Valvular Heart Disease - 1

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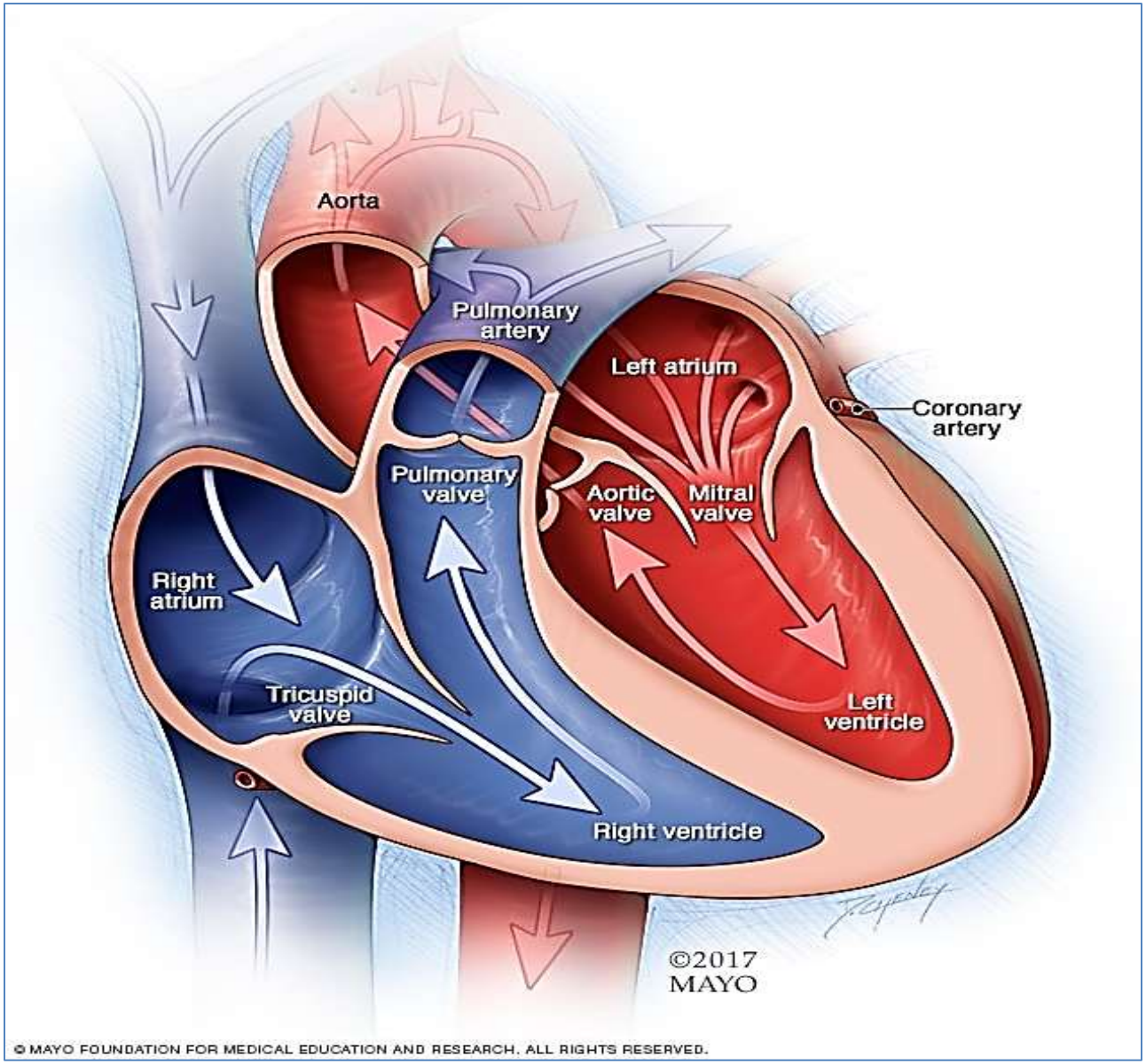
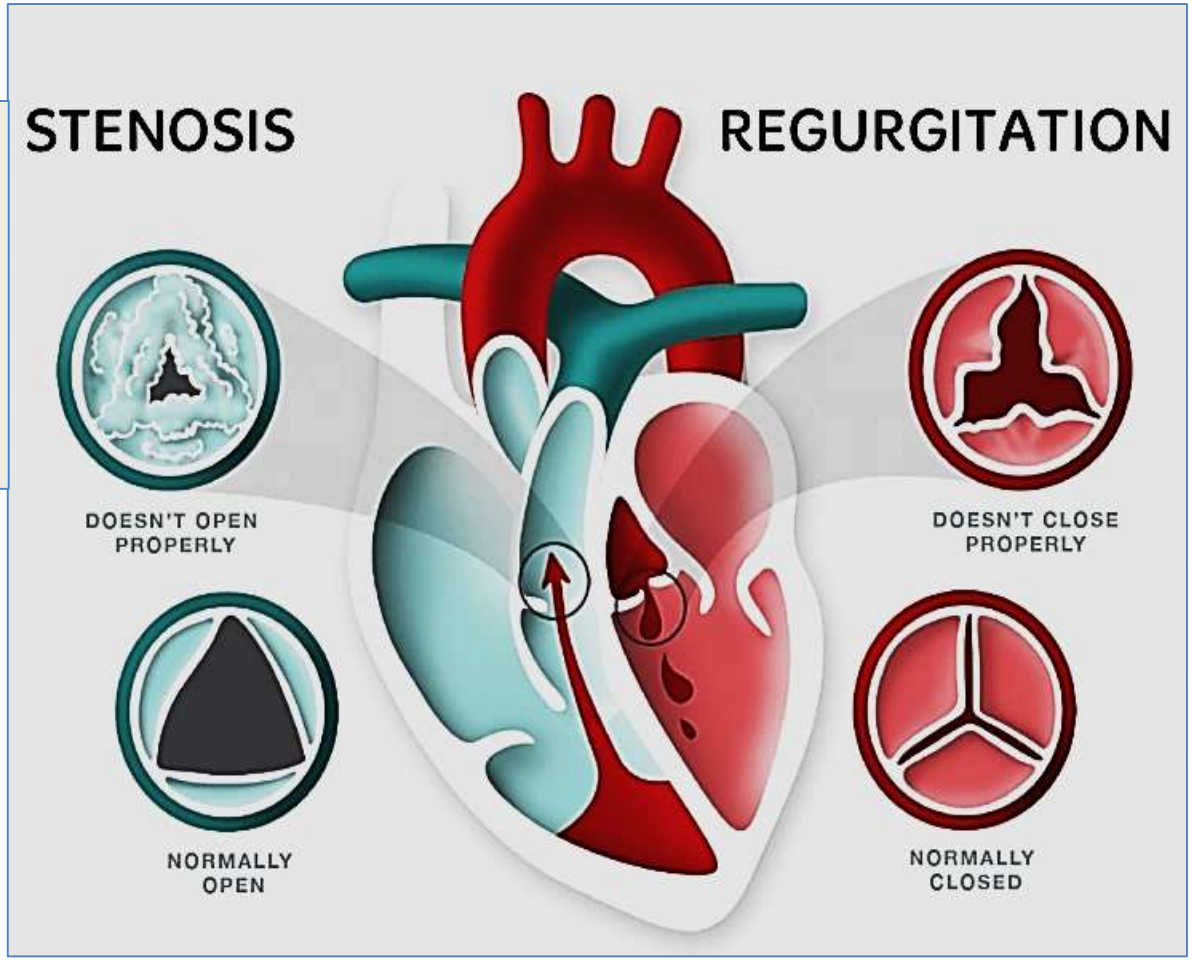
Normal Heart Valves



