

# Aortic Regurgitation

# Aortic Regurgitation: Etiology

## Abnormalities of valve leaflets

- Rheumatic
- Endocarditis
- Bicuspid valve

## Dilatation of aortic root

- Aortic aneurysm/dissection
- Annulo-aortic ectasia
- Marfan syndrome
- Syphilis

# Aortic Valve Regurgitation: Pathophysiology

## Normal Valve Function:

- Total cusp area > aortic root area by 1.8 x
- Allows leaflets to overlap/abut
- Helps prevent prolapse in diastole

## Impact of Diseases:

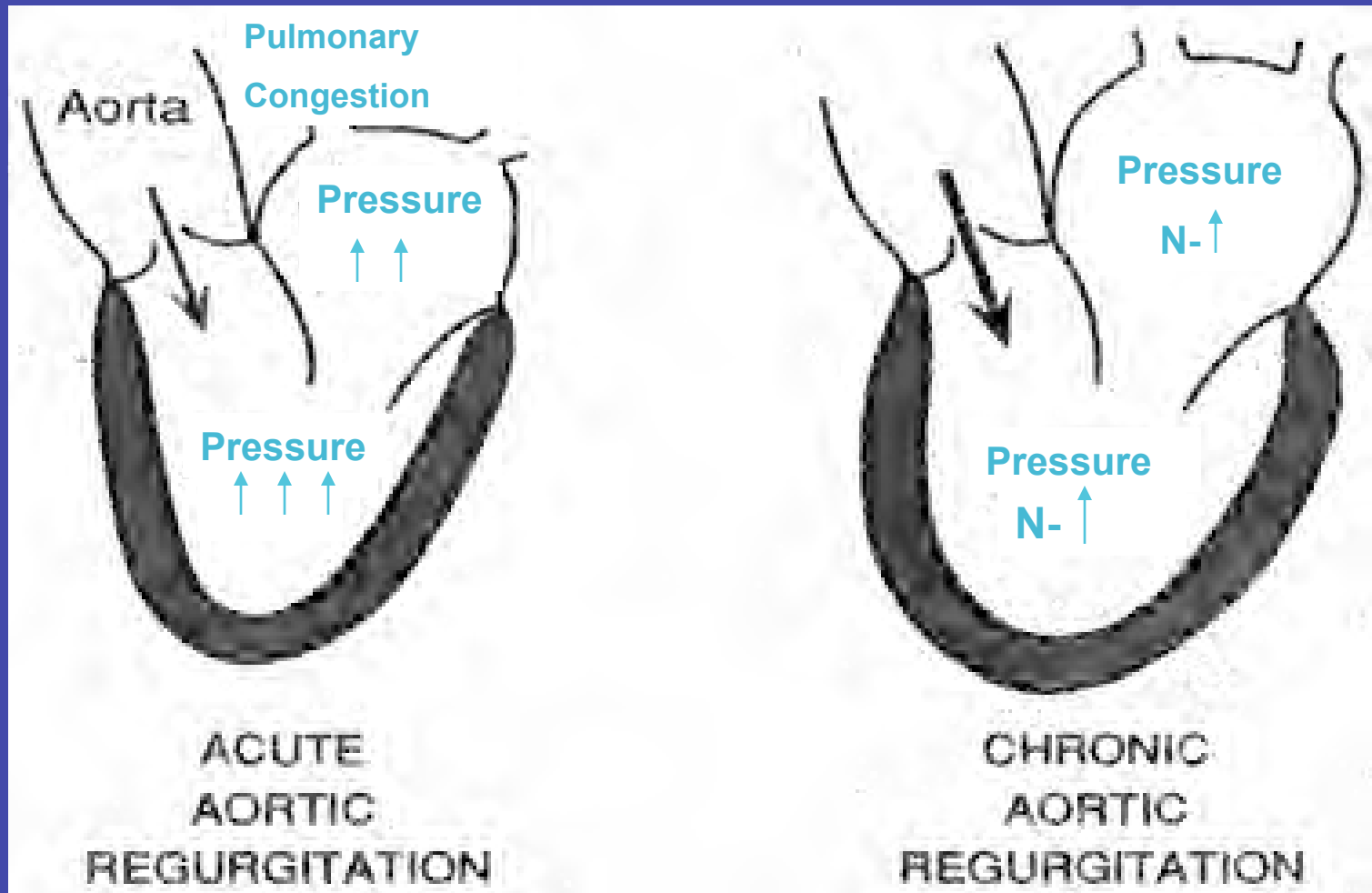
- Rheumatic: ↓ Cusp area → central defect
- Endocarditis: Destroys cusp by tears
- Aortic root: Dilation → central defect

