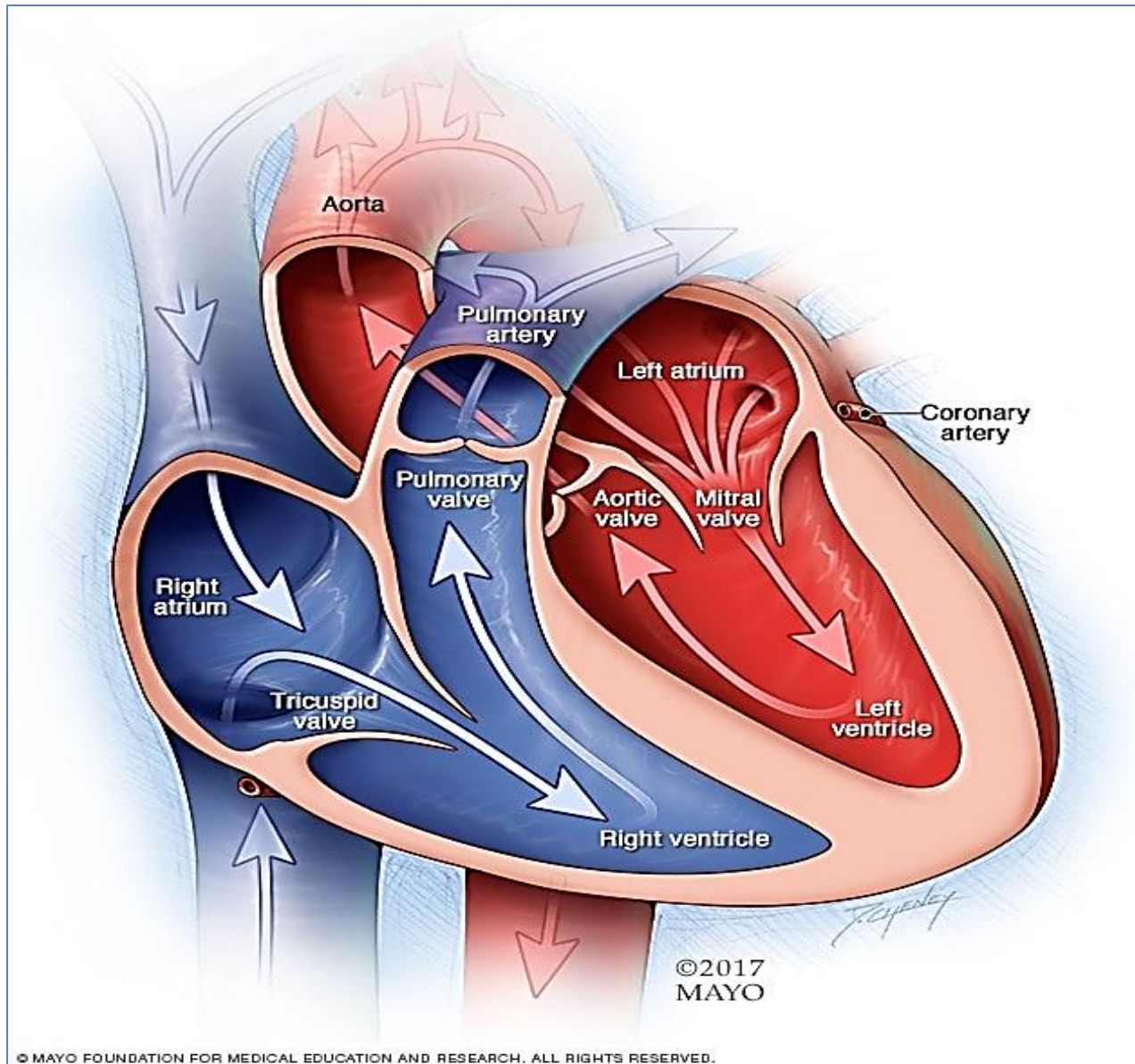


# Valvular Heart Disease - 1

**Dr. Nisreen Abu Shahin**  
**Associate Professor of Pathology**  
**Pathology Department**  
**University of Jordan**

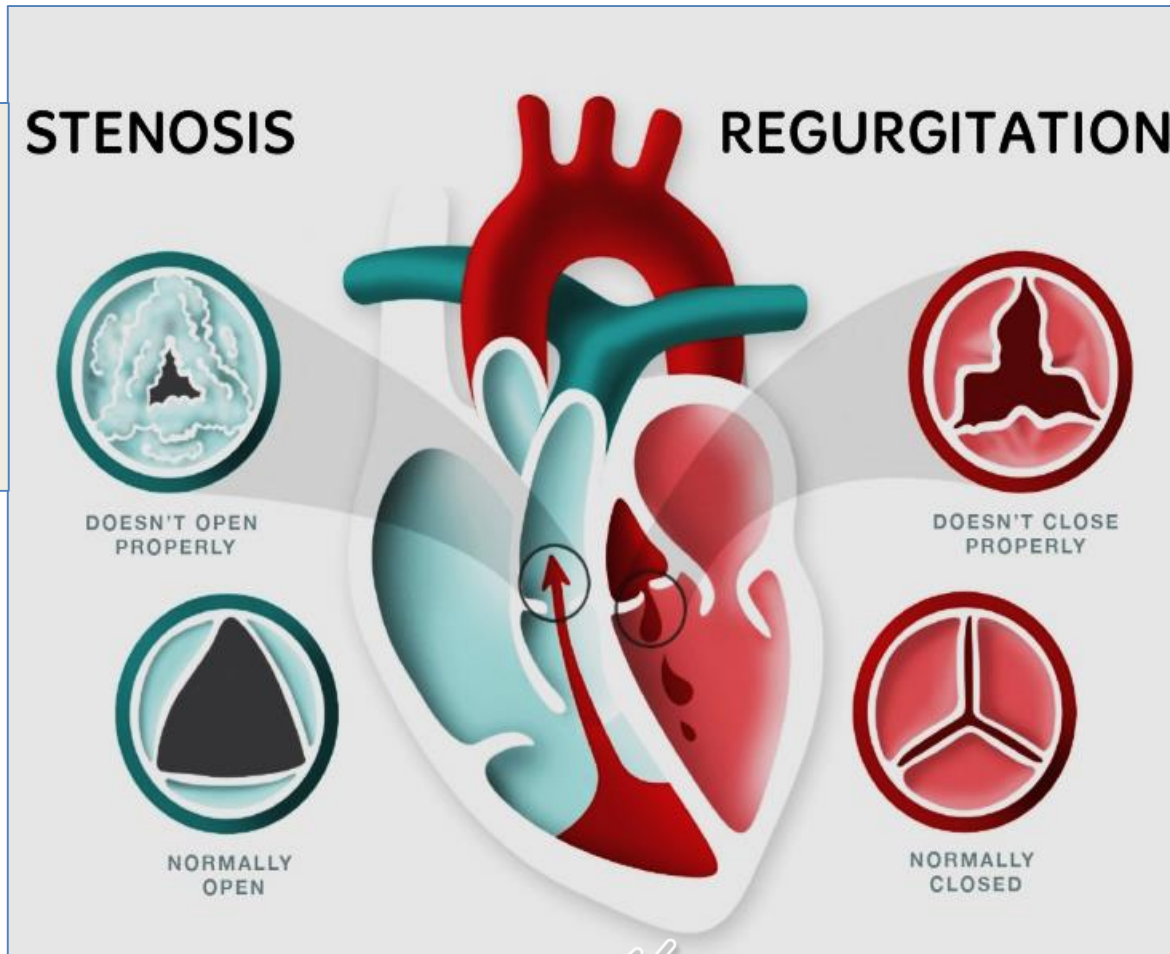


# Normal Heart Valves



# VALVULAR HEART DISEASE

Due to a **chronic** process (e.g. calcification or scarring)



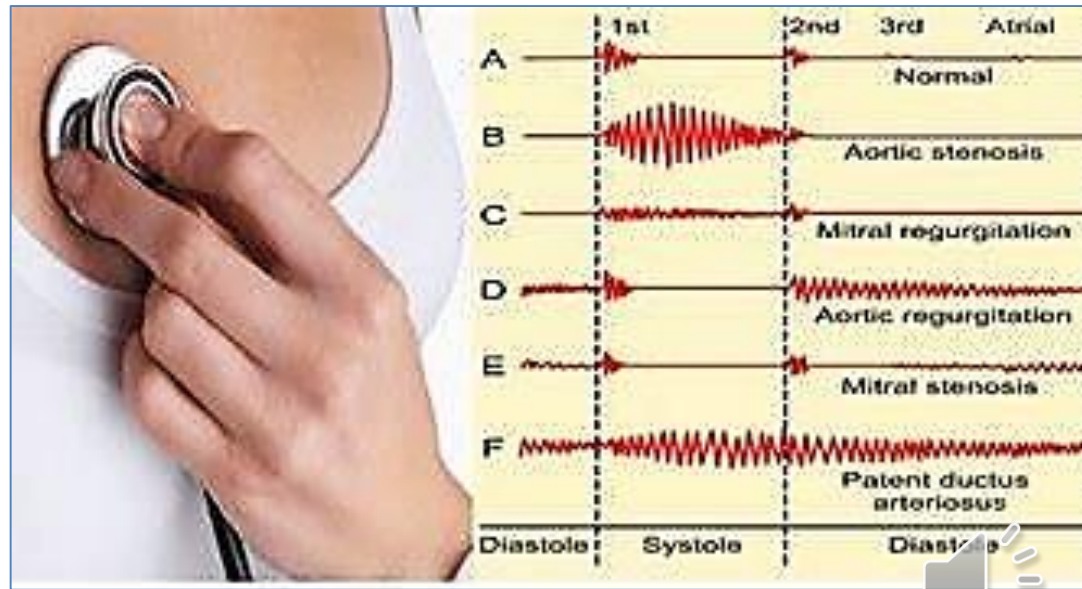
Abnormality:  
1- valve cusps  
2- supporting structures (e.g. mitral annulus, tendinous cords, papillary muscles)

It can be either **acute** (e.g. **chordal rupture**) or **chronic** (e.g. **scarring**)



