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# CARDIOTHORACIC SURGERY



# Objectives

- **At the end of the unit, the student will be able:**
  - To indicate three principles of cardiopulmonary bypass (CPB)**
  - To mention indications and contraindications of Coronary Artery Bypass Grafting (CABG)**
  - To indicate the differences between valve regurgitation and valve stenosis disorders.**
  - To discuss preoperative nursing care of the patient undergoing cardiac surgery.**
  - To discuss Nursing management of the patient post cardiac**



# Cardiothoracic surgery

▶ Also known as thoracic surgery is the field of medicine involved in surgical treatment of organs inside the thorax (the chest)

( Generally treatment of conditions of the heart and lungs )



# Cardiopulmonary bypass

- Is a technique that temporarily takes over the function of the heart and lungs during surgery, maintaining the circulation of blood and the oxygen content of the patient's body.

# About Heart Lung Machine



iamblomed.com





# Principles of cardiopulmonary bypass (CPB)

## Anticoagulant

- (heparin) × (protamine sulfate)

## Hypothermia

- 28-32 (The cooled blood slows the body's basal metabolic rate, decreasing its demand for oxygen)

## Hemodilution

# Coronary Artery Bypass Grafting (CABG)

- **Is a surgical procedure to restore normal blood flow to an obstructed coronary artery.**

**(A normal coronary artery transports blood to and from the heart muscle itself, not through the main circulatory system)**

# indications of Coronary Artery Bypass Grafting (CABG)

- Over 50% left main coronary artery stenosis
- Over 70% stenosis of the proximal left anterior descending (LAD) and proximal circumflex arteries
- Three-vessel disease in asymptomatic patients or those with mild or stable angina
- One- or two-Vessel disease and a large area of viable myocardium in high-risk area in patients with stable angina
- Over 70% proximal LAD stenosis with either an ejection fraction (EF) below 50% or demonstrable ischemia on noninvasive testing



