Heart Valves and Heart Sounds

Pathophysiology of valvular lesion of the Heart

By
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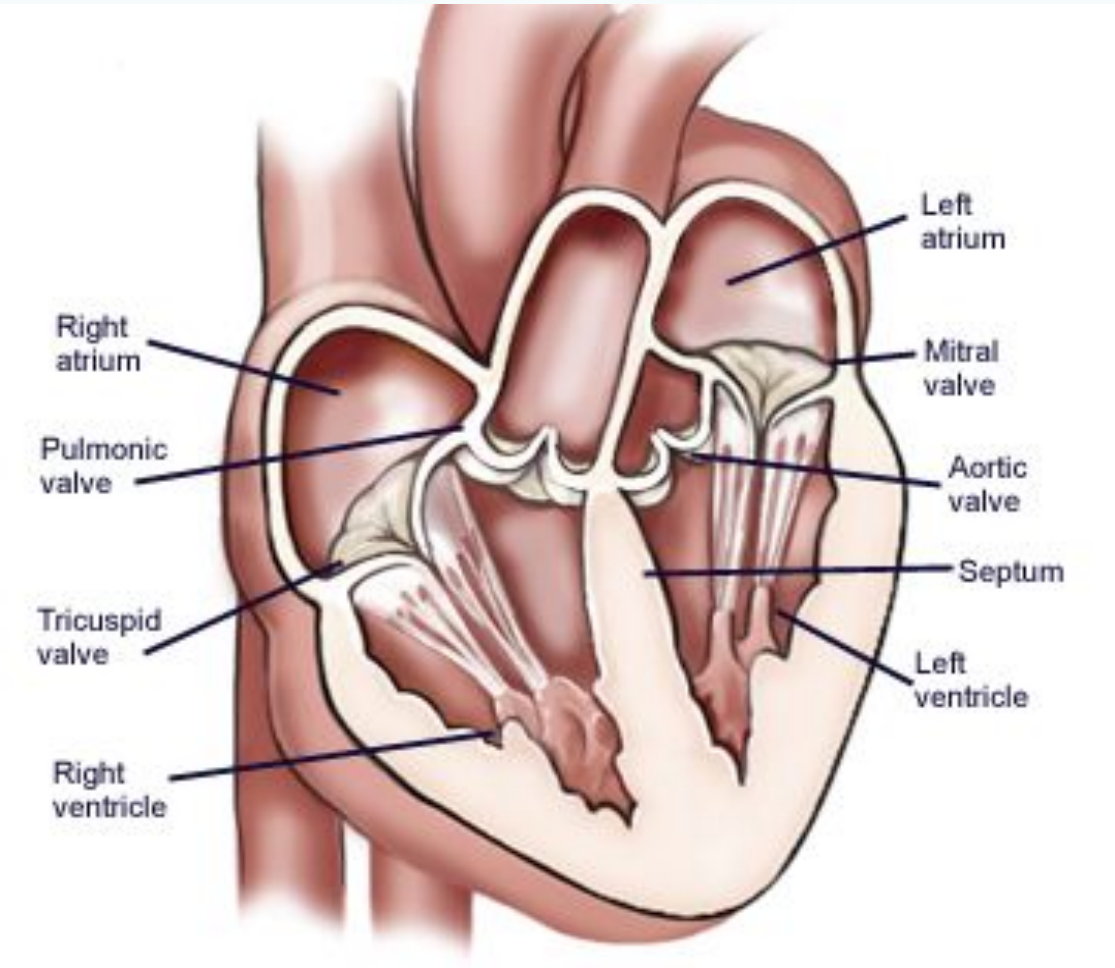
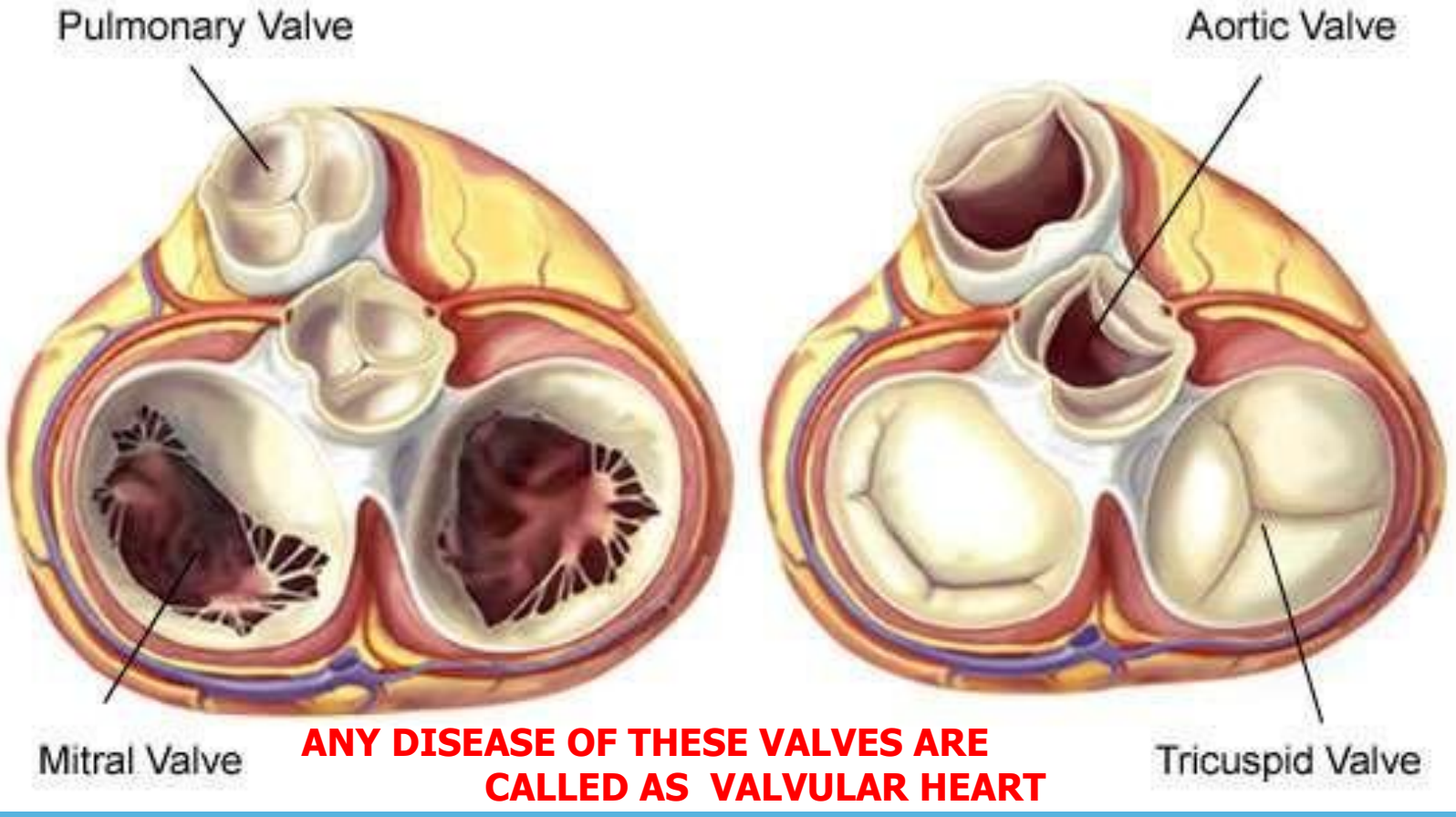
Learning objectives