VALVULAR HEART DISEASE

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

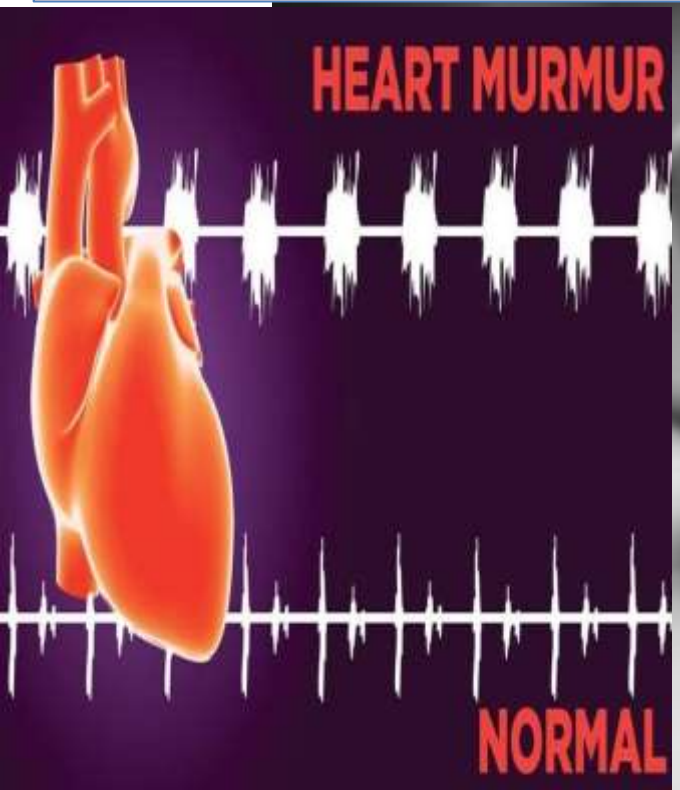


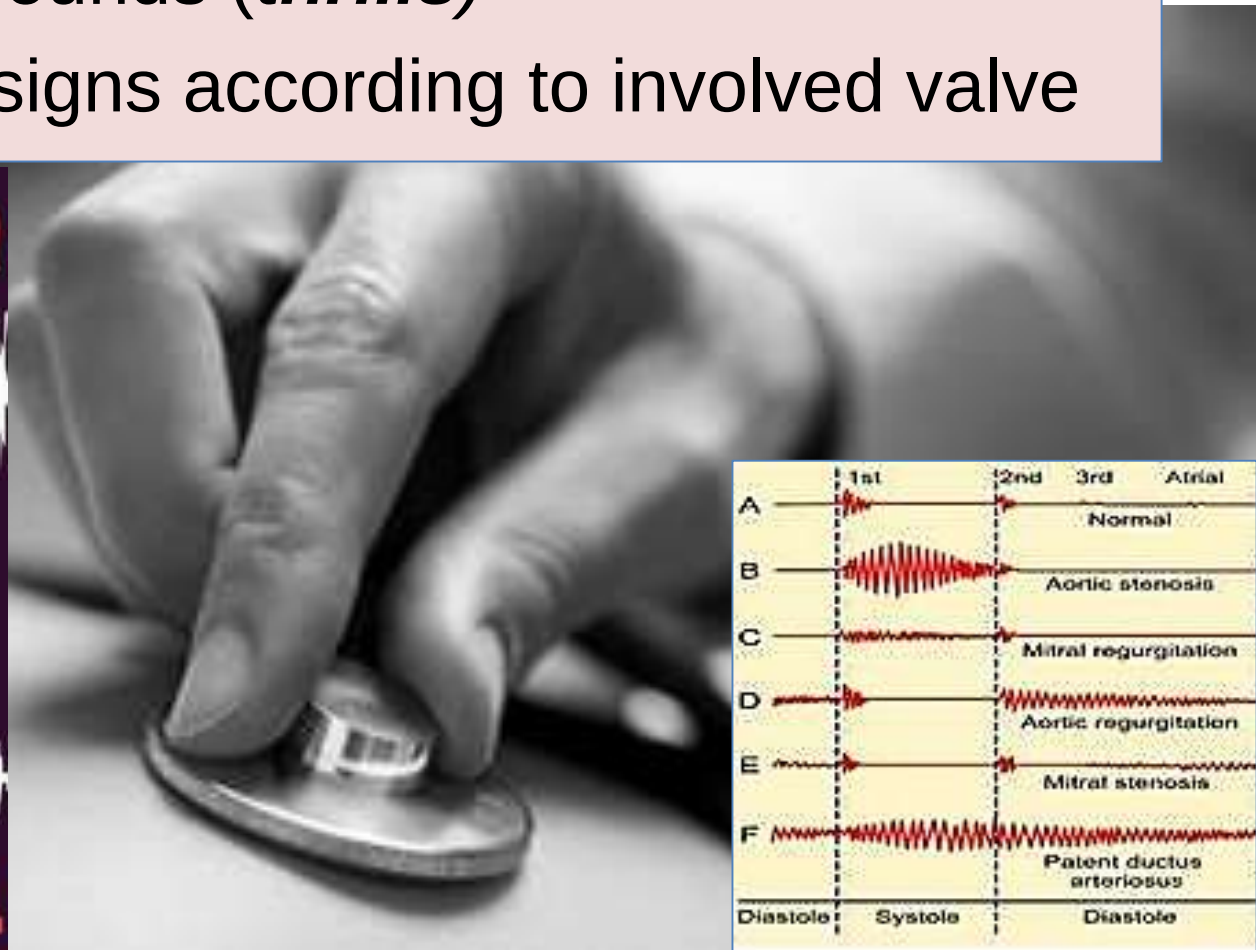
Abnormality:
1-valve cusps
2- supporting structures (e.g. mitral annulus, tendinous cords, papillary muscles)