# Aortic Valve Regurgitation: Pathophysiology

## Dominant Hemodynamics: LV volume overload

- Critical determinant of severity - area of regurgitant orifice area
- End diastolic volume increases & stroke volume increases
- Dilation and hypertrophy of LV
- Diastolic burden reaches critical point → leading to heart failure
- Low diastolic blood pressure: incomp. valve and vasodilation

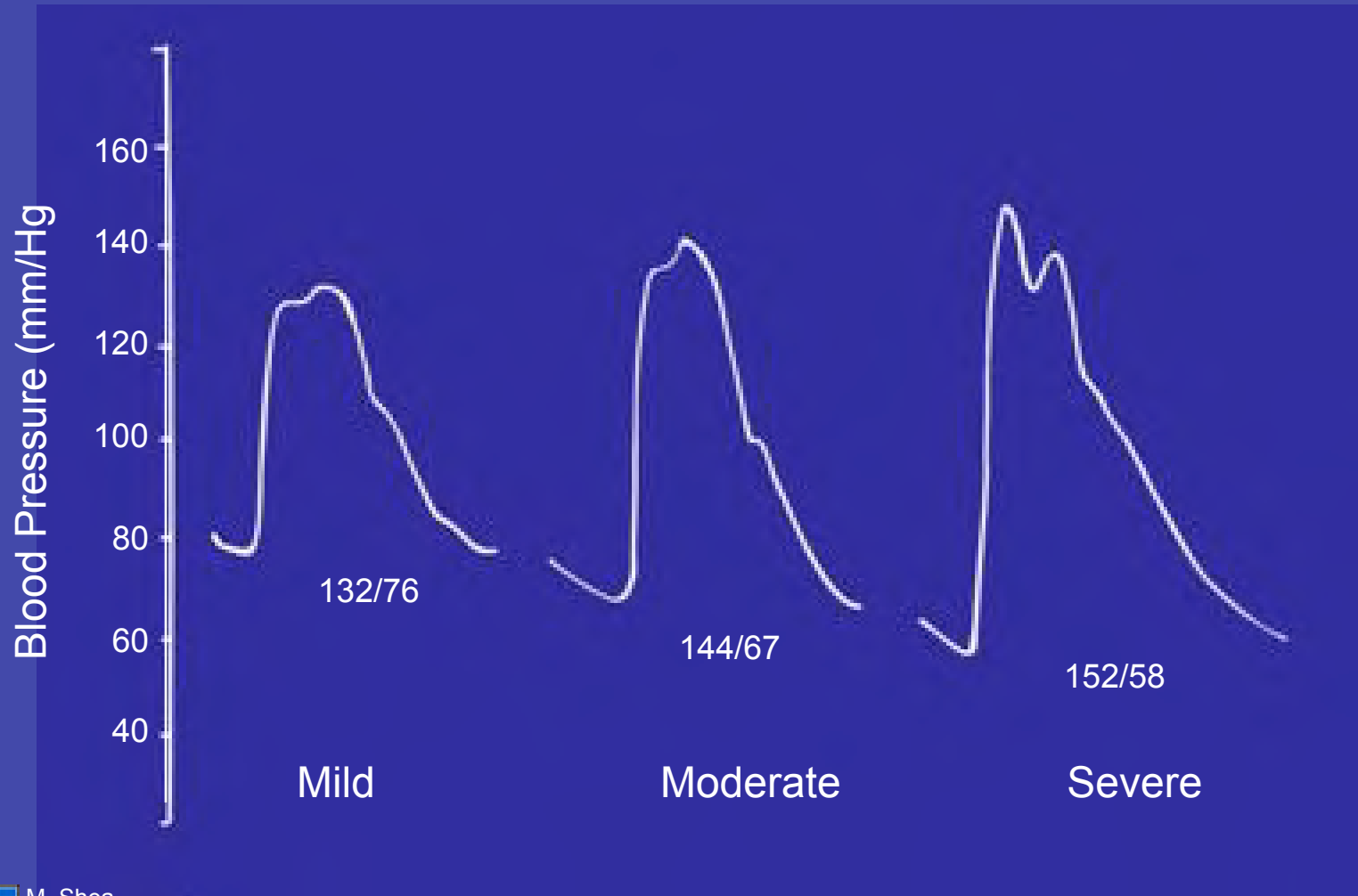
# Aortic Valve Regurgitation: Pathophysiology - Acute vs. Chronic