- Describe the heart valves
- name the heart sounds
- Mechanism of heart sounds production
- Auscultation areas of the heart sound
- Valvular lesions
- Pathophysiology and haemodynamics of valvular lesions
- Murmur sounds in each lesion

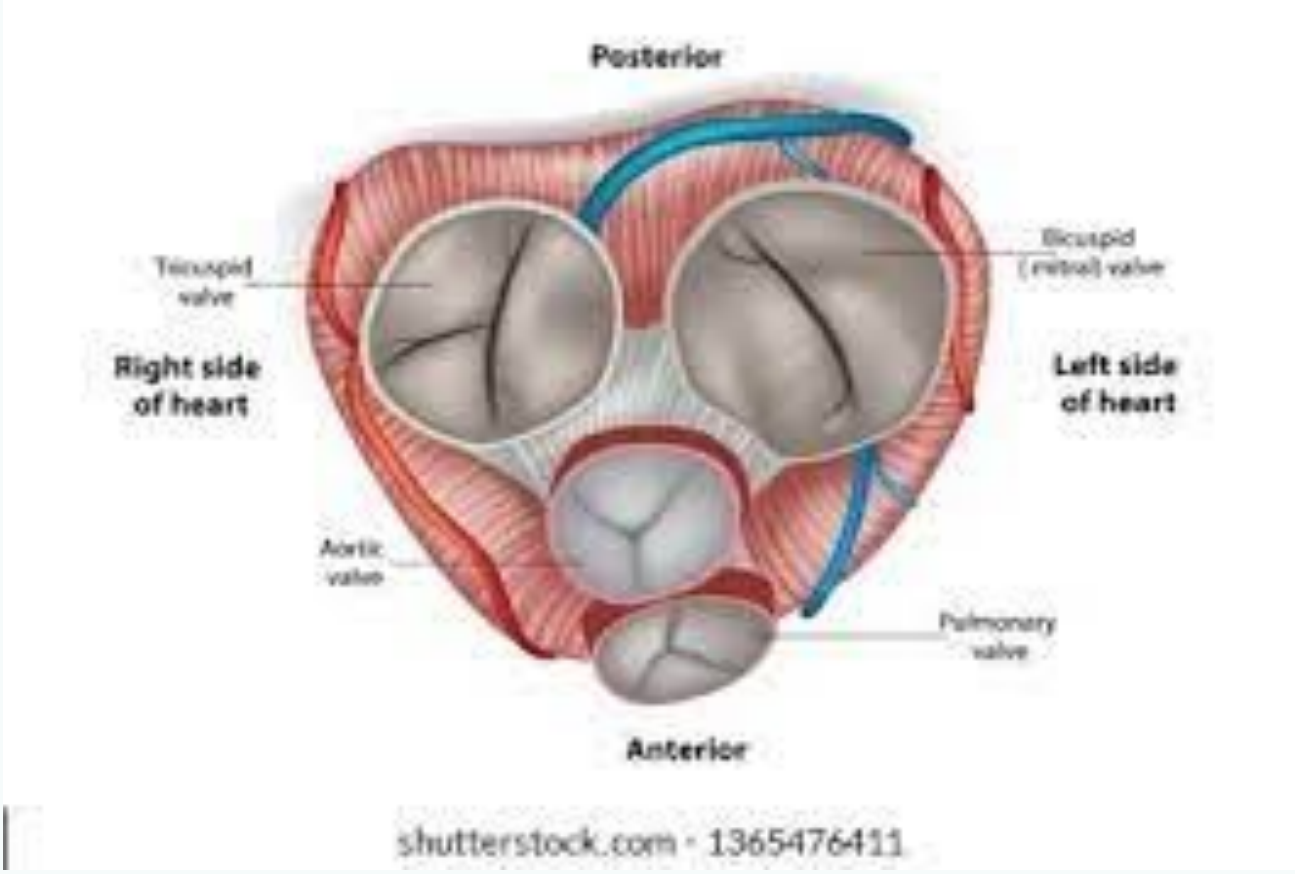
Heart Valves



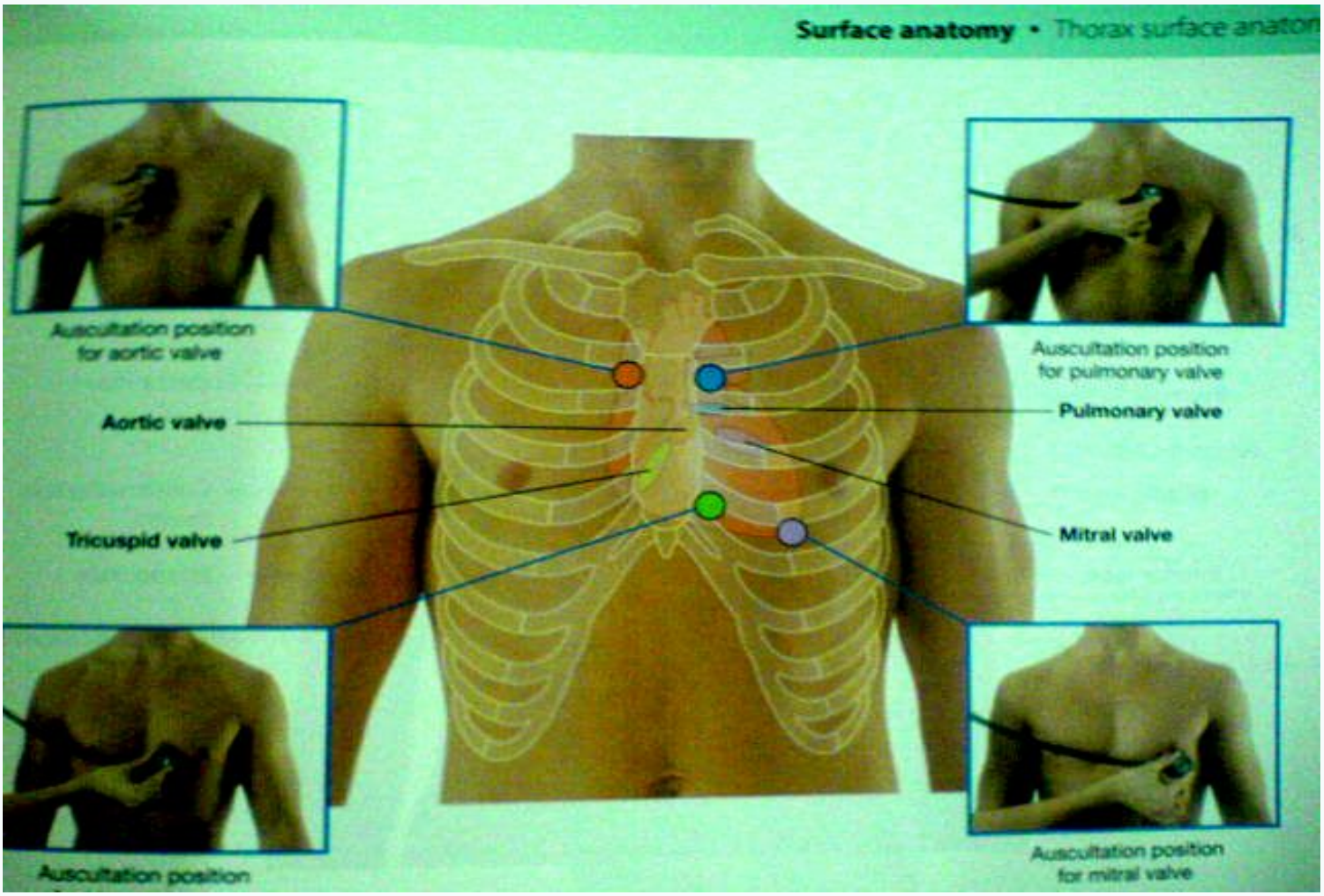


ANY DISEASE OF THESE VALVES ARE CALLED AS VALVULAR HEART DISEASE!