# Clinical **Signs** of Valve Disease

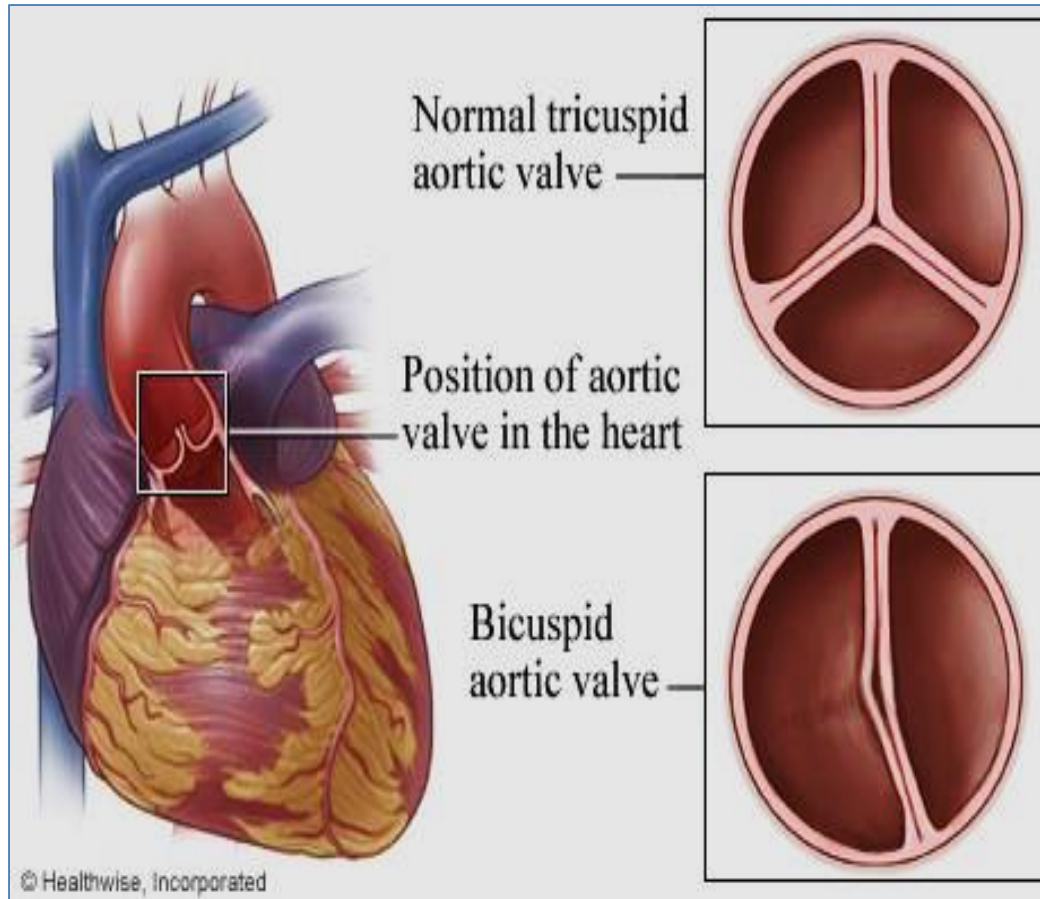
- Abnormal heart sounds (*murmurs*)
- Palpated heart sounds (*thrills*)
- Specific clinical signs according to involved valve



- Valvular abnormalities can be congenital or acquired
- The most common congenital valve lesion is *bicuspid aortic valve*
- Most important cause of acquired valve disease is *rheumatic fever*