# contraindications of Coronary Artery Bypass Grafting (CABG)

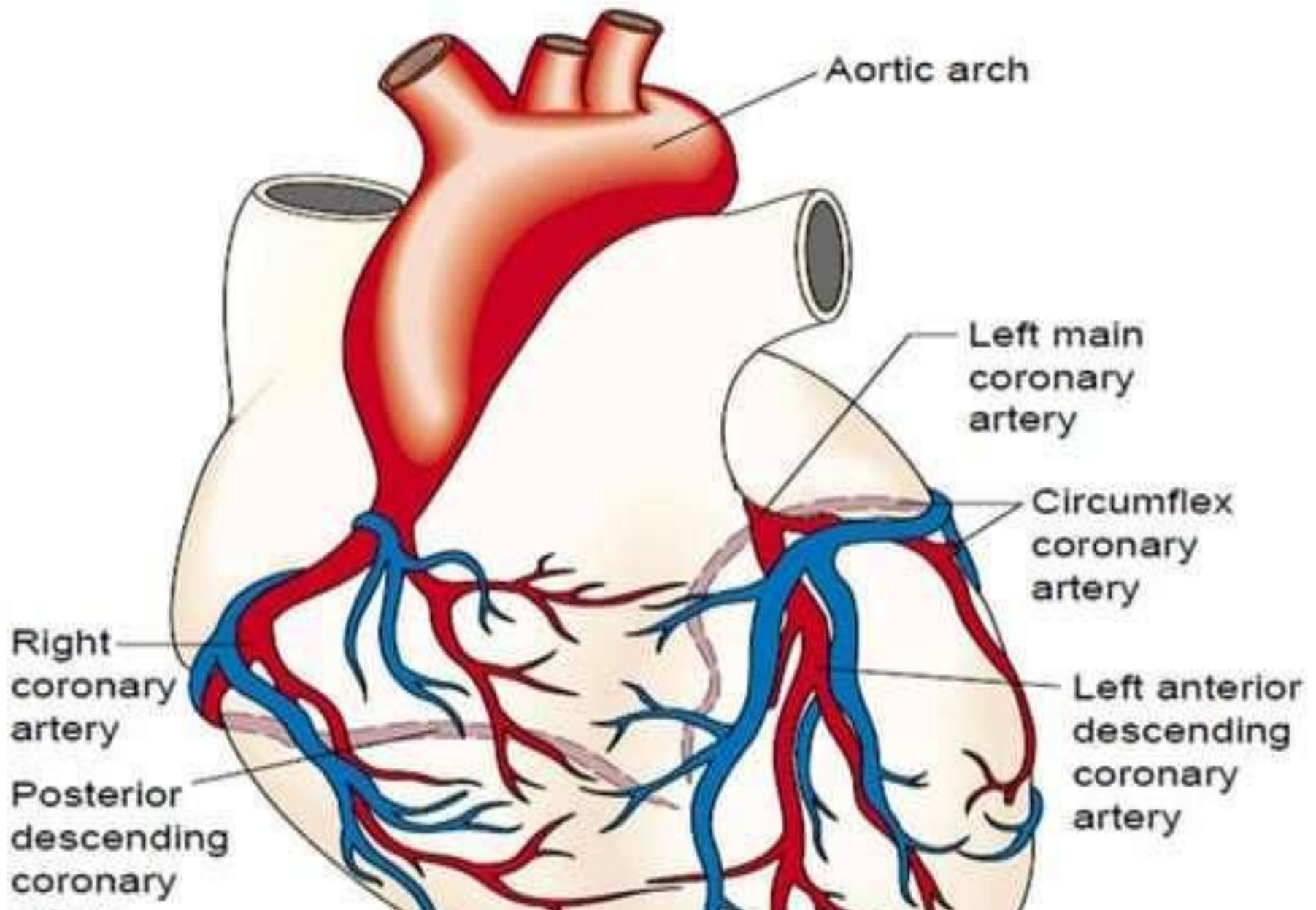
## Aneurysms

(when artery wall weakens and causes an abnormal large bulge can cause rupture and internal bleeding)

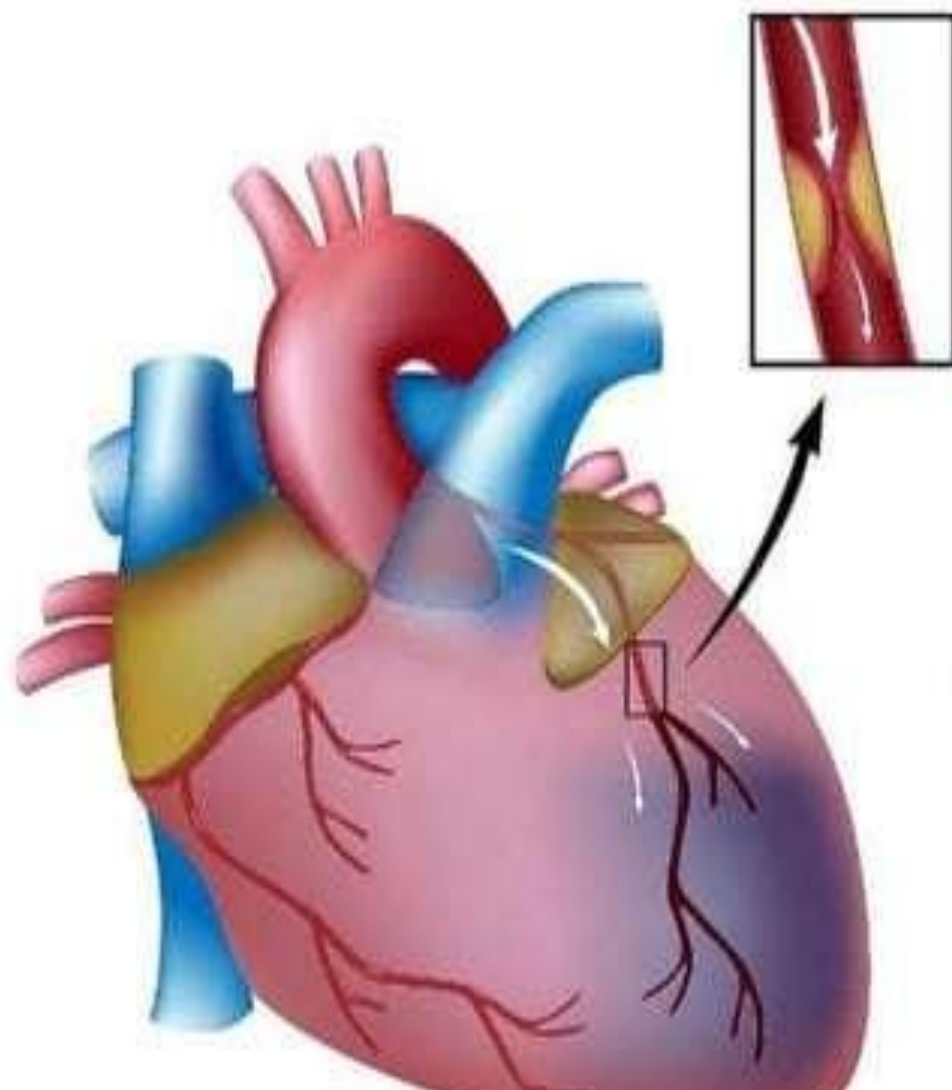
## Valvular diseases

## Congenital diseases

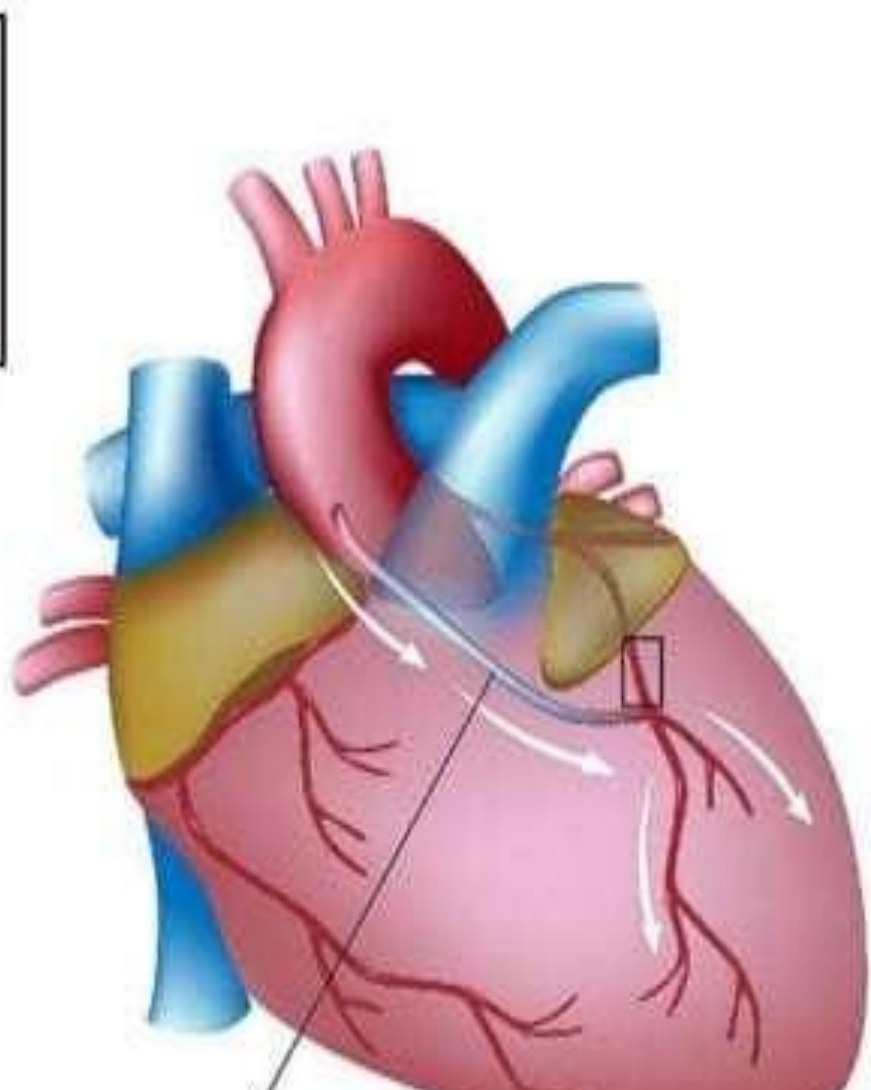
## Diseases of blood



**Before**



**After**





A person in a light blue hospital gown is shown from the chest up, with their arms raised. A semi-transparent heart shape is overlaid on the person's chest. The background is a soft, out-of-focus light blue.

# valve disease

- **Stenotic Valve**

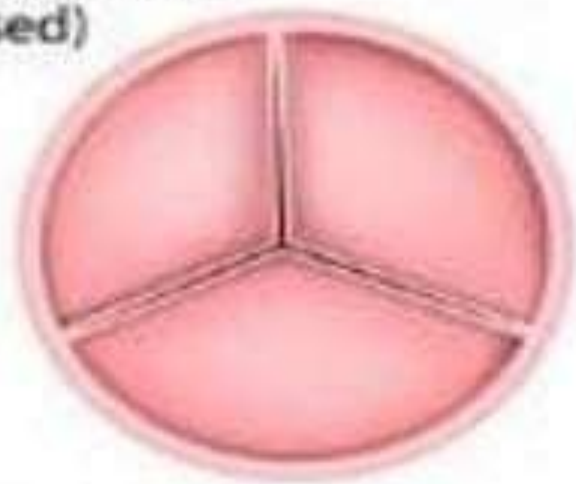
A narrowed or stenotic valve requires the heart to pump harder, which can strain the heart and reduce blood flow to the body.

- **Regurgitation Valve**

A regurgitate (incompetent, insufficient, or leaky) valve does not close completely, letting blood move backward through the valve.

# HEART VALVE DISEASE

Normal valve  
(closed)



Valve stenosis  
(closed)



Normal valve  
(open)



Valve stenosis  
(open)



## Mitral Valve Disease

### Mitral Stenosis

Postinflammatory scarring (rheumatic heart disease)

### Mitral Regurgitation

Abnormalities of leaflets and commissures  
Postinflammatory scarring  
Infective endocarditis  
Mitral valve prolapse  
"Fen-phen"—induced valvular fibrosis  
Abnormalities of tensor apparatus  
Rupture of papillary muscle  
Papillary muscle dysfunction (fibrosis)  
Rupture of chordae tendineae  
Abnormalities of left ventricular cavity and/or annulus  
Left ventricular enlargement

## Aortic Valve Disease

### Aortic Stenosis

Postinflammatory scarring (rheumatic heart disease)  
Senile calcific aortic stenosis  
Calcification of congenitally deformed valve

### Aortic Regurgitation

Intrinsic valvular disease  
Postinflammatory scarring (rheumatic heart disease)  
Infective endocarditis  
Aortic disease  
Degenerative aortic dilation  
Syphilitic aortitis  
Ankylosing spondylitis  
Rheumatoid arthritis  
Marfan syndrome



## B) Valve Regurgitation

**NORMAL**



**REGURGITATION**



Backward Heart Failure

*Aortic stenosis* limits forward flow of blood from the left ventricle  
*Aortic regurgitation* permits blood flow back into the left ventricle

Increased blood volume and pressure in the left ventricle

Left ventricular hypertrophy and dilation; blood from the left atrium cannot get into the left ventricle

Increased blood volume and pressure in the left atrium

Left atrium hypertrophy and dilation

Increased blood volume and pressure in the pulmonary veins

Pulmonary congestion (shortness of breath and pulmonary edema), increased pulmonary vascular pressure

Forward Heart Failure

Not enough blood flows through the aorta for the body's needs (decreased cardiac output)

Angina pectoris, postural hypotension, fatigue, dizziness

*Mitral stenosis* limits the forward flow of blood into the left ventricle  
*Mitral regurgitation* permits blood flow back into the left atrium



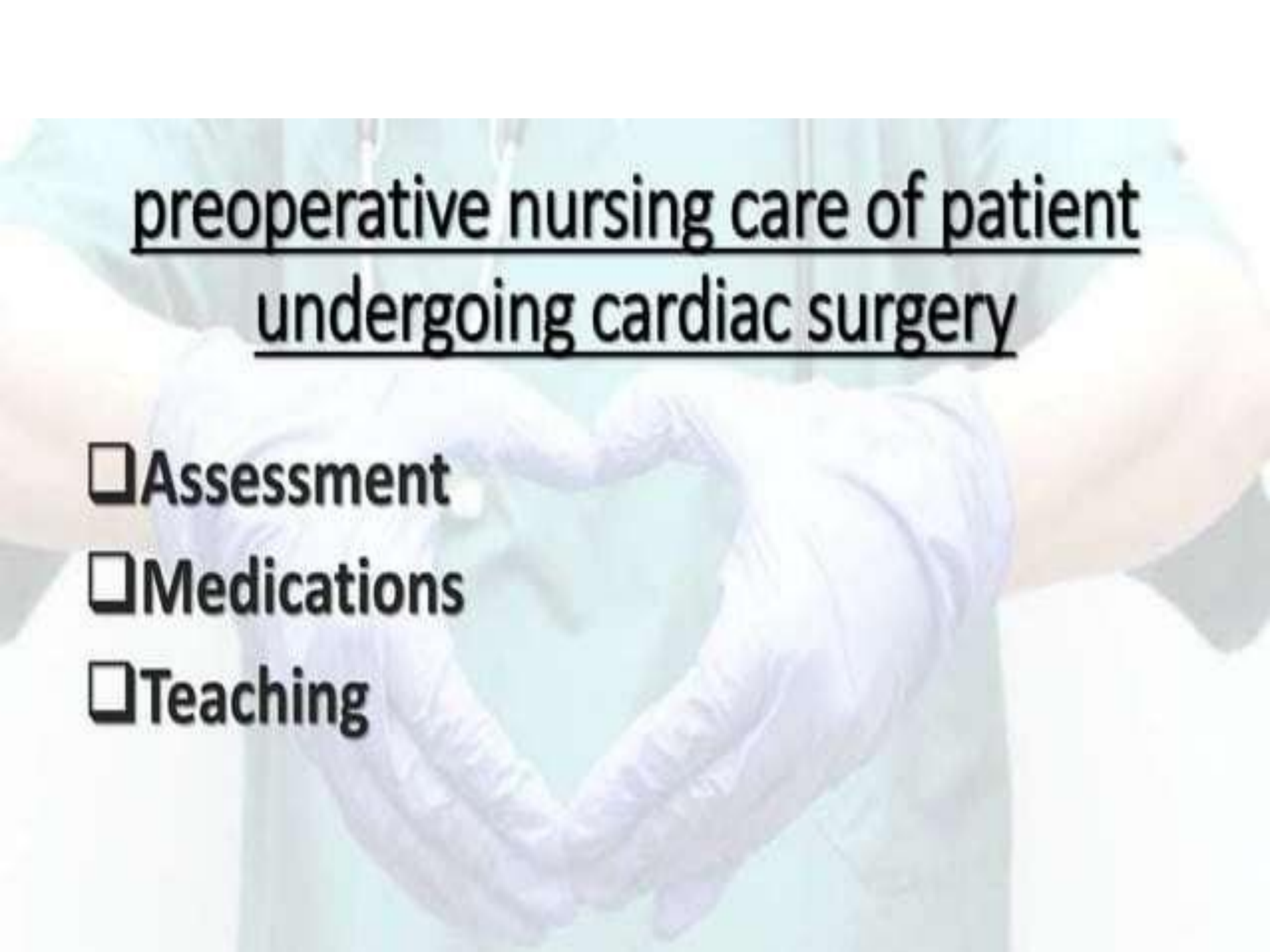
# Valvuloplasty

A commissurotomy

- Closed or open

An annuloplasty





preoperative nursing care of patient  
undergoing cardiac surgery

- Assessment
- Medications
- Teaching

A person wearing a blue surgical cap and white gloves is holding a patient's hand. The background is a soft, out-of-focus light blue.

# Assessment

- Systematic assessment
- physiologic assessment
- Assessment psychosocial spiritual factors , concerns
- Past history of medicine
- Lab investigation
- Radiographers assess

# Medications


- Medication history.
- Aspirin and non-steroidal anti-inflammatory products must be discontinued at least 7 to 10 days prior to surgery.
- penicillin interfere with platelet function.
- Digoxin is withheld 1 to 2 days prior to surgery (except in patients with atrial fibrillation)
- All anti-anginal agents such as nitrates, beta-adrenergic blocking agents, calcium channel blockers are continued to prevent exacerbation of ischemic symptoms or myocardial





# Teaching

- Description of the surgery
- The disease process and the risk factors necessitating surgery.
- Expectations about the anticipated events during the postoperative period.



# nursing care of patient post cardiac surgery

- Assessment
- Restoration of Cardiac Output
- monitor Intake / Output
- Adequate Gas Exchange
- Airway Clearance
- Pain Relief

# Nursing Diagnosis

- Decrease Cardiac tissue perfusion
- Risk for bleeding
- Decreased Cardiac Output related to, Hypothermia, Anesthesia, Myocardial edema, Electrolyte imbalances.



**THANK YOU!**



