

Lecture Outline

Mitral Stenosis

Mitral Regurgitation

- Etiology
- Pathophysiology
- Clinical features
- Diagnostic testing
- Differential diagnosis
- Management

Mitral Stenosis: Pathophysiology

Etiology: rheumatic; female>male
by 6:1

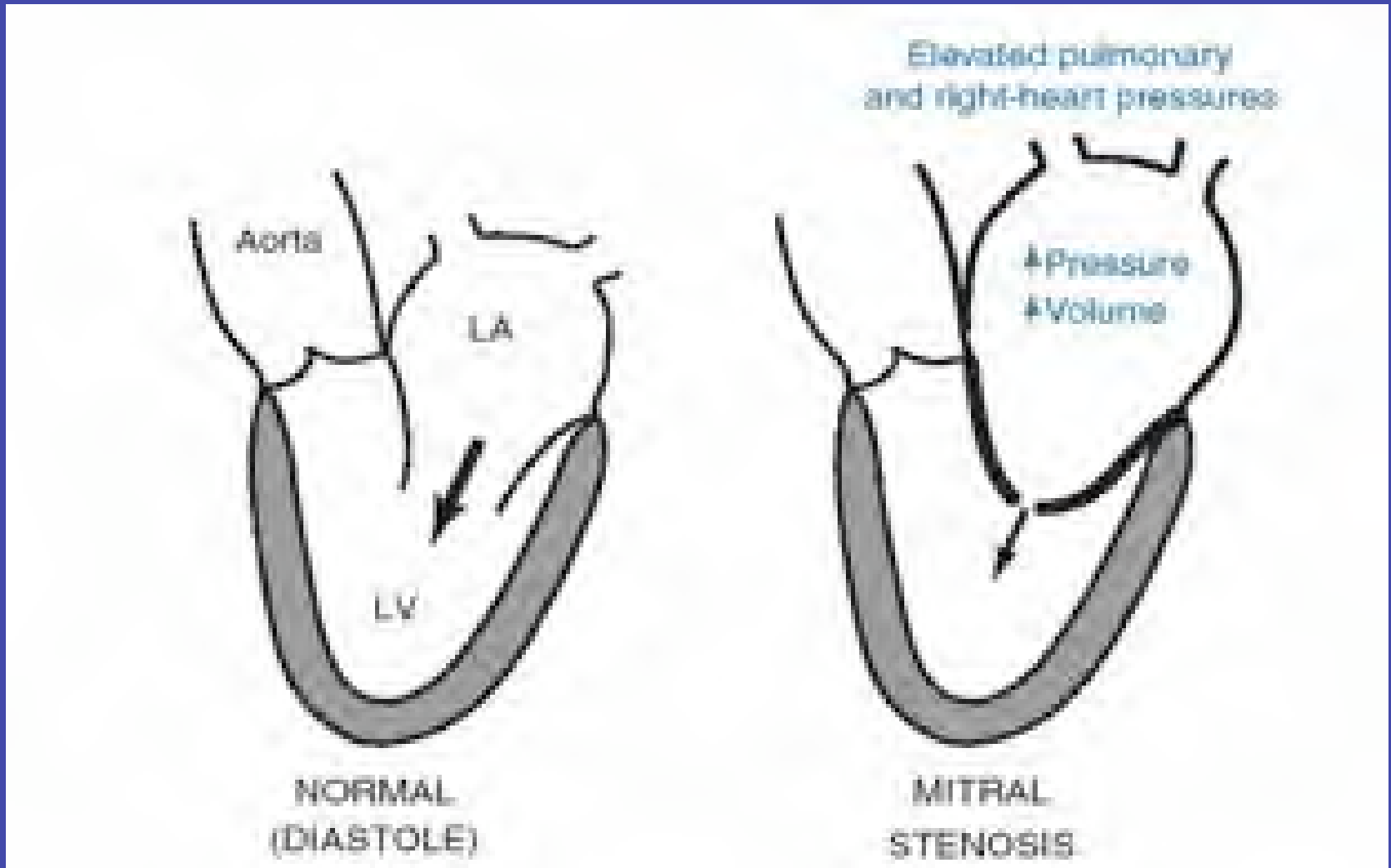
Mitral leaflets:

- Large anterior is contiguous to aorta
- Smaller posterior is contiguous to left atrial endocardium
- Normal area: 4-5cm²

Mitral Stenosis: Pathophysiology

- Fundamental problem: Inability to get blood from left atrium → left ventricle
- Stenotic process:
 - Scarring and fibrosis of leaflets and chordae tendineae
 - Commissural fusion
 - Leads to funnel-shaped orifice and pressure gradient across valve

Mitral Stenosis: Pathophysiology



Mitral Stenosis: Pathophysiology

- Consequences of ↑ left atrial pressure:
 - Left atrial enlargement, blood stasis may lead to atrial thrombus formation and embolism
 - Development of atrial fibrillation
- Consequences of ↑ pulmonary vein pressure
 - Leads to pulmonary artery HTN
 - Then RV hypertrophy and dilation

Mitral Stenosis: Pathophysiology

- Measuring severity: valve area
 - Severe: $\leq 1.0 \text{ cm}^2$
 - Moderate: $1.0\text{-}1.4 \text{ cm}^2$
 - Mild: $1.5\text{-}4.0 \text{ cm}^2$
- Symptoms unusual until area $\leq 1.5 \text{ cm}^2$ but... during unusual flows \uparrow (eg. exercise) or ...tachycardia which \downarrow left atrial filling time... dyspnea may occur
- Symptoms progress as valve narrows

Mitral Stenosis: Clinical Features

History

- Long course before sx onset
- Sx worsen with onset of atrial fibrillation
- Typically asx → then dyspnea with marked effort → then minimal effort → then orthopnea, paroxysmal nocturnal dyspnea

Mitral Stenosis: Clinical Features

History

- Fatigue is common → patient cannot augment cardiac output
- Hemoptysis
- Embolic stroke.... usually when patient is in atrial fibrillation

Mitral Stenosis: Clinical Features

Physical exam:

- Palpation – may be a parasternal lift (RV)
- Auscultation:
 1. Accentuated first heart sound (S_1)
 2. Opening snap → sudden stop in leaflet opening
 3. Diastolic rumble

