

# Cardiac Surgical Diseases

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# Cardiac Surgical Diseases

CAD

Aortic Valve

↳ Stenosis

↳ Regurgitation

Mitral Valve

↳ Stenosis

↳ Regurgitation

Heart Failure

↳ Assist Devices

↳ Transplantation

Arrhythmia

↳ Atrial Fibrillation

Tumors

↳ Benign

↳ Malignant

Aortic Disease

Endocarditis



# Indications

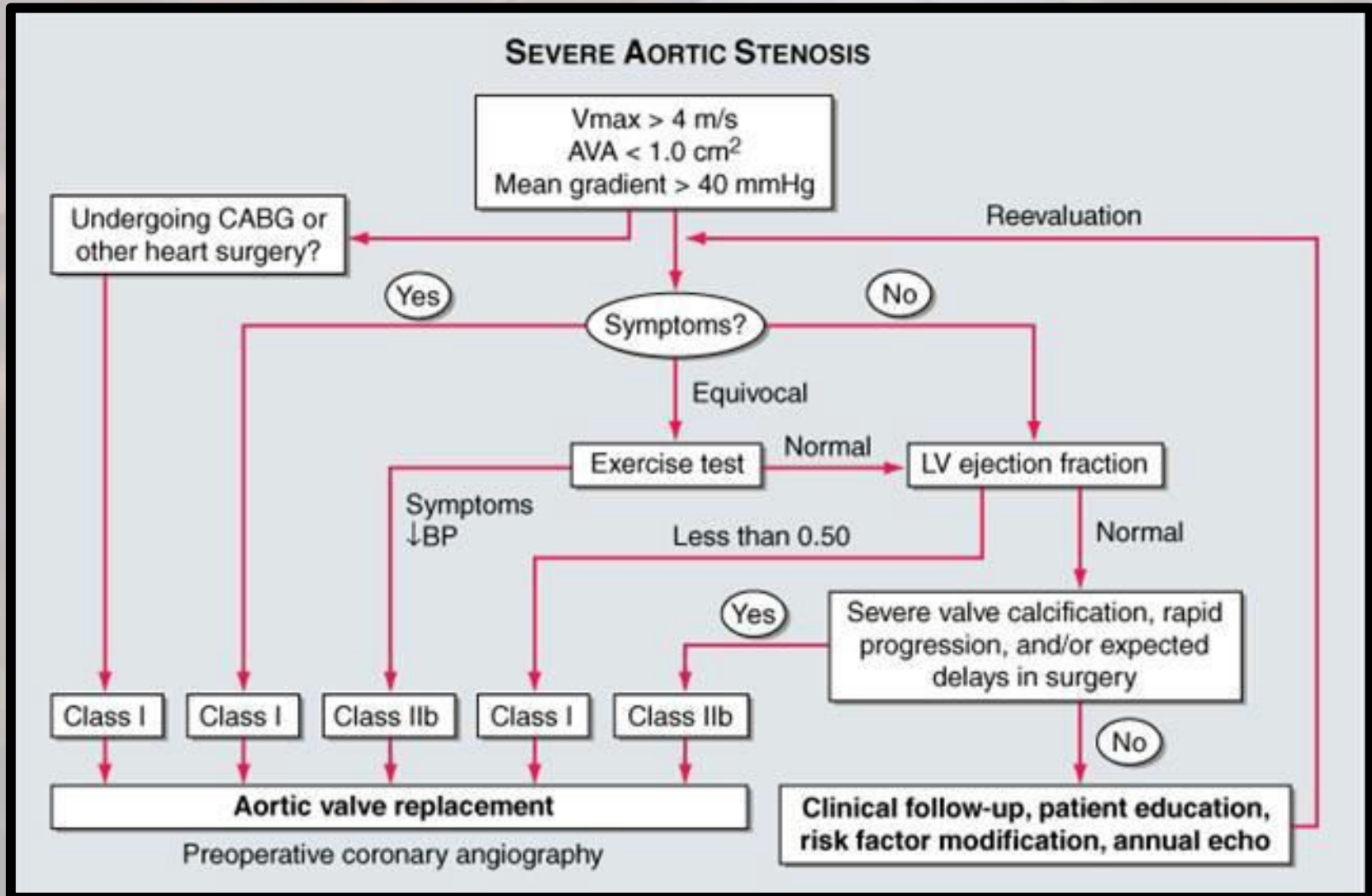
# Coronary Artery Bypass Surgery

Indication	Asymptomatic or Mild Angina	Stable Angina	Unstable Angina/NSTEMI	Poor LV Function
Left main stenosis >50%	Class I	Class I	Class I	Class I
Stenosis of proximal LAD and proximal circumflex >70%	Class I	Class I	Class I	Class I
3-vessel disease	Class I	Class I		Class I, with proximal LAD stenosis
2-vessel disease		Class I if there is large area of viable myocardium in high-risk area	Class IIb	

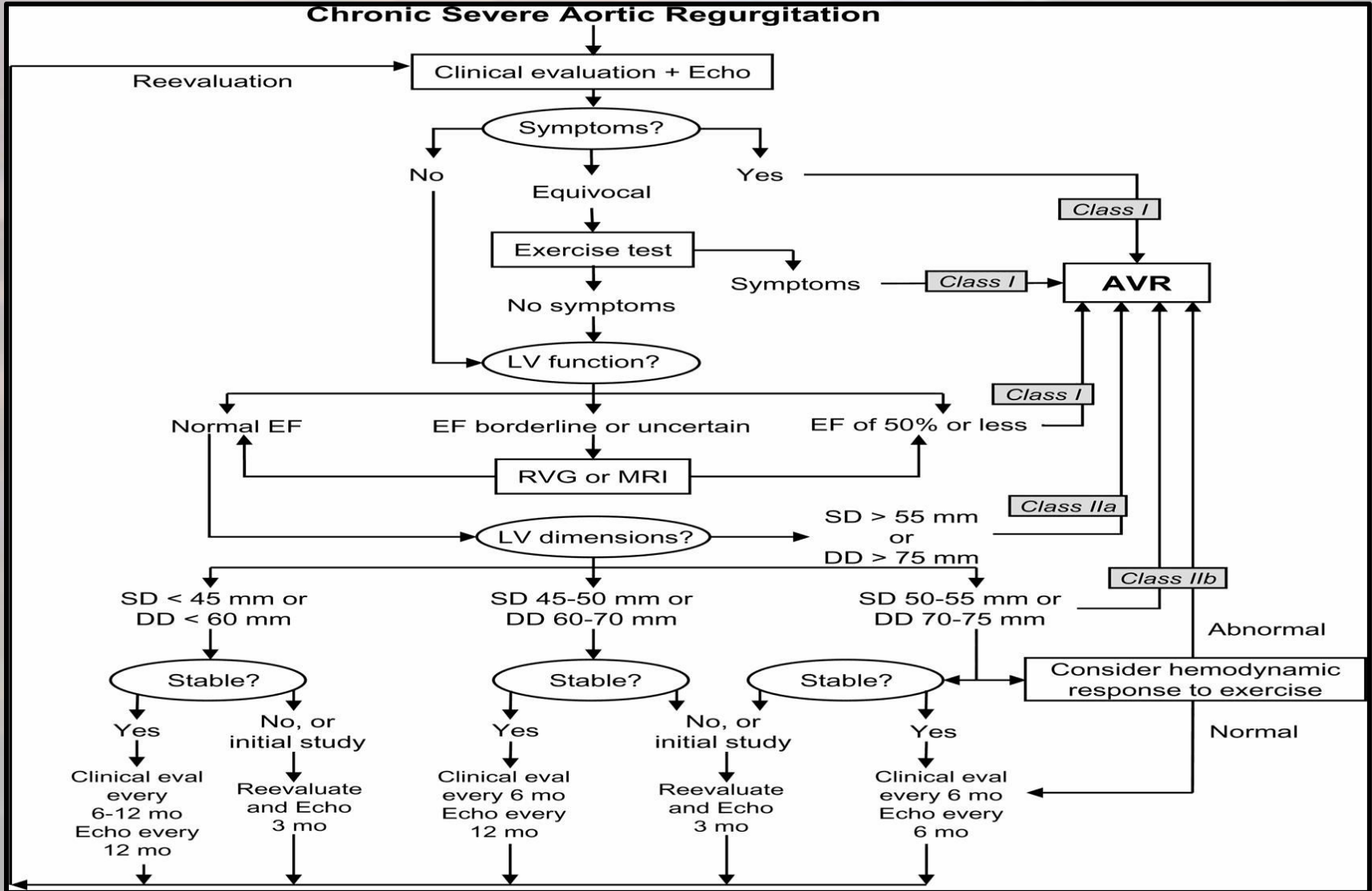
# Coronary Artery Bypass Surgery

Revascularization	CABG			DES		
	No-risk	DM	LVD	No-risk	DM	LVD
1-vessel	N	N	N	Y	Y	Y
Proximal LAD	Y	Y	Y	N	N	N
2-vessel without LAD	N	N	N	Y	Y	Y
2-vessel with LAD	Y	Y	Y	Y	Y	Y
2-vessel + proximal LAD	Y	Y	Y	N	N	N
3-vessel	Y	Y	Y	C	C	C
3-vessel + proximal LAD	Y	Y	Y	N	N	N
LMC ± other lesions	Y	Y	Y	N	N	N

