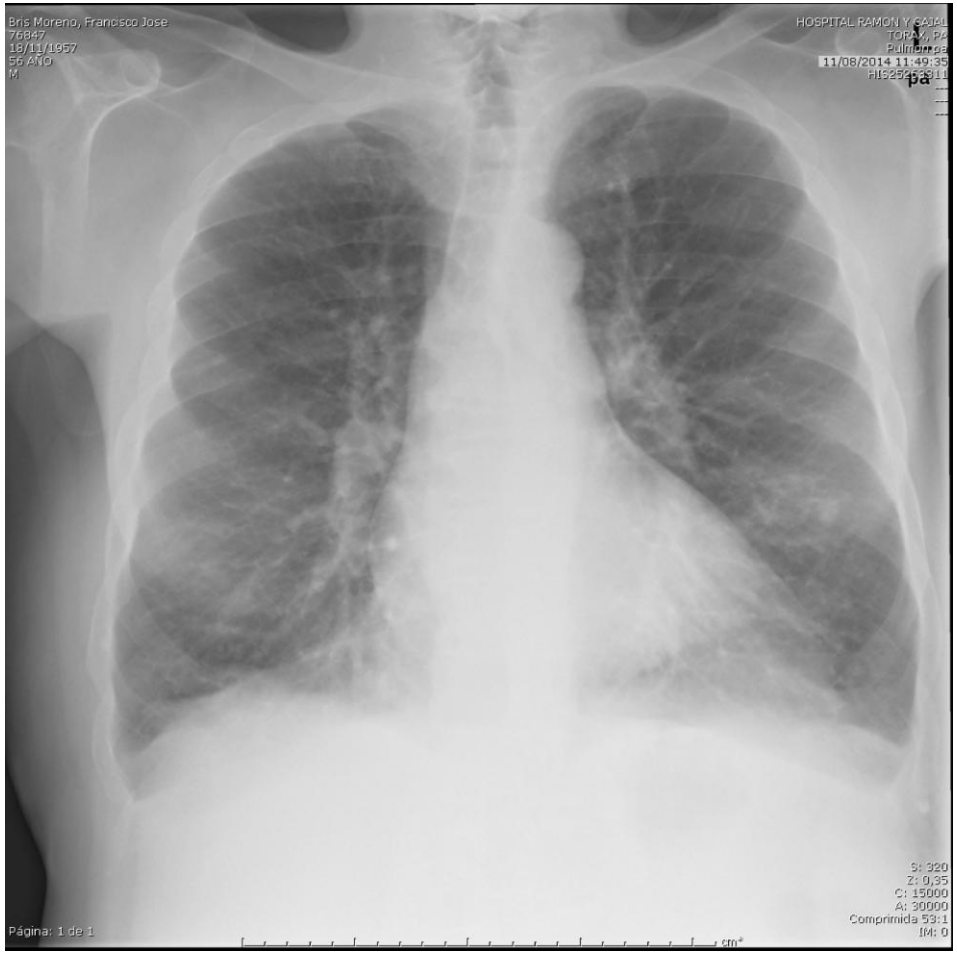
Case presentation (cont‘d)



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Qu. 1 Which is the most likely diagnosis?

MCQ

1. COPD exacerbation
2. Congestive heart failure
3. Recurrent PE
4. Pulmonary hypertension
5. Panic attack

Respiratory physician

Does this patient have a COPD exacerbation?

Disease severity and exacerbations

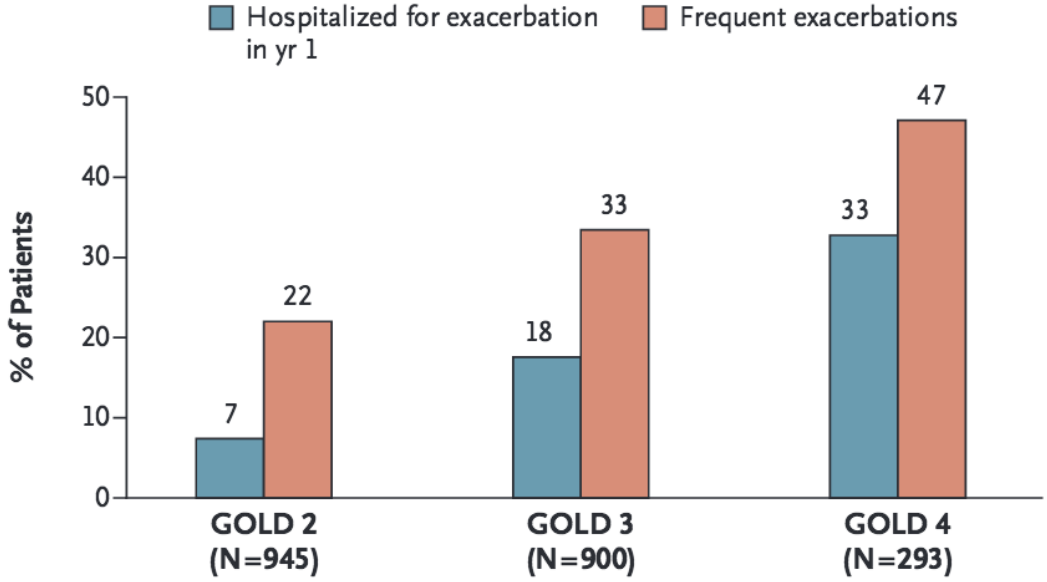
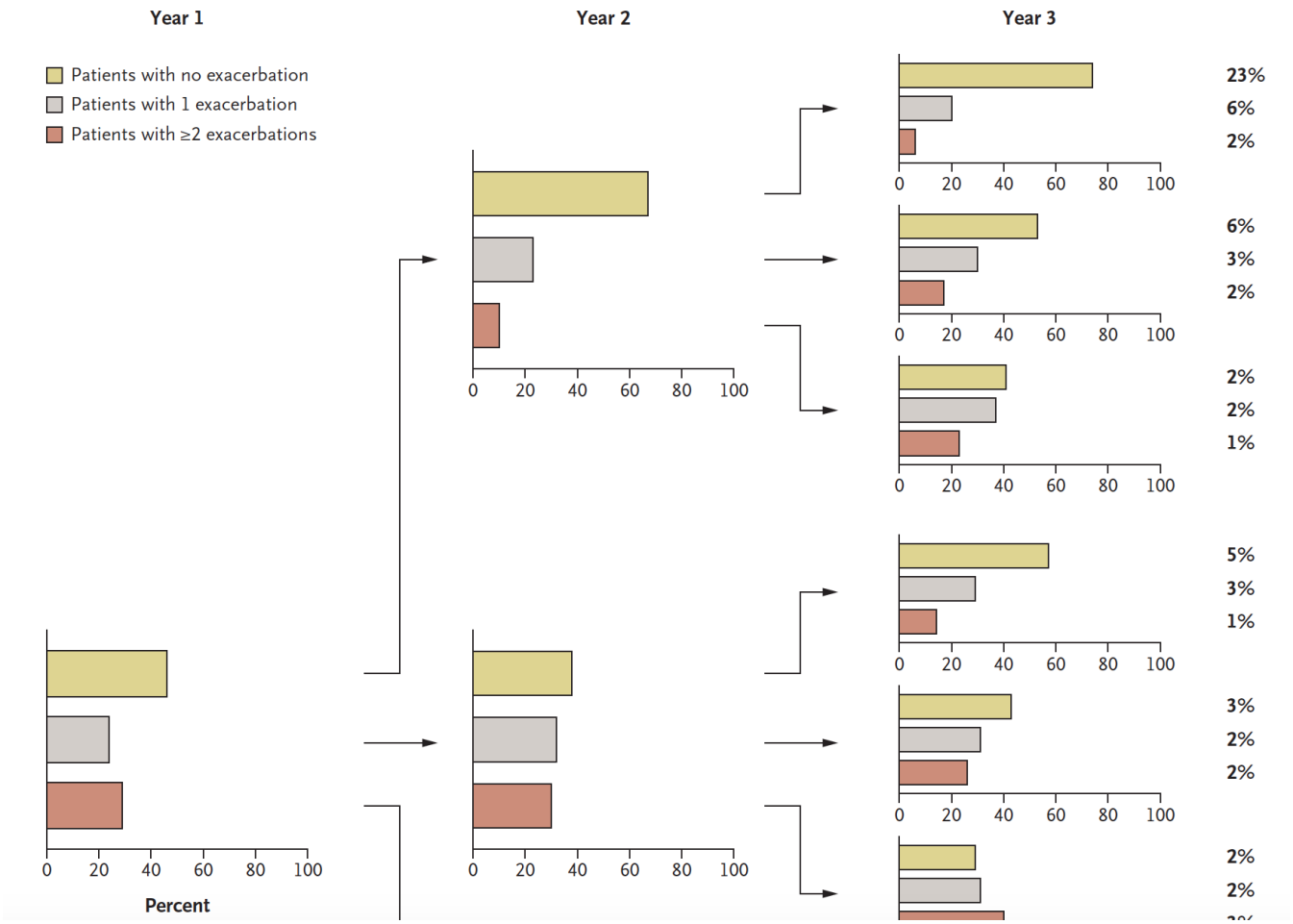