# Aortic Regurgitation: Clinical Features

- Long course
- Palpitations
- Dyspnea
- Fatigue
- Angina pectoris

# The Arterial Pulse and Blood Pressures in Aortic Regurgitation



# Carotid Pulse



PD-INEL Source Undetermined



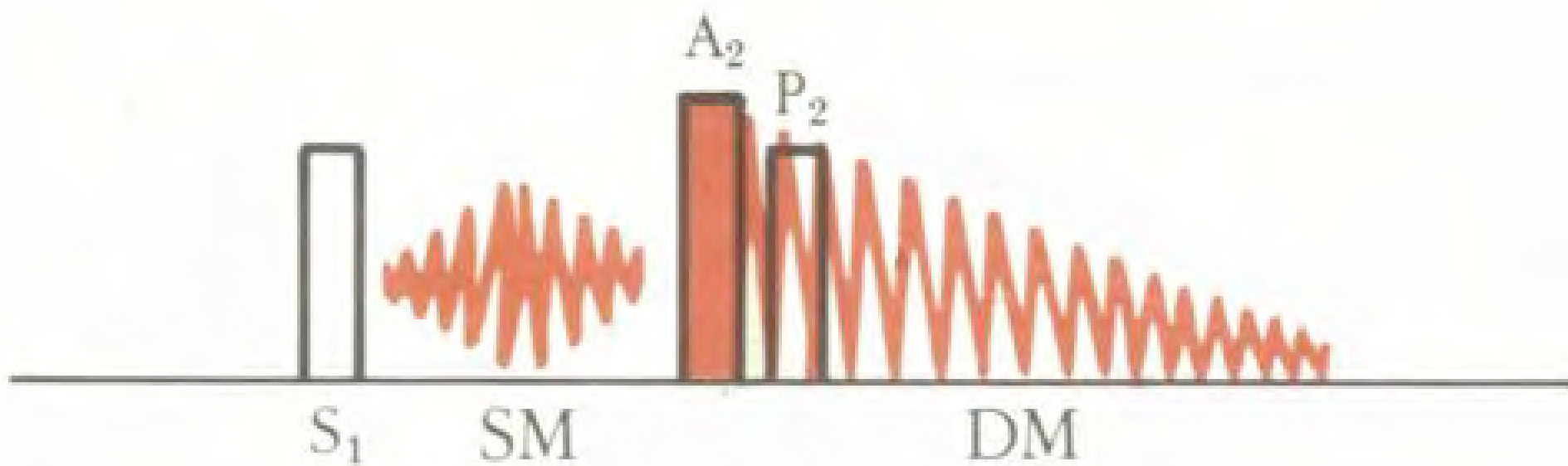
PD-INEL Source Undetermined

Hyperkinetic pulse



# Aortic Valve Regurgitation: Physical Examination

- LV apex impulse: displaced laterally, downward, dynamic, enlarged
- Systolic murmur: may or may not imply valve stenosis...rapid ejection of stroke volume across aortic valve
- Diastolic murmur: decrescendo murmur; valvular AR - louder LUSB. Aortic root disease - louder RUSB