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

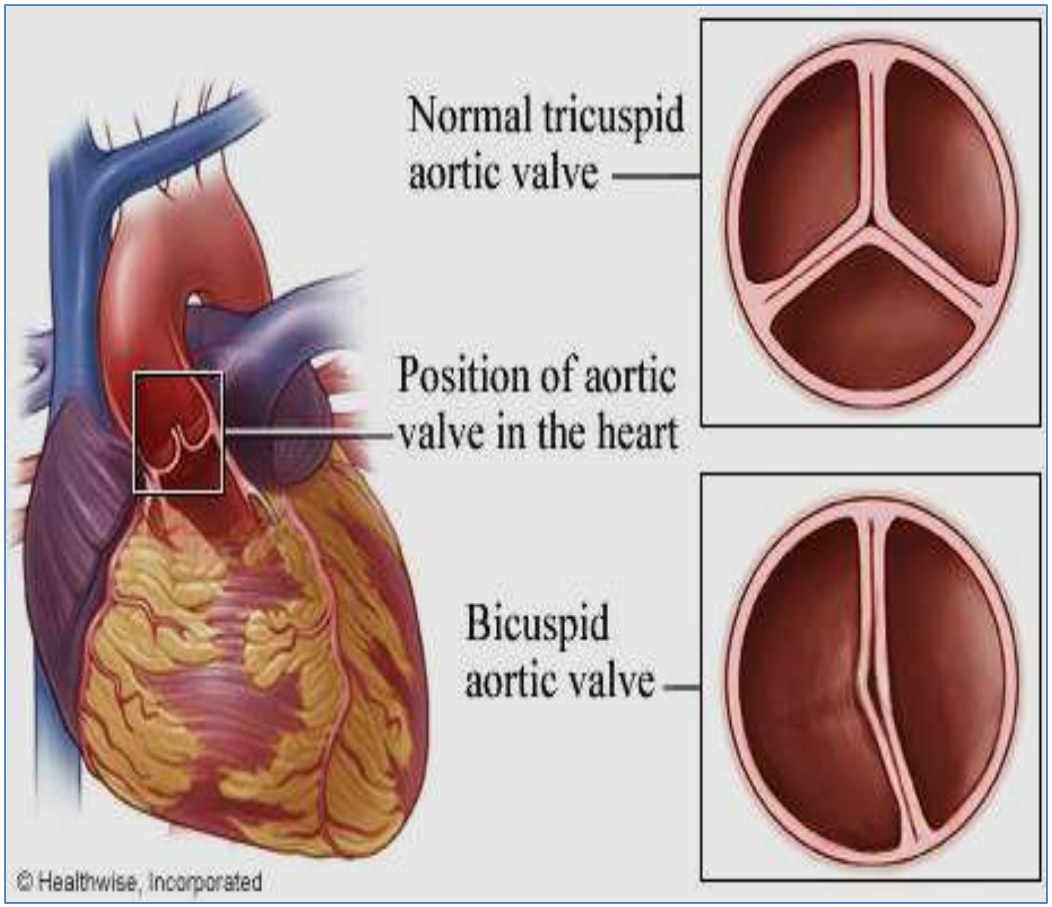




- Valvular abnormalities can be congenital or acquired

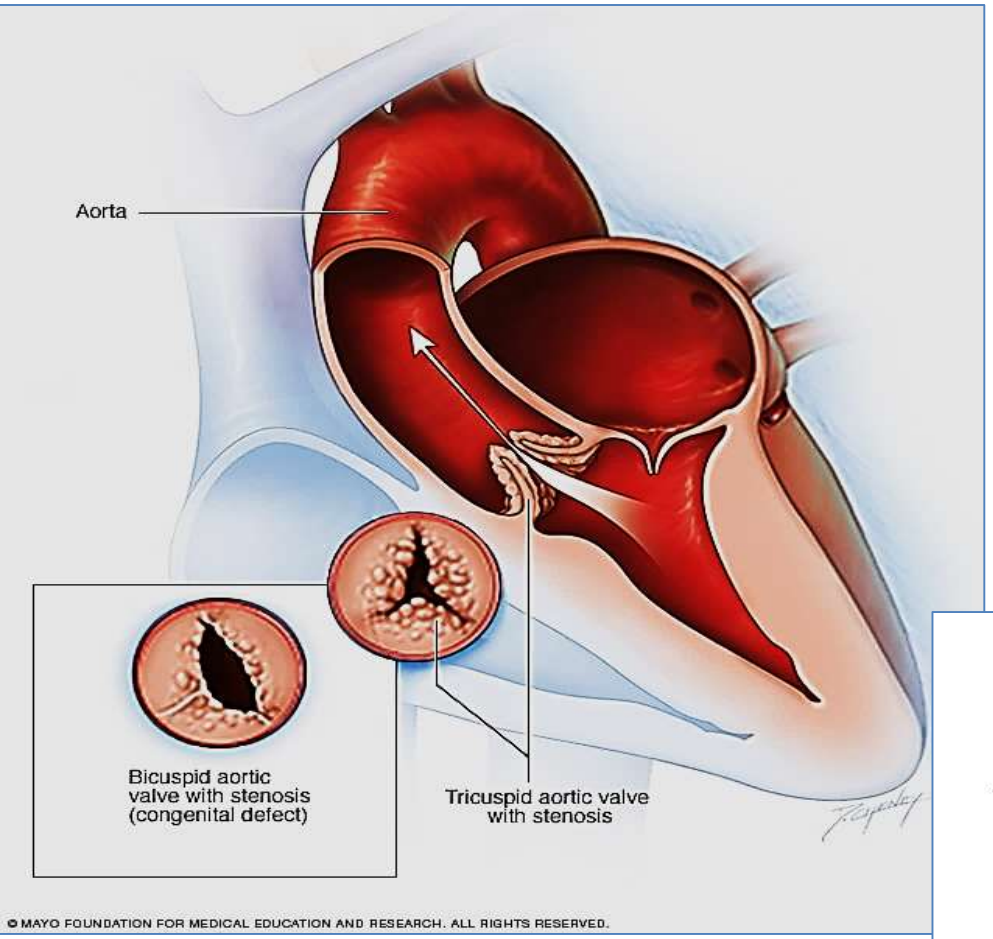
- The most common **congenital** valve lesion is ***bicuspid aortic valve***
- Most important cause of **acquired** valve disease is ***rheumatic fever***