Figure 1. Association of Disease Severity with the Frequency and Severity of Exacerbations during the First Year of Follow-up in Patients with Chronic Obstructive Pulmonary Disease.

Patients with two or more exacerbations during the year were considered to have frequent exacerbations. An exacerbation requiring hospitalization was classified as severe. Disease severity was classified according to the stages of disease defined by the Global Initiative for Chronic Obstructive Lung Disease (GOLD). P<0.001 for both comparisons.

Hurst JR, N Engl J Med 2010

History of exacerbations



Hurst JR, N Engl J Med 2010

Respiratory physician

Does this patient have COPD exacerbation?

- No cough or sputum purulence
- Mild COPD
- No history of exacerbations
- Discrepancy between COPD stage and pulmonary arterial enlargement on chest X-ray

Cardiologist

Does this patient have recurrent PE?

Prevalence of PE in COPD exacerbations

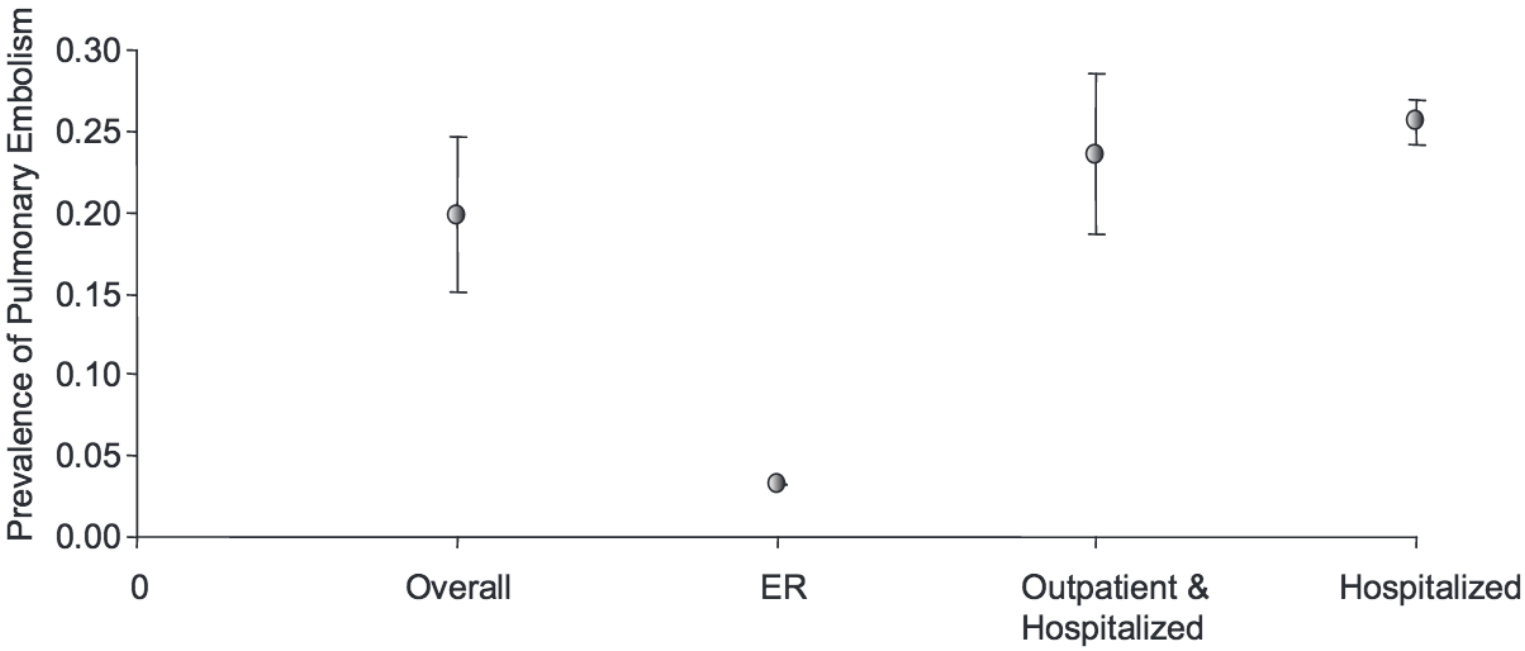
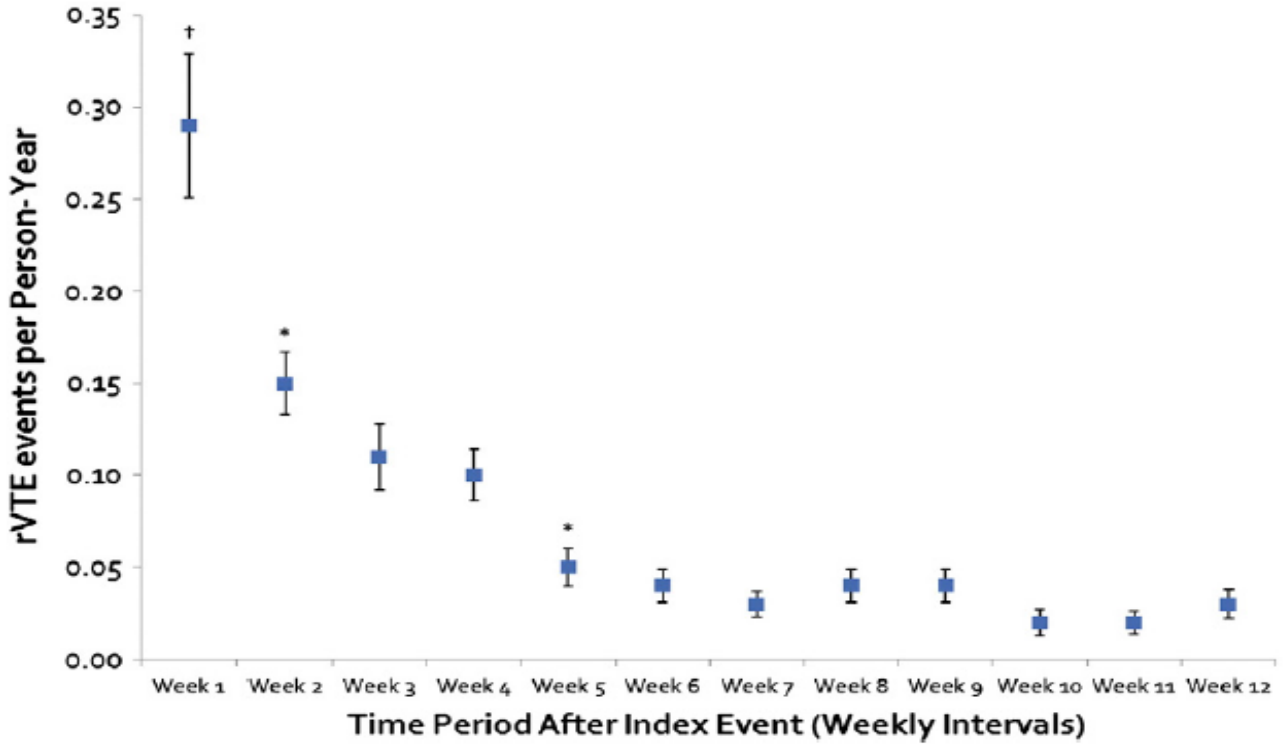