Closure of valves



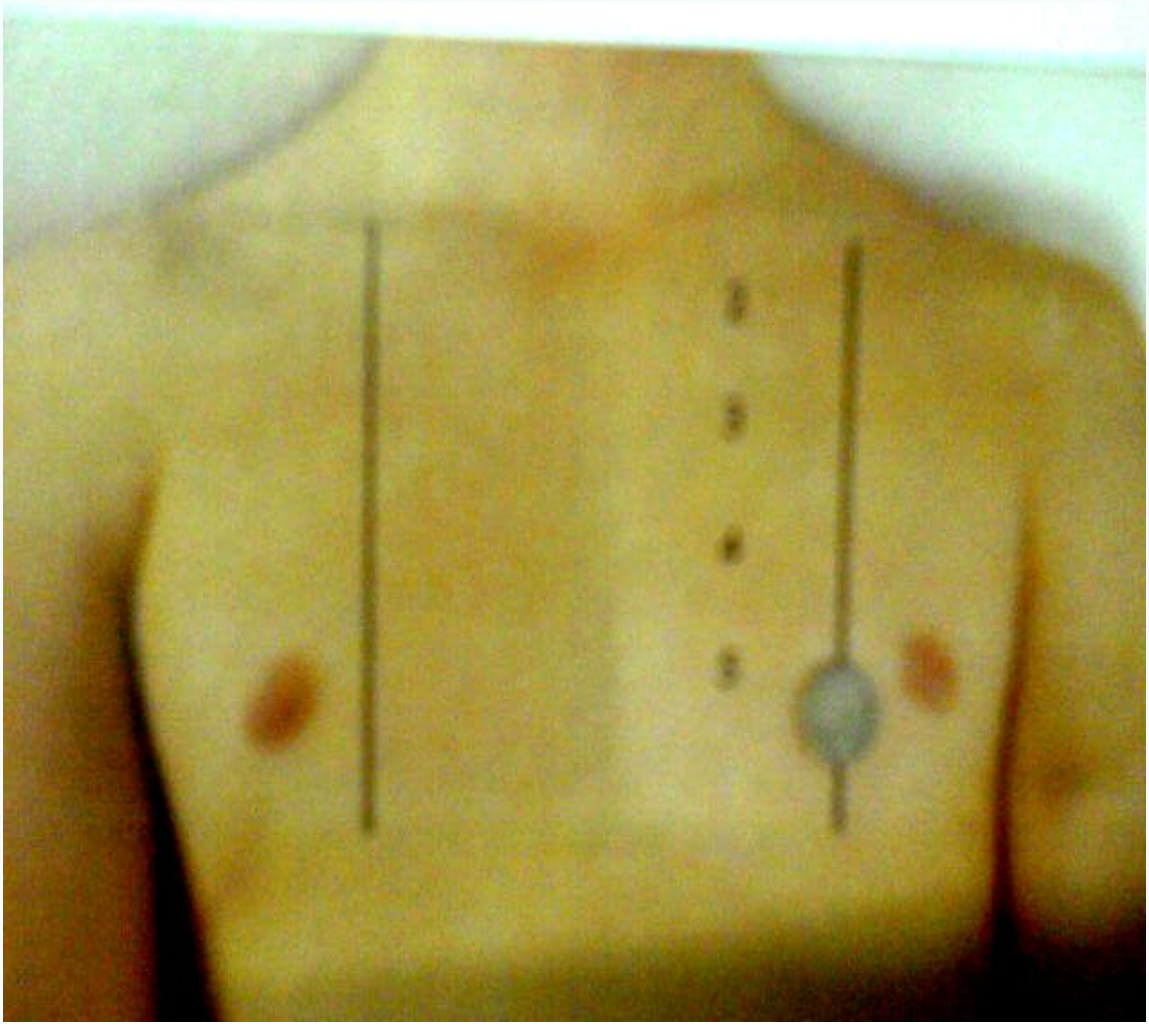
Areas of Heart sounds



TO FIND THE APEX BEAT

APEX BEAT

AREA OF THE APEX BEAT

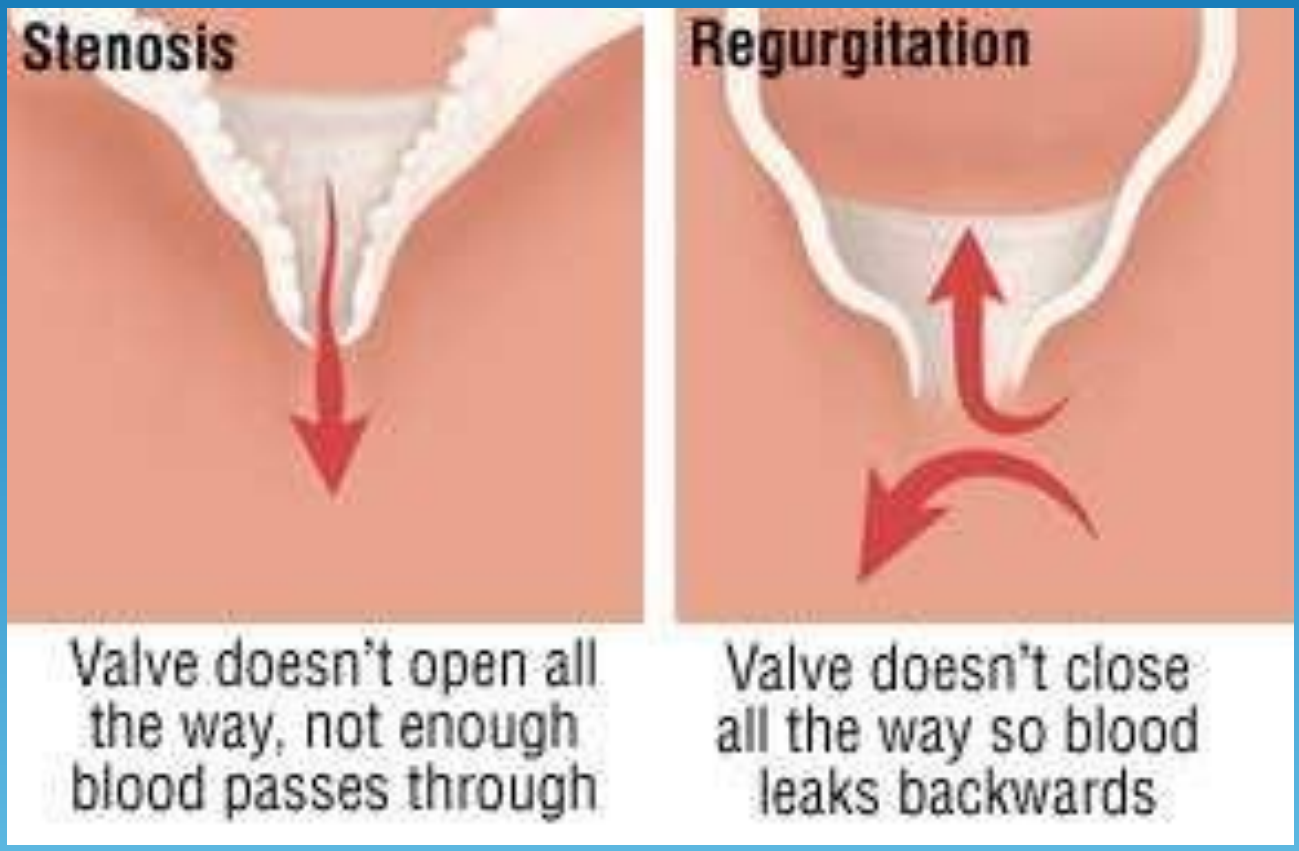


Pathophysiology of valvular lesions

