

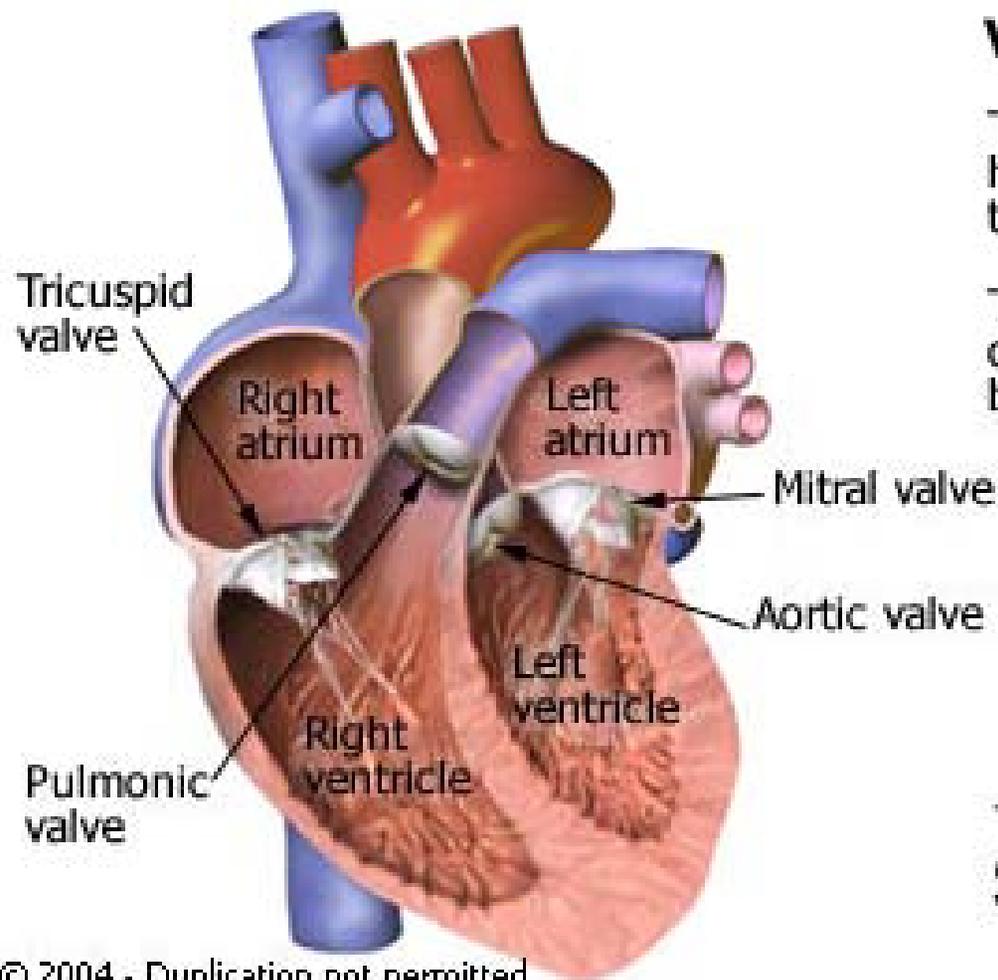
Cardiac Valvular Disorders

Chapter 24

Williams & Hopper

Four Heart Valves

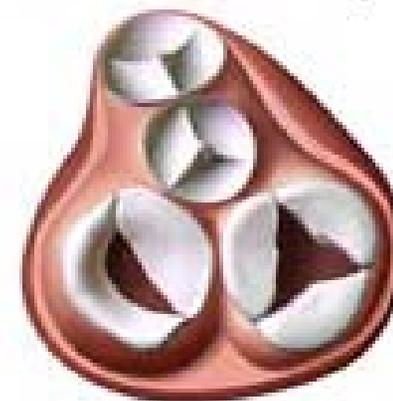
- Aortic
- Pulmonic
- Mitral and Tricuspid
 - Chordae tendineae and papillary muscle
 - Ensure valves close tightly



