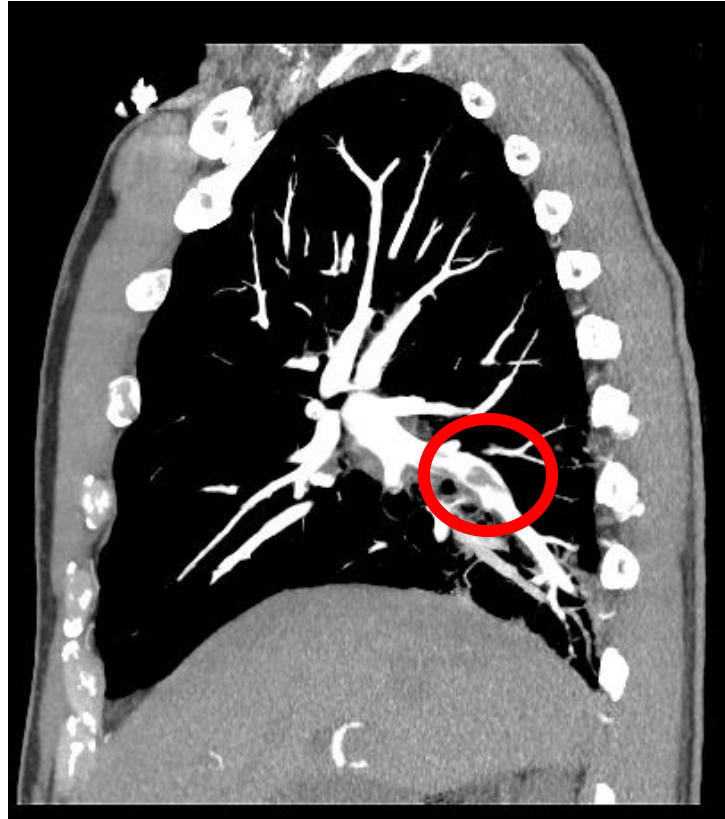
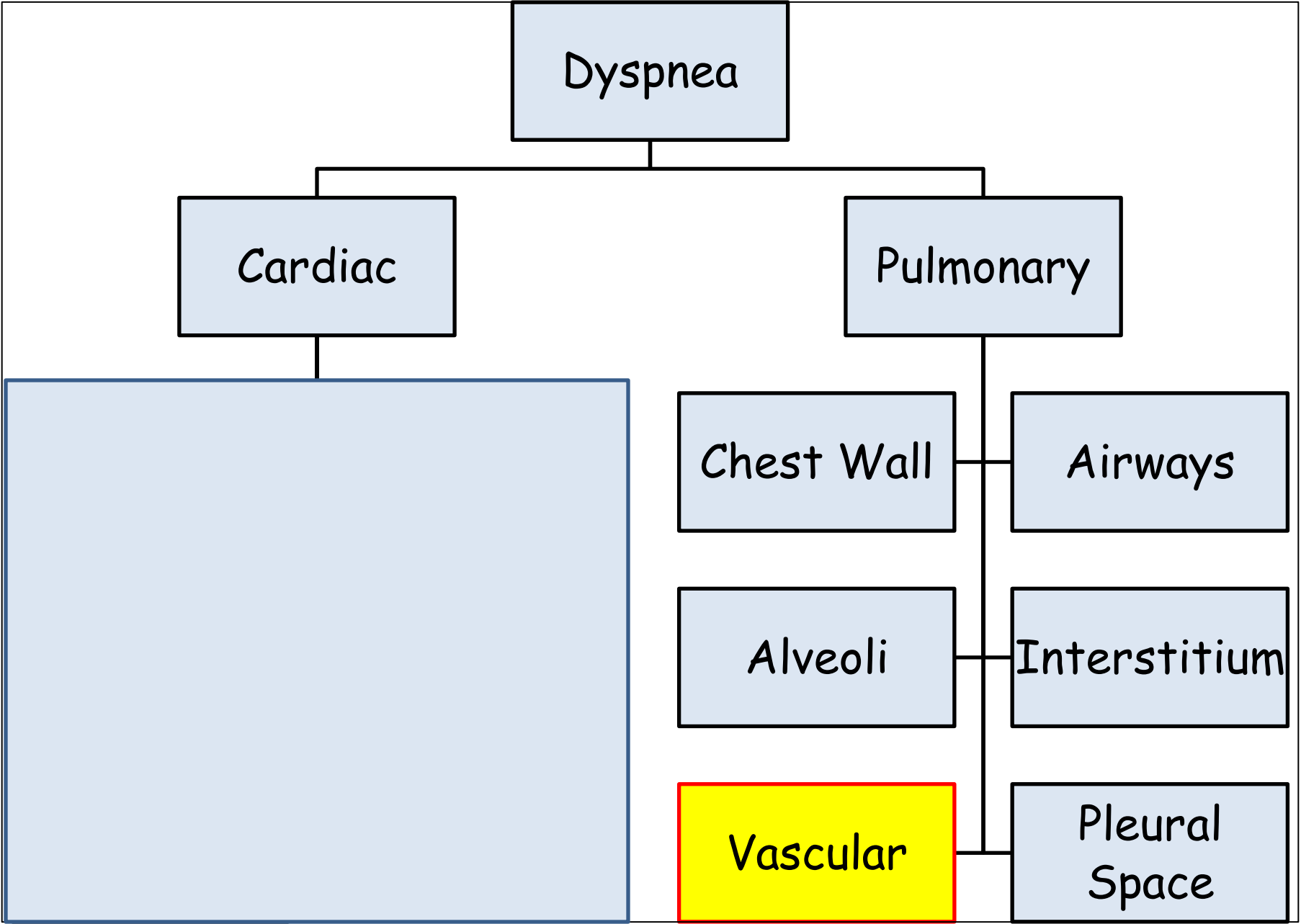


## Pulmonary-Vascular Disease



Howard J. Sachs, MD

[www.12daysinmarch.com](http://www.12daysinmarch.com)



Dyspnea

Cardiac

Pulmonary

[Empty light blue box]

Chest Wall

Airways

Alveoli

Interstitialium

Vascular

Pleural Space

# Pulmonary Vascular Disorders

## Part I:

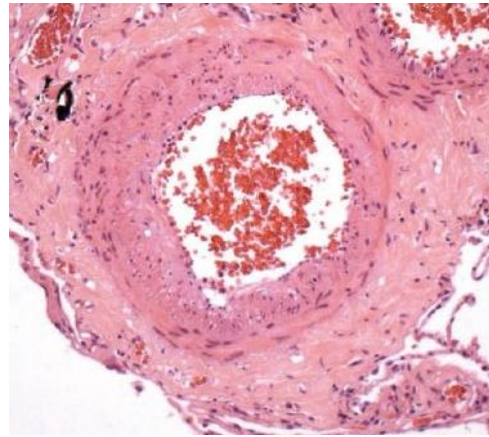
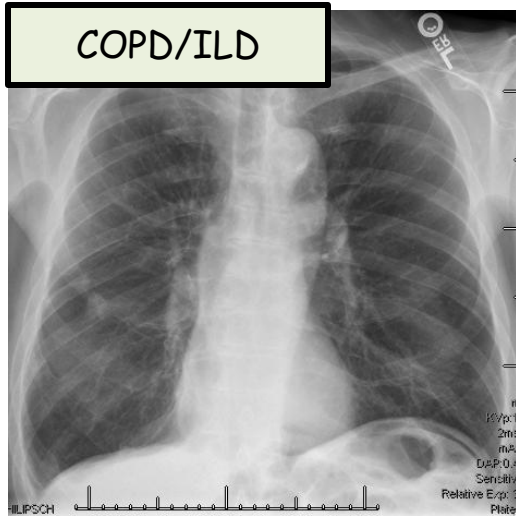
General Principles  
Differential Diagnoses  
Basic Physiology/Diagnostics

