

Surgical Therapy for Cardiovascular Disease

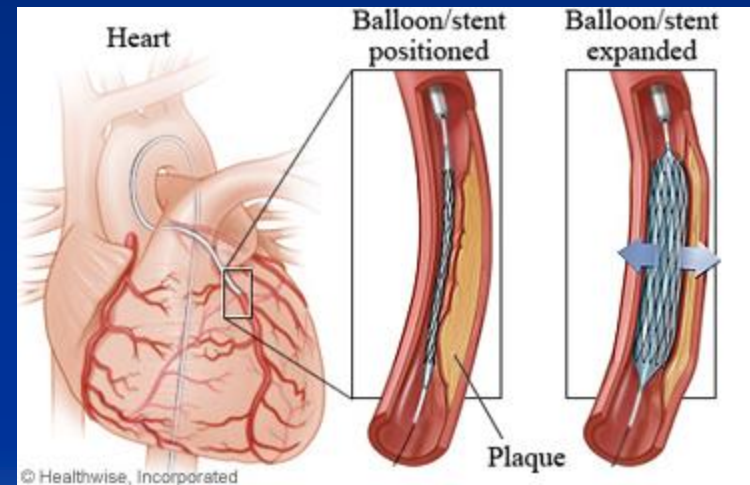
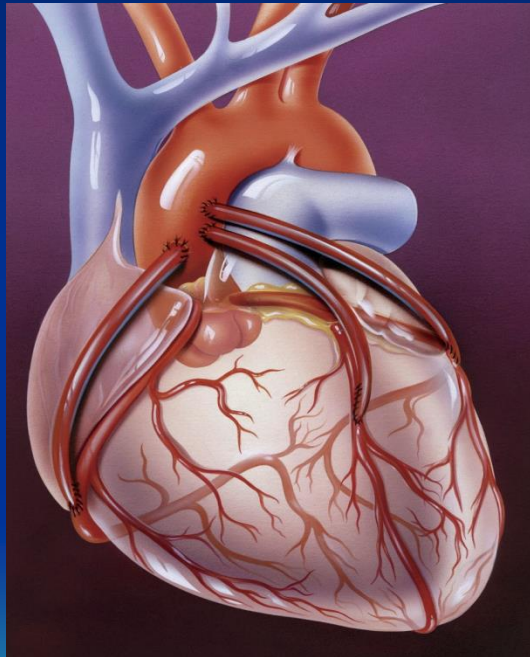


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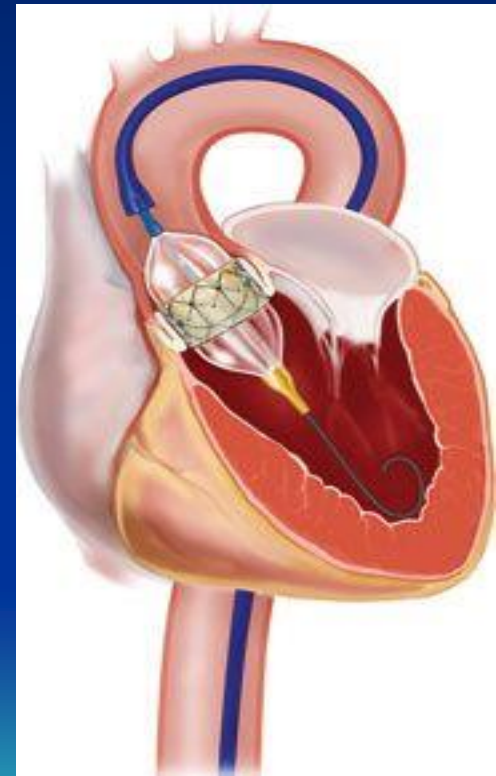
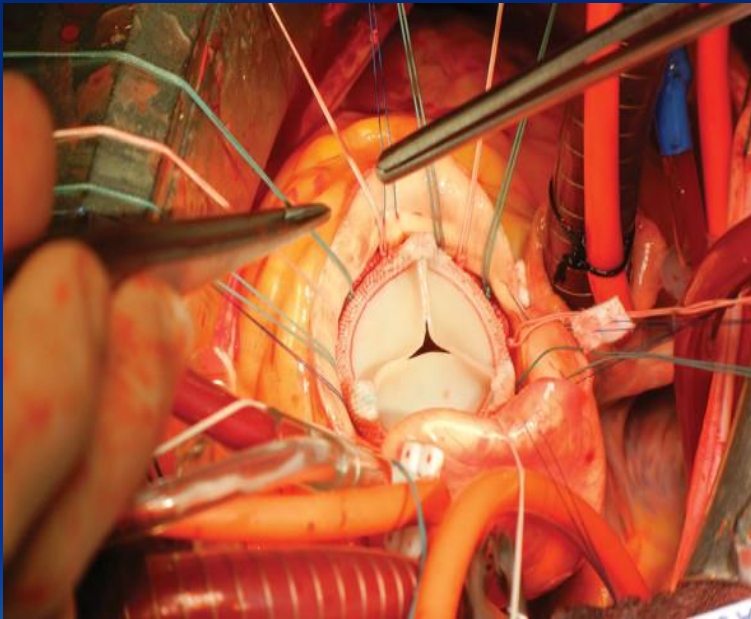
Newest trends in cardiovascular surgery