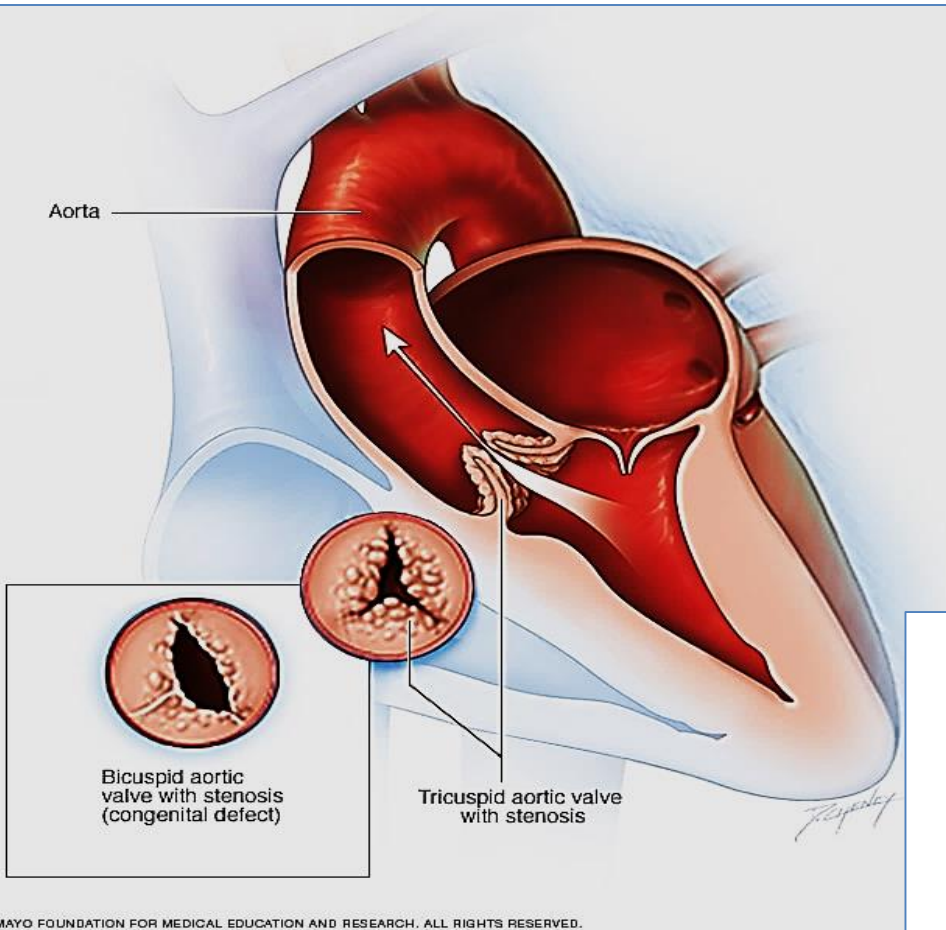
# Bicuspid Aortic Valve



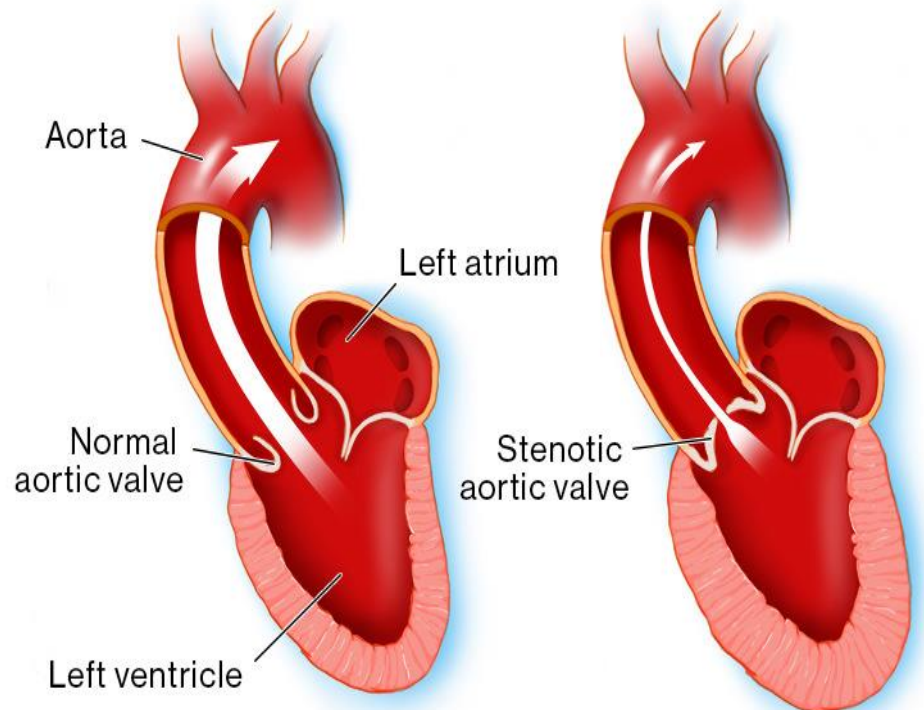
- only 2 functional cusps instead of 3
- 1% - 2% of live births
- Isolated or associated with genetic mutations
- early life → Asymptomatic
- Later → early & progressive degenerative calcification of aortic valve



# Aortic Valve Stenosis



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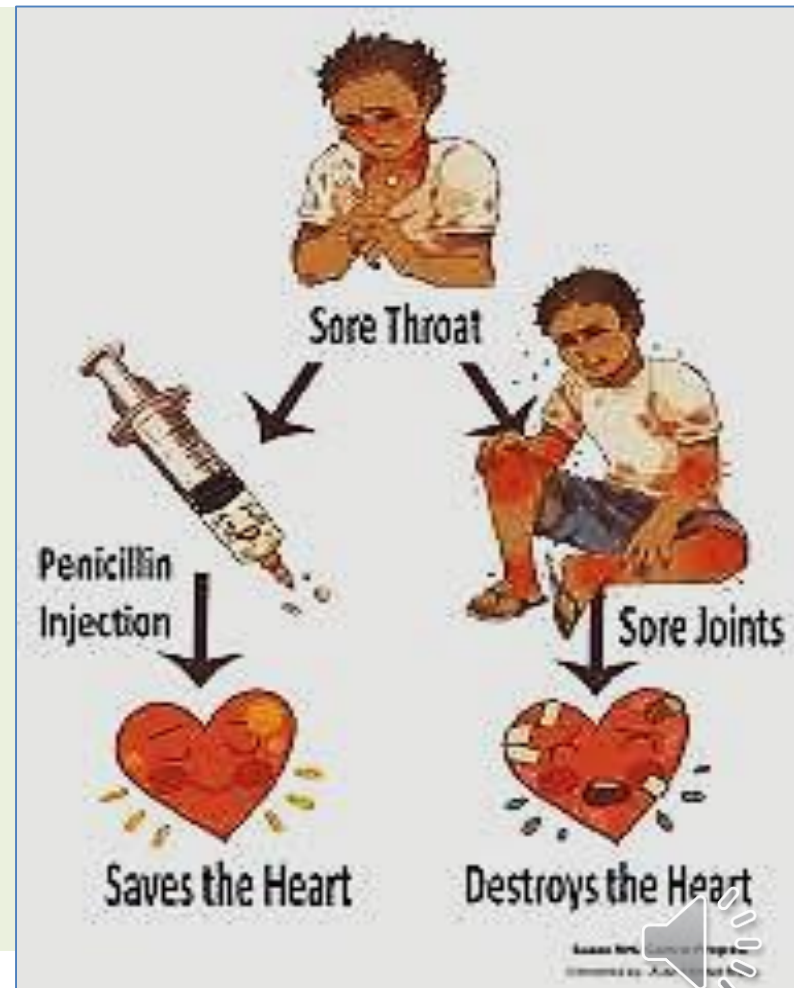
- Acquired Valve Diseases
- **Mitral valve** most common target of acquired valve diseases
- Most common cause of acquired valvular diseases is **post-inflammatory scarring** due to **rheumatic fever** (2/3)