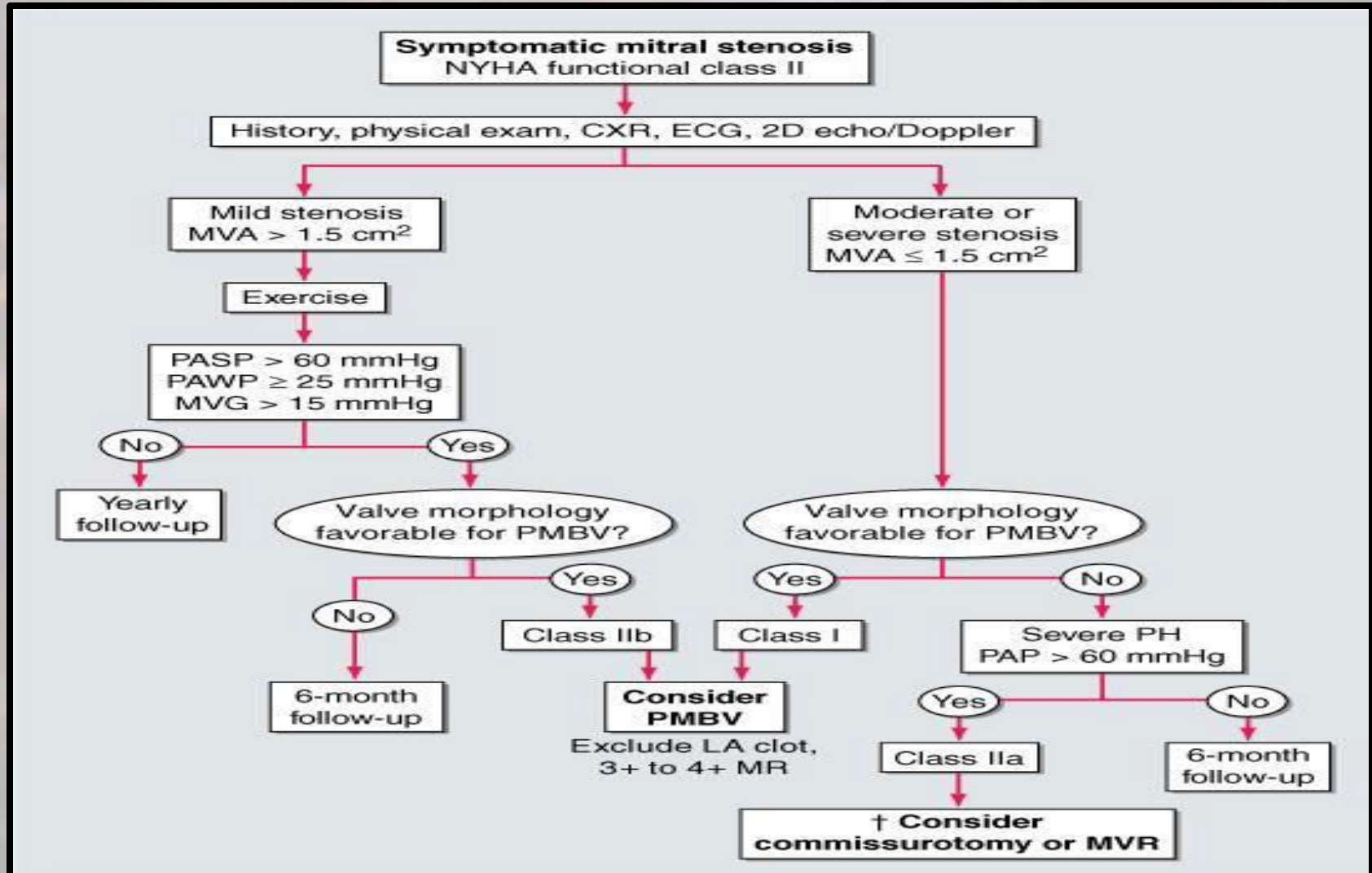
# Aortic Valve



# Aortic Valve



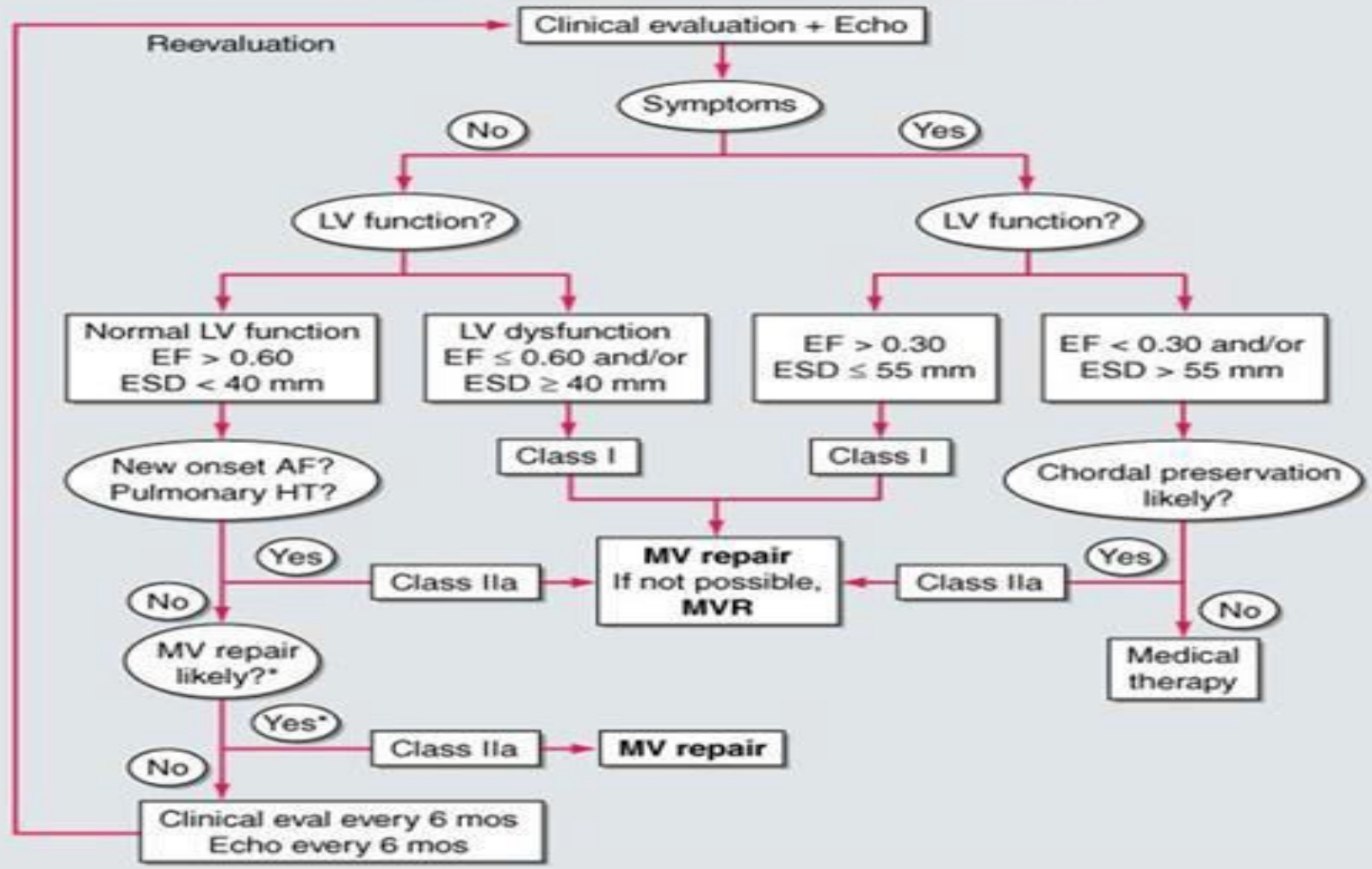
# Mitral Valve





# Mitral Valve

## CHRONIC SEVERE MITRAL REGURGITATION



# Aortic Disease

## When to Operate ?

> 6.0 cm

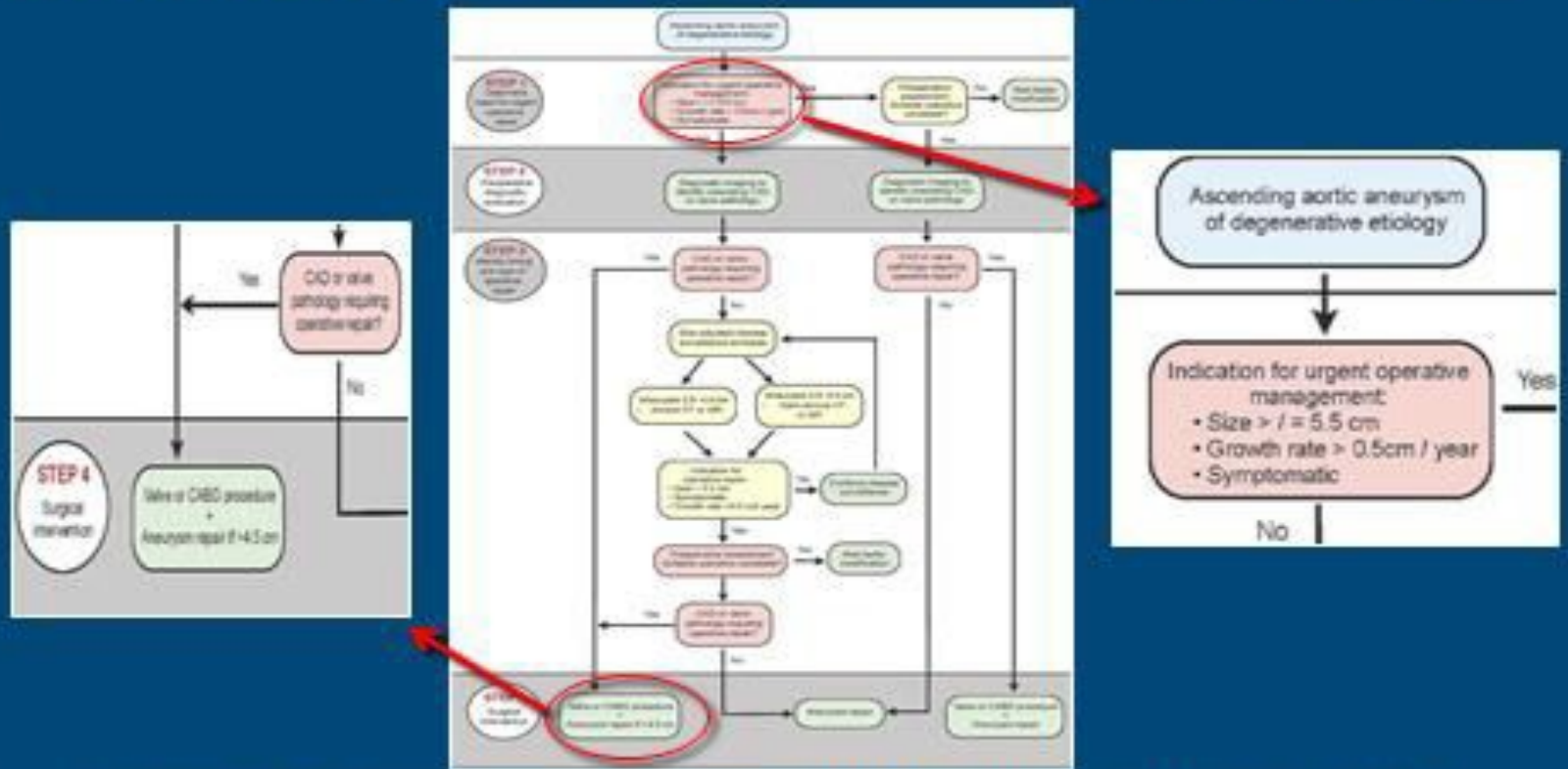
> 5.5 cm



> 6.5 cm

# Aortic Disease

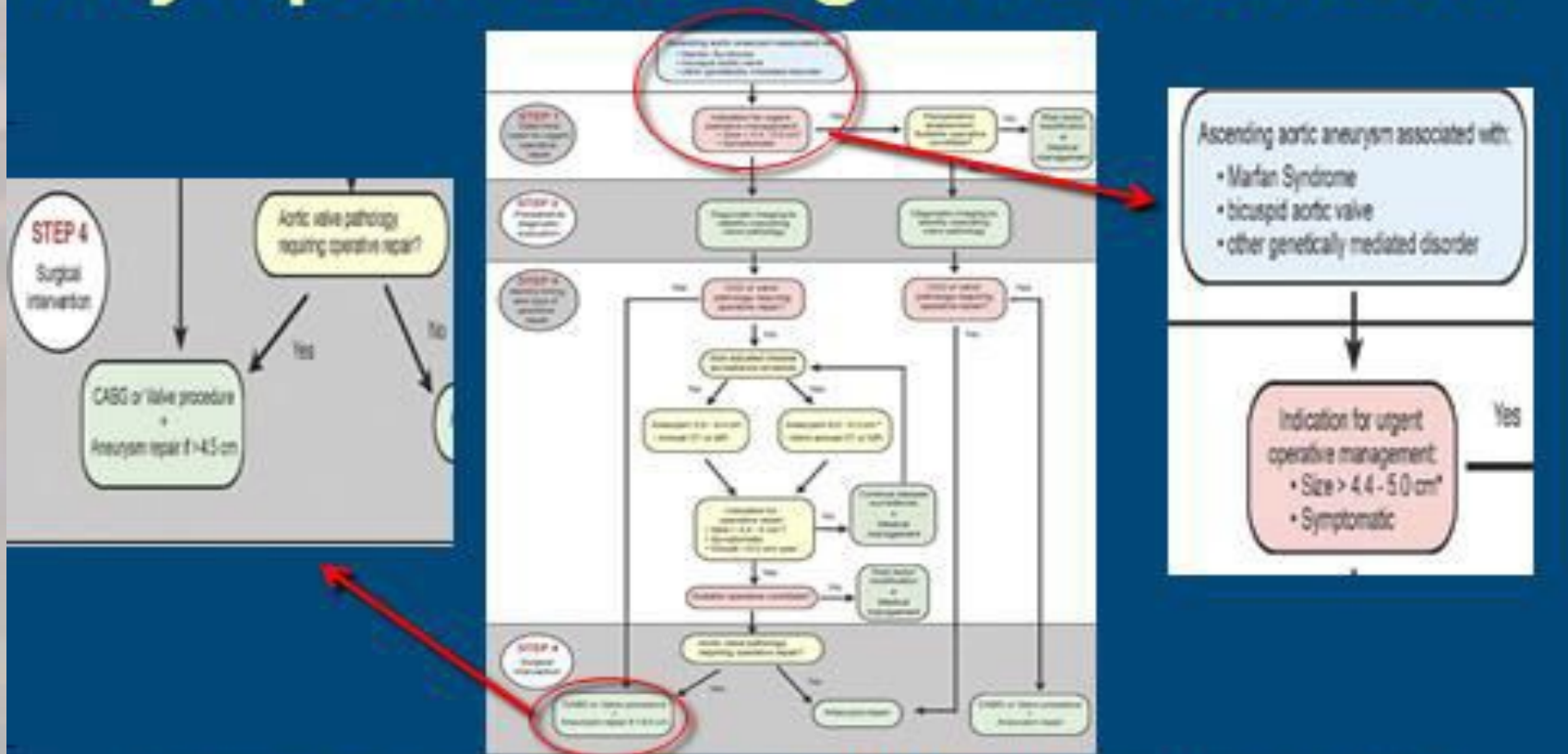
## Asymptomatic/ Low Risk Patients



American College of Cardiology Foundation, et al. J Am Coll Cardiol 2010;55:1509-1544

# Aortic Disease

## Asymptomatic/ High Risk Patients



American College of Cardiology Foundation, et al. J Am Coll Cardiol 2010;55:1509-1544

# Heart Failure

## *Indications for Heart Transplant:*

- Cardiogenic shock requiring mechanical assistance.
- Refractory heart failure with continuous inotropic infusion.
- NYHA functional class 3 and 4 with a poor 12 month prognosis.
- Progressive symptoms with maximal therapy.
- Severe symptomatic hypertrophic or restrictive cardiomyopathy.
- Medically refractory angina with unsuitable anatomy for revascularization.
- Life-threatening ventricular arrhythmias despite aggressive medical and device interventions.
- Cardiac tumors with low likelihood of metastasis.
- Hypoplastic left heart and complex congenital heart disease.

# Heart Failure

## **Table 3. Contraindications to cardiac transplantation.<sup>5</sup>**

- Pulmonary hypertension (TPG > 15 mm Hg, SPAP > 50 mm Hg, PVR > 4 WU, PVRI > 6)
- Systemic disease (anticipated to limit long-term survival)
- Elevated creatinine (> 200  $\mu\text{mol/L}$ )
- Active infection
- Psychosocial (substance abuse, smoking, medical noncompliance)
- Malignancy (within 5 years)
- Morbid obesity (> 140% ideal body weight)
- Marked cachexia (< 60% ideal body weight)
- Osteoporosis
- Peripheral or cerebrovascular disease
- Diabetes mellitus with end organ damage

# Heart Failure

## Ventricular Assist Devices:

### Indications

Frequent hospitalisations for HF

Intolerance to neurohormonal antagonists

NYHA IIIb–IV functional limitations despite OMT

End-organ dysfunction owing to low CO

Increasing diuretic requirement

CRT nonresponder

Inotrope dependence

Low peak  $\text{Vo}_2$  (<14mL/kg/min)

### Absolute Contraindications

Irreversible hepatic disease

Irreversible renal disease

Irreversible neurological disease

Medical nonadherence

Severe psychosocial limitations

*HF = Heart failure; OMT = optimal medical therapy; NYHA = New York Heart Association; CO = cardiac output; CRT = cardiac resynchronisation therapy. Adapted from Peura et al.<sup>11</sup> and published with the permission of the American Heart Association.*