Higher left atrial P^o , shorter S_2 to OS interval

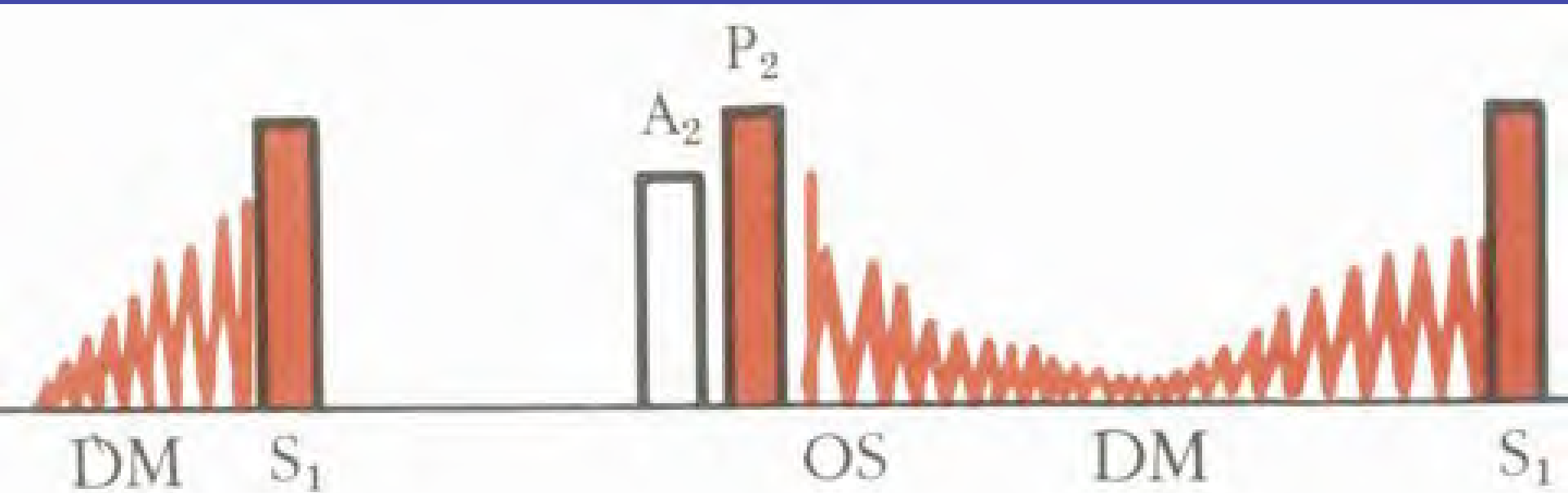
Mitral Stenosis: Clinical Features

Diastolic rumble:

- Low frequency murmur
- Occurs after opening snap (OS)
- Decrescendo contour

Pulmonary Hypertension:

- $\uparrow P_2$ component of S_2



Mitral Stenosis

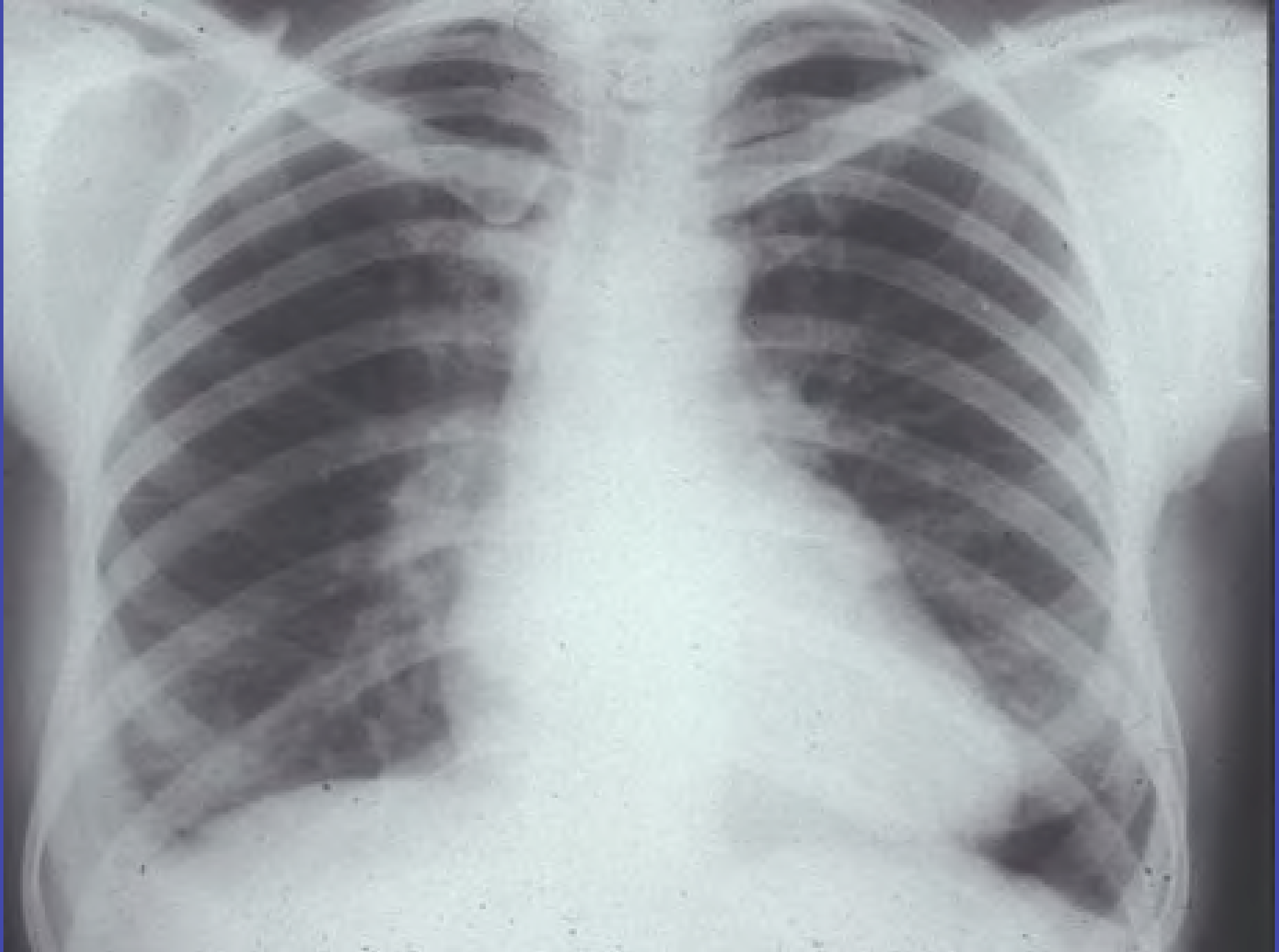
Diagnostic testing