FIGURE 2. The prevalence of PE across different sites. The filled circles represent the mean, and the line bars represent SE; p value for overall = 0.014; p value for emergency department (ER) is not calculable because there was only one study; p value for studies that evaluated inpatients and outpatients = 0.133; p value for studies that evaluated only hospitalized patients = 0.034.

Rizkallah J, Chest 2009

Risk of venous thromboembolism recurrence

Metaanalysis including 15 trials, 27,237 patients



Limone BL, Thromb Res 2013

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Risk factors for VTE recurrence

Early recurrence[1]

- Poor quality of anticoagulation (failure to achieve therapeutic aPTT and INR)
- Cancer

aPTT, activated partial thromboplastin time; BMI, body mass index; INR, international normalized ratio.

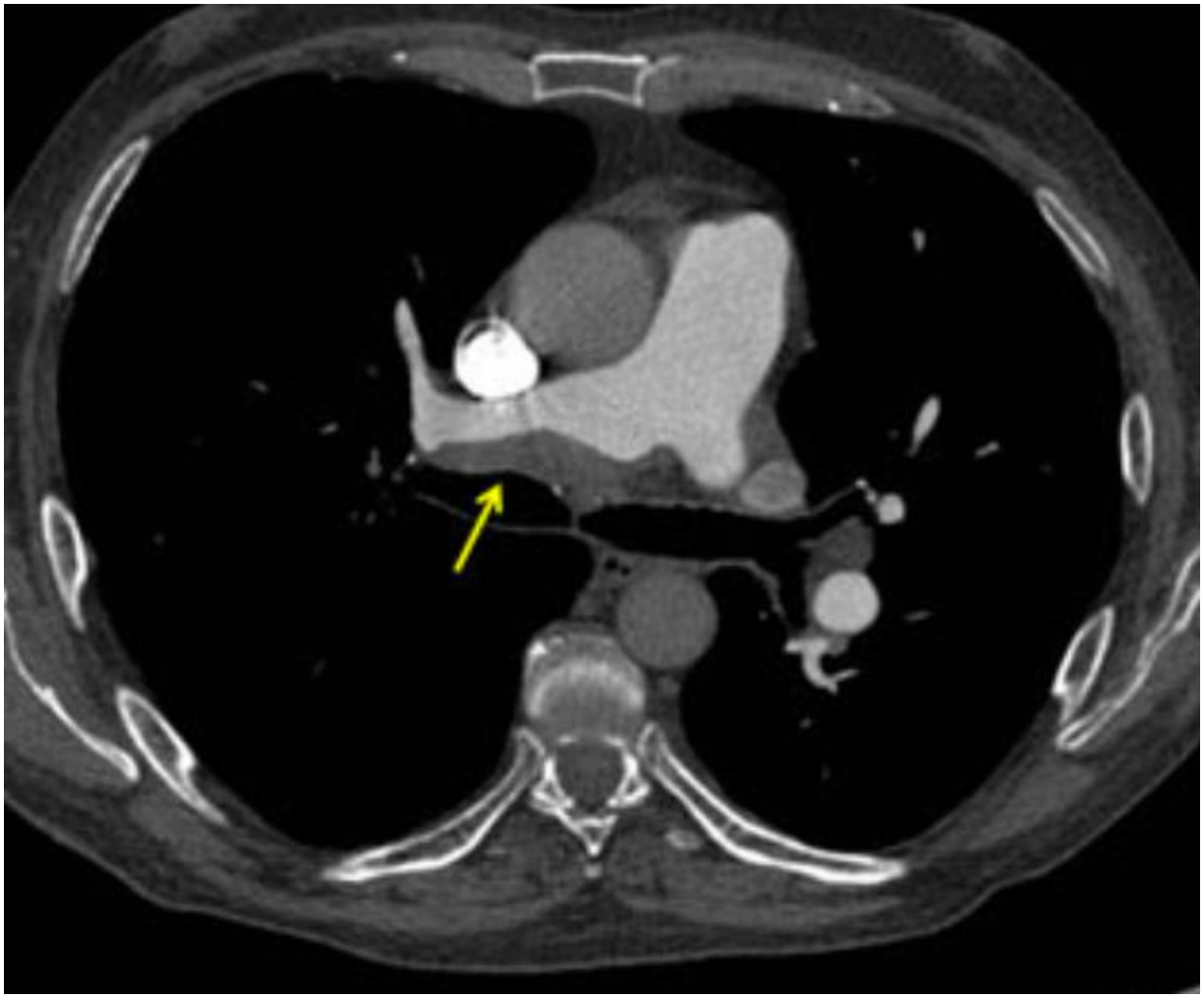
Diagnosis of recurrent PE: REPEAD study

516 patients with suspected recurrent PE

Pathway	N	3-month VTE risk % (95% CI)
PE unlikely, normal DD	88	0
PE unlikely, abnormal DD *or* PE likely, negative CTPA	249	2.8 (1.2-5.5)

Mos IC, Thromb Res 2014

Case: CT pulmonary angiography



Heart Team

Does this patient have pulmonary hypertension?