## Part II (The Disorders):

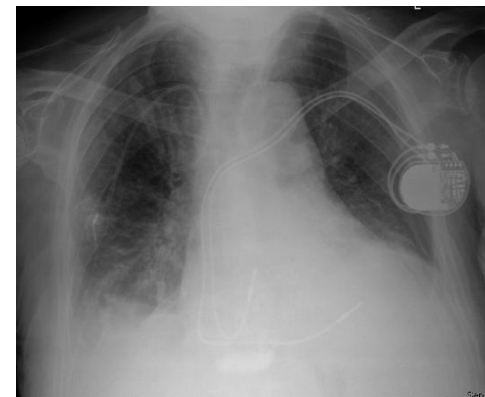
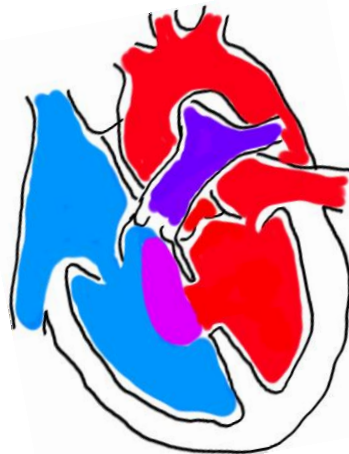
Primary Pulmonary Hypertension  
Thromboembolic Disease

# Pulmonary HTN

Pulmonary Artery > 25 mmHg (normal ~ 12)