# Endocarditis

**Table 2.** Indications for and Timing of Surgery in Patients with Left-Sided, Native-Valve Infective Endocarditis.\*

Indication	Timing of Surgery†
<b>Heart failure</b>	
Aortic or mitral-valve infective endocarditis with severe acute regurgitation or obstruction causing refractory pulmonary edema or cardiogenic shock	Emergency
Aortic or mitral-valve infective endocarditis with fistula into a cardiac chamber or pericardium causing refractory pulmonary edema or cardiogenic shock	Emergency
Aortic or mitral-valve infective endocarditis with severe acute regurgitation or obstruction and persistent heart failure or signs of poor hemodynamic tolerance (early mitral-valve closure or pulmonary hypertension)	Urgent
Aortic or mitral-valve infective endocarditis with severe regurgitation and heart failure easily controlled with medical treatment	Elective
<b>Uncontrolled infection</b>	
Locally uncontrolled infection (abscess, false aneurysm, fistula, enlarging vegetation, or dehiscence of prosthetic valve)	Urgent
Persistent fever and positive blood cultures for >5–7 days	Urgent
Infection caused by fungi or multidrug-resistant organisms, such as <i>Pseudomonas aeruginosa</i> and other gram-negative bacilli	Elective
<b>Prevention of embolism</b>	
Aortic or mitral-valve infective endocarditis with large vegetations (>10 mm in length) after one or more embolic episodes, despite appropriate antibiotic therapy, especially during the first 2 weeks of therapy	Urgent
Aortic or mitral-valve infective endocarditis with large vegetations (>10 mm) and other predictors of complicated course (heart failure, persistent infection, or abscess)	Urgent
Isolated, very large vegetations (>15 mm); surgery may be preferred if a procedure preserving the native valve is feasible	Urgent



# Arrhythmia

Recommendations	Class <sup>a</sup>	Level <sup>b</sup>
Surgical ablation of AF should be considered in patients with <u>symptomatic AF undergoing cardiac surgery.</u>	IIa	A
Surgical ablation of AF may be performed in patients with <u>asymptomatic AF undergoing cardiac surgery if feasible with minimal risk.</u>	IIb	C
<u>Minimally invasive surgical ablation</u> of AF without concomitant cardiac surgery is feasible and may be performed in patients with <u>symptomatic AF after failure of catheter ablation.</u>	IIb	C

# Cardiac Tumors

**Table I – Primary cardiac tumors**

Benign (75% of the cases)

Myxoma

Rhabdomyoma

Fibroma

Lipoma

Atrioventricular node tumor

Papillary fibroelastoma

Hemangioma

Malign (25% of the cases)