Heart Team

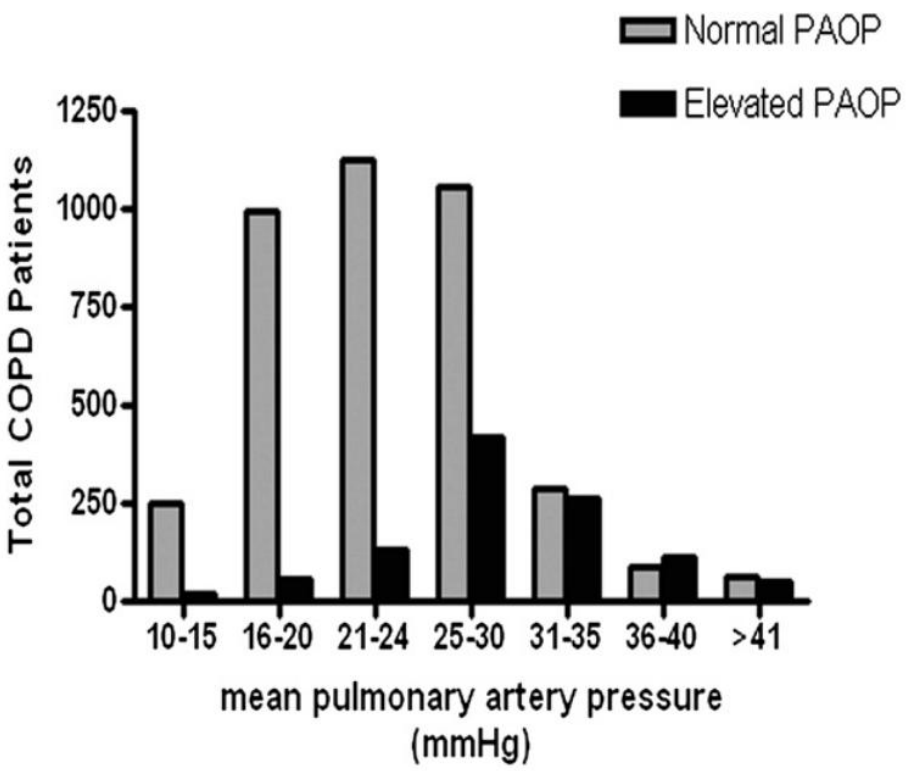
Does this patient have pulmonary hypertension?

- COPD and pulmonary hypertension (3.1)
- OSA and pulmonary hypertension (3.4)
- Chronic thromboembolic pulmonary hypertension (4.1)

Heart Team

Does this patient have COPD pulmonary hypertension?

- Few epidemiological data (most in very severe COPD)
- Prevalence in patients listed for lung transplantation: 31%

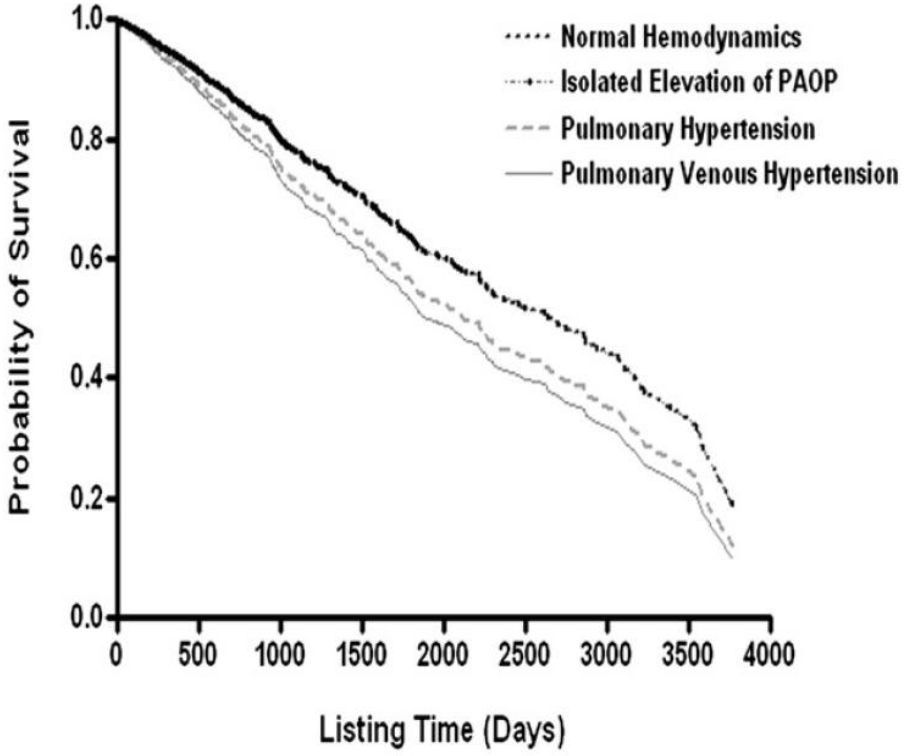


Cuttica MJ, Respir Med 2010

Heart Team

Does this patient have COPD pulmonary hypertension?