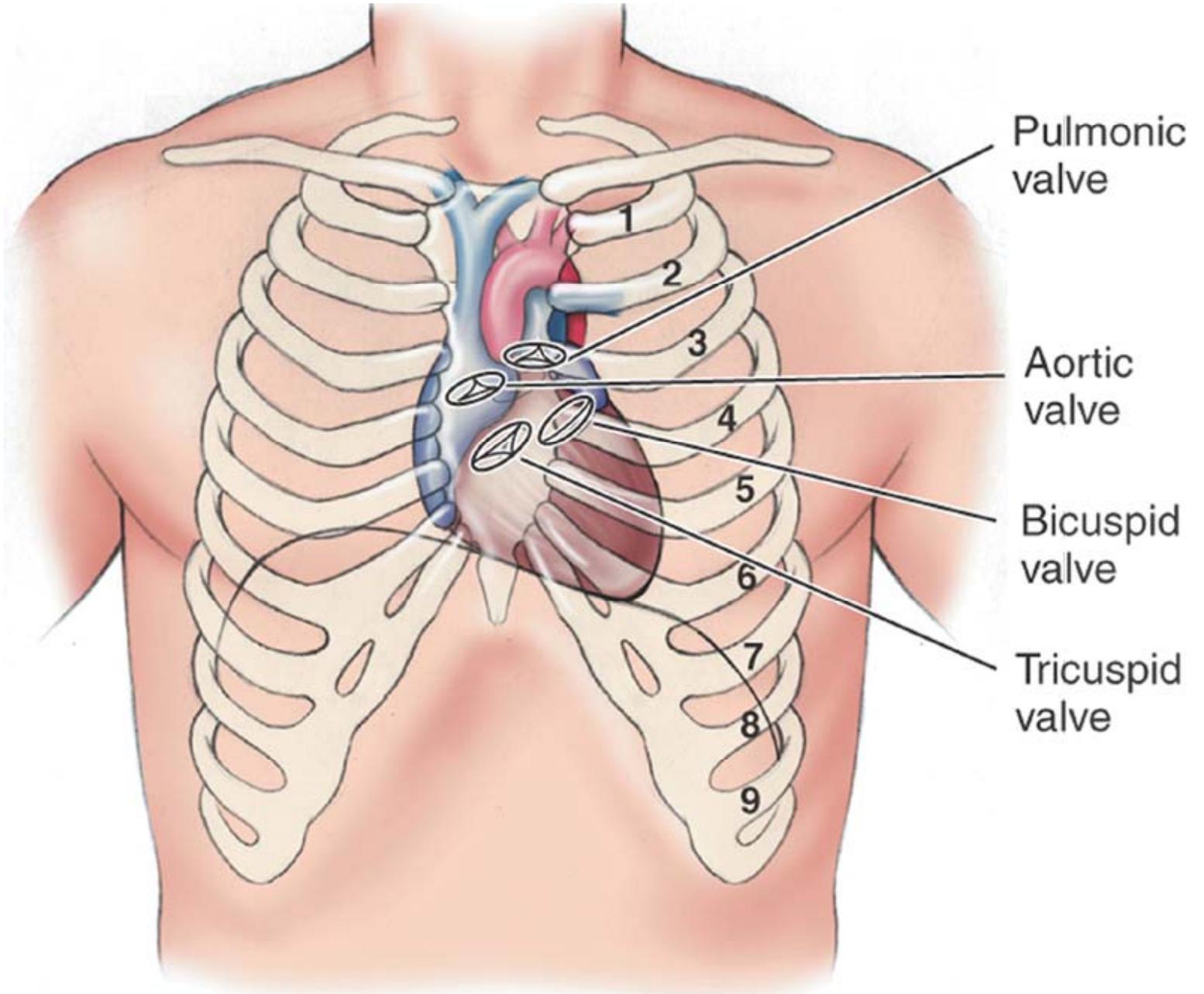
Valves of the Heart

The tricuspid and pulmonic valves help keep blood flowing to the lungs to pick up oxygen.

The mitral and aortic valves help keep oxygenated blood flowing to the body.



Top view: The rhythmic opening and closing of the valves creates the "lub-dub" sound of the heartbeat.