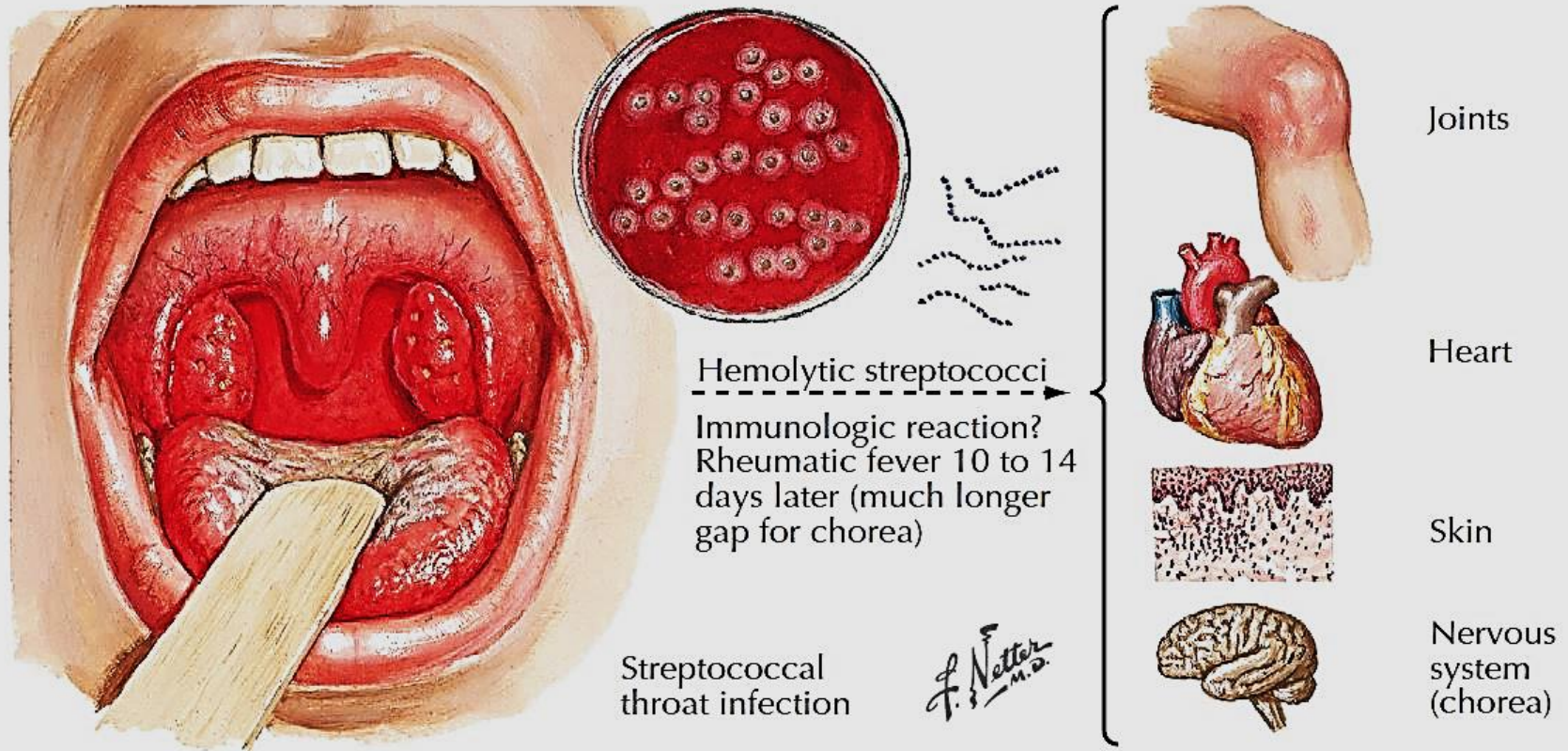


# Rheumatic fever (Rheumatic Valve Disease)

- Immune- mediated inflammatory disease that follows infection by **group A streptococci**
- Incidence ↓ in Western world (improved socioeconomics, rapid diagnosis, and Rx of strept. pharyngitis)
- Still, important public health problem in developing countries



# Rheumatic Fever



## PATHOGENESIS:

hypersensitivity reaction due to **antibodies** against group A streptococcal antigens

These antibodies are cross-reactive with **host antigens** (heart; brain; joints; skin)



# Rheumatic Fever

- Manifestations seen a few weeks after pharyngitis or skin infection
- Major organs involved: heart; joints; skin; and brain
- 2 phases:
  - **Acute**: fever; arthritis; CNS symptoms; carditis
  - **Chronic**: cardiac valve disease
  - .....
- **Acute phase**:
  - 80% children
  - fever; migratory polyarthritis; **carditis**
  - Carditis (**arrhythmias; myocarditis; cardiac dilation; functional mitral insufficiency and CHF**).
  - ↑ serum titers streptococcal antigens (streptolysin O; DNA-ase)
  - **culture for streptococci is (-) at time of symptom onset**



# Acute Rheumatic Fever- JONES criteria

## Signs & Symptoms

Joints (arthritis)

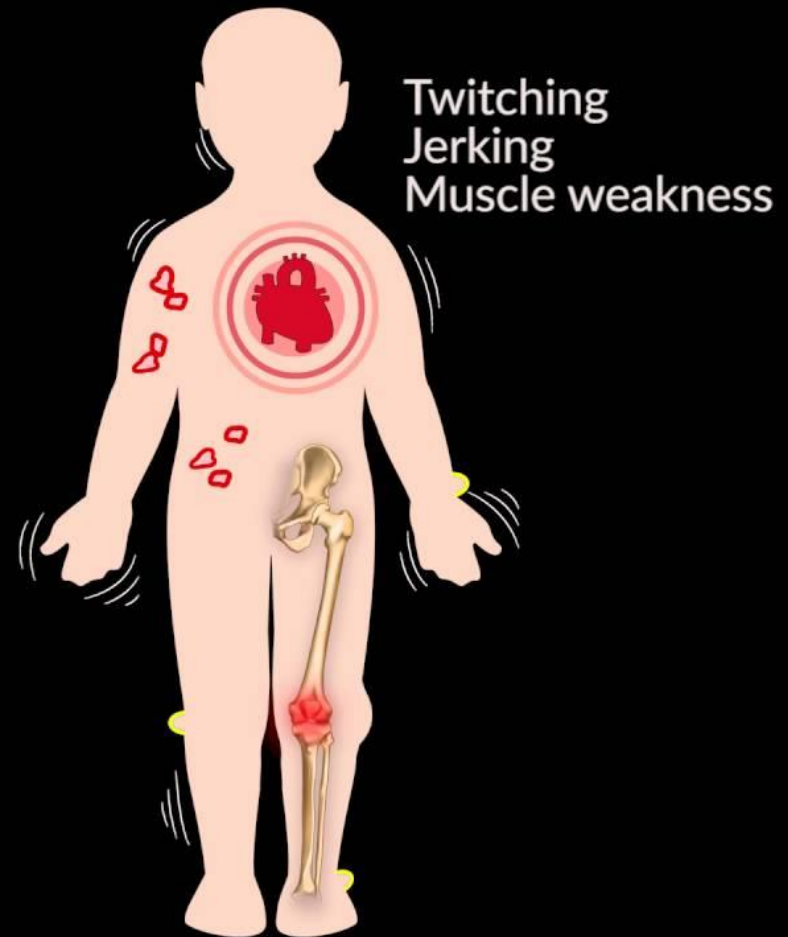
♥ Carditis

Nodules (subcutaneous)

Erythema marginatum

Sydenham's chorea

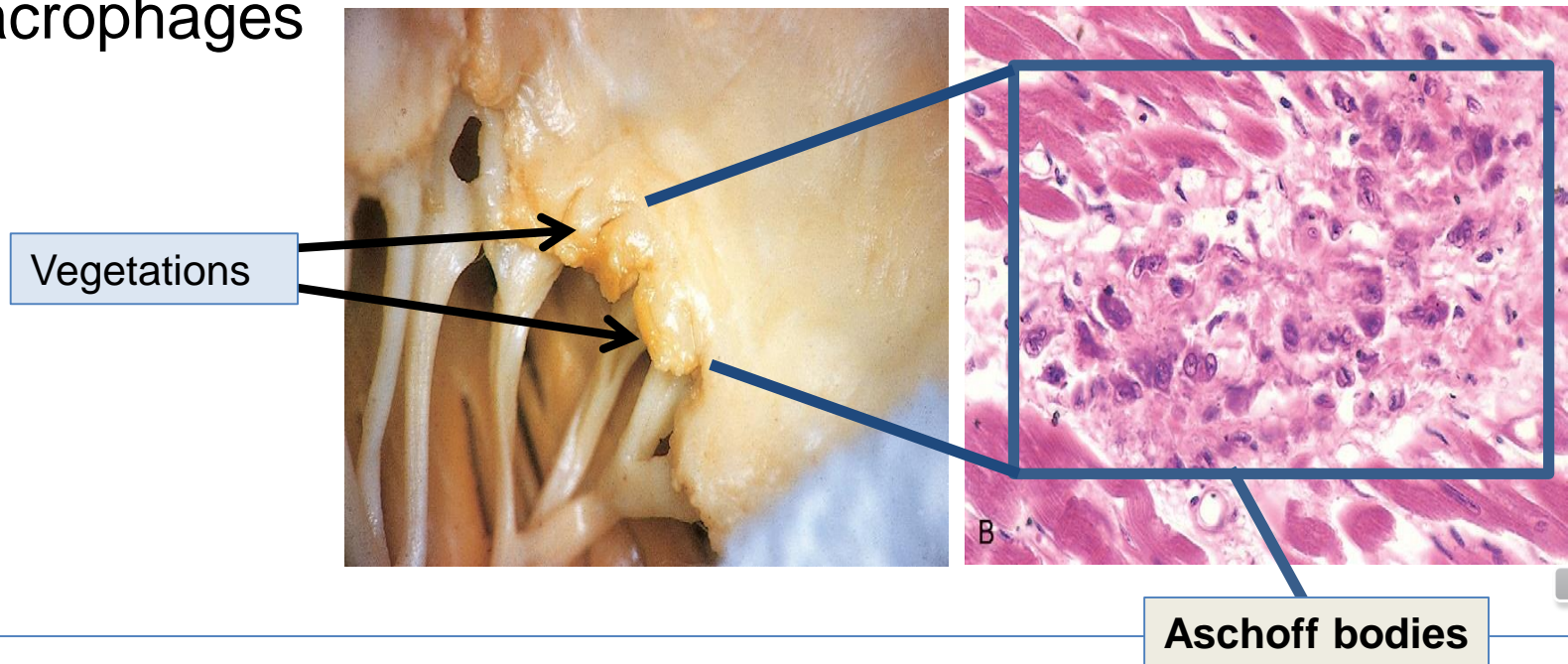
- can present 3-4 months after GAS infection
- mean duration: 12-15 weeks
- episodes may last 6-12 months



# Carditis

## Morphology- Acute Phase

- Valve vegetations
- (**Aschoff bodies**)
  - inflammatory lesions in affected tissues
  - *pathognomonic (diagnostic)* for RF
  - collections of T lymphocytes+ plasma cells+ activated macrophages



# Diagnosis of Acute Rheumatic Fever

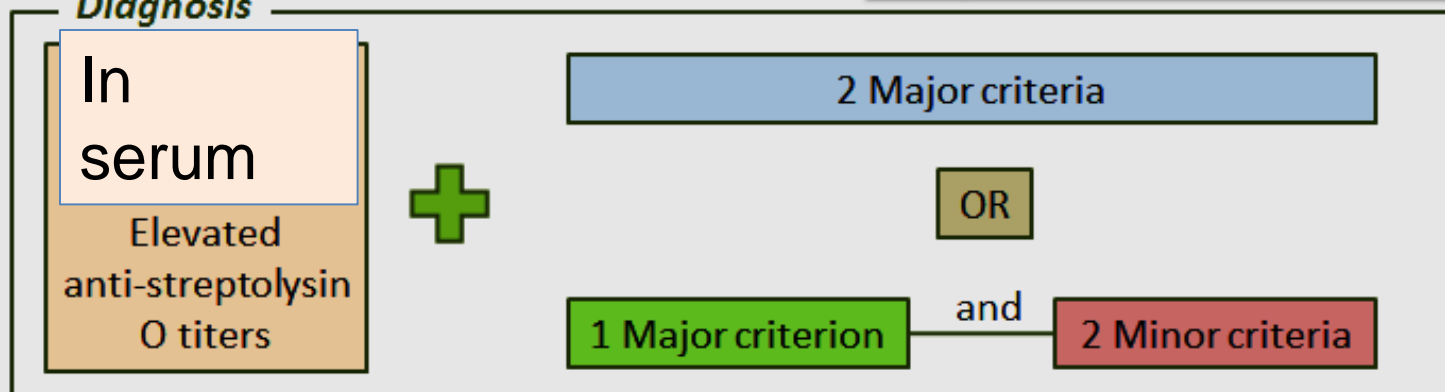
## Major Criteria

J	Joint Involvement
O	O looks like a heart = myocarditis
N	Nodules, subcutaneous
E	Erythema marginatum
S	Sydenham chorea

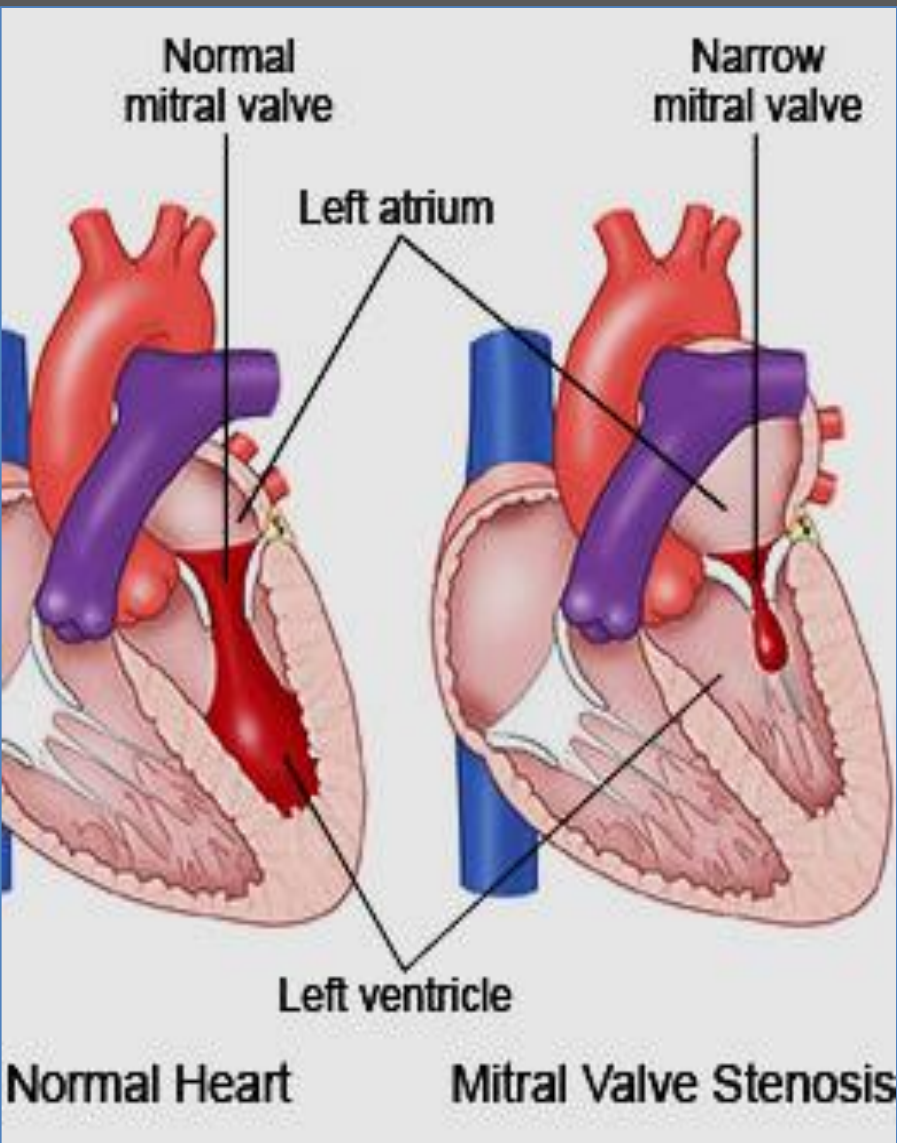
## Minor Criteria

C	CRP Increased
A	Arthralgia
F	Fever
E	Elevated ESR
P	Prolonged PR Interval
A	Anamnesis of Rheumatism
L	Leukocytosis

### *Diagnosis*



# Chronic Rheumatic Carditis- Clinical Picture



**Onset:** years/ decades after initial acute episode

**Chronic inflammation** → **scarring** → **stenosis**

murmurs - CHF - arrhythmias - mural thrombi

Prognosis: variable.

Management: Surgical repair or replacement of diseased valve



# Chronic Phase - Morphology

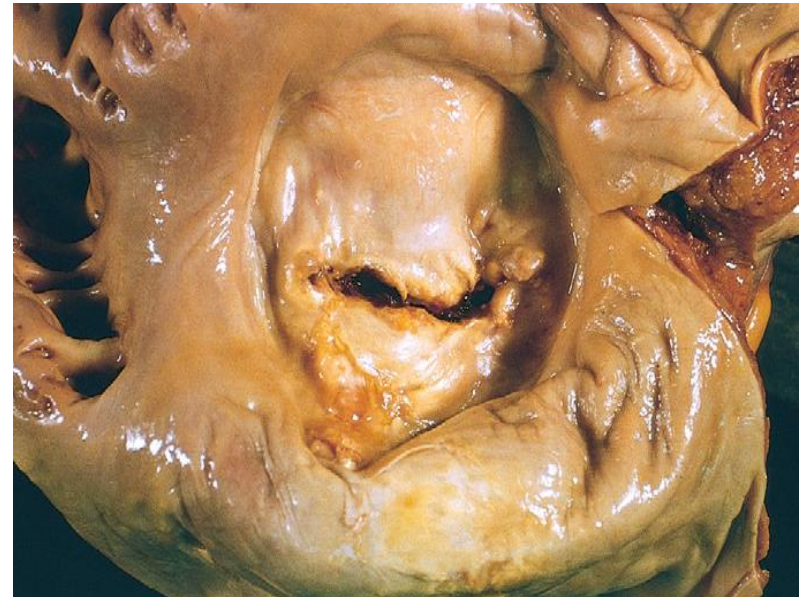
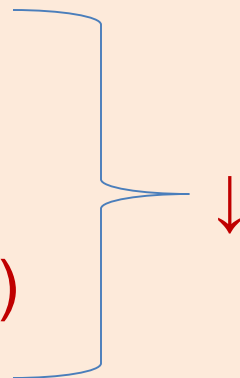
- Inflammation is followed by **scarring**
- Aschoff bodies **rarely** seen now
- **Valve stenosis** (most imp. functional consequence)

**mitral** valve (m/c)

aortic disease

tricuspid valve

**pulmonary** valve (rare)



Scarring and calcifications