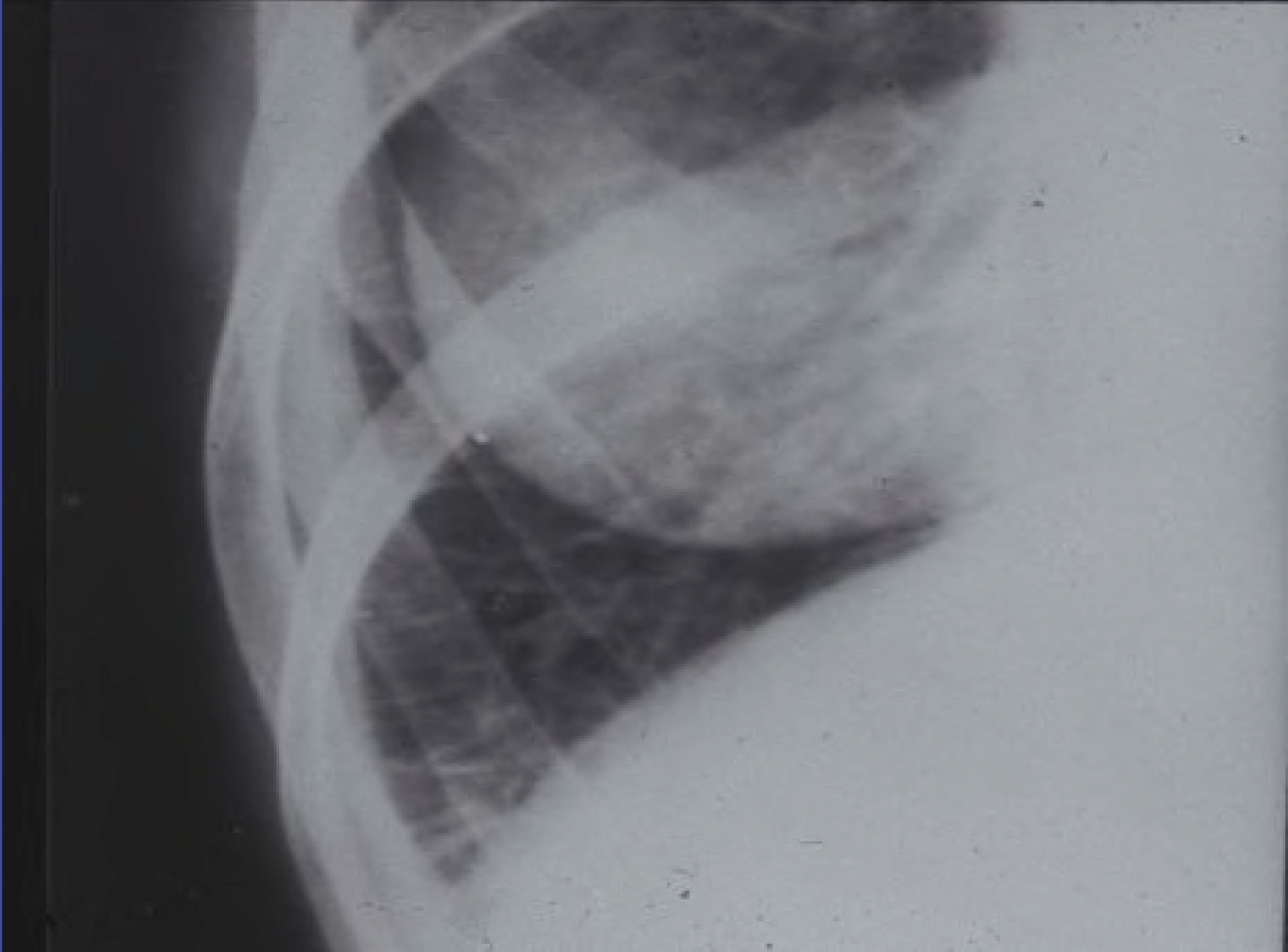
- Chest radiology
- Electrocardiography
- Echocardiography
- Cardiac catheterization