Angiosarcoma

Rhabdomyosarcoma

Fibrosarcoma

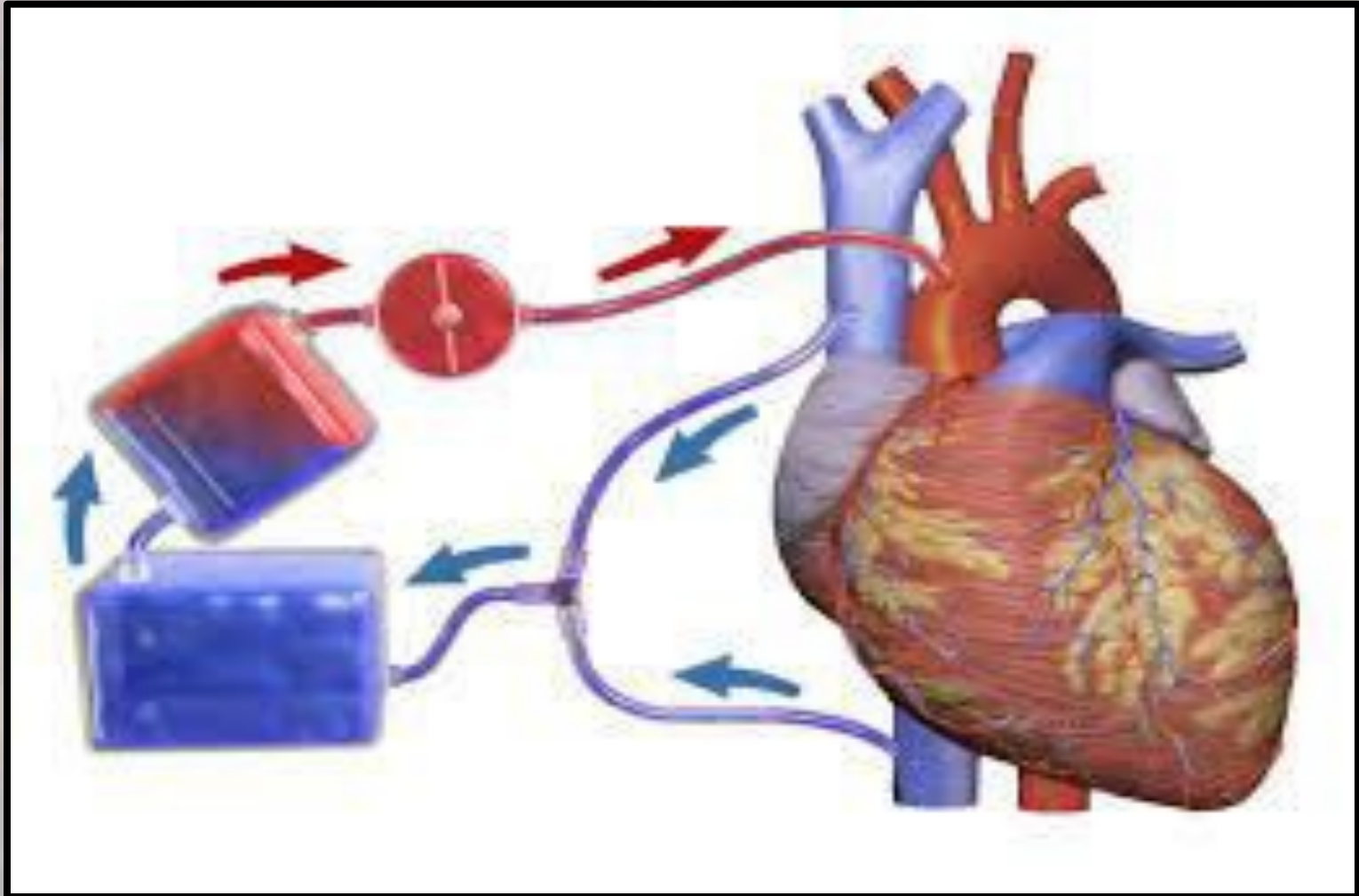


# **Surgical Treatment**

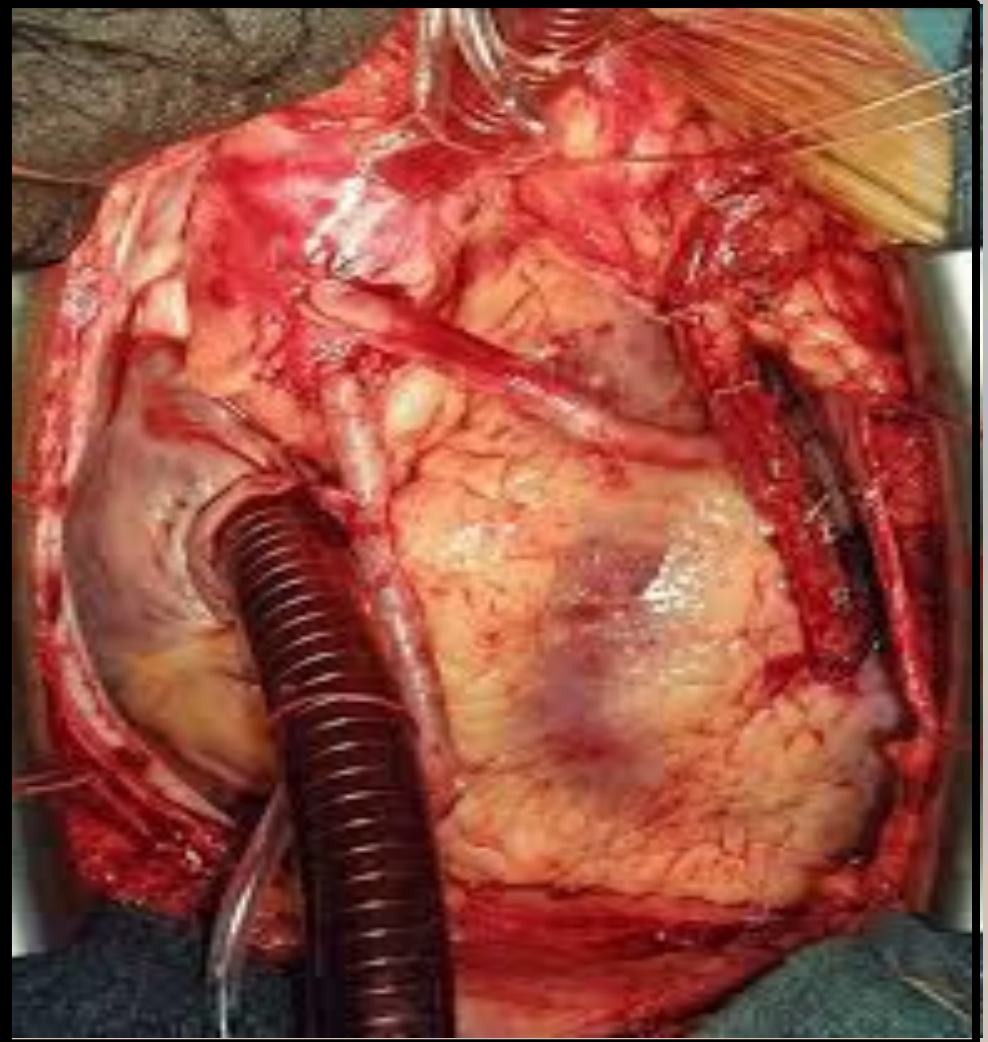
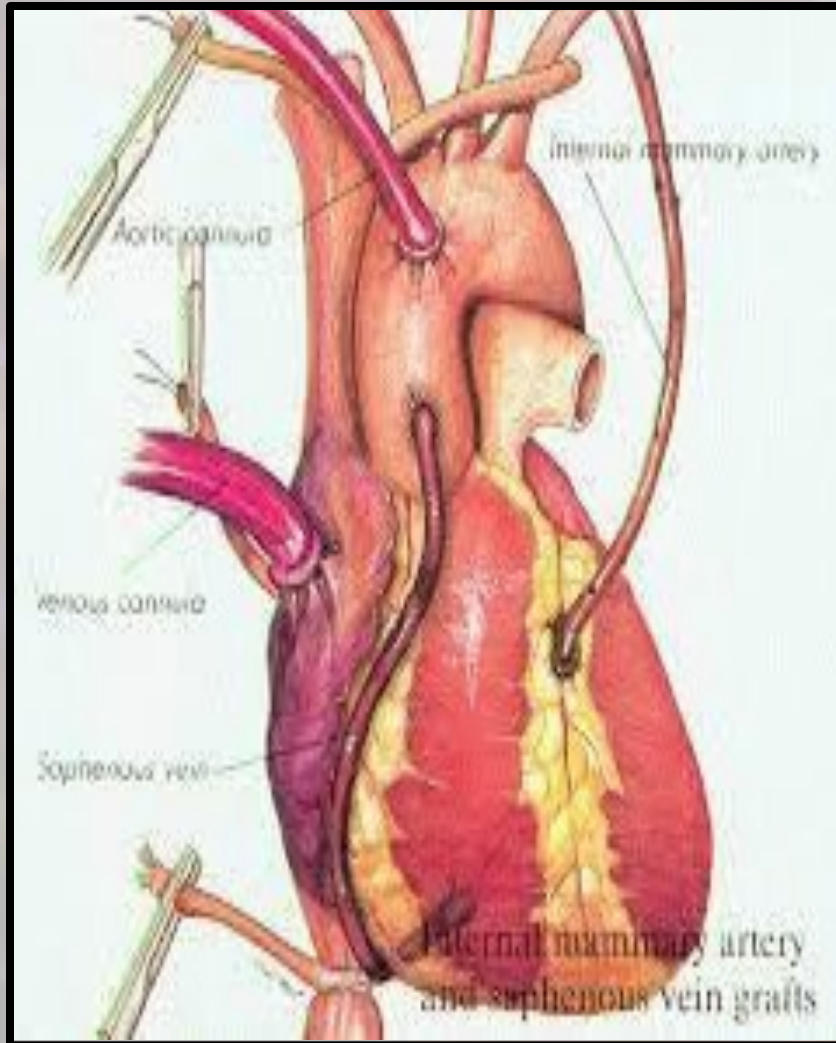
# Coronary Artery Bypass Surgery



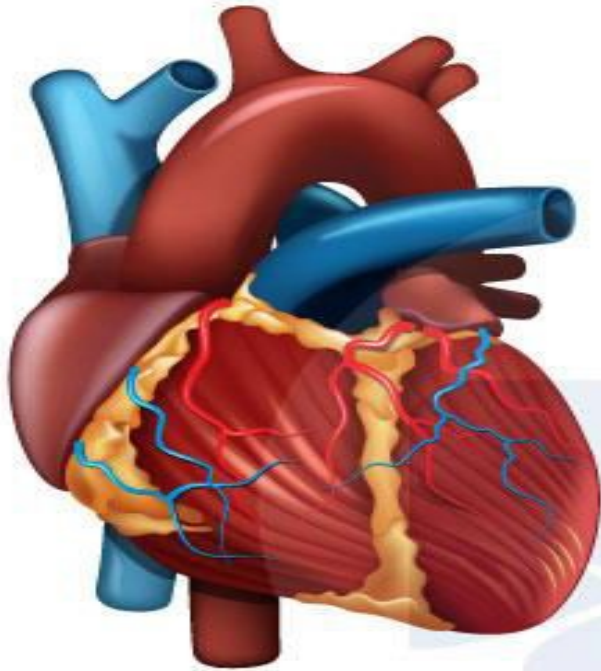
# Coronary Artery Bypass Surgery



# Coronary Artery Bypass Surgery



# Coronary Artery Bypass Surgery



## **BENEFITS OF OFF PUMP CABG**

Reduced incidence of stroke  
& cognitive problems

Lesser renal dysfunction

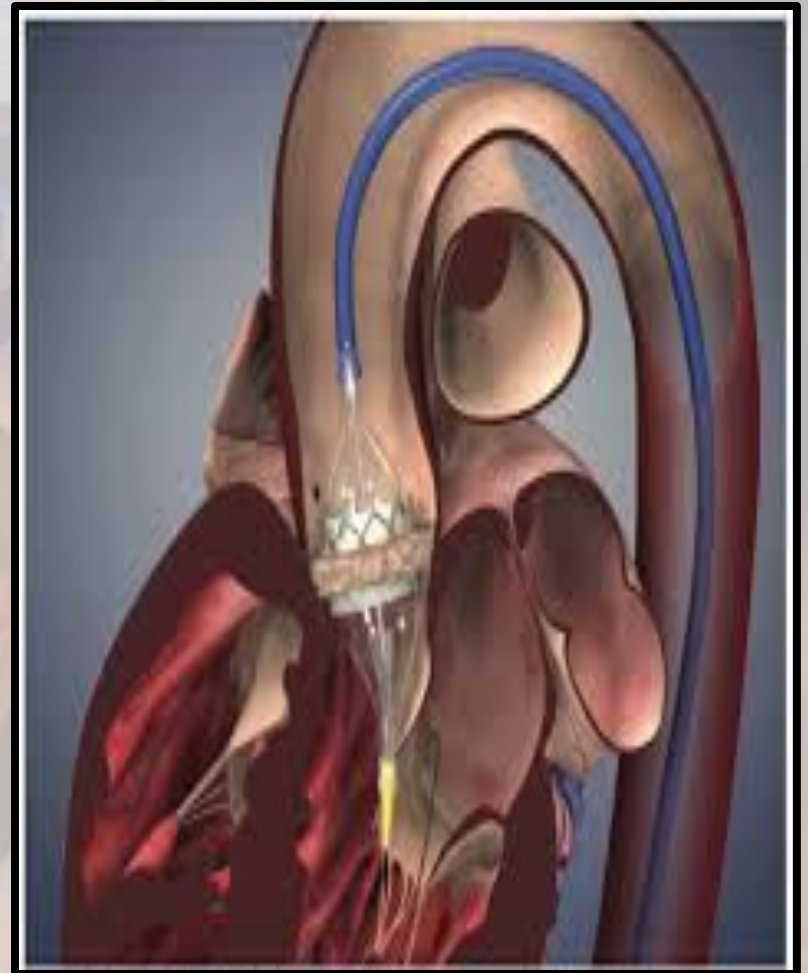
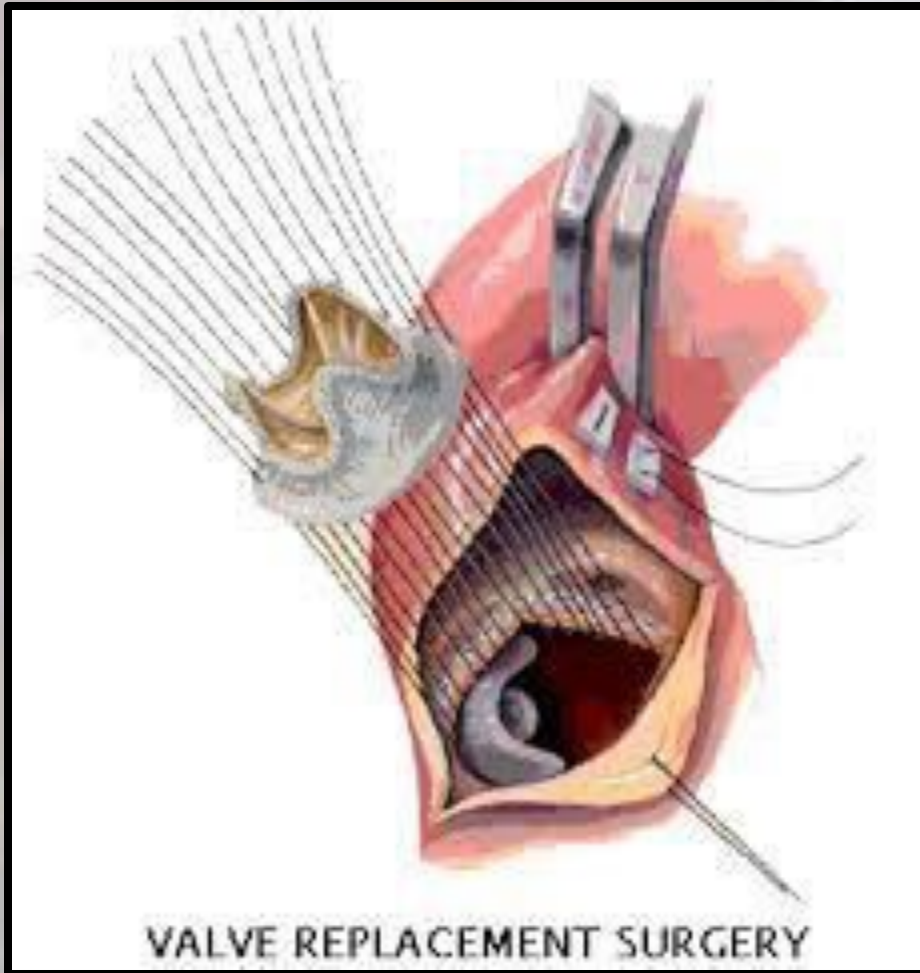
Reduced inflammatory  
response