- Pulmonary hypertension increases mortality in advanced COPD



Cuttica MJ, Respir Med 2010

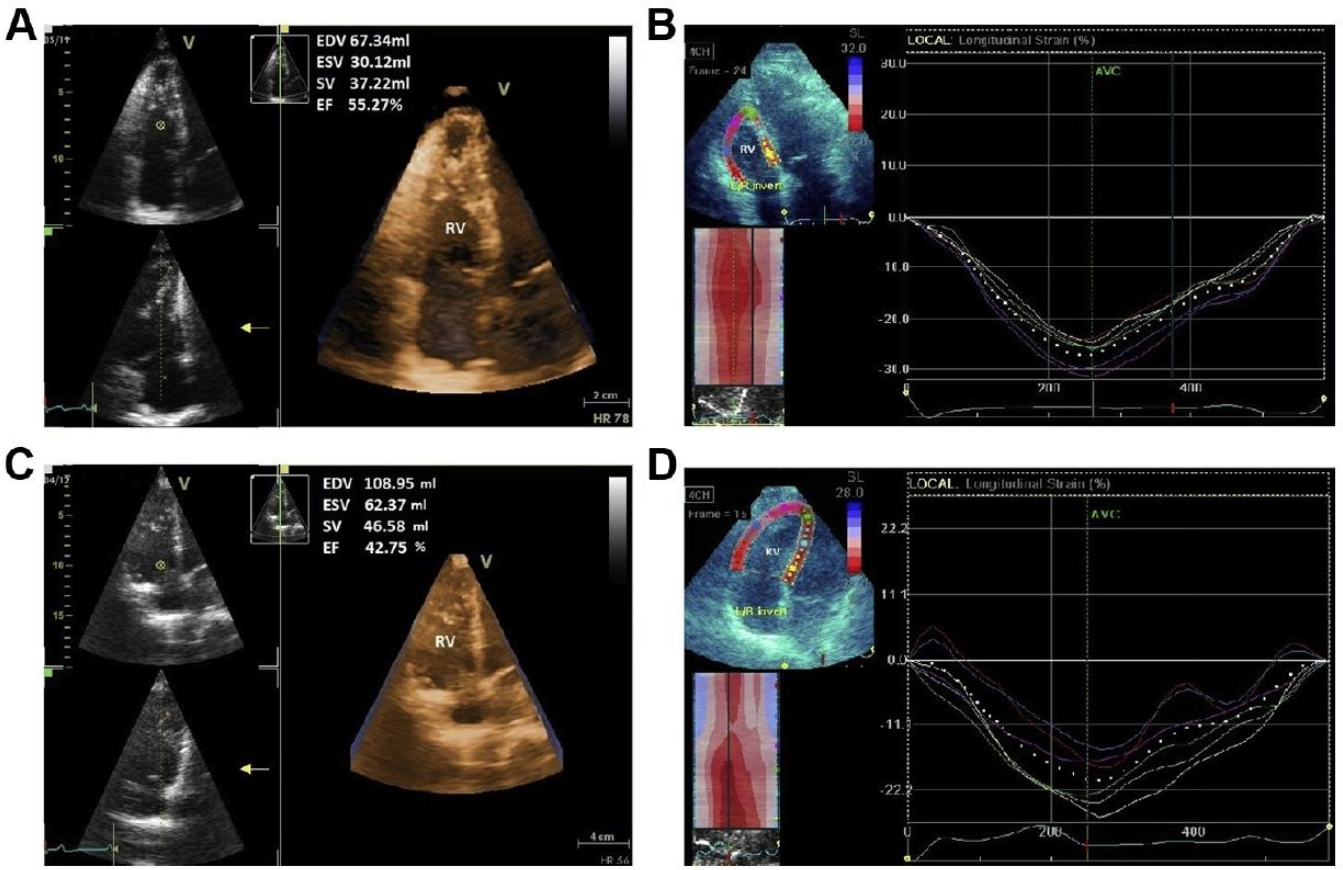
Heart Team

Does this patient have COPD pulmonary hypertension?

- Discrepancy between COPD stage and pulmonary arterial enlargement on chest X-ray

Heart Team

Does this patient have OSA pulmonary hypertension?

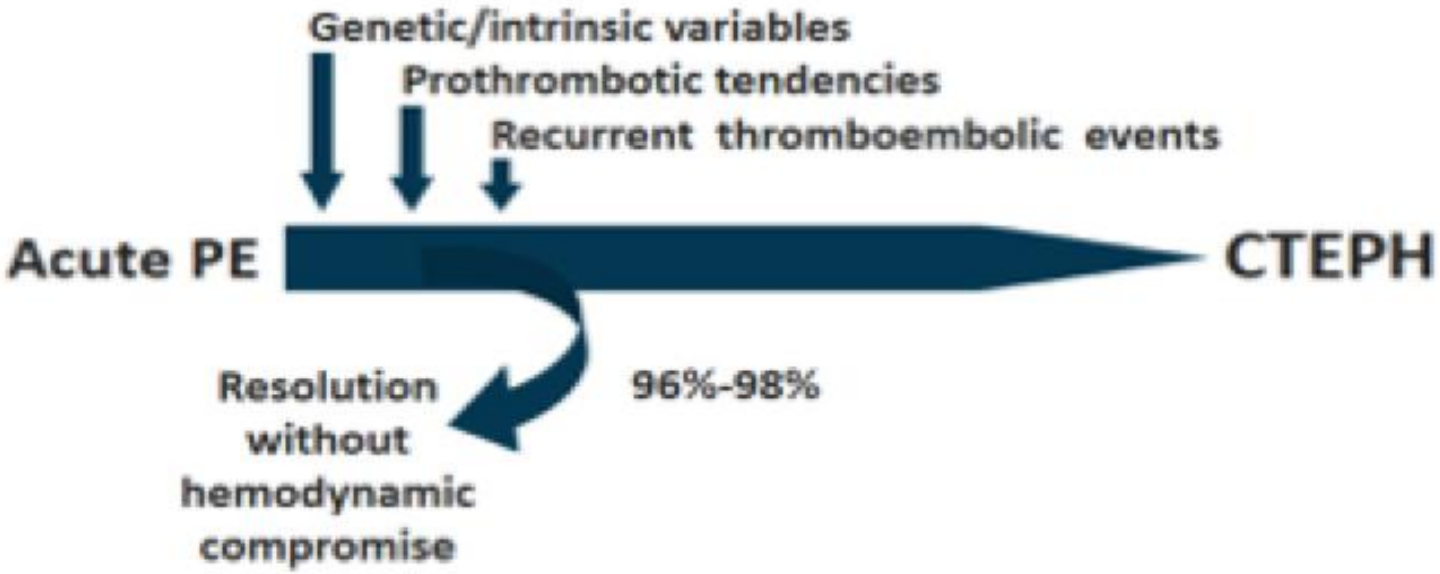


Vitarelli A, Can J Cardiol 2015

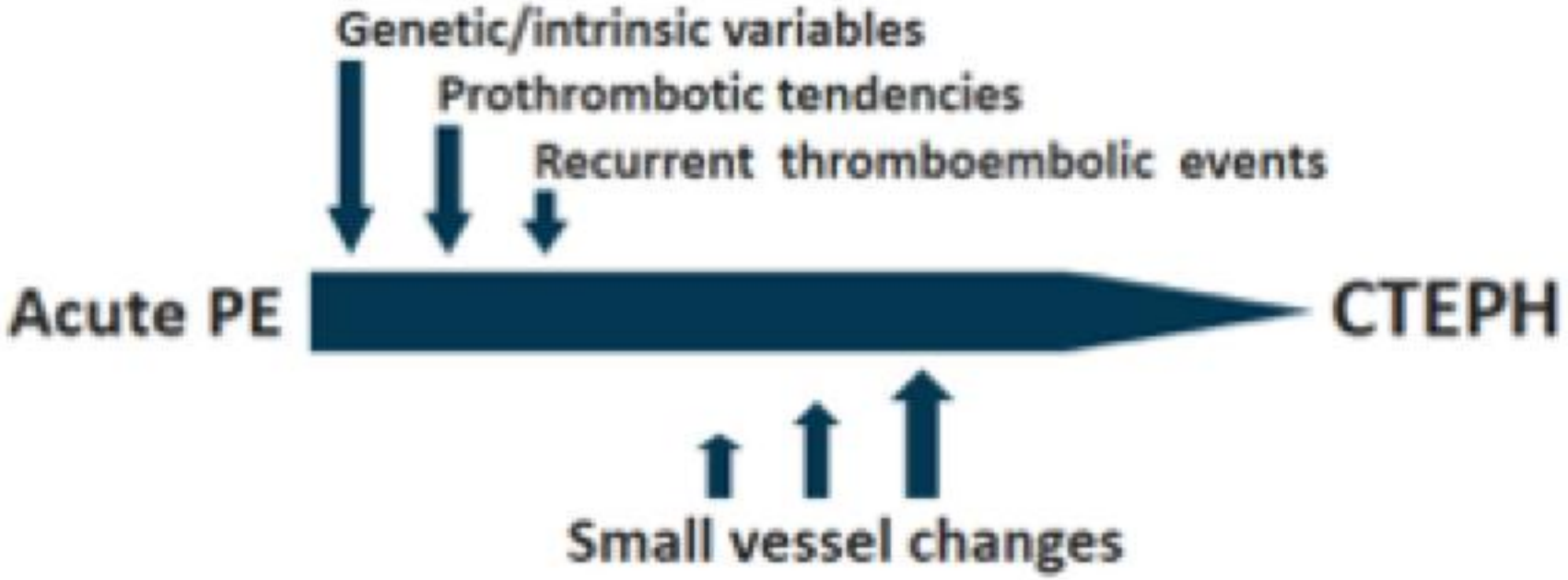
Heart Team

Does this patient have chronic thromboembolic pulmonary hypertension?