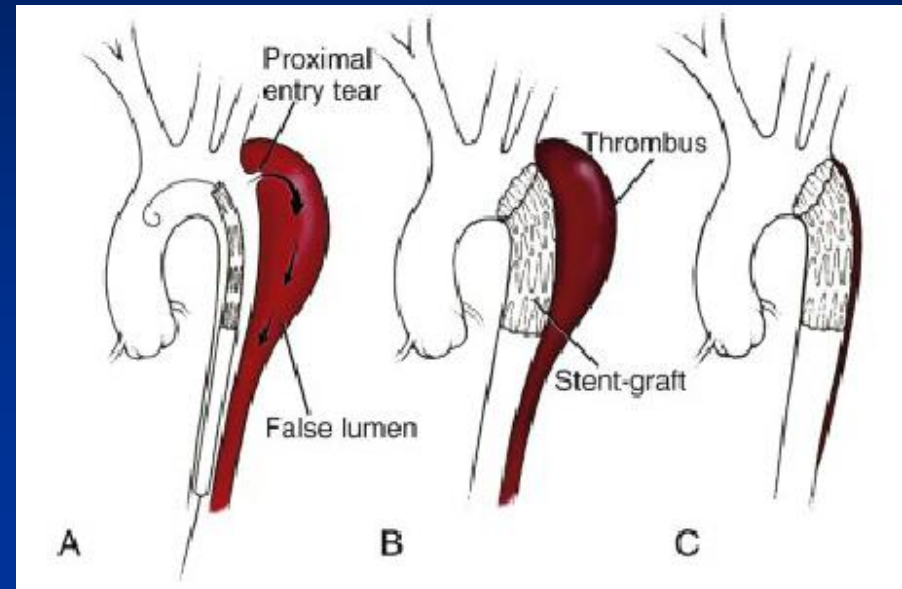
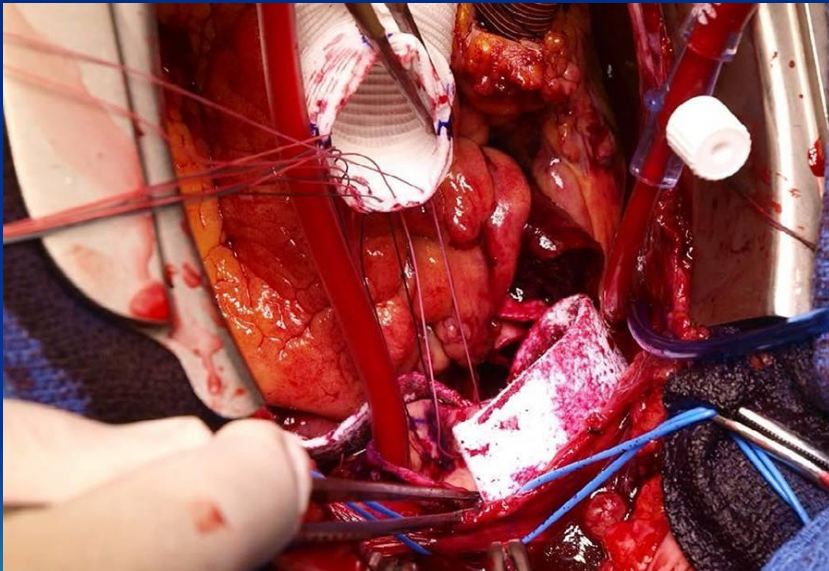
Coronary artery disease



Heart valve disease



Aortic dissection



Question?

- What is the destination of cardiac surgery?
- Will it be developing or declining?



Introduction to cardiac surgery program PVHMC



Cardiac Surgery at Pomona Valley Hospital Medical Center

- Providing nationally-recognized cardiovascular health services
- Recognized by healthgrades as top 10 percent in the nation for cardiac surgery
- Received awards in 2018
 - Cardiac surgery excellence award
 - Five-star rating for coronary artery bypass surgery



Cardiac Surgeon

Three-procedure profession

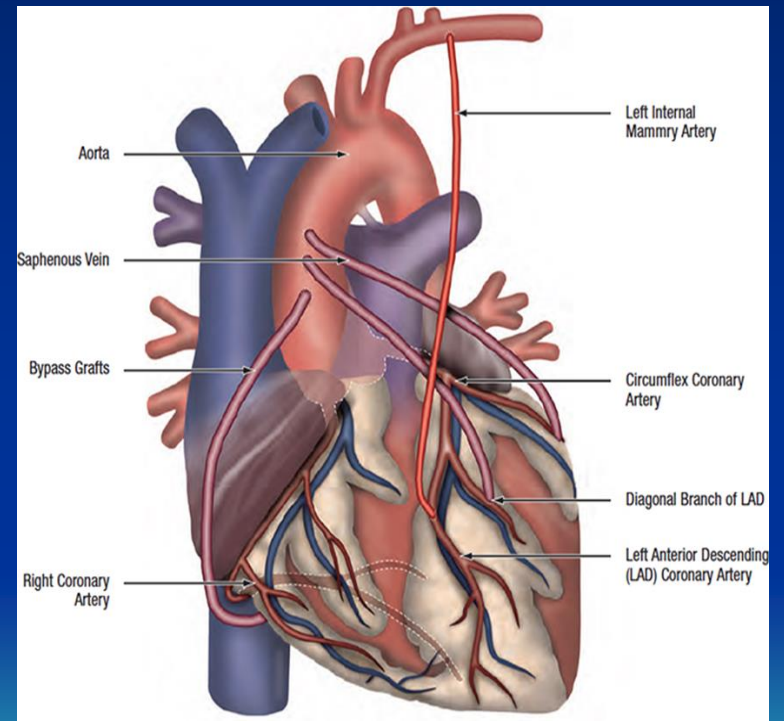
1. Coronary artery bypass grafting surgery
2. Heart valve replacement vs. repair
3. Aortic aneurysm/dissection -Repair