Lesser coagulopathy &  
requirement of  
blood transfusion

Reduced length of time in  
intensive care & hospital  
stays

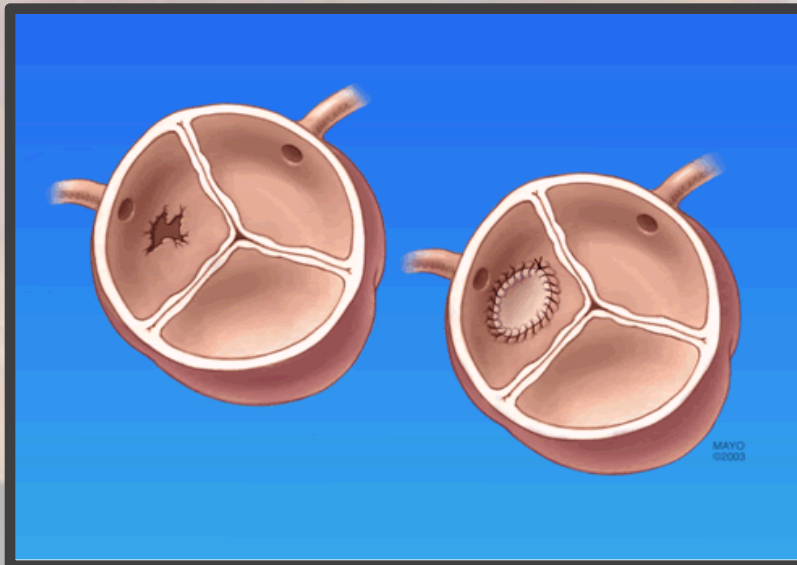
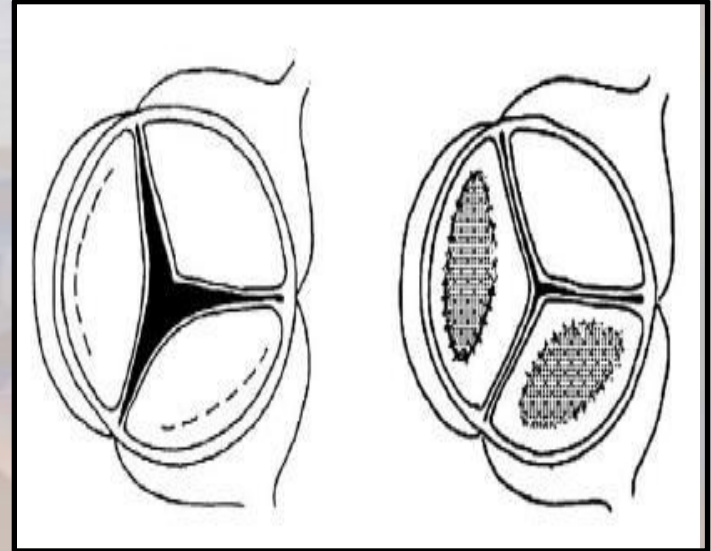
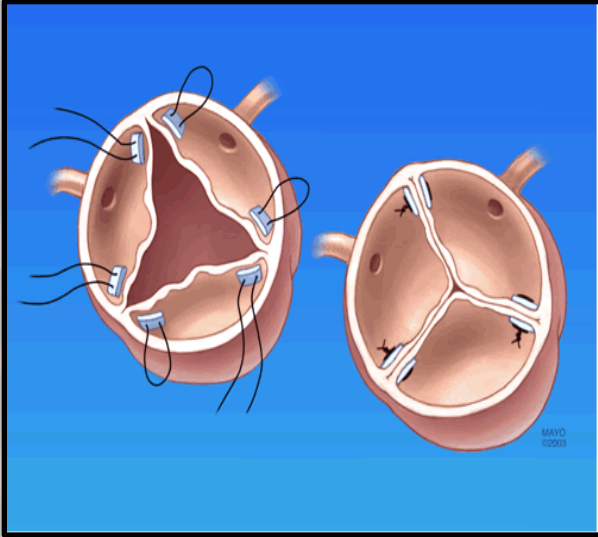
Reduced morbidity &  
mortality rates