# Aortic Regurgitation

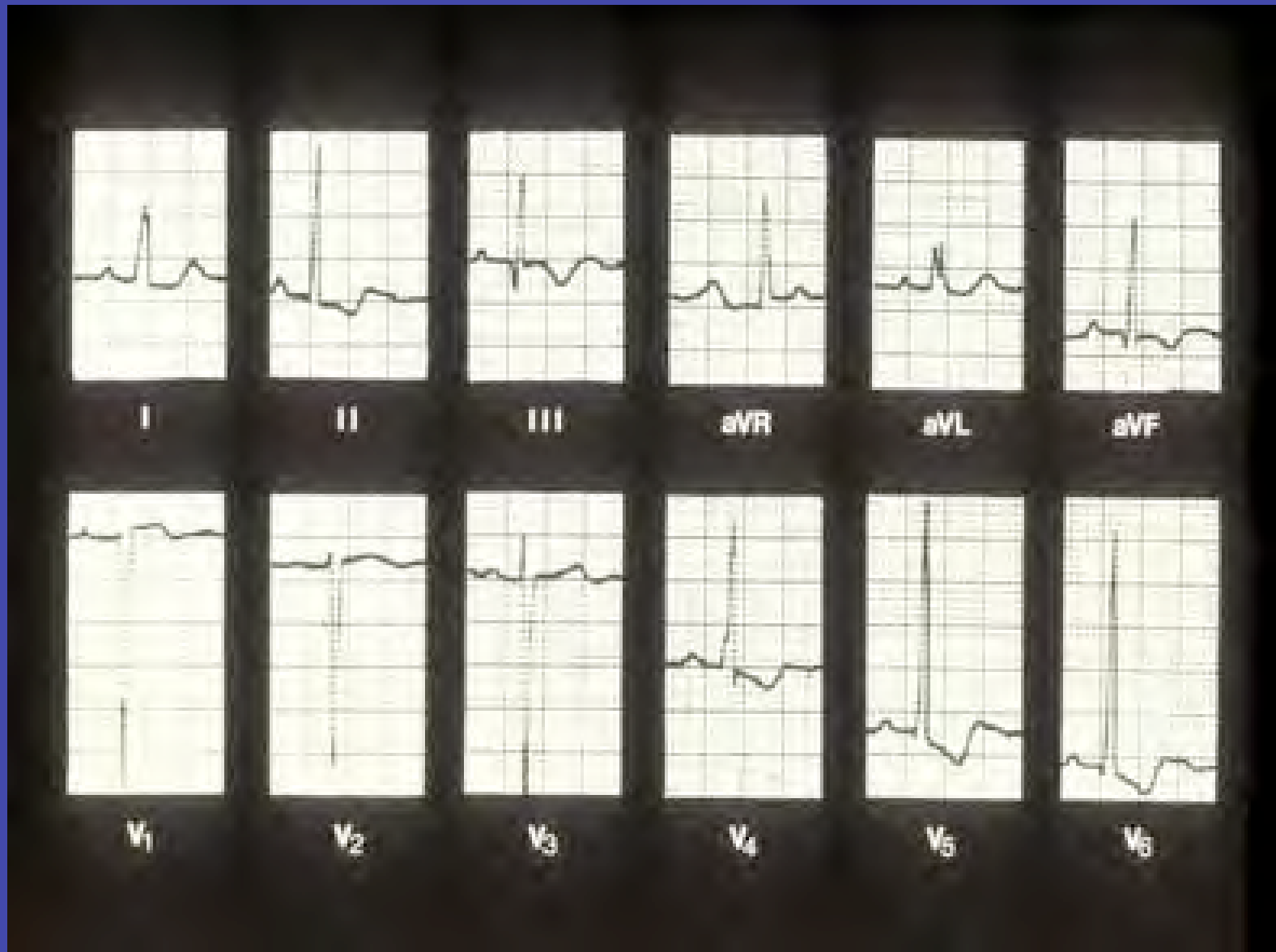
## Laboratory Evaluation

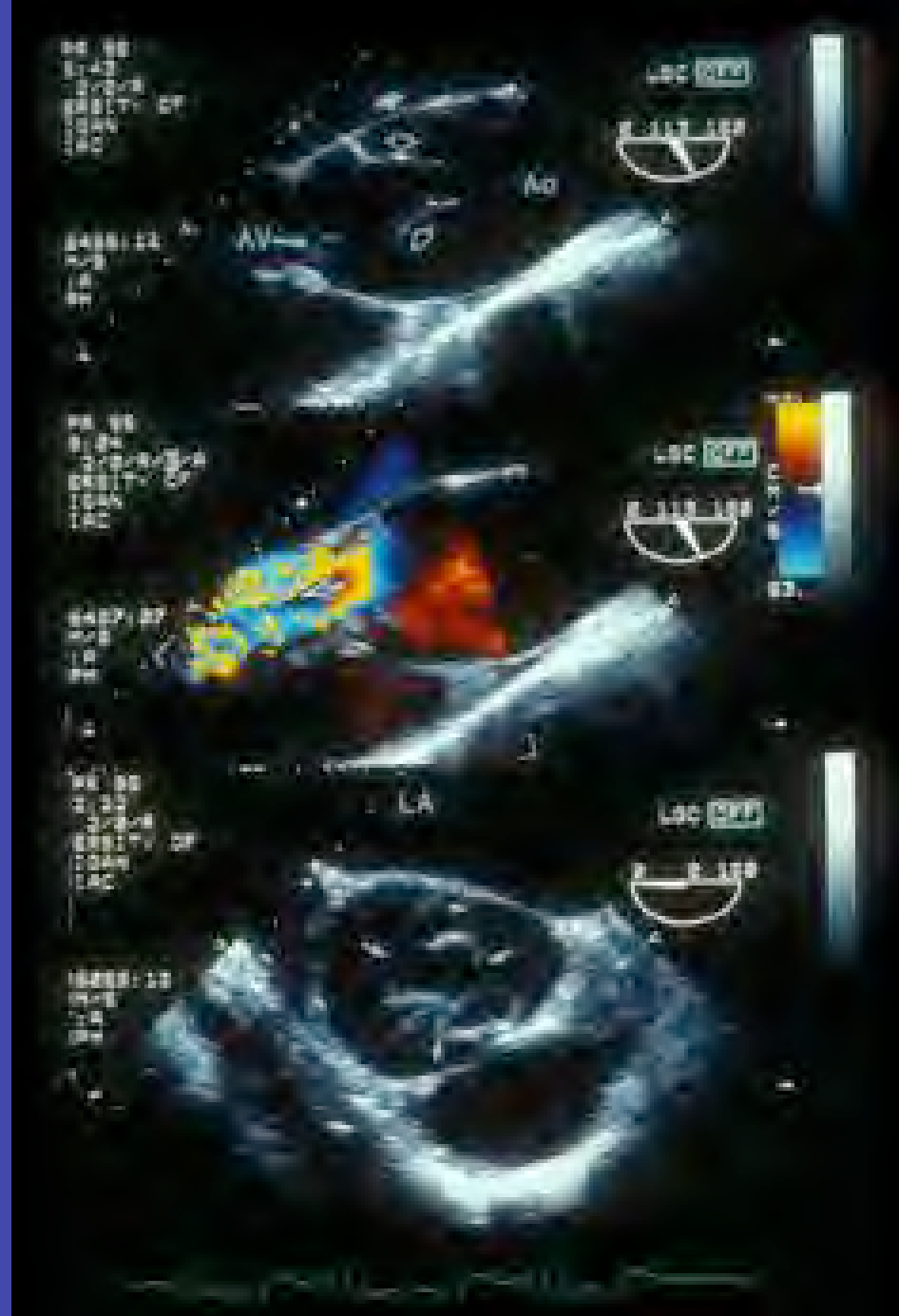
- Chest radiology
- Electrocardiography
- Echocardiography
- Exercise testing
- Cardiac catheterization

# Aortic Regurgitation: Chest X-ray



# The Electrocardiogram





# Aortic Regurgitation

## Laboratory Evaluation

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# Aortic Regurgitation: Differential Diagnosis