Natural history of CTEPH



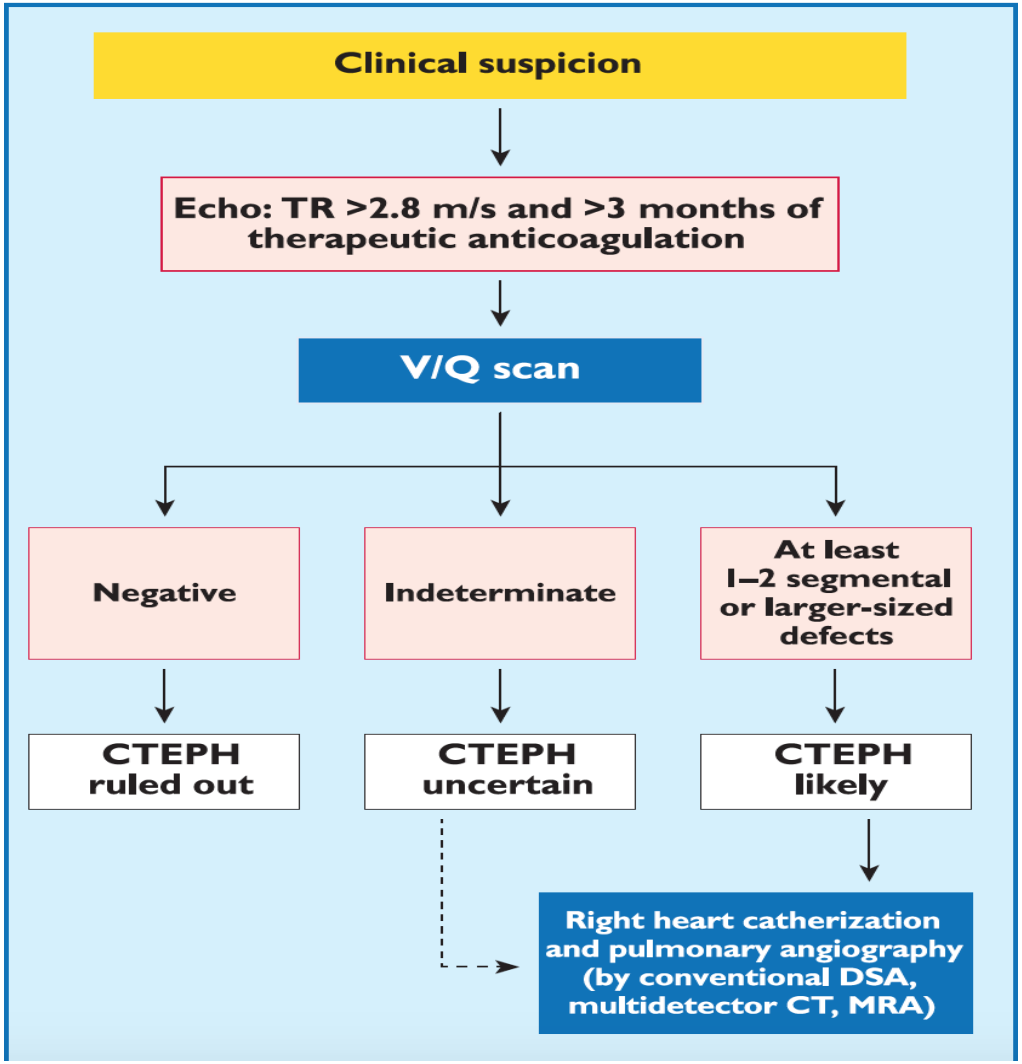
Natural history of CTEPH



Qu. 2 Regarding CTEPH, which of the following is true?

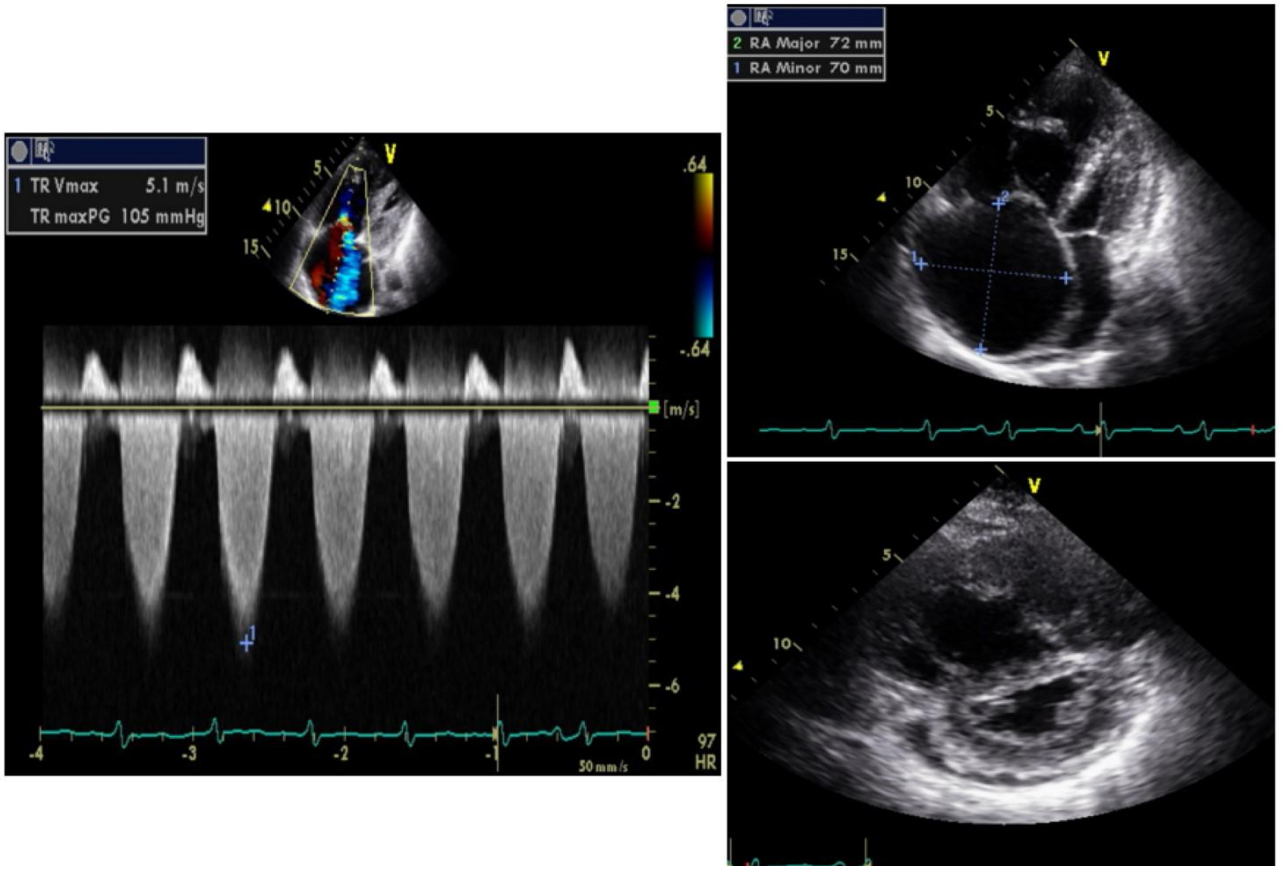
1. The prevalence of CTEPH after PE is 15% after 2 years
2. Multiple episodes of PE increase the risk of CTEPH
3. A normal V/Q scan does not exclude the disease
4. The treatment of choice for CTEPH is balloon angioplasty
5. The treatment of choice for CTEPH is epoprostenol