# Aortic Stenosis

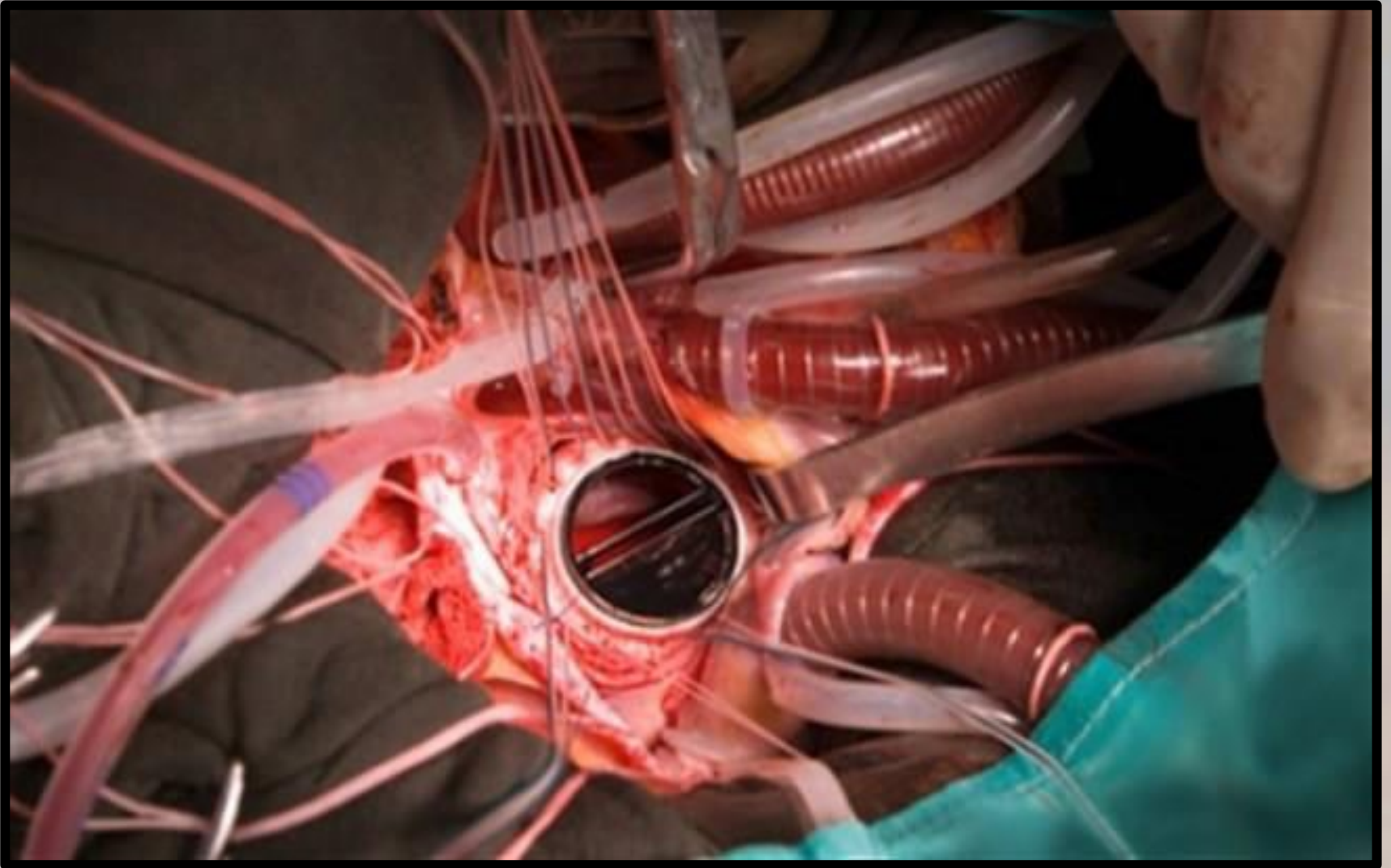




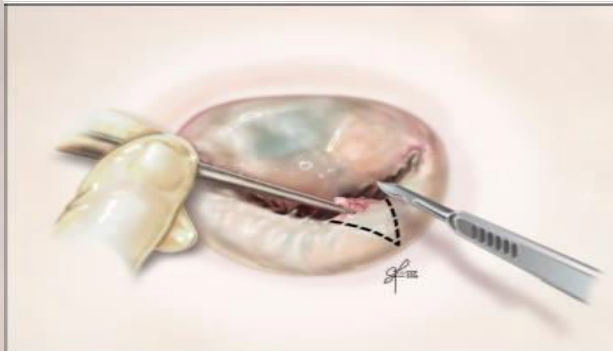
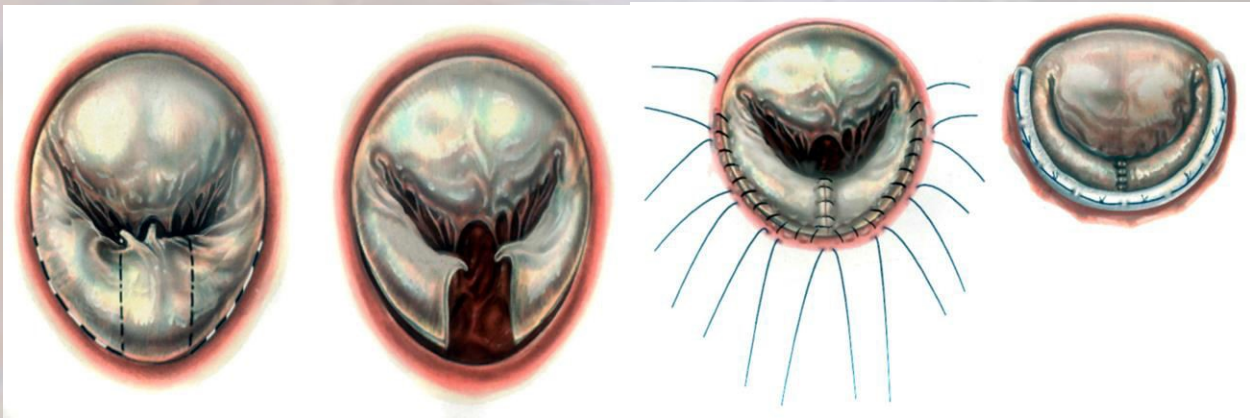
# Aortic Regurgitation



# Mitral Stenosis



# Mitral Regurgitation



# Valvular Prostheses

## Prosthetic Heart Valves



### Biologic

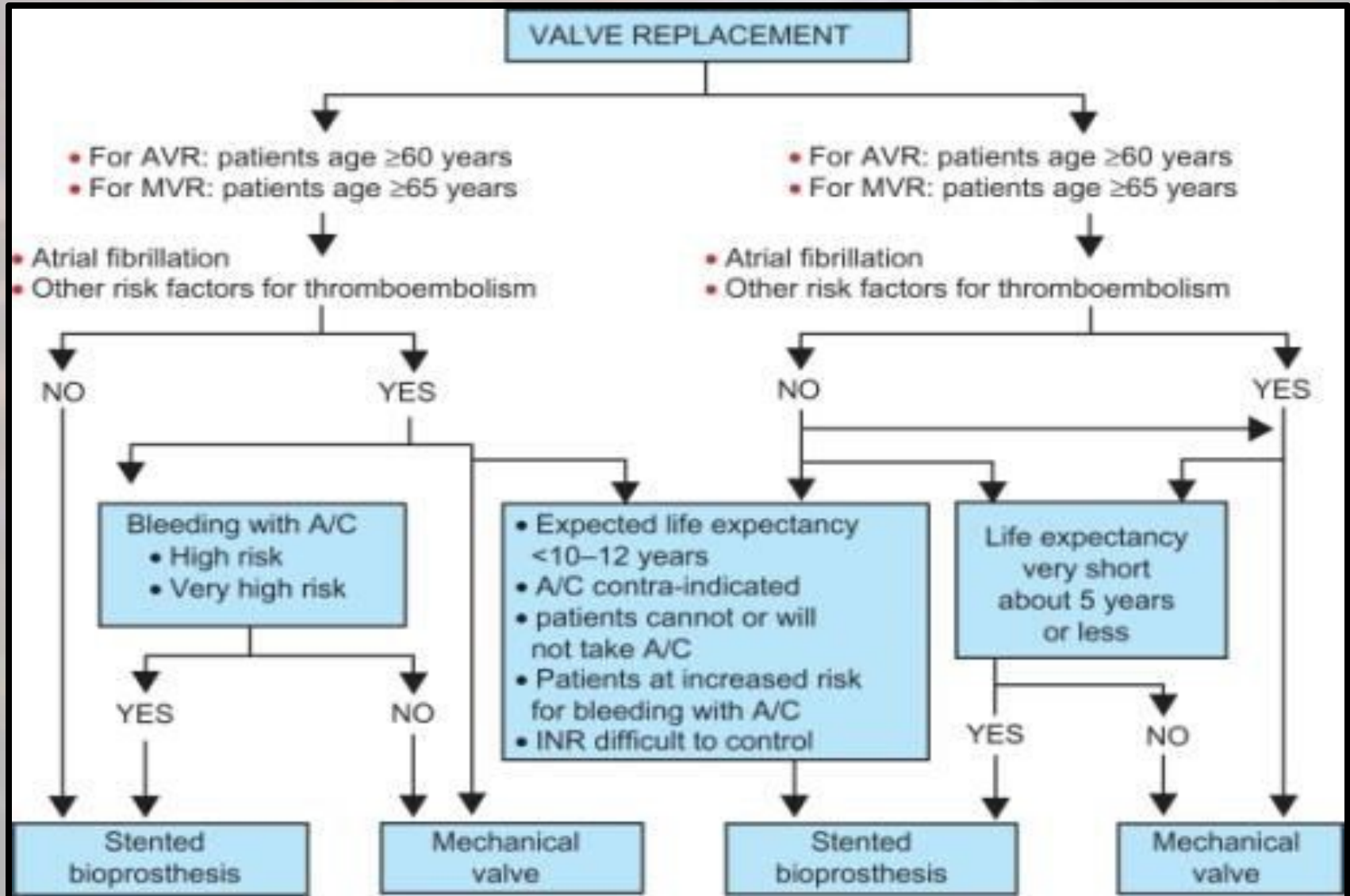
- Lasts 8-10 years
- No anticoagulation
- No Click



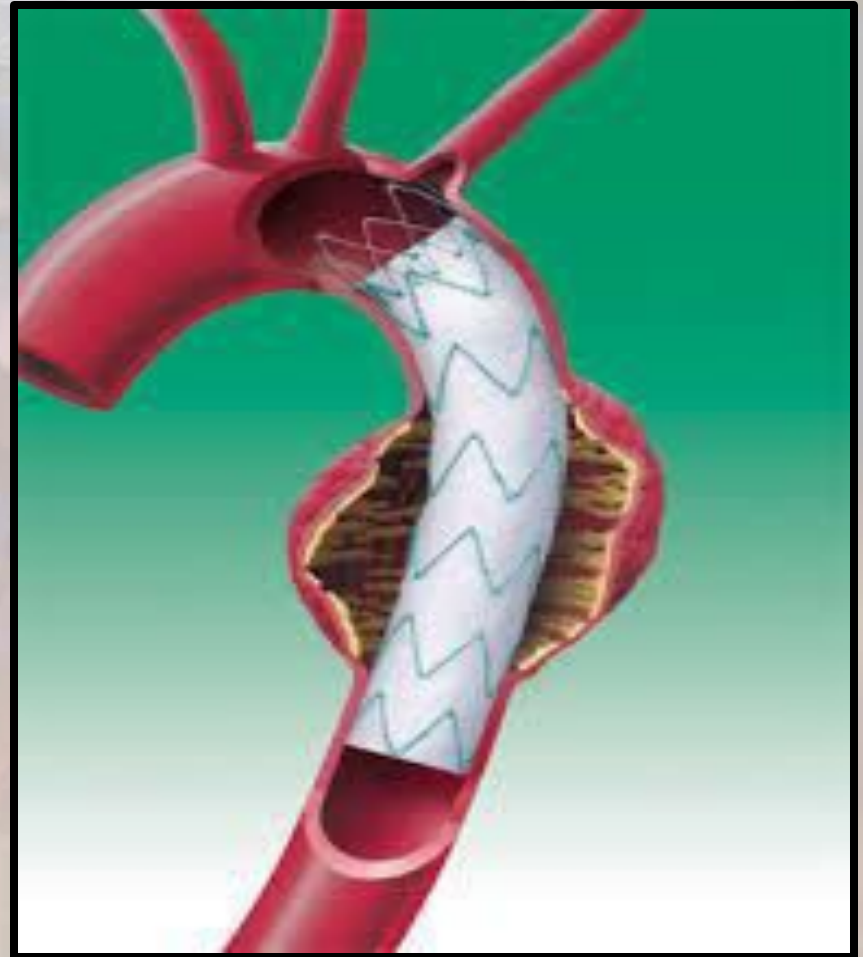
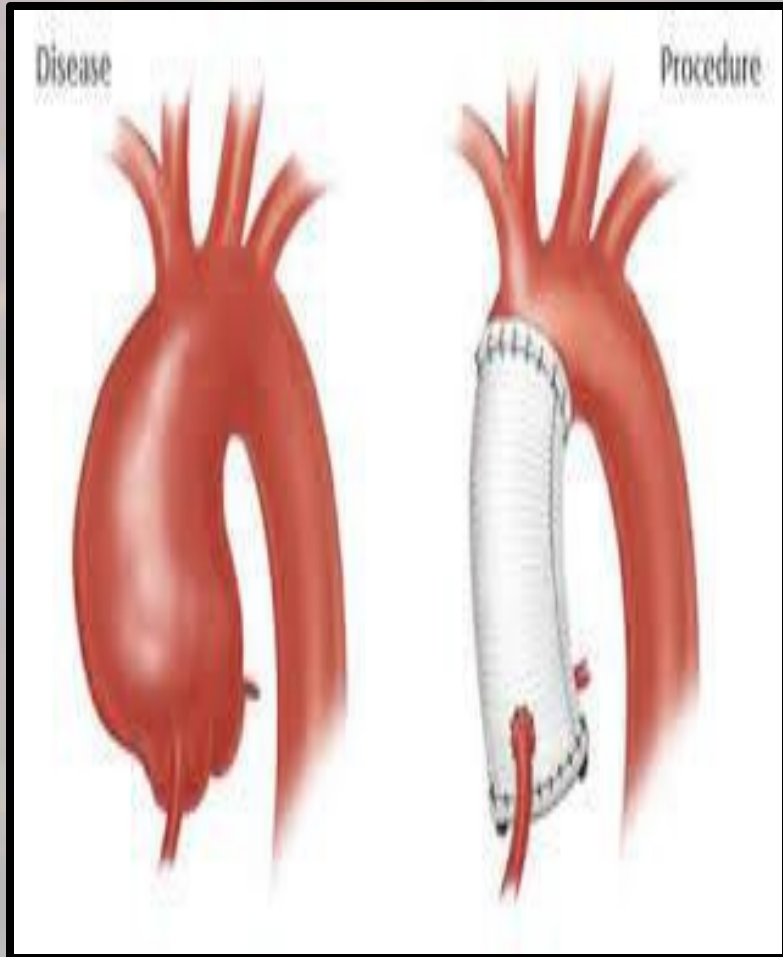
### Mechanical