Mitral Stenosis: CXR findings

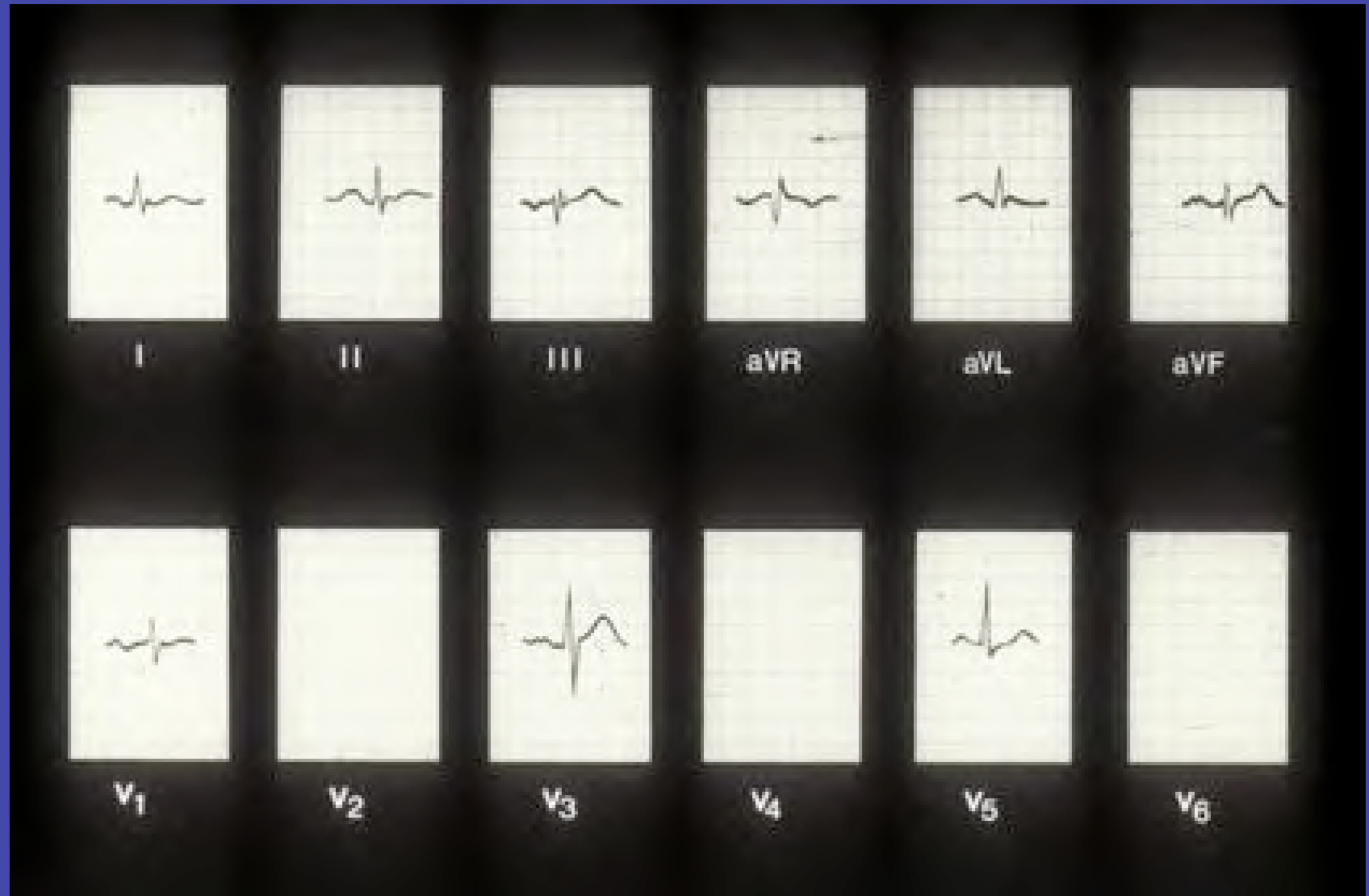
Reflect left atrial HTN

- Double density right cardiac border
- Convexity (LA appendage) just below left PA → 4 bump sign: aorta, pulm artery, atrial appendage, left ventricle
- Elevated left main bronchus
- Kerley lines