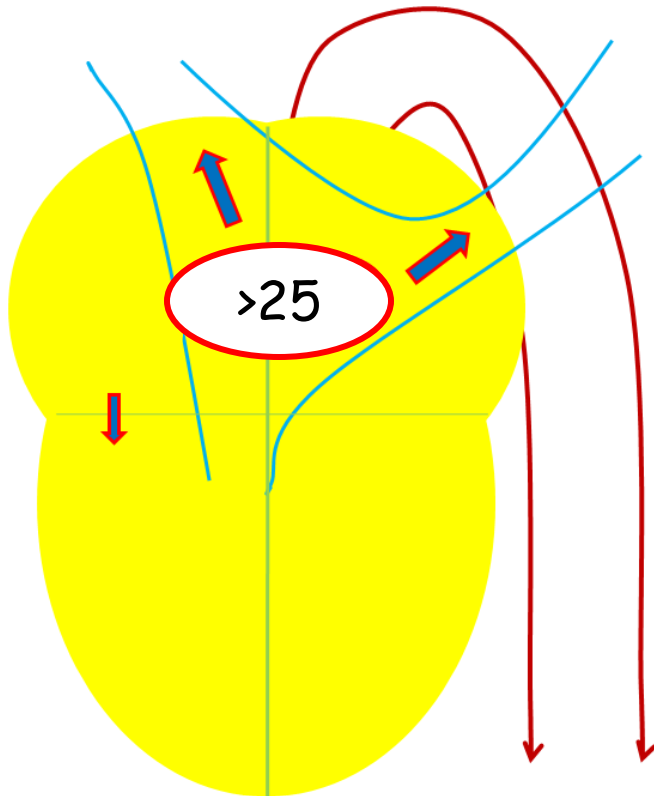


Hyperkinetic  
LEFT → right Shunt

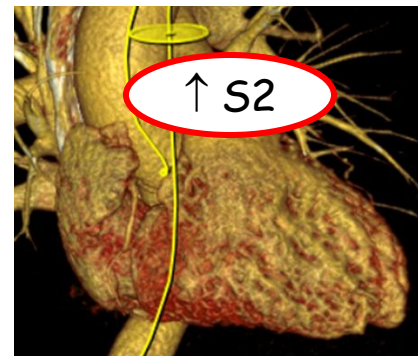


# What do all the causes share in common?

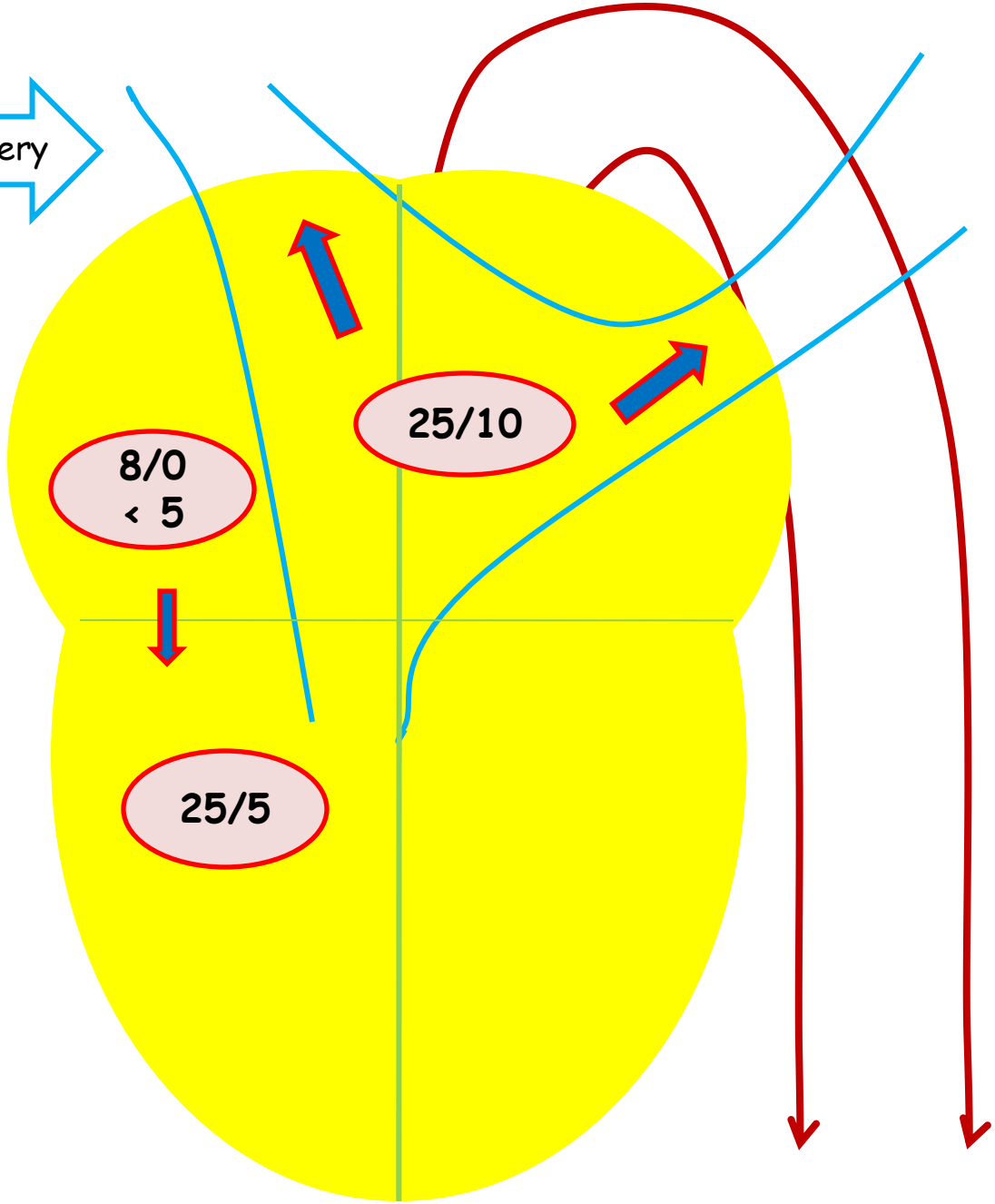
Elevated Pressures



Clinical Stigmata



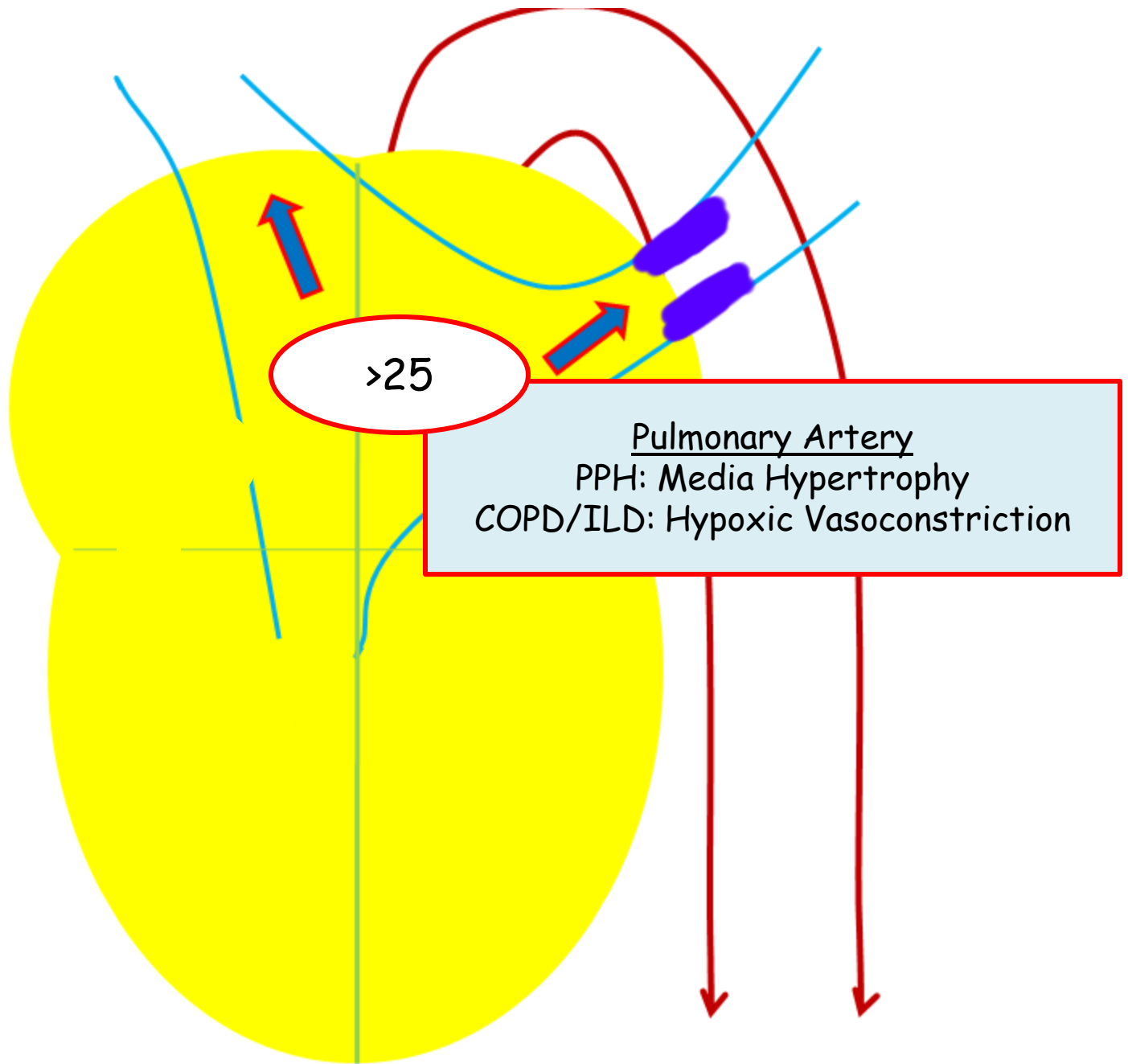