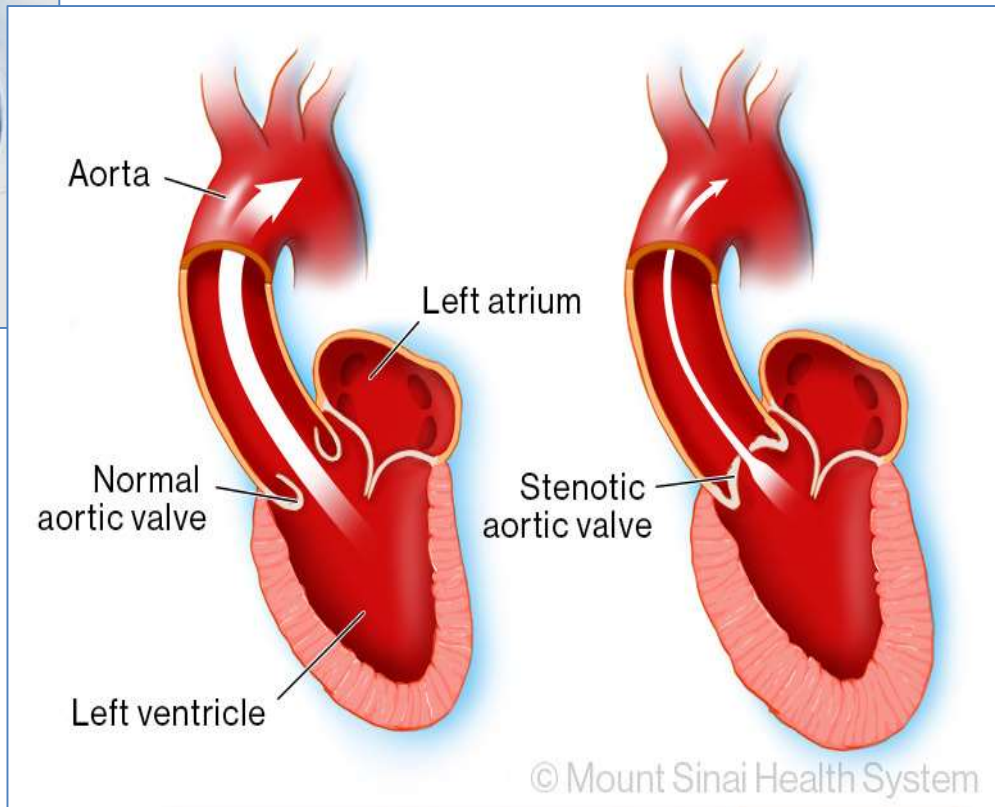
Bicuspid Aortic Valve



-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





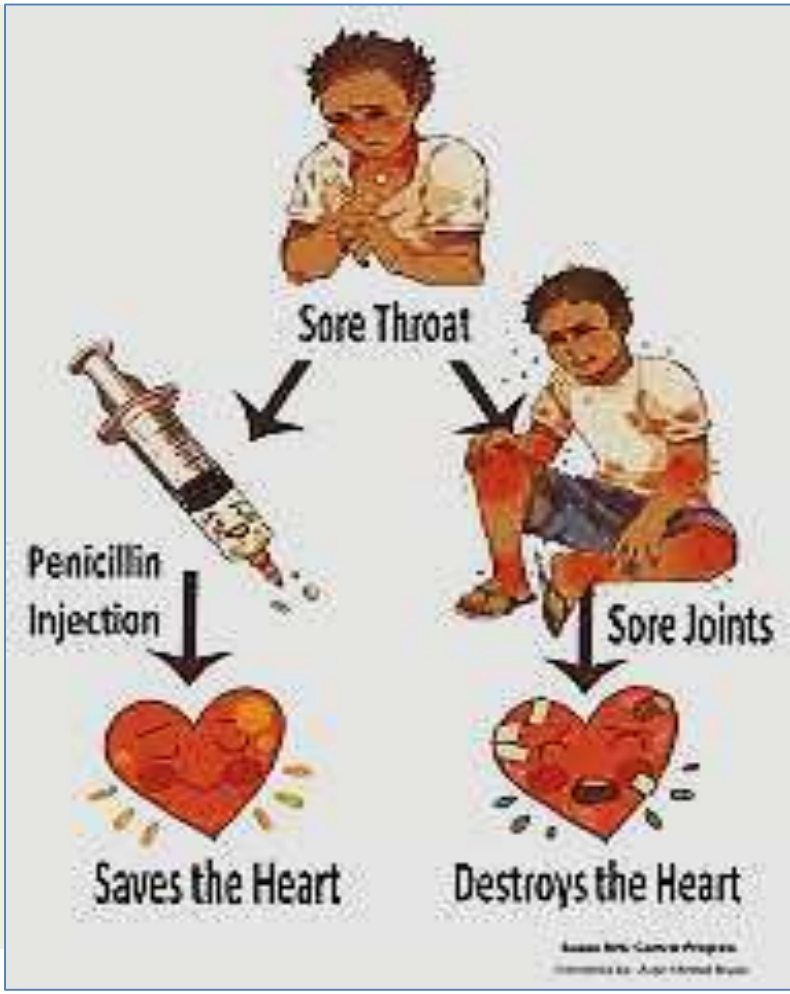
- **Acquired Valve Diseases**