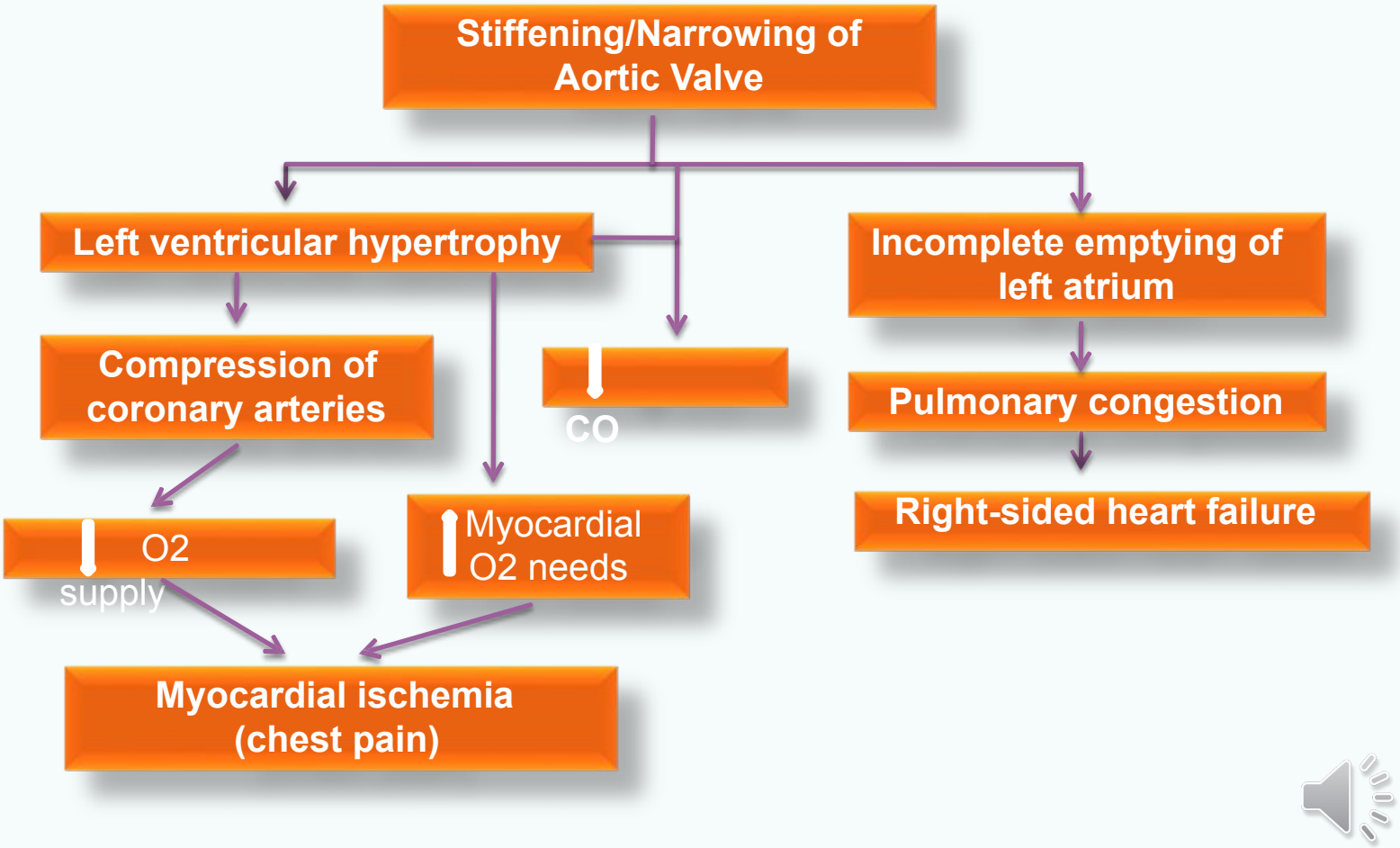
Valvular Heart Disease

1. MITRAL STENOSIS
2. MITRAL REGURGITATION
3. AORTIC STENOSIS
4. AORTIC REGURGITATION
5. TRICUSPID STENOSIS
6. TRICUSPID REGURGITATION
7. PULMONARY STENOSIS
8. PULMONARY REGURGITATION