Pulmonary Artery

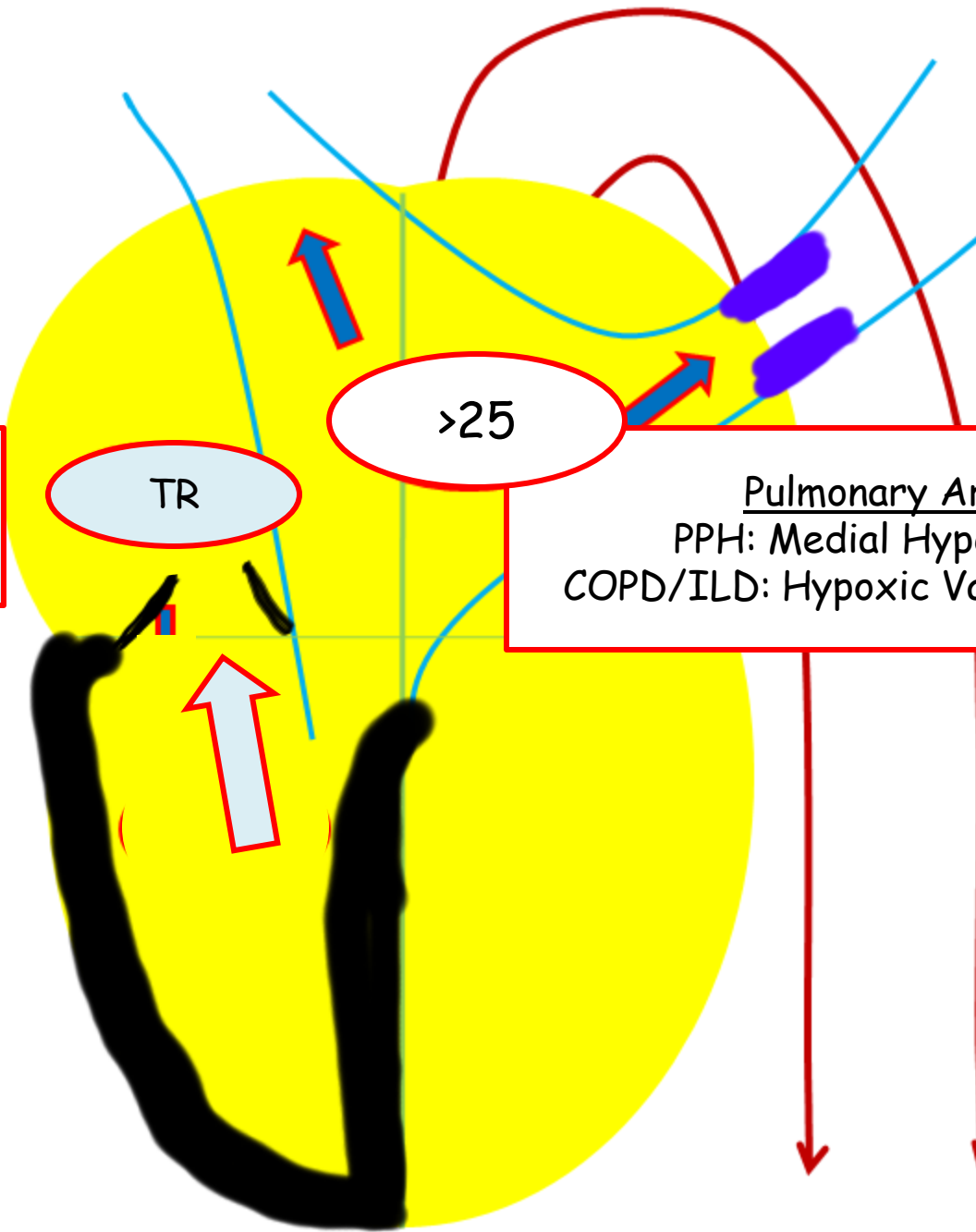


8/0  
< 5

25/10

25/5





2/6 systolic murmur at LLSB

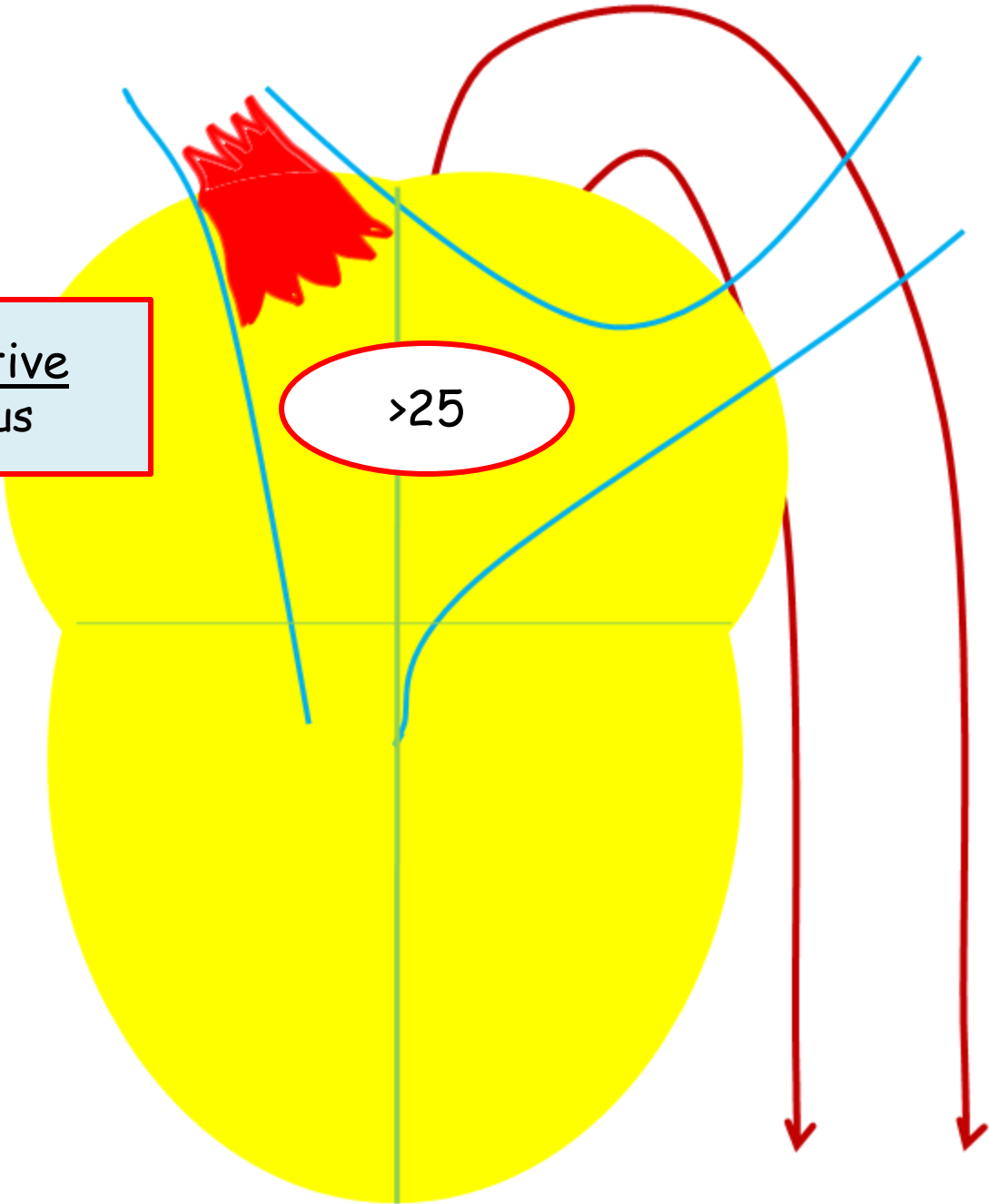
TR

>25

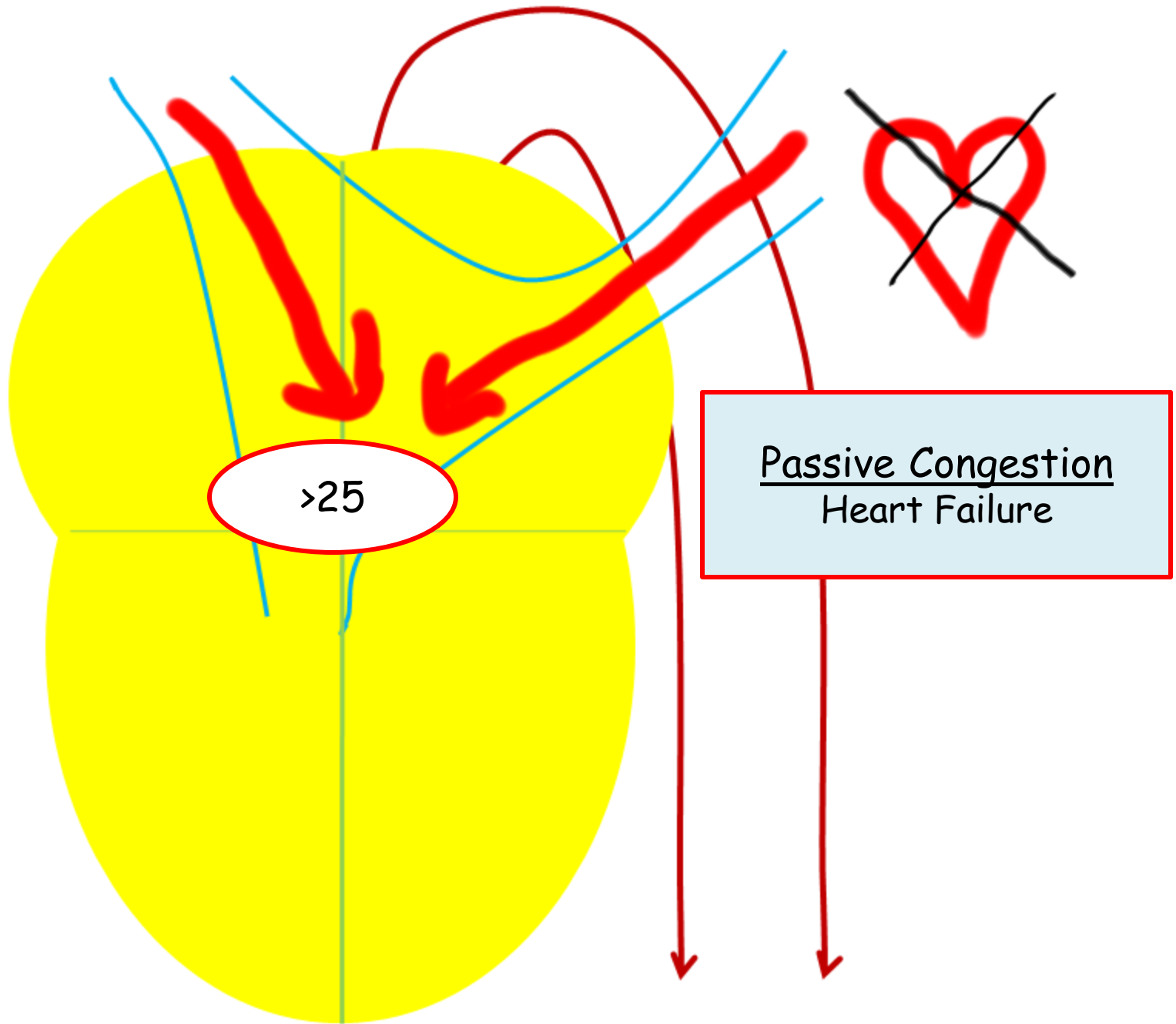
Pulmonary Artery  
PPH: Medial Hypertrophy  
COPD/ILD: Hypoxic Vasoconstriction