- Lasts > 20 years
- Lifelong anticoagulation
- Click

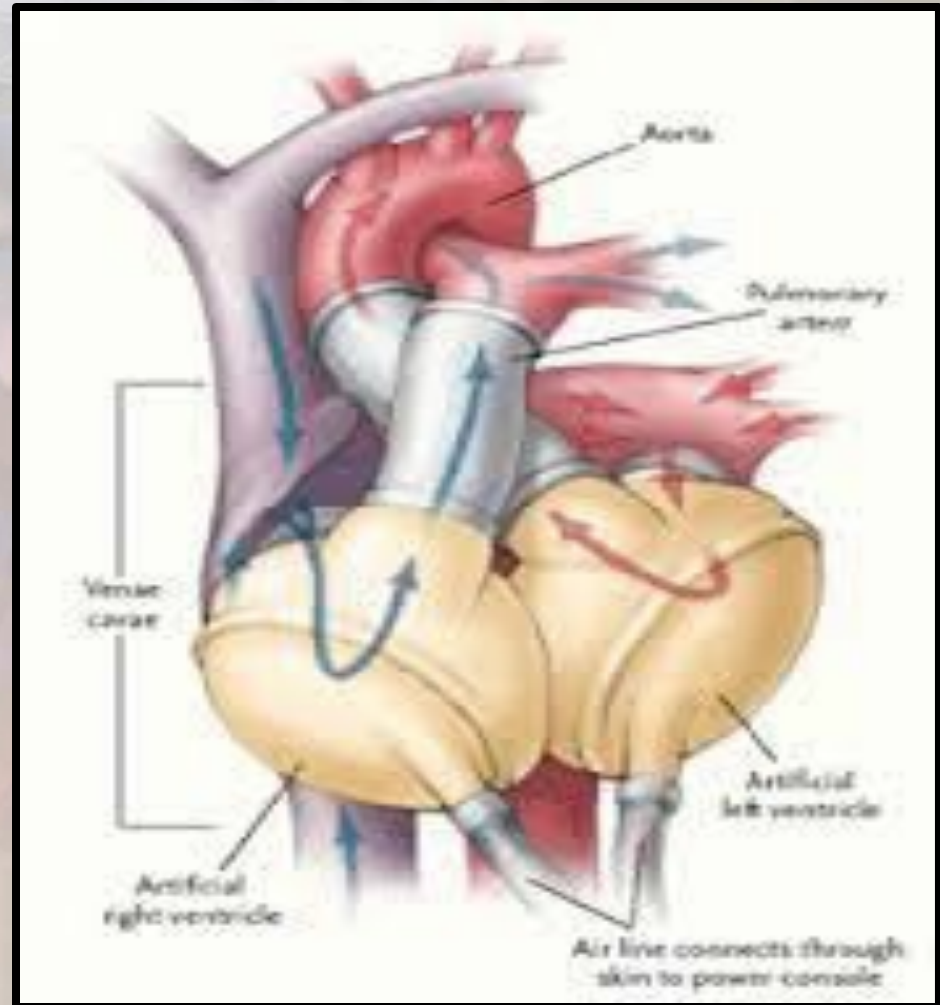
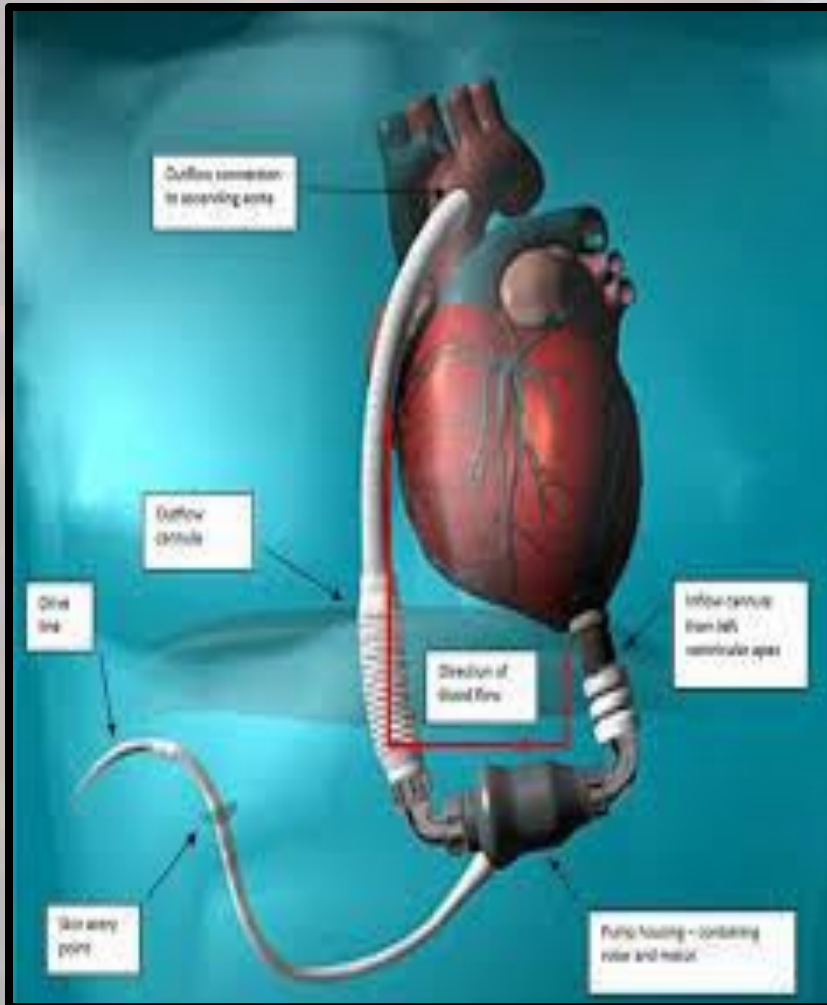
# Valvular Prostheses