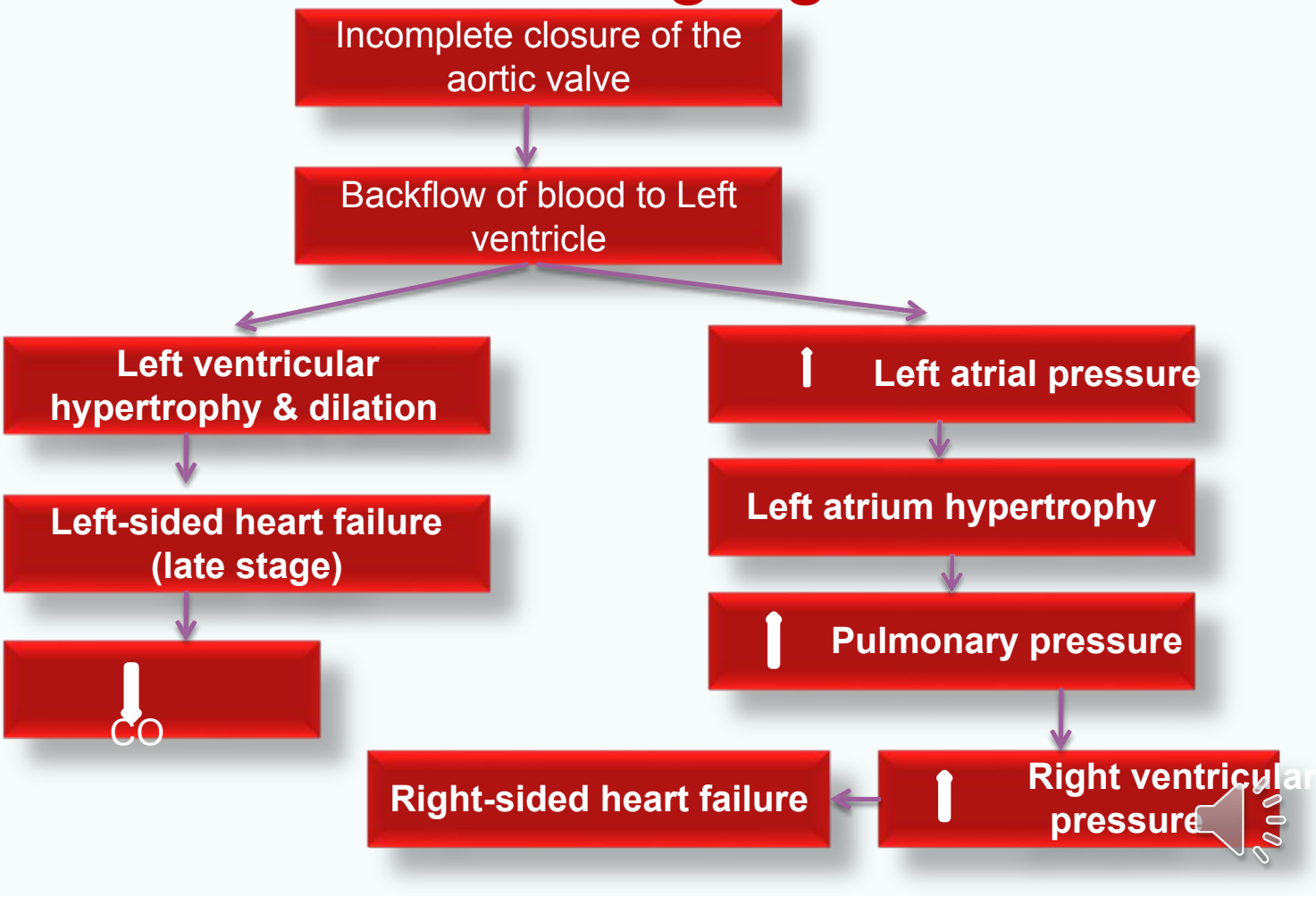
Types of valve disease



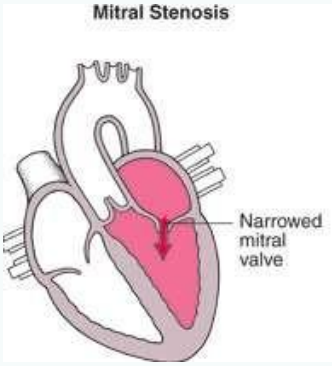
Pathophysiology (Haemodynamics) in Aortic valve stenosis



Pathophysiology (Haemodynamics)
Aortic valve regurgitation



Pathophysiology (Haemodynemics) in Mitral valve stenosis



Narrowing of mitral valve

↑ left atrial pressure → Dilatation of left atrium

↑ pulmonary pressure

↑ pulmonary congestion

O2/CO2 exchange (fatigue, dyspnea, orthopnea)