Obstructive  
Thrombus

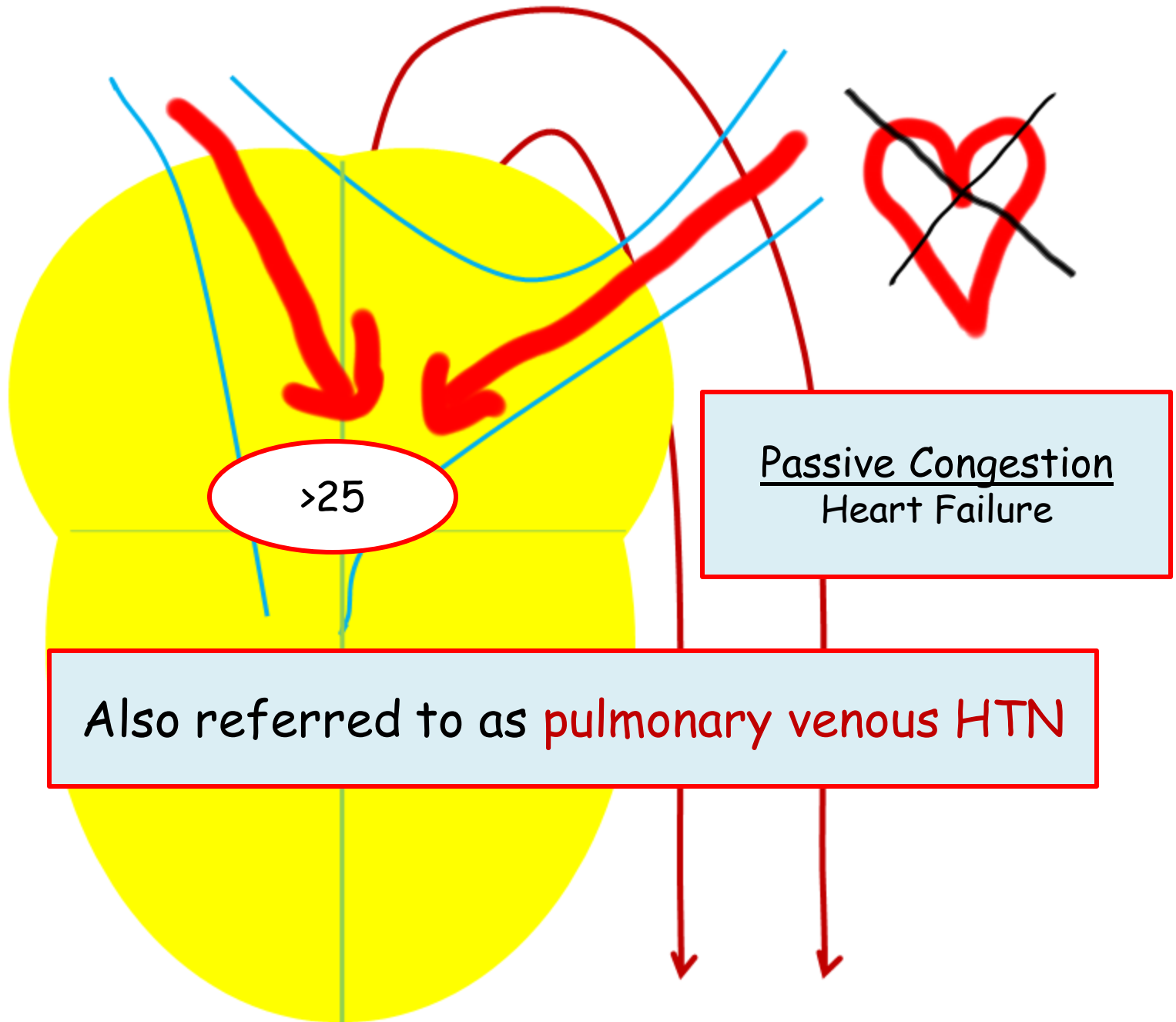


>25



>25

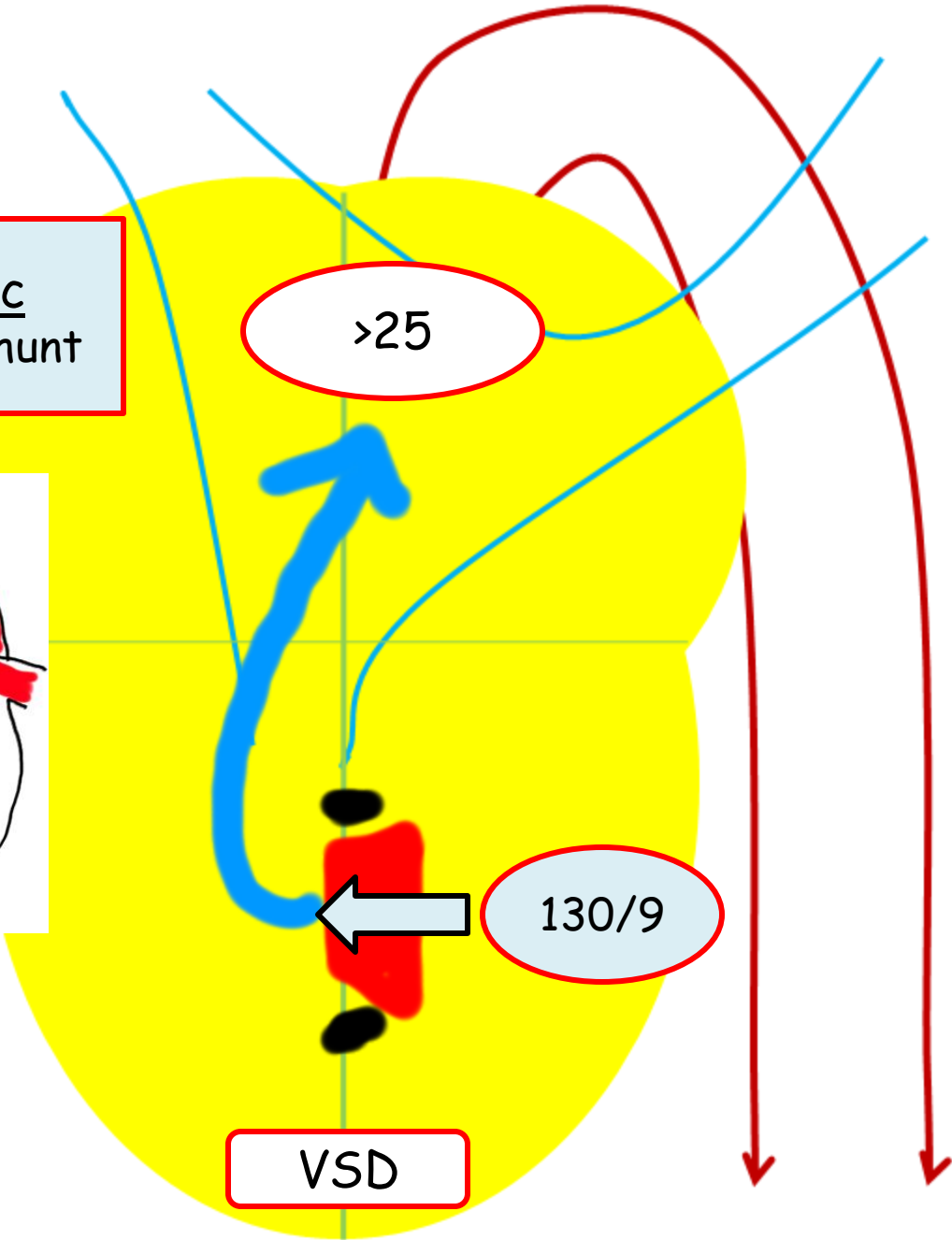
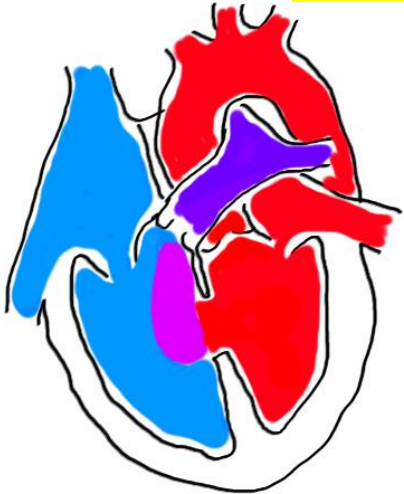
Passive Congestion  
Heart Failure