- Mitral valve most common target of acquired valve diseases

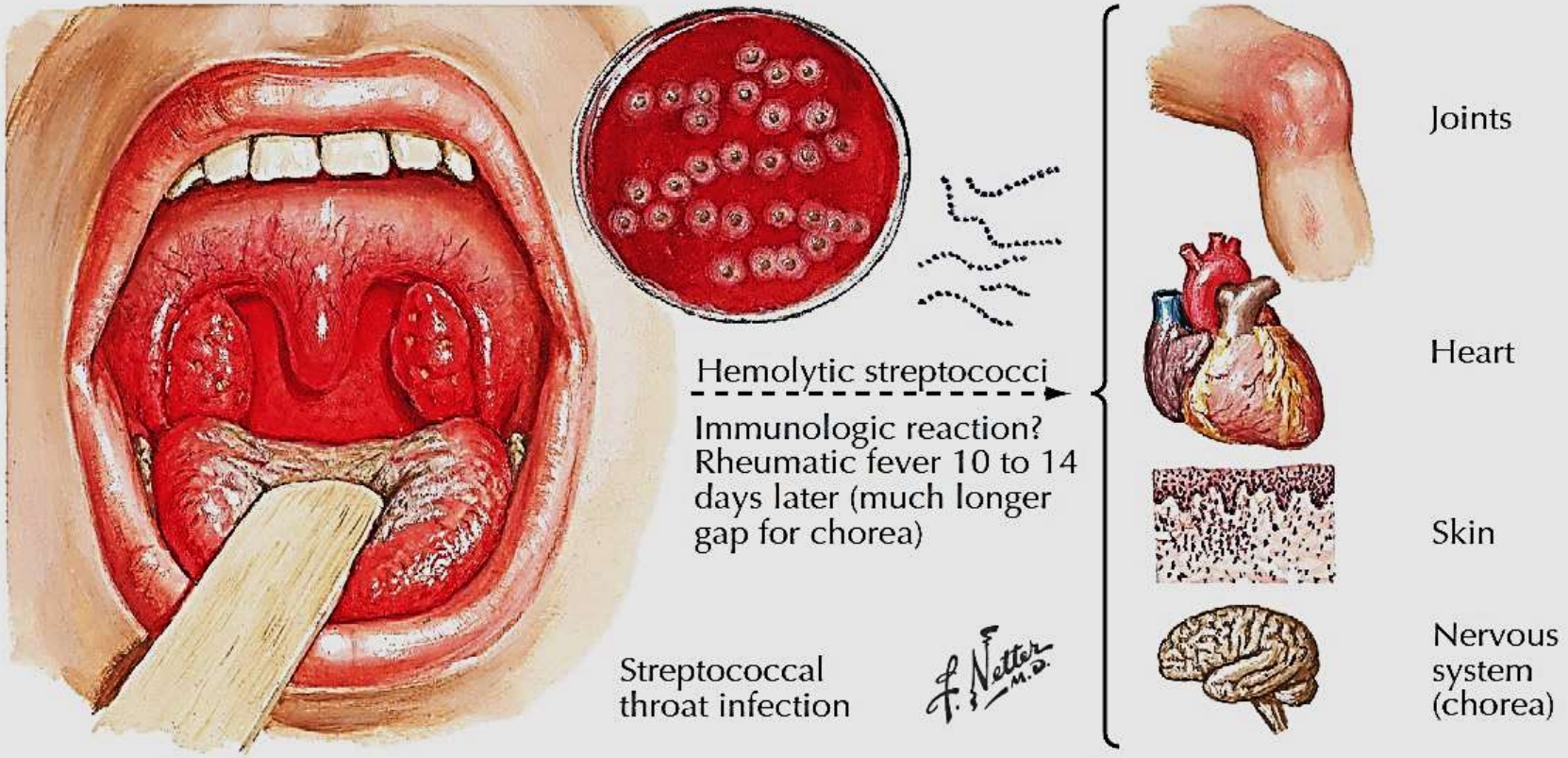
- Most common cause of **acquired** valvular diseases is **post-inflammatory scarring** due to rheumatic fever (2/3)