Mitral Stenosis: The ECG



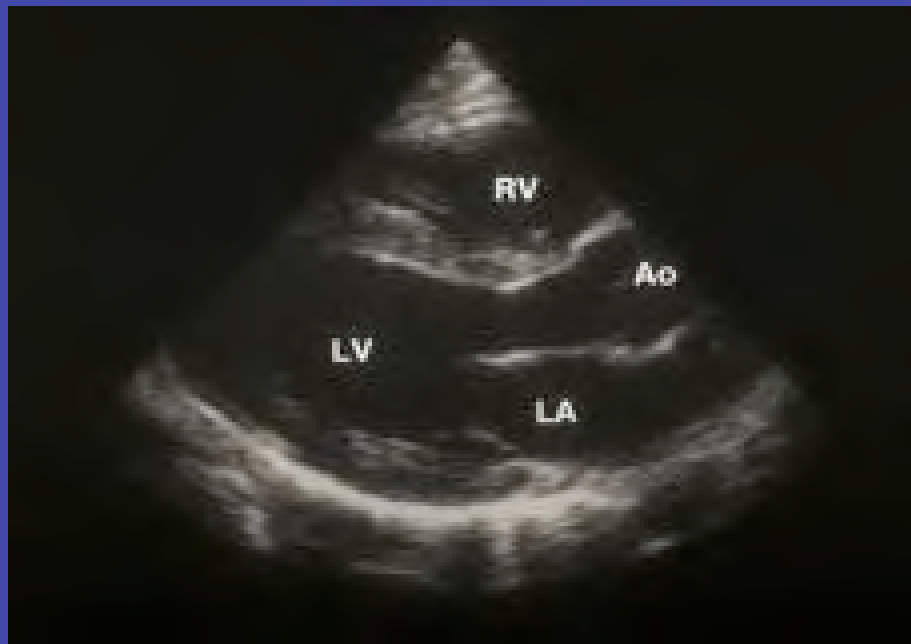
Mitral Stenosis

Diagnostic testing

- Chest radiology
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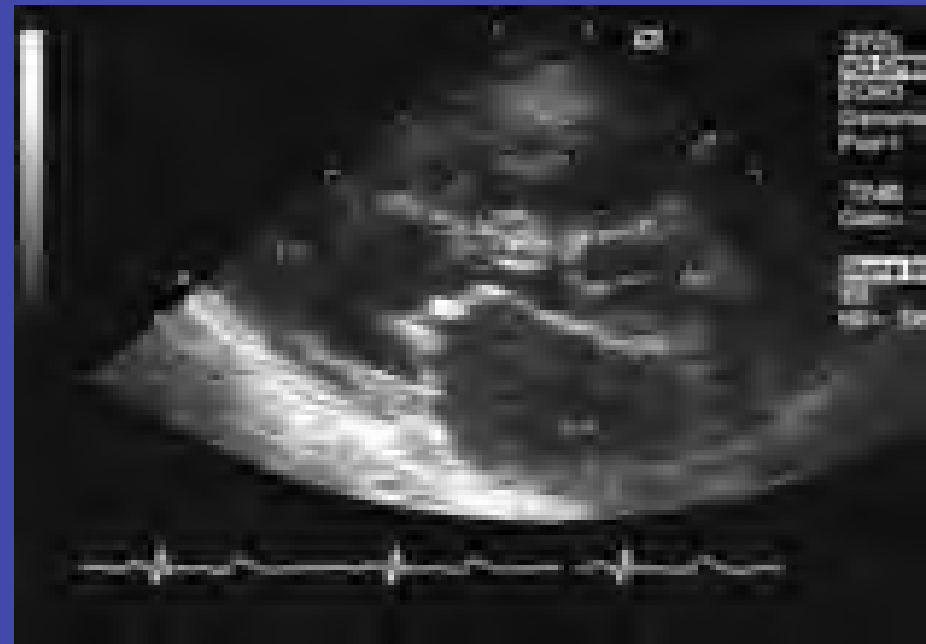
Echocardiography: Parasternal