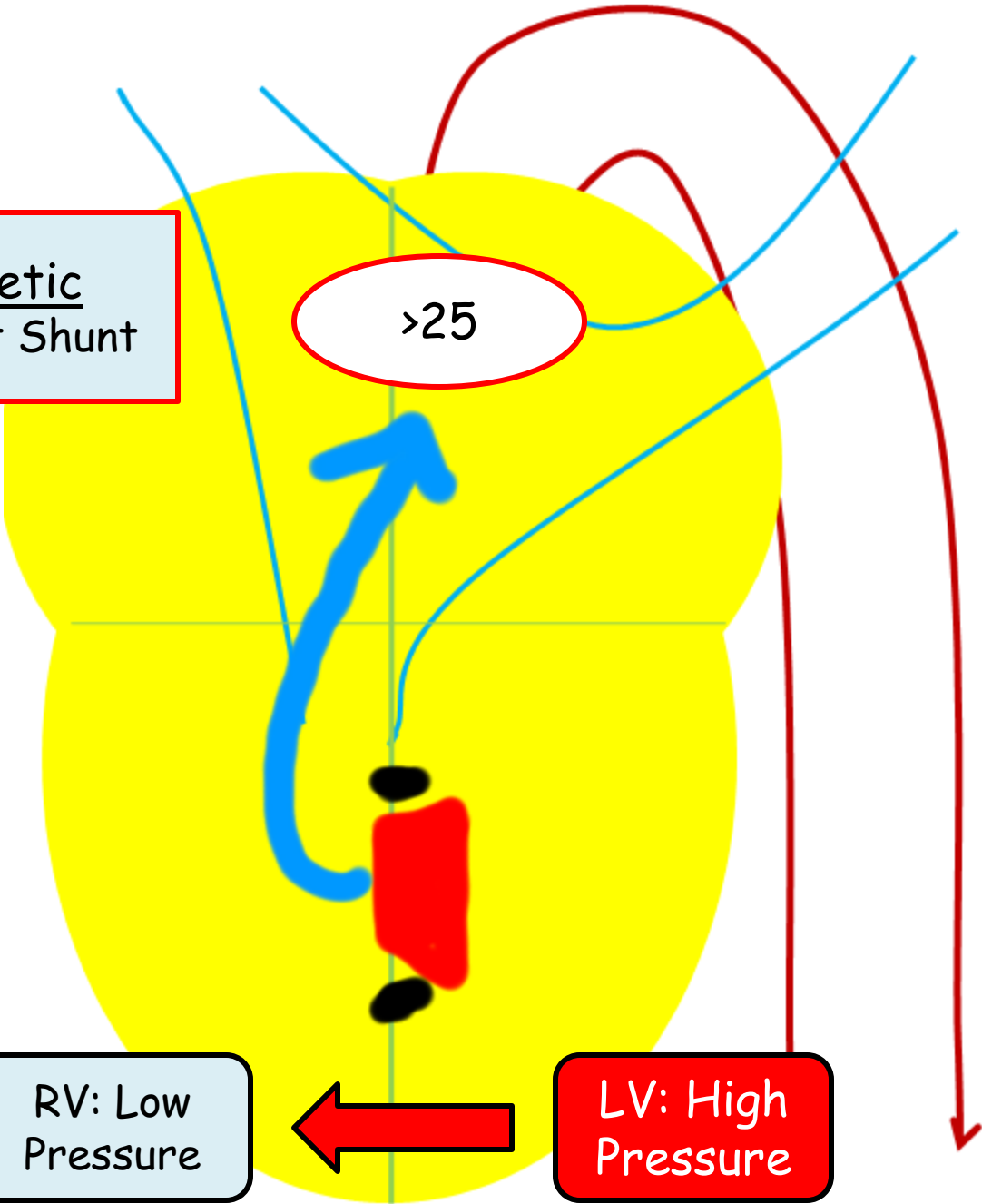
Passive Congestion  
Heart Failure

Also referred to as **pulmonary venous HTN**

Hyperkinetic  
Left → Right Shunt



Hyperkinetic  
Left → Right Shunt



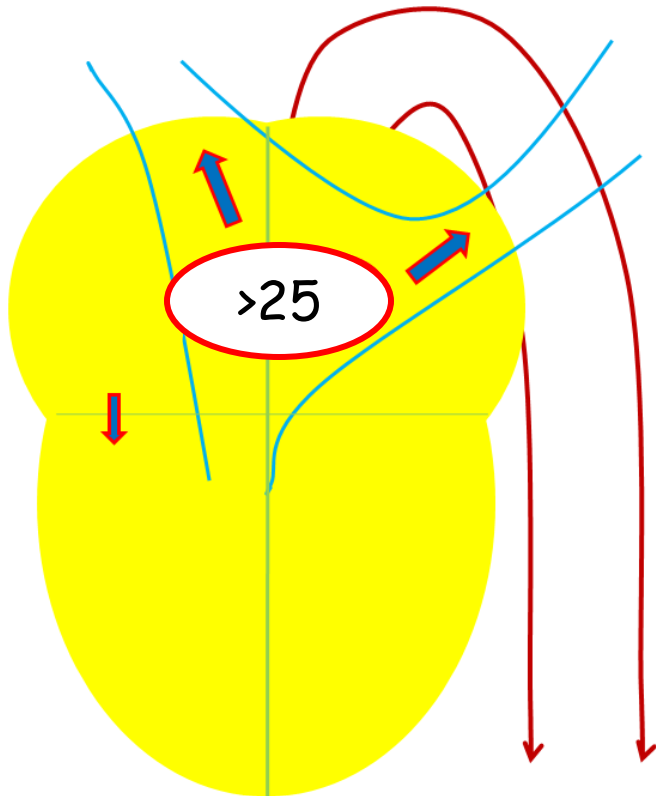
>25

RV: Low Pressure

LV: High Pressure

# What do all the causes share in common?

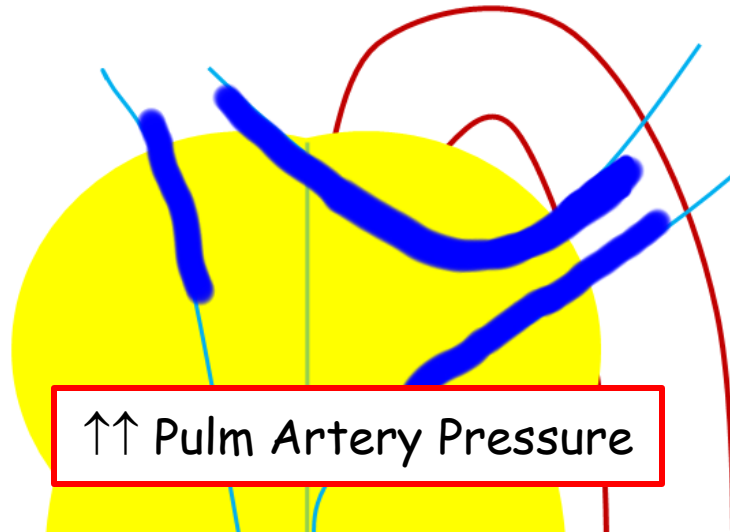
## Elevated Pressures



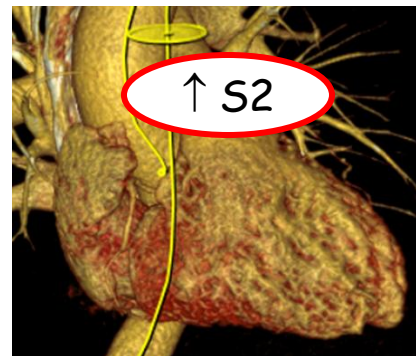
### Causes:

1. Primary Pulmonary HTN
2. Thromboembolism
3. Hypoxic Vasoconstriction
4. Congestive Heart Failure
5. Left → Shunt (VSD)

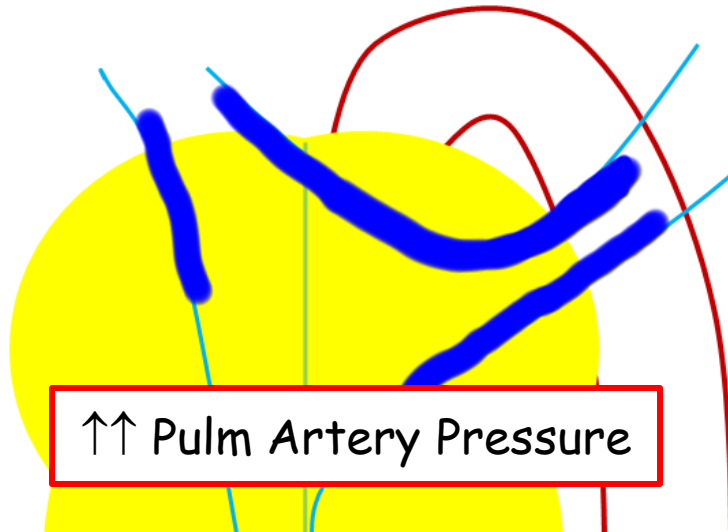
# What do all the causes share in common?



## Clinical Stigmata (Cor Pulmonale)



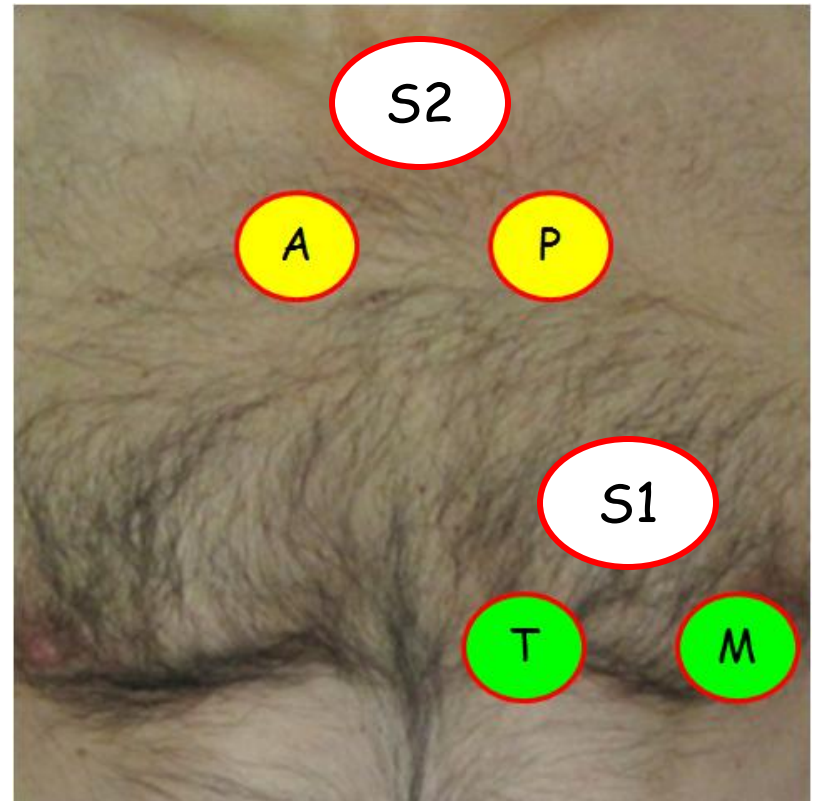
# What do all the causes share in common?