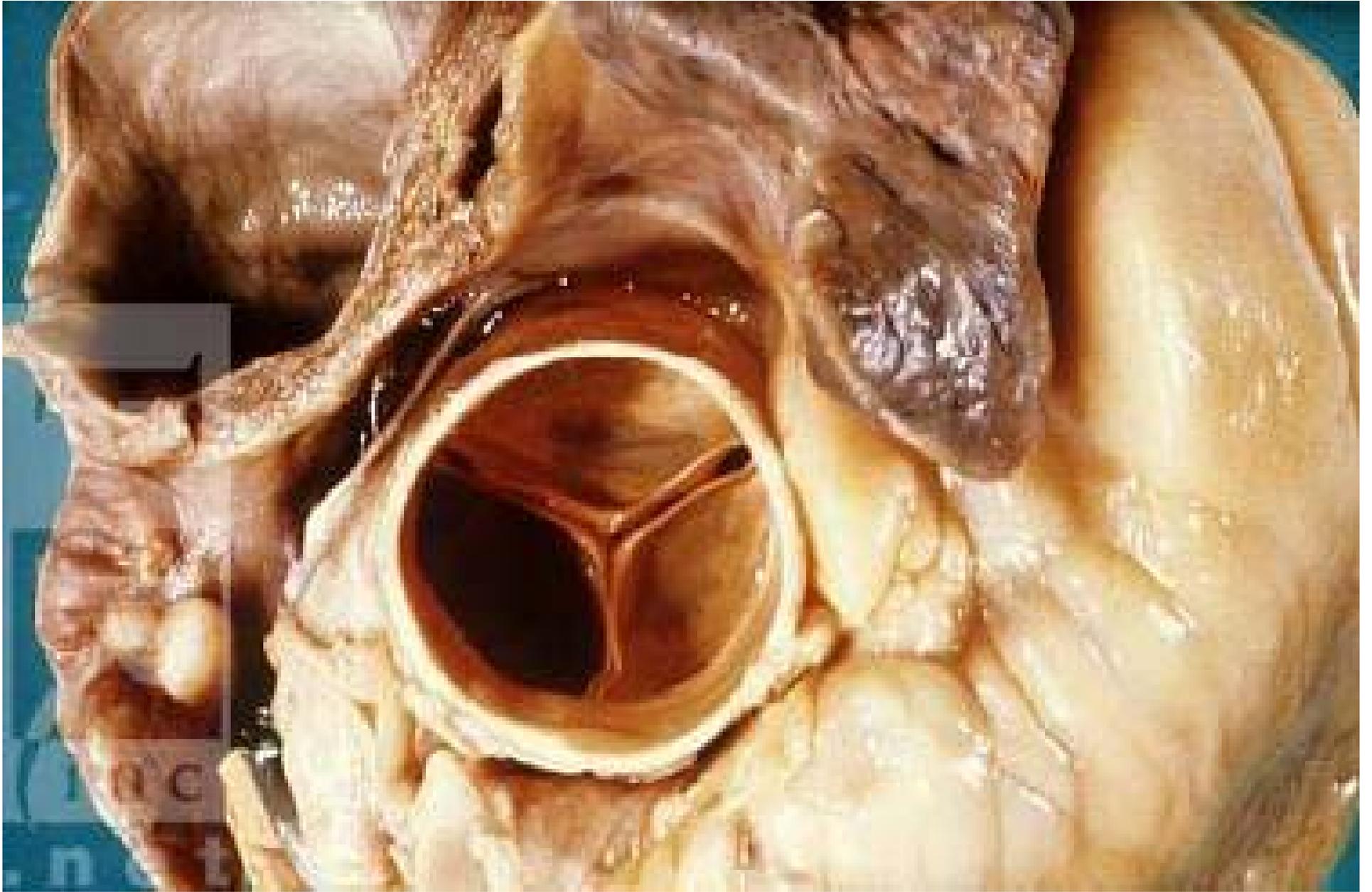


Pulmonic valve

Aortic valve

Bicuspid valve

Tricuspid valve

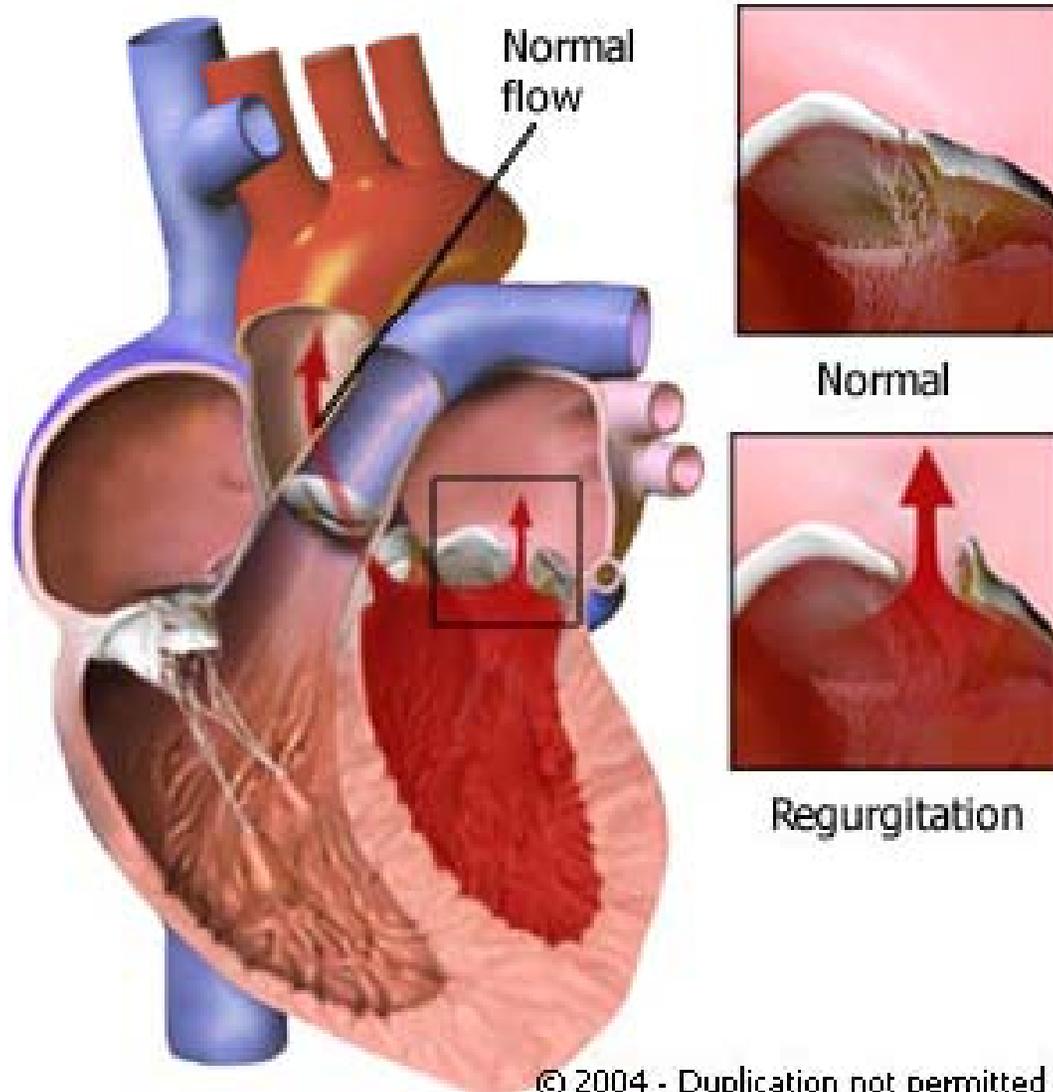


Damage to Valves

- Stenosis
 - Forward flow hindered
 - Valve narrowed
- Regurgitation or insufficiency
 - Blood backs up
 - Valve does not close completely

Valvular Regurgitation

A condition in which blood leaks in the wrong direction because one or more heart valves closes improperly. Mitral valve prolapse (illustrated here) is a common cause of regurgitation.