- Mitral stenosis
- Pulmonic regurgitation
- Patent ductus arteriosus



# Aortic Regurgitation

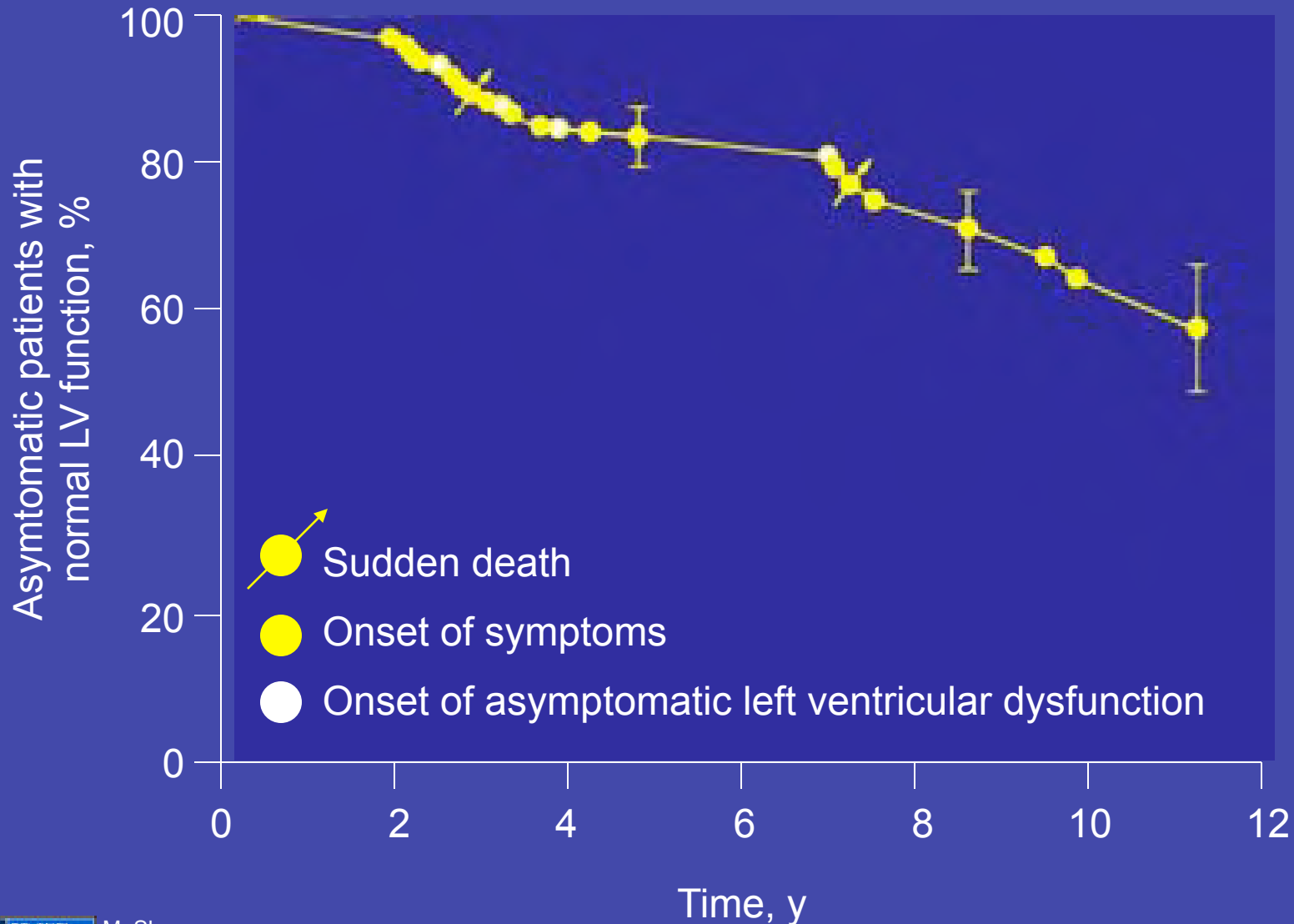
## Management

# Aortic Regurgitation: Management

## Medical Therapy

- Noninvasive follow-up

# Severe Aortic Regurgitation: The Asymptomatic Patient



# Aortic Regurgitation: Management

## Surgical Therapy

- Aortic valve
  - Repair
  - Replacement
- Aortic root replacement