S2: A2 + P2

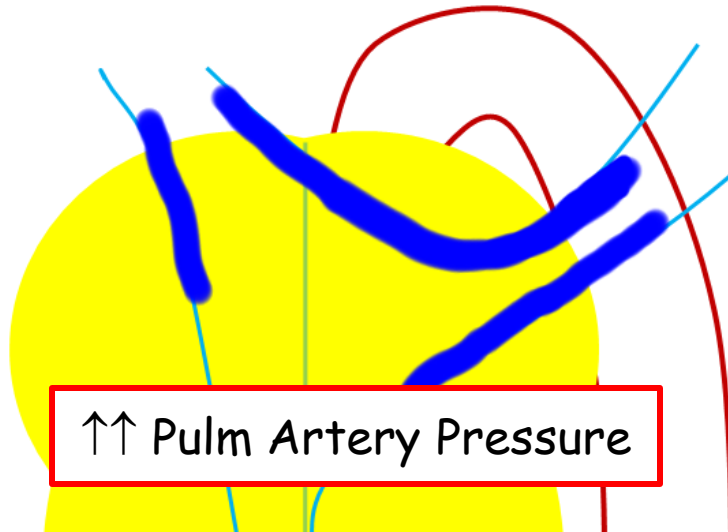
P2: loud, accentuated

## Left Upper Sternal Border





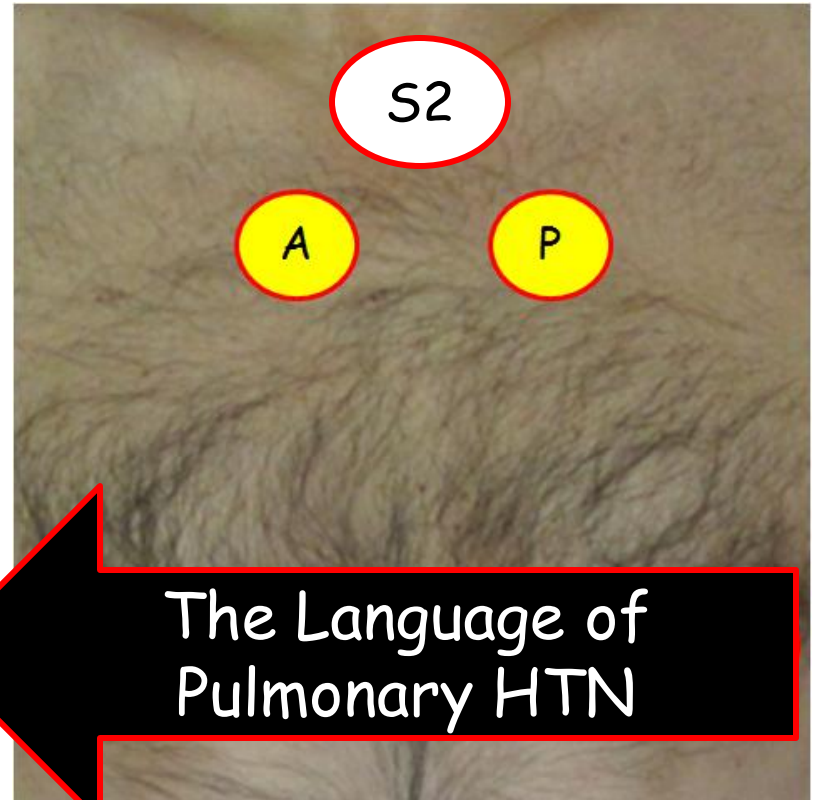
# What do all the causes share in common?



S2: A2 + P2

P2: loud, accentuated

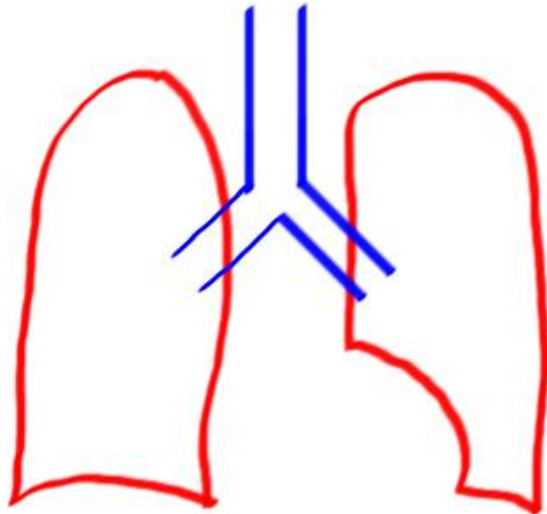
Left Upper Sternal Border



The Language of  
Pulmonary HTN

## Causes:

1. Primary Pulmonary HTN
2. Thromboembolism
3. Hypoxic Vasoconstriction
4. Congestive Heart Failure
5. Left → Shunt (VSD)



What will the pulmonary exam reveal?



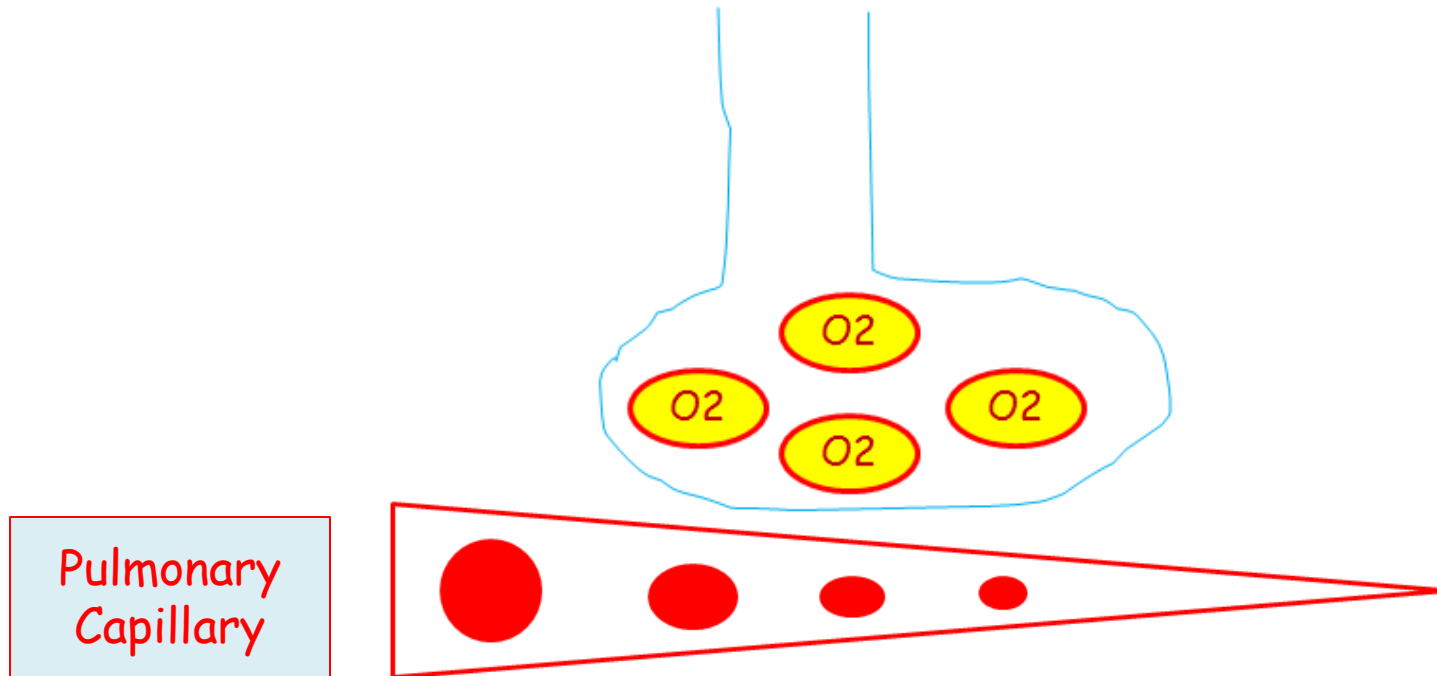
### Causes:

1. \*Primary Pulmonary HTN → normal breath sounds
2. \*Thromboembolism → normal breath sounds
3. Hypoxic Vasoconstriction → stigmata of COPD, ILD
4. Congestive Heart Failure → rales
5. Left → Shunt (VSD); murmur (mid LSB, maneuvers)

\* Primary Pulmonary-Vascular diseases  
reveal normal breath sounds.