Diagnostic pathway for suspected CTEPH



Konstantinides S, Eur Heart J 2015

Case: echocardiography



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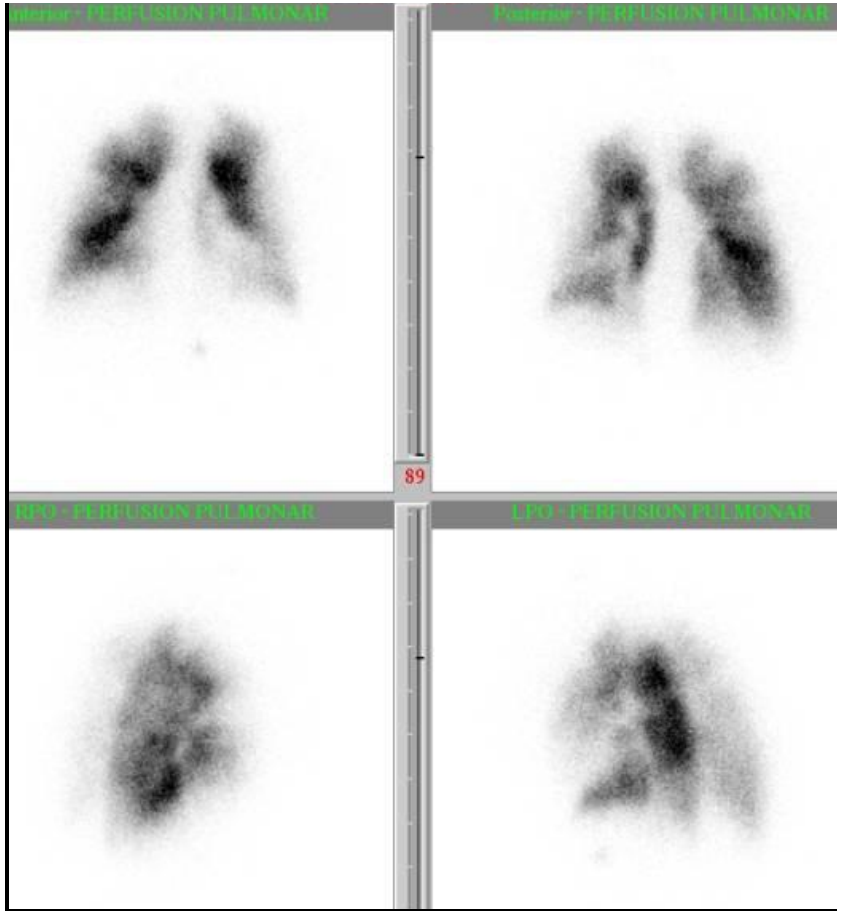
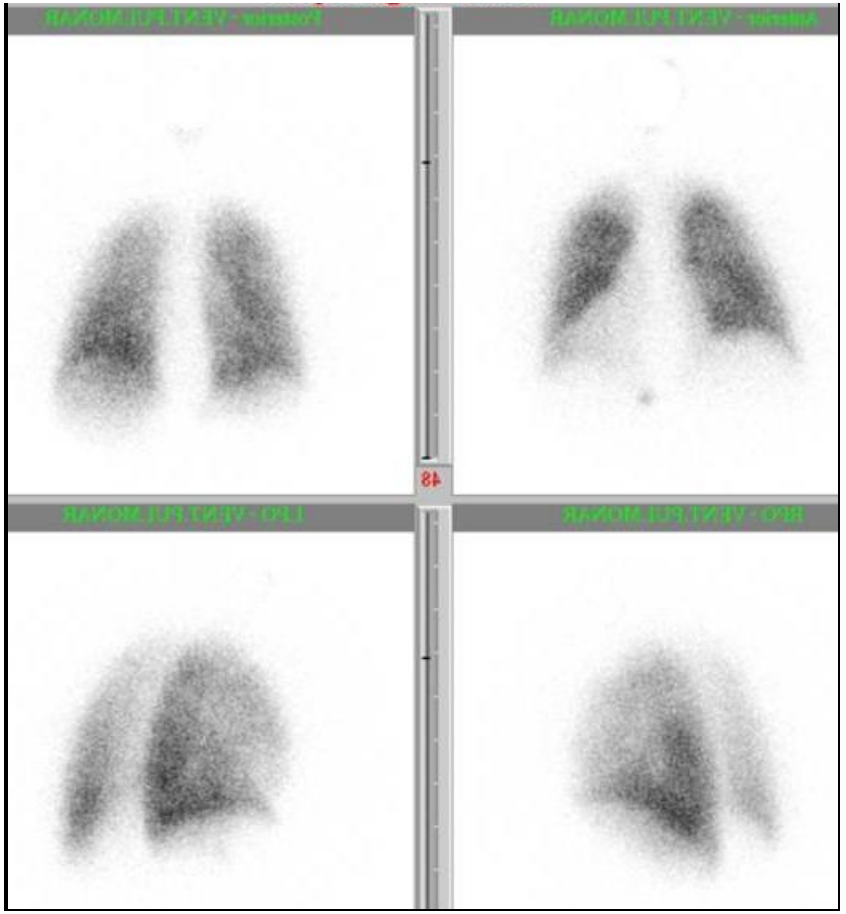
Case: V/Q scan