Right-sided failure

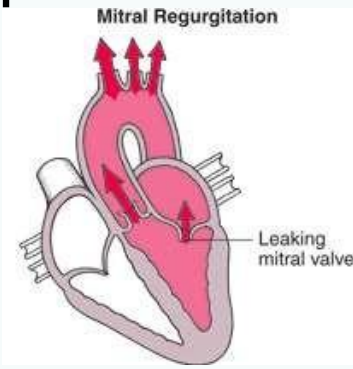
↓ blood flow to left ventricle

↓ Cardiac output

Left ventricular atrophy

Fatigue

Pathophysiology (Haemodynemics) in Mitral valve rugurgitation or incompetence



Incomplete closure of mitral valve

↓

Backflow of blood to the left atrium

↓ vol. of blood ejected by left ventricle

↓

↓ CO

↑ Left atrial pressure

↓

↑ Left atrial hypertrophy

↓

↑ Pulmonary pressure

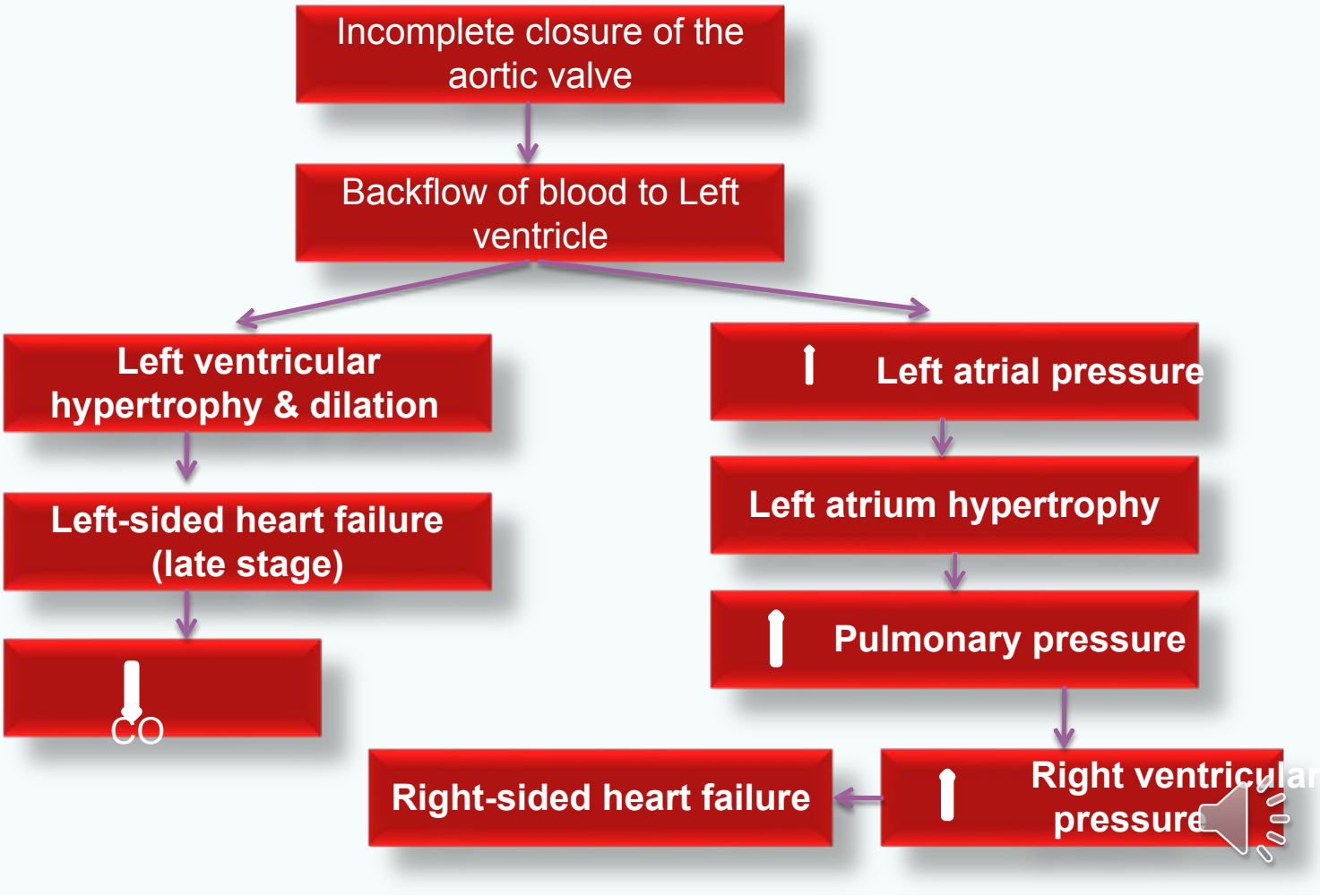
↓

↑ Right ventricular pressure

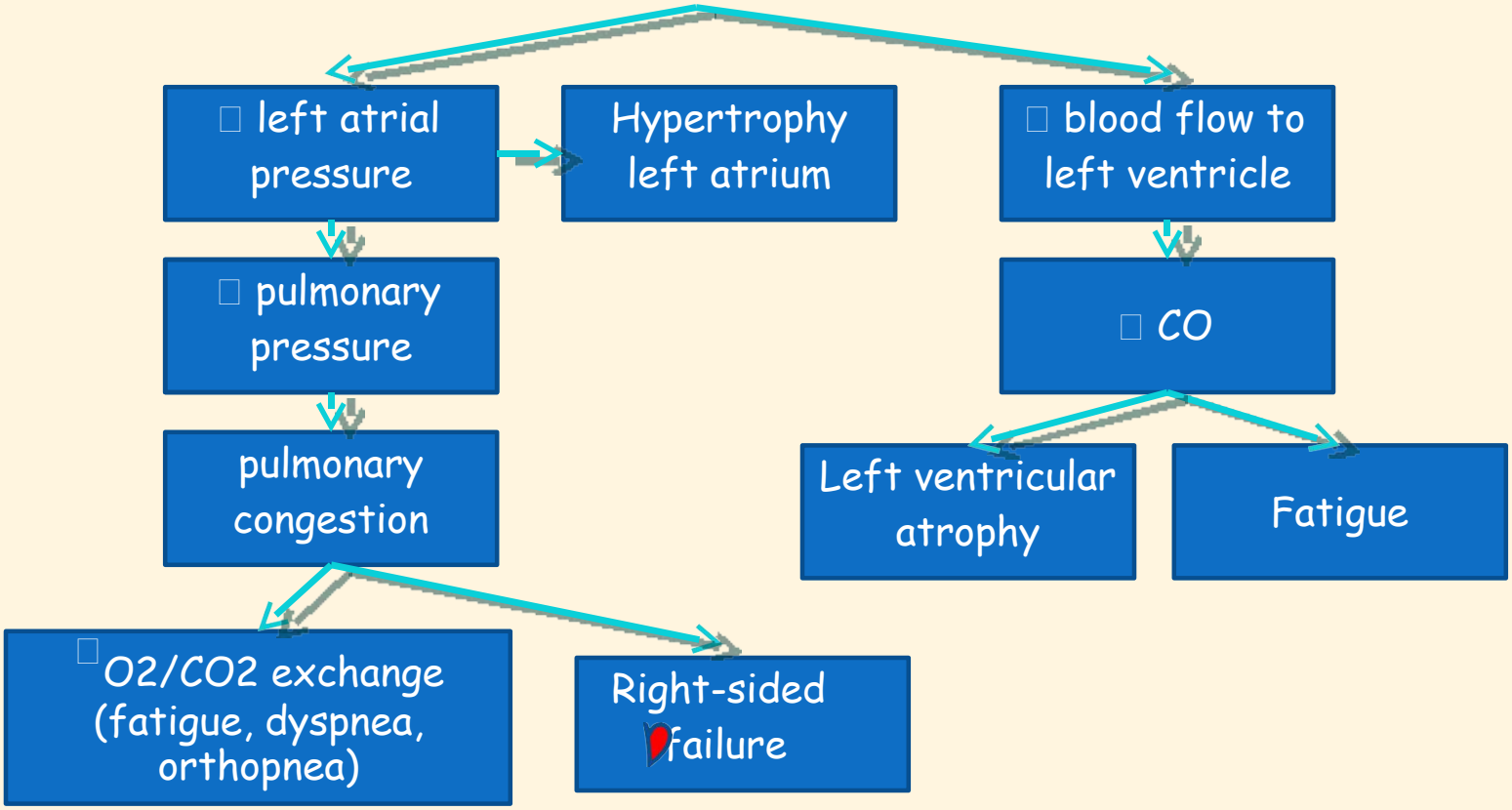
←

Right-sided heart failure

Pathophysiology (Haemodynamics)