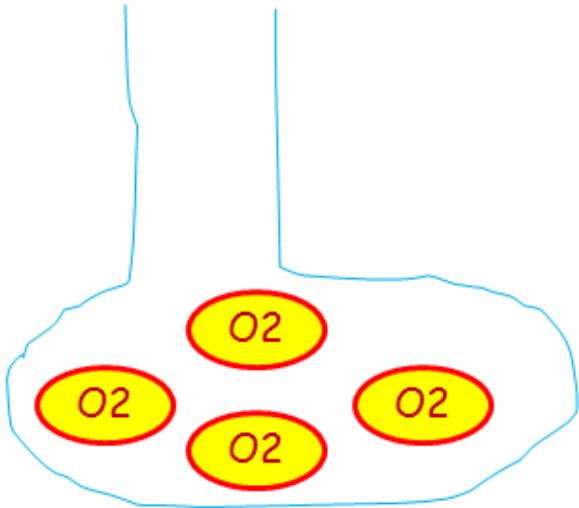
If the patient is noted with rales (plus edema, JVD  
and/or S3), they are telling you the patient has CHF.

# Diagnostic Testing: Diffusing Capacity (DLCO)

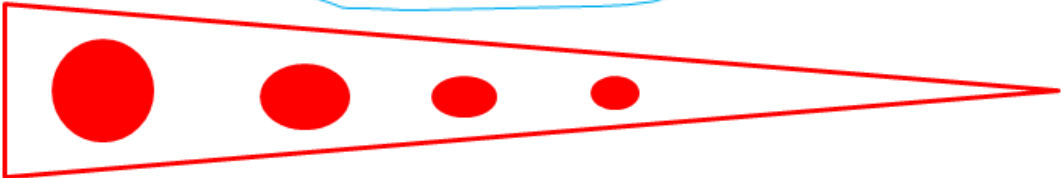


DLCO: Alveolar Gas Exchange

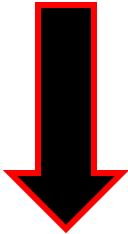
# Diagnostic Testing: Diffusing Capacity (DLCO)



Pulmonary  
Capillary

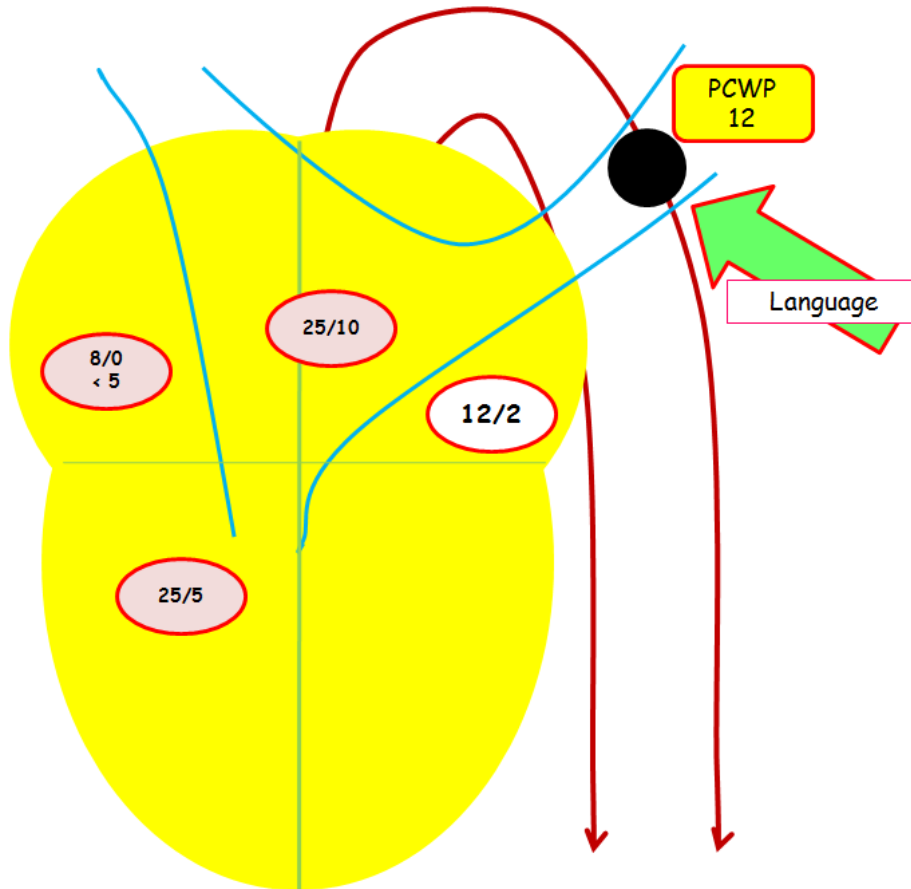


Diffusion Capacity	PreDrug	Pre%Pred	Predicted
Dsb	14.60	59	24.75
DsbHb	14.60	59	24.75



DLCO: Alveolar Gas Exchange

# Diagnostic Testing: Pulmonary Capillary Wedge Pressure



## PCWP

Wedged in Pulmonary  
'Capillary'

Measures Left Atrial  
Pressures

Normal value means  
no left sided failure

# Diagnostic Testing: Pulmonary Capillary Wedge Pressure

## Language:

'Patient day 3 post-MI. Acute onset of symptoms (SOB, hypotension). PE: lungs clear; no murmur. EKG tachycardia. Troponin negative. **The PCWP is normal.** What happened?'

LV Failure  
MI extension  
Papillary Muscle Rupture  
Pulmonary Embolism

eft

# Pulmonary Vascular Disorders

## Part I:

General Principles  
Differential Diagnoses  
Basic Physiology/Diagnostics

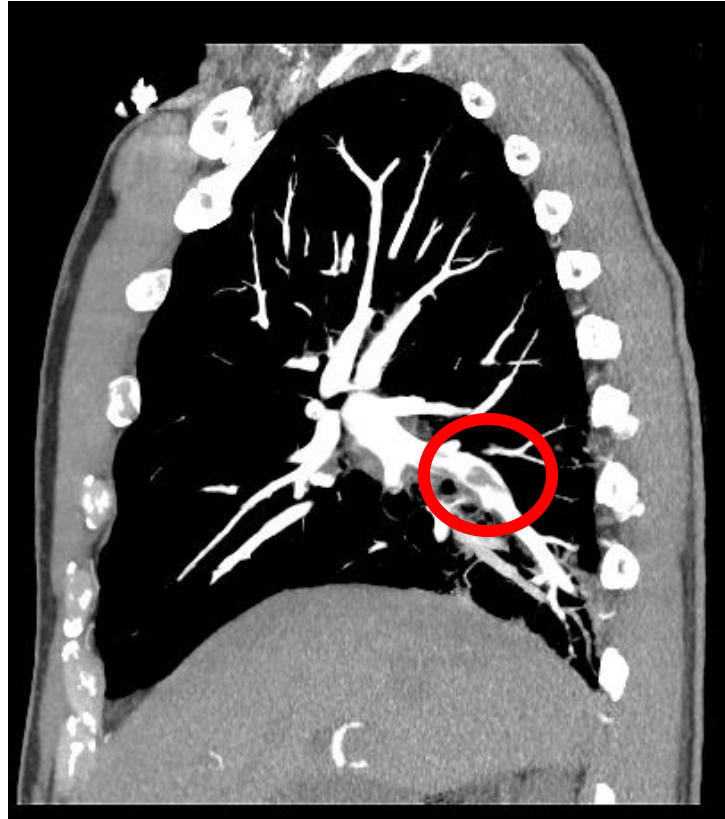
## Part II (The Disorders):

Primary Pulmonary Hypertension  
Thromboembolic Disease

[Howard@12daysinmarch.com](mailto:Howard@12daysinmarch.com)



## Pulmonary-Vascular Disease



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[www.12daysinmarch.com](http://www.12daysinmarch.com)