# Aortic Surgery

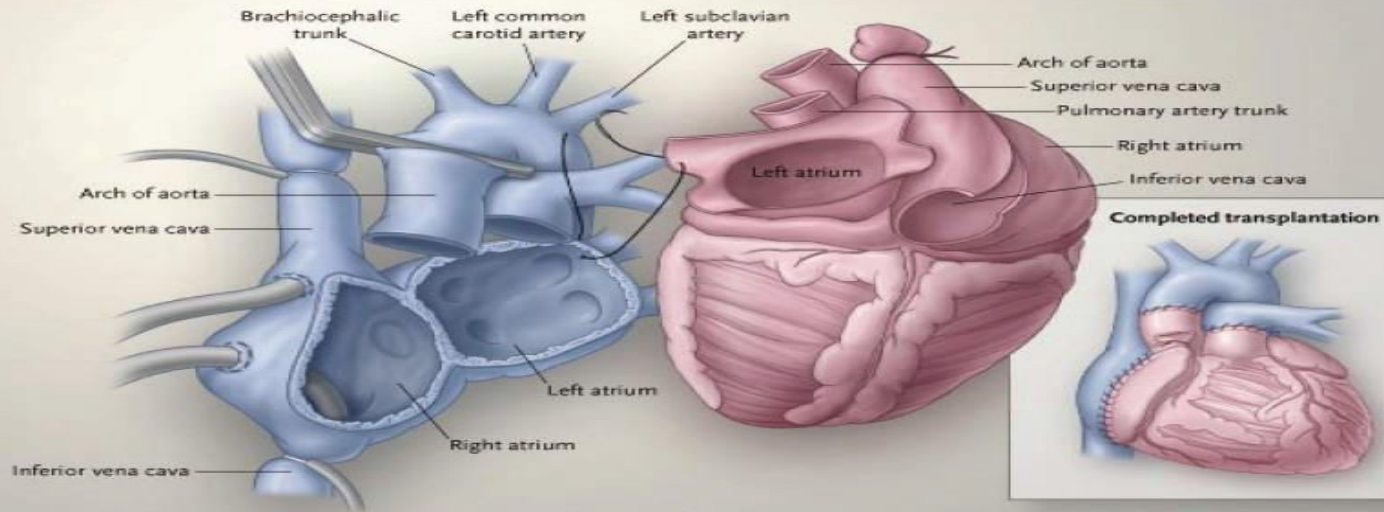


# Heart Failure

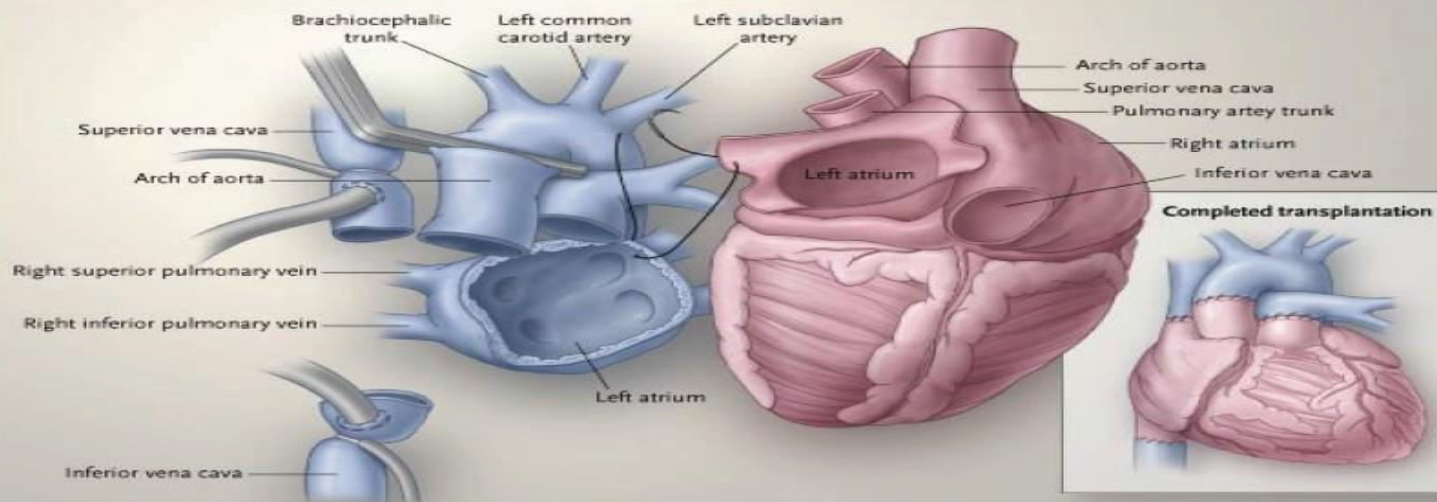


# Heart Failure

## A Standard (Biatrial) Heart Transplantation

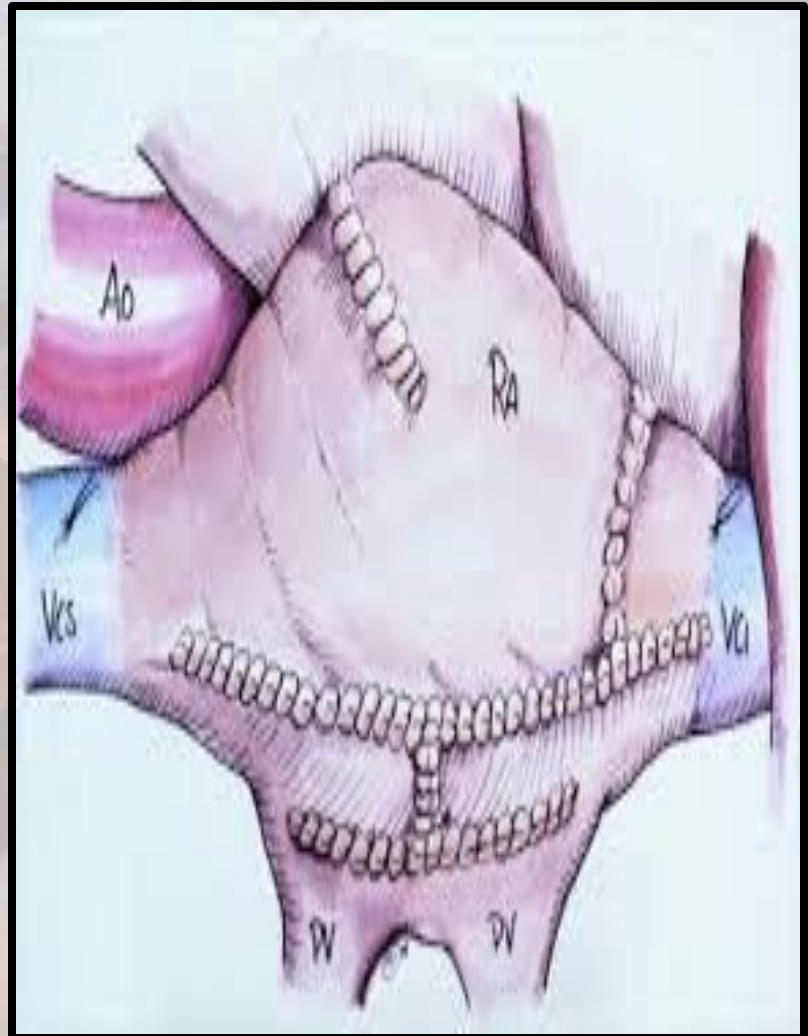
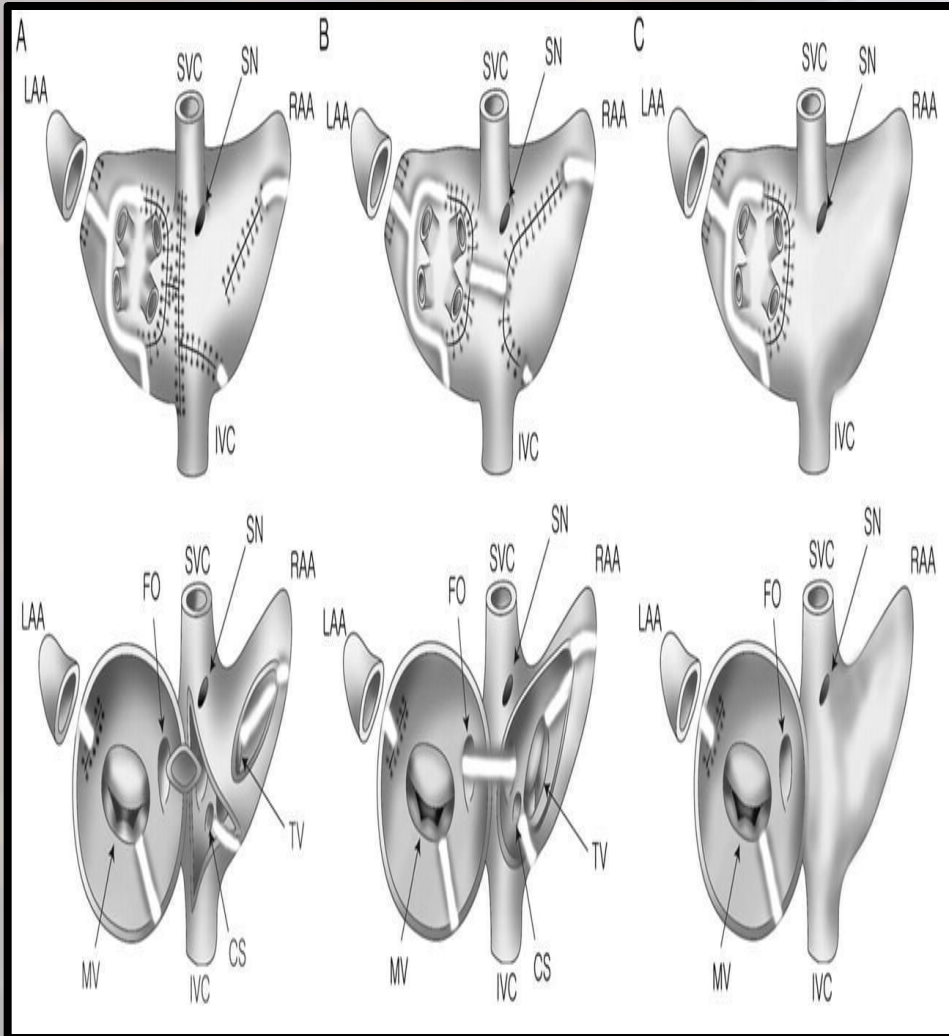


## B Orthotopic Cardiac Transplantation with Bicaval Technique

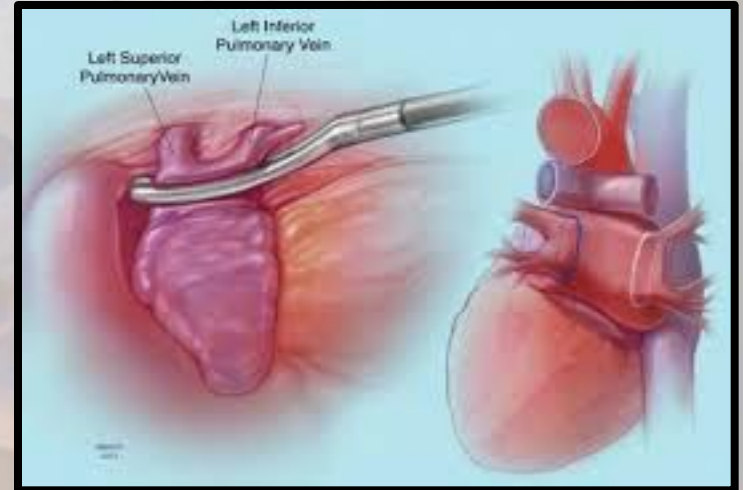
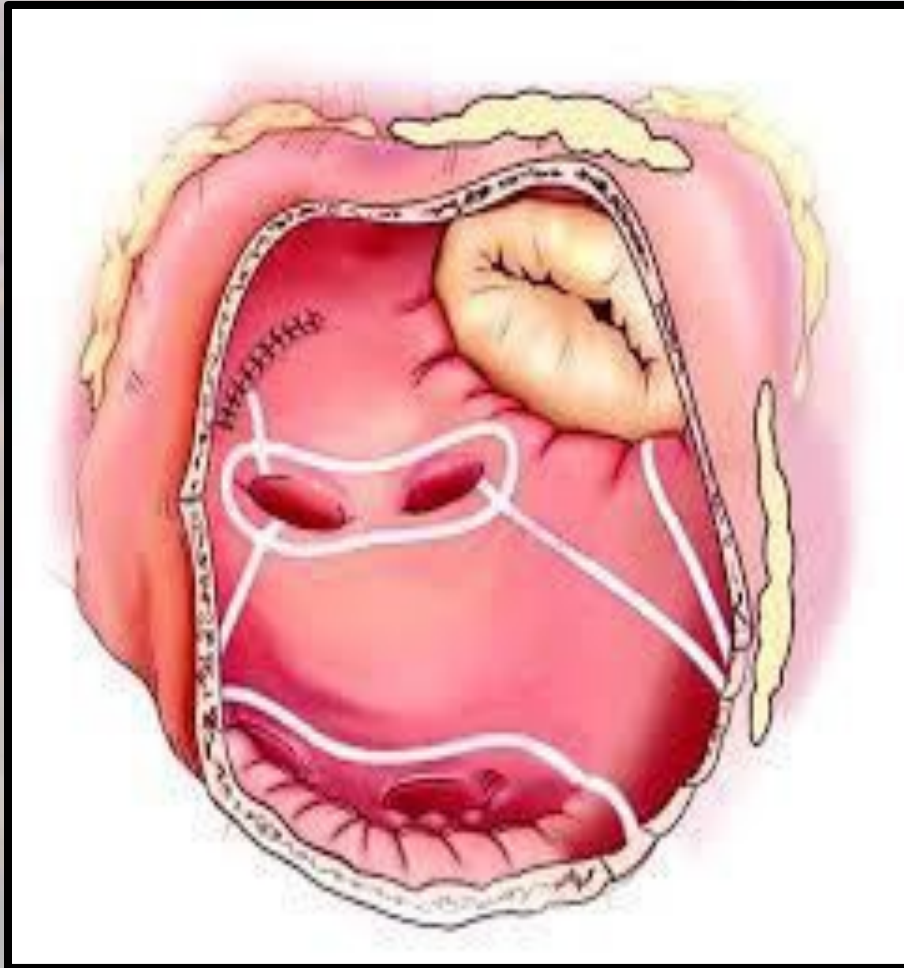


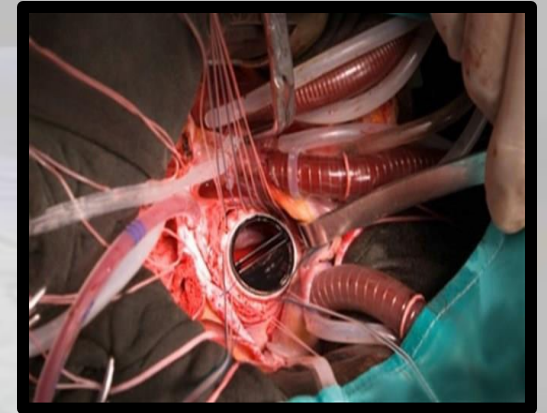
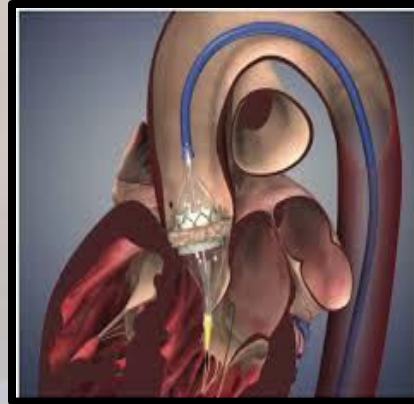
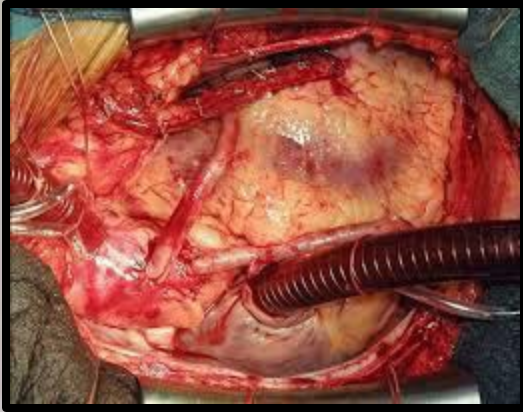


# Arrhythmia Surgery



# Arrhythmia Surgery





**Thank You**