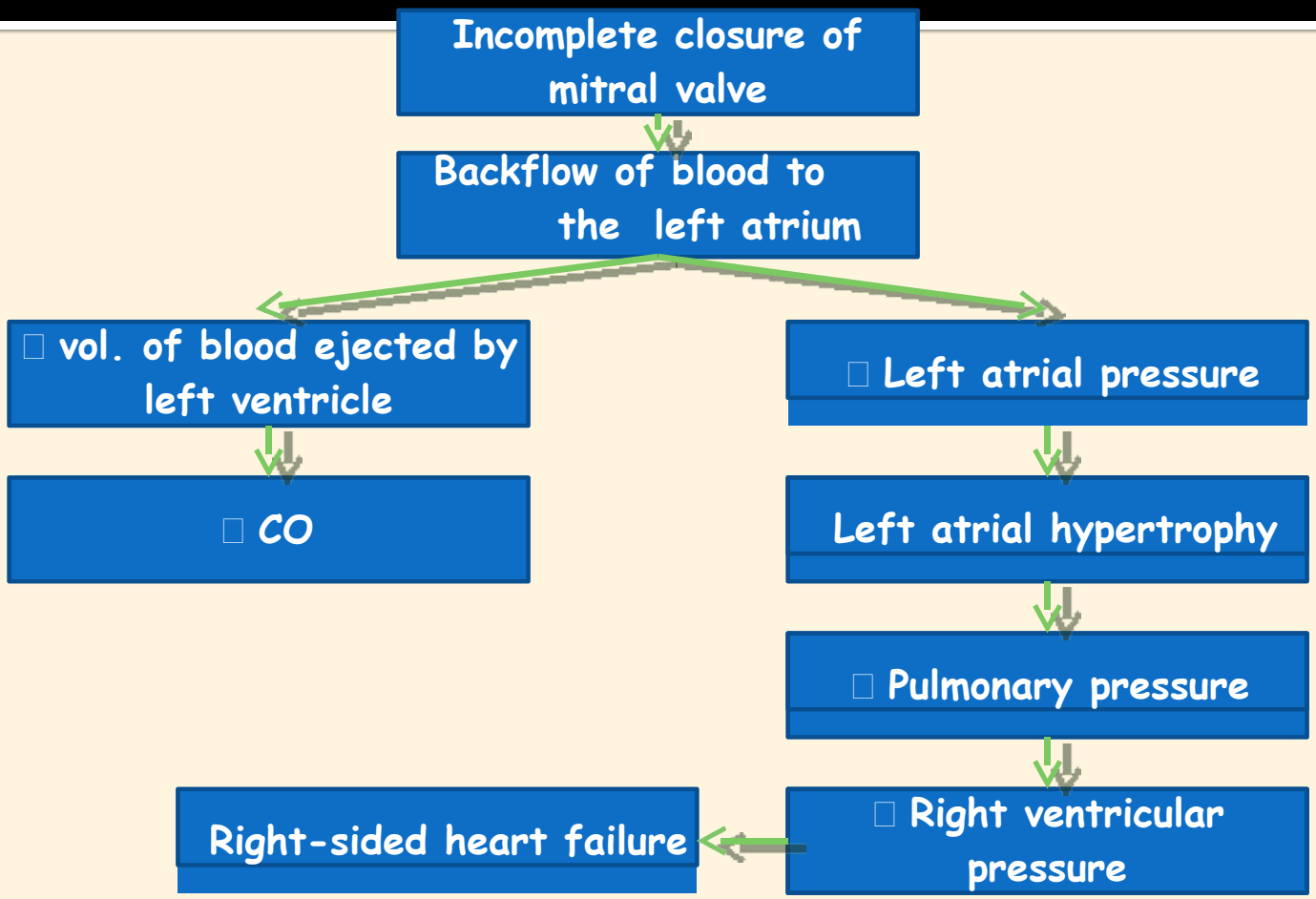


Mitral valve Stenosis
Narrowing of mitral valve



Mitral Valve regurgitation

Pathophysiology



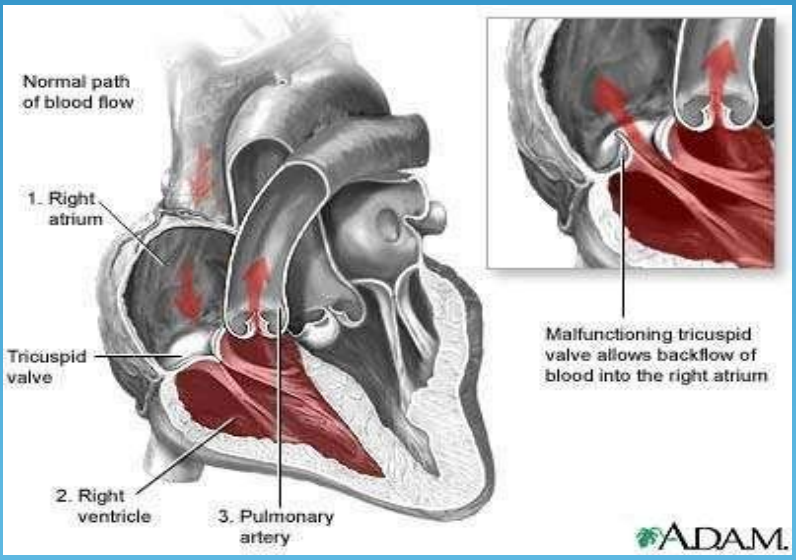
Tricuspid Stenosis

- usually occurs together with aortic or mitral stenosis
- may be due to rheumatic heart disease (<5%)
  - □ blood flow from right atrium to right ventricle
    - □ □ right ventricular output
    - □ □ left ventricular filling □ □ co
- □ systemic pressure

Tricuspid Regurgitation

- common, and is most frequently ‘functional’ as a result of enlargement of right ventricle

- an insufficient tricuspid valve allows blood to flow back into the right atrium venous congestion & right ventricular output   blood flow towards the lungs