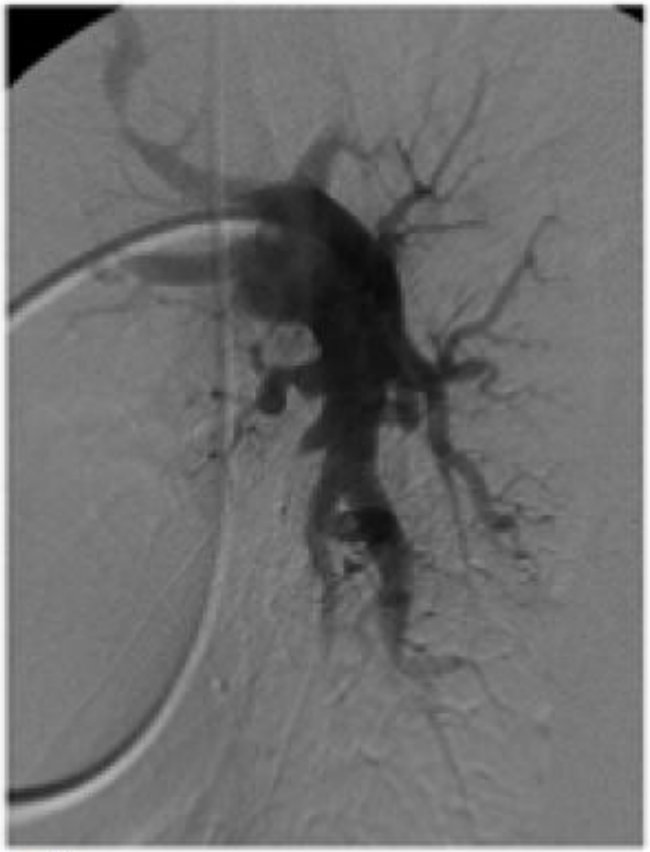


Q scan



V scan

Case: Pulmonary angiogram



Left

Right

Case presentation (cont'd)

Hemodynamic data on right heart catheterization

- RAP: 26 mmHg
- PAP: 90/35 mmHg (mean, 57 mmHg)
- PAWP: 16 mmHg
- Cardiac output: 2.5 L/min
- PVR: 1294 dyn·sec/cm^5
- Pulmonary artery saturation: 43%

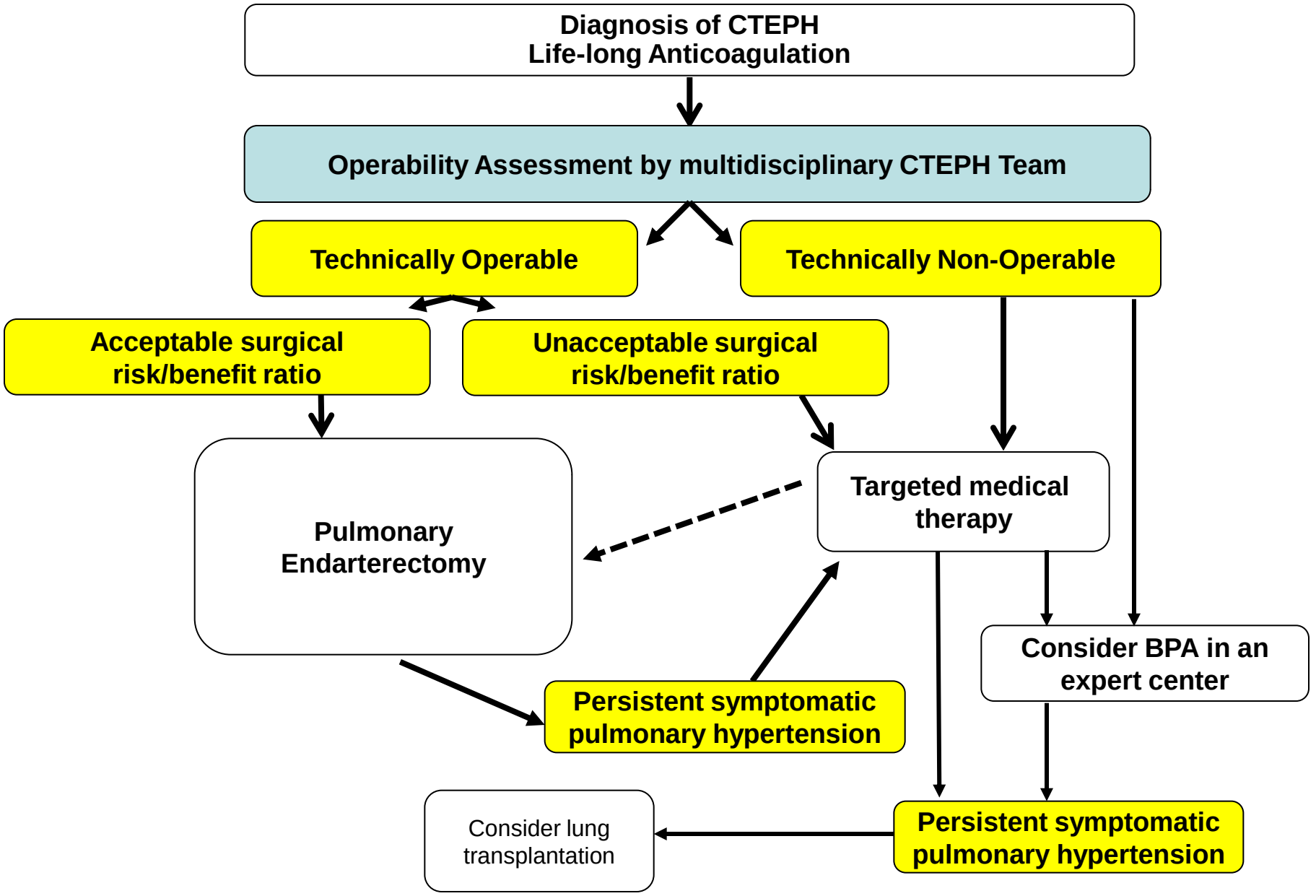
Heart Team

Final diagnosis

Chronic thromboembolic pulmonary hypertension

Chronic obstructive pulmonary disease (mild)

Obstructive sleep apnea



BPA, balloon pulmonary angioplasty.

Galie N, Eur Heart J 2016

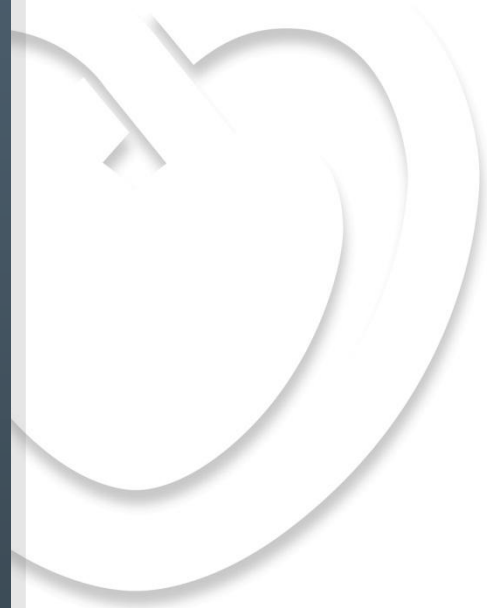
Take home messages

Acute dyspnea is a complex symptom

Different clinical situations (often combined) may cause acute dyspnea

A multidisciplinary approach to patients with acute dyspnea might improve patient outcomes

Thank you!



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