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% of pateints are children
- fever; migratory polyarthritis; **carditis**
- Carditis (arrhythmias; myocarditis; cardiac dilation; functional mitral insufficiency and CHF).
- ↑ serum antibody titers to streptococcal antigens (anti-streptolysin O; anti-DNA-ase)
- **culture for streptococci is usually (-) at time of rheumatic fever**

Acute Rheumatic Fever- JONES criteria

Signs & Symptoms

Joints (arthritis)

❤ Carditis

Nodules (subcutaneous)

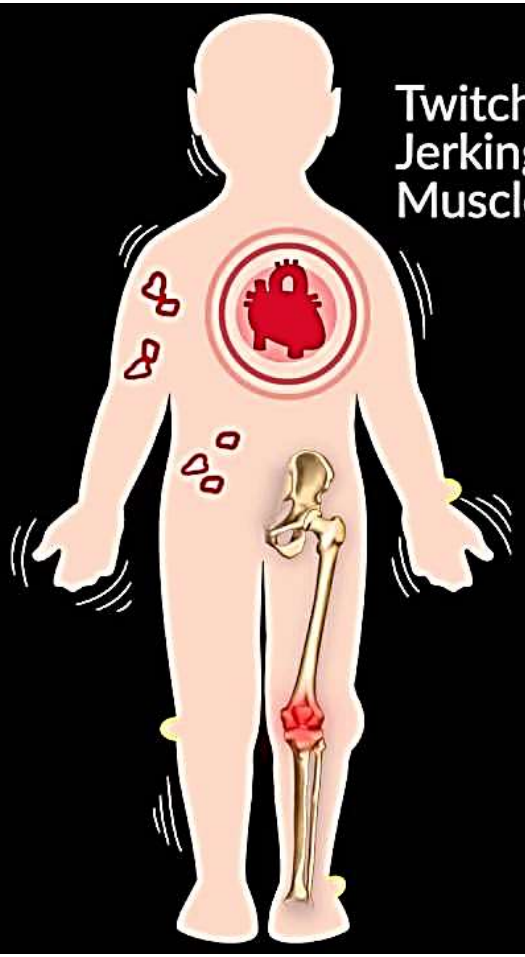
Erythema marginatum

Sydenham's chorea

-can present 3-4 months after GAS infection

-mean duration: 12-15 weeks

-episodes may last 6-12 months



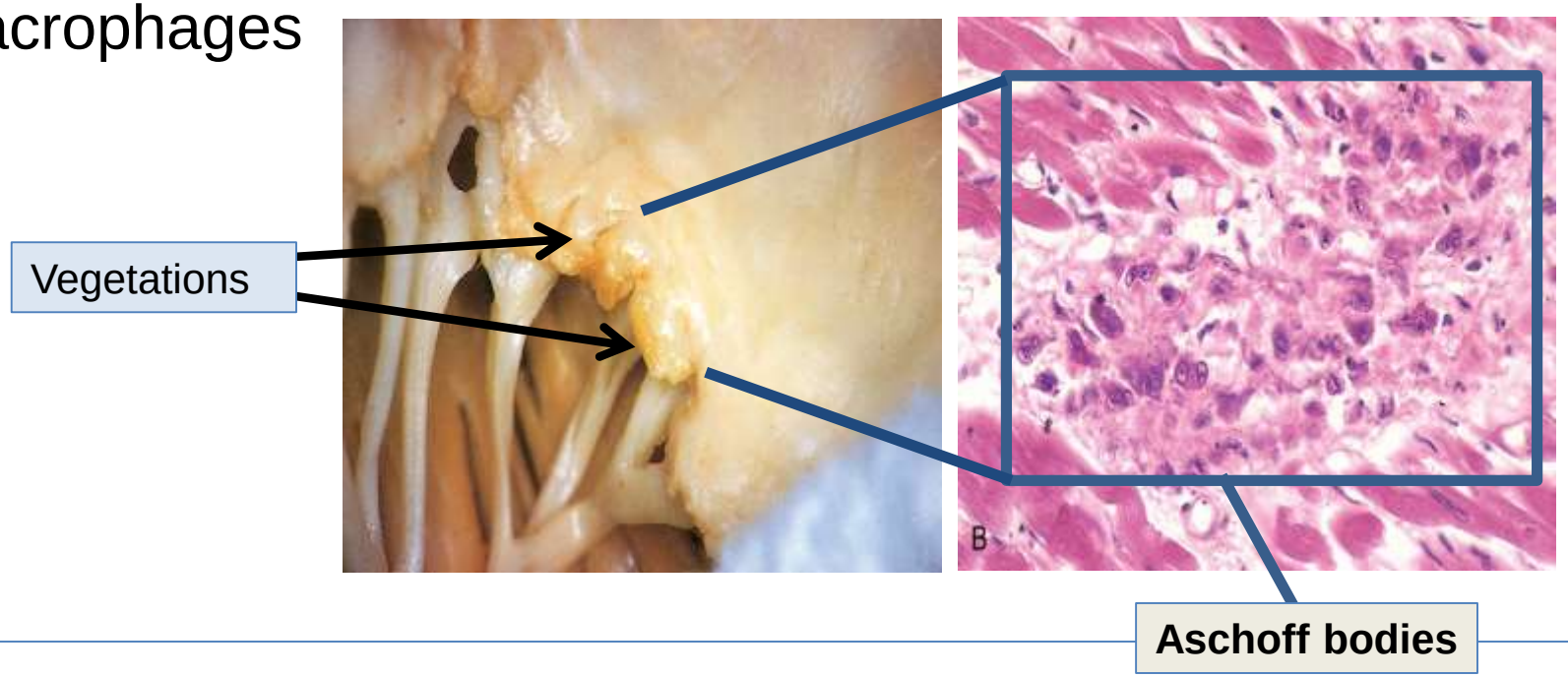
Carditis
Morphology- Acute Phase

- 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

In serum

Elevated anti-streptolysin O titers

+

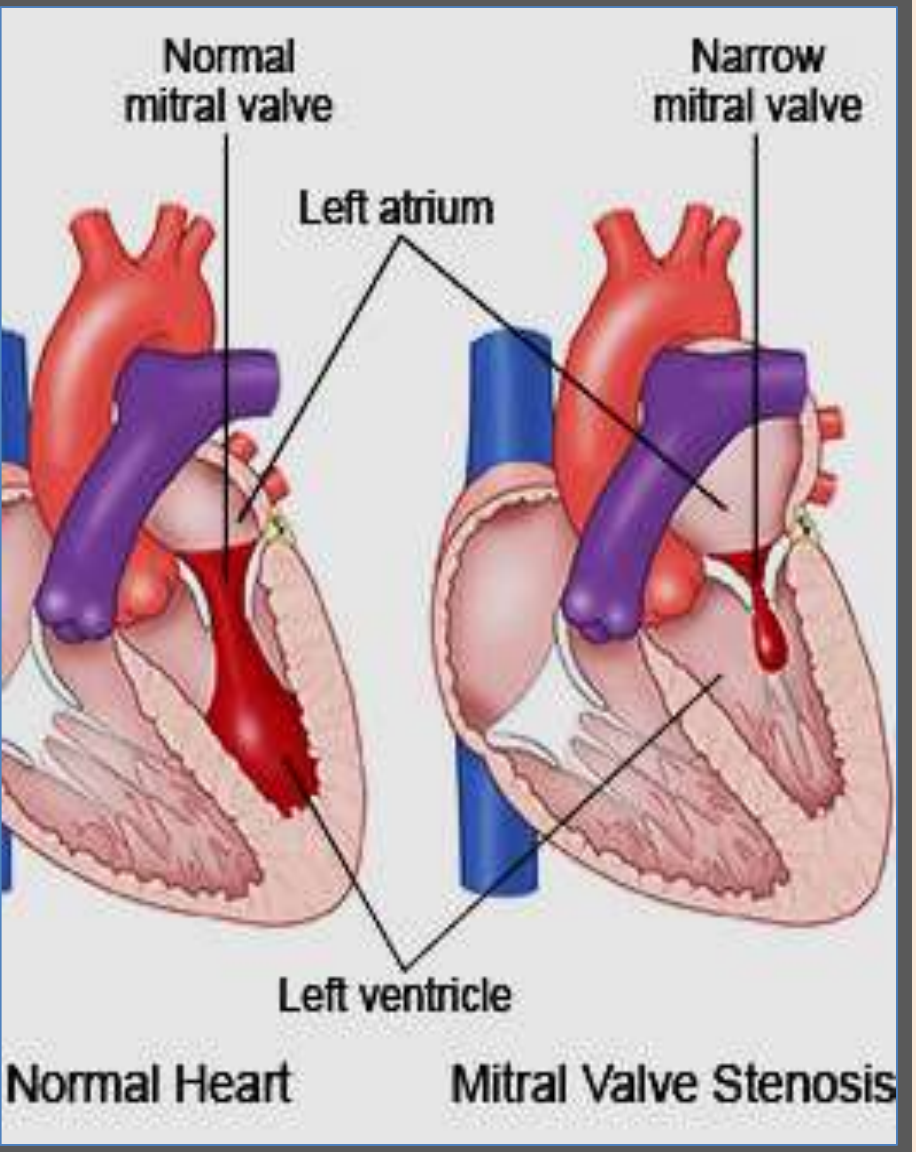
2 Major criteria

OR

1 Major criterion and 2 Minor criteria

* Anamnesis: a preliminary case history of a medical patient

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 in chronic phase

- **Valve stenosis** (most important functional consequence)

mitral valve (m/c)
aortic disease
tricuspid valve
pulmonary valve (rare)

↓

Scarring and calcifications