Treatment

- Usually none
- If symptoms
 - Healthy lifestyle (diet, exercise, stress mgmt)
 - Medical and surgical tx – applies to all valvular dx
 - Avoid stimulants (coffee, nicotine)
 - Stress management
- Complications (rare)
 - Left side of heart dilation
 - Heart failure
 - Infective endocarditis (abx-invasive procedures)

Mitral Stenosis

- Thickened mitral valve and shortening of chordae tendinae causing narrowing
- Back up of blood/pressure in left atrium – atrium enlarges
 - Subsequent increased pressure:
 - Pulmonary circulation
 - Right ventricle progressing to failure
 - Right ventricle dilates to handle increased pressure
 - Decreased cardiac output

Signs and symptoms

- Initially none
- Pulmonary s/s (due to pulm congestion)
 - Dyspnea, cough, hemoptysis
 - Fatigue
 - Palpitations (a-fib/flutter)
 - Click, murmur
 - Heart failure if severe

Treatment

- Prophylactic antibiotics
- Anticoagulants (a-fib/flutter)
- Digoxin & diuretics (heart failure)
- Percutaneous transluminal balloon valvuloplasty (PTBV)
- Commissurotomy or annuloplasty – forms of valvular repair
- Valvuloplasty (valve replacement)
 - Severe cases with ventricular failure



Mitral Regurgitation

- Incomplete closure
- Backflow of blood into left atrium
- Increased pressure in Lt atrium
- Left ventricle dilates
- Increased pressure in pulm circulation and rt ventricle
- Lt and rt ventricular failure

Signs and Symptoms

- Initially none
- Then similar to those of mitral stenosis

Treatment

- No treatment without symptoms
- Prophylactic antibiotics
- ACEIs
- Anticoagulants
- Surgery

Aortic Stenosis

- Blood flow from LV into aorta impaired
- Narrowed aortic valve
 - r/t thickening, scarring, calcification, valve fusion
 - Lt ventricular hypertrophy(to maintain CO)
 - Increased Lt atrial contraction
 - “atrial kick”
 - Lt ventricular failure

Signs and Symptoms

- Initially asymptomatic
- Angina
- Murmur
- Dysrhythmias – decreased CO
- s/s of heart failure
- Orthopnea, dyspnea on exertion, fatigue

Treatment

- Valve replacement
 - Mechanical valves
 - Middle-age pt, need lifelong anticoagulation
 - Biological valves
 - Used for older pts, no anticoagulation, last 12 yrs.
- Prophylactic antibiotics
 - Before any invasive procedures
- Medications
 - Reduce contractility of heart and CO
 - CCBs, BBs

Aortic Regurgitation

- Incomplete closure of aortic valve cusps
- Backflow of the blood into the Lt vent and Lt atrium
- Lt ventricular dilation and hypertrophy – worse than with other valvular disorders
- Pulmonary edema if severe

Signs and Symptoms

- Palpitations
- Pounding in head
- Exertional dyspnea and fatigue
- murmur
- Corrigan's pulse
- Widened pulse pressure
- Angina – occurs late
- Heart failure
- Poor prognosis with severe dysfunction

Treatment

- Surgery – treatment of choice
 - Surgical valve replacement
- Prophylactic antibiotics
- Digitalis, diuretics, vasodilators, ACEIs,
 - Reduce SBP and cardiac workload before surgery

Nursing process

- Assessment
- Nursing diagnosis
- Planning
- Nursing interventions
- Evaluation
- Education is key
 - Med compliance
 - Prophylactic antibiotic need

Cardiac Valvular Surgical Interventions

- Heart Valve Repairs
 - Commisurotomy-valves incised or broken apart
 - Annuloplasty- sutures or ring into annulus of valve to improve closure of leaflets
- Heart Valve Replacement
 - See next slide

Heart Valve Replacement

- Mechanical
 - Durable
 - Turbulent blood flow
 - Hemolysis
- Biological
 - 3 sources
 - Porcine (pig), bovine (cow), allografts (human)
 - Low incidence of thrombus formation
 - Not as durable as mechanical