Normal



PD-INEL Source Undetermined

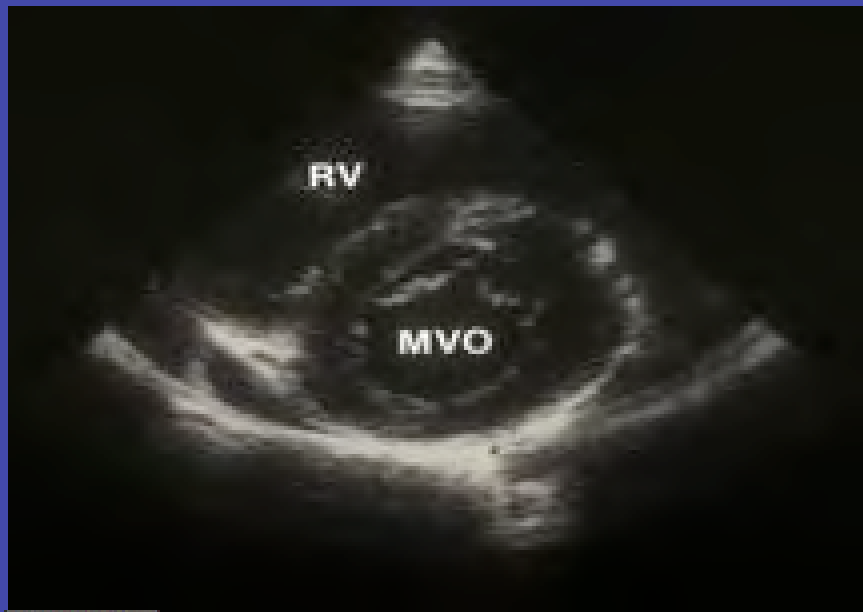
Mitral Stenosis



PD-INEL Source Undetermined

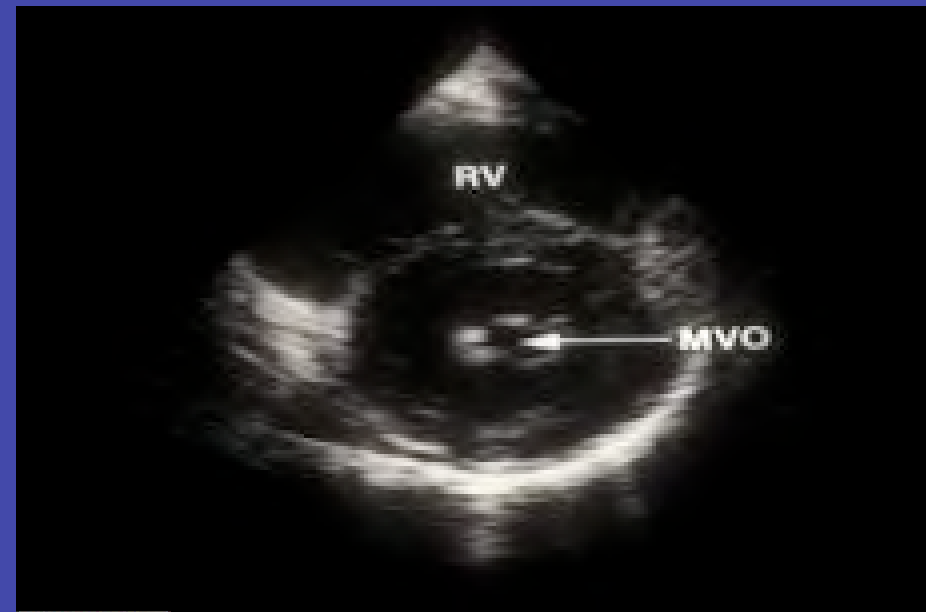
Echocardiography: Short Axis

Normal



PD-INEL Source Undetermined

Mitral Stenosis



PD-INEL Source Undetermined

Mitral Stenosis: Clinical Manifestations and Diagnosis

- Echo: 2D images
 - Increased LA size
 - Doming of valve leaflets
 - Valve stenosis
 - Valve area can be planimetered

Mitral Stenosis: Cardiac Catheterization

- Not required to establish dx in young patients – echo is sufficient
- Cath may be needed if:
 - Sx disproportionate to objective evidence
 - Other forms of heart disease suspected... eg. CAD
 - Mitral regurgitation of uncertain degree

Mitral Stenosis

Differential Diagnosis

- Atrial myxoma
- Cor triatriatum
- Congenital mitral stenosis

Mitral Stenosis: Management

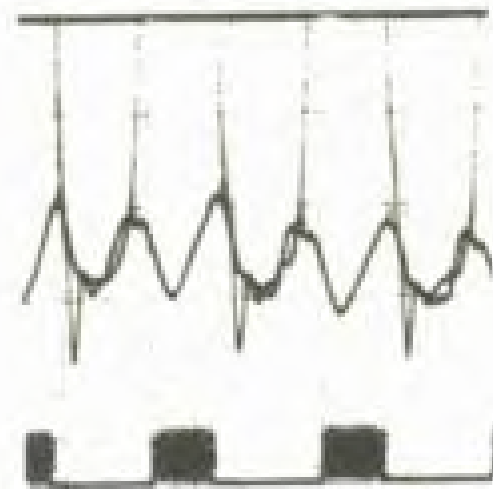
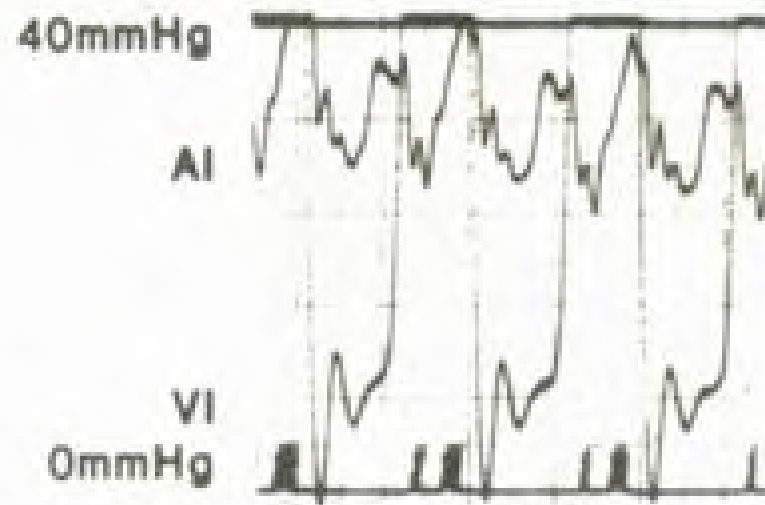
Medical

- 2° prevention: penicillin → years
- Rate control for atrial fibrillation:
beta-blockade, digoxin
- Anticoagulation
- Diuretics and rate control for congestion

Mitral Stenosis

Mechanical Relief

- Closed surgical commissurotomy
- Open surgical commissurotomy
- Valve replacement
- Balloon mitral commissurotomy





Mitral Regurgitation