Tricuspid Regurgitation

Symptom

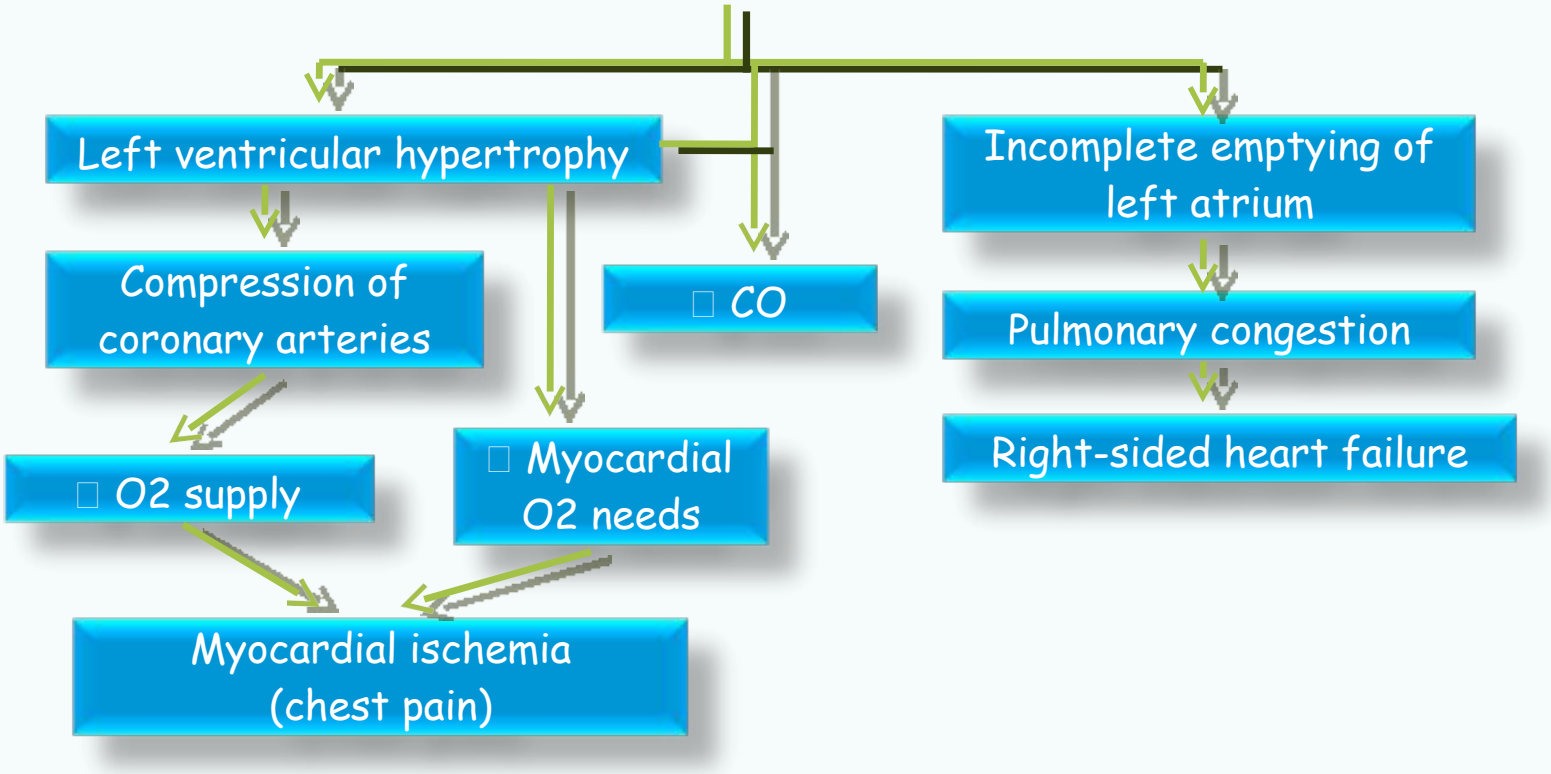
- Usually non-specific
- Tiredness (reduced forward flow)
- Oedema
- Hepatic enlargement (venous congestion)

Sign

- Raised JVP
- Pansystolic murmur (left sternal edge)
- Pulsatile liver

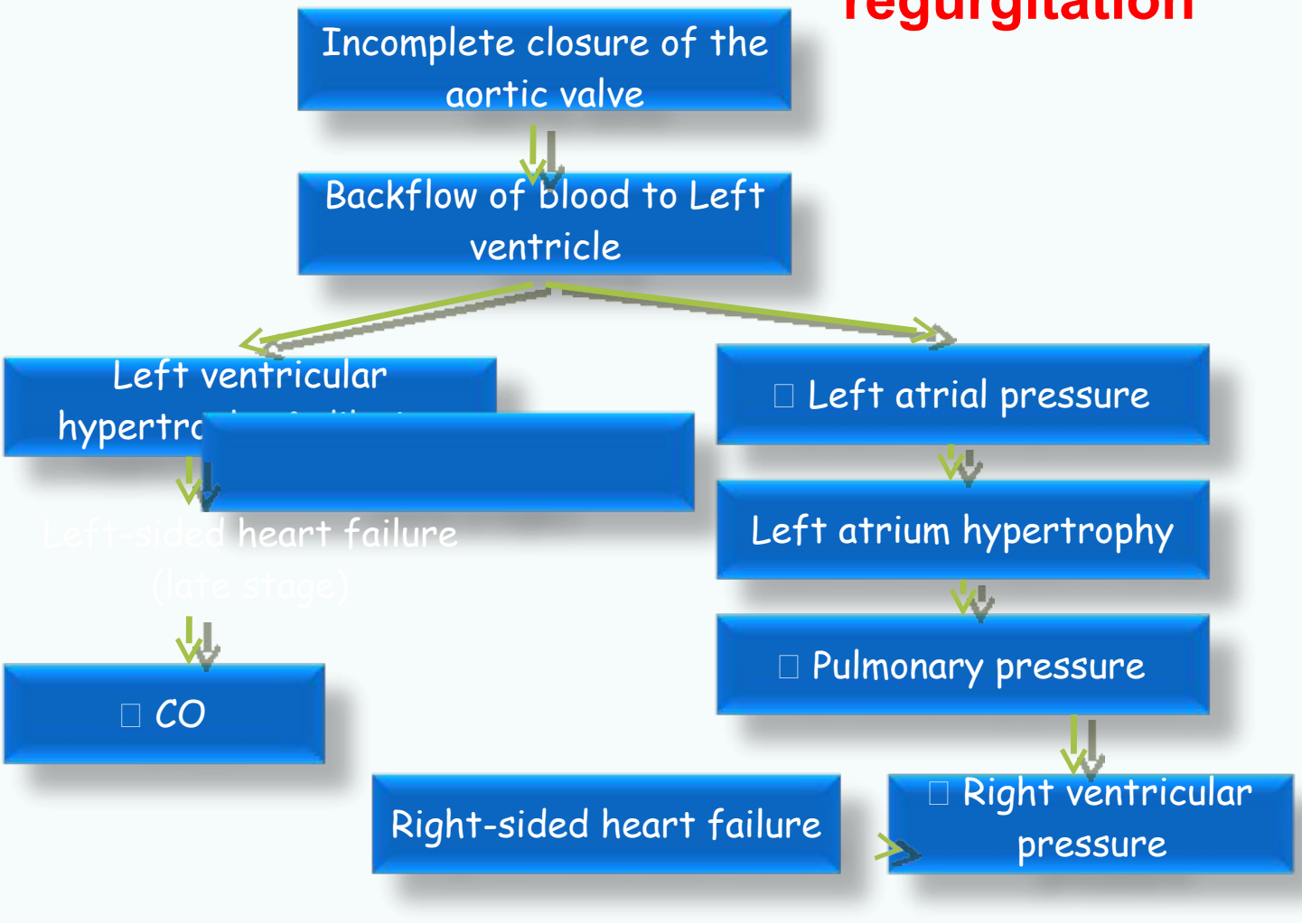
Aortic Valve Stenosis

Stiffening/Narrowing of Aortic Valve



Pathophysiology

Aortic Valve regurgitation



Pulmonic Valve Stenosis

- rare, usually congenital in origin
- flow of blood to the pulmonary artery due to narrowing
- blood flows back to right ventricle and right atrium
- right ventricle hypertrophy to compensate for
- blood volume and force blood to the pulmonary artery

S/Sx:

- harsh systolic murmur
- fatigue, dyspnea on exertion, cyanosis
- poor weight gain or failure to thrive in infants
- hepatomegaly, ascites, edema

Pulmonary Regurgitation

- a rare condition caused by infective endocarditis, tumors or RF

- blood flows back into Right ventricle → Right ventricle and atrium hypertrphy → symptoms of Right-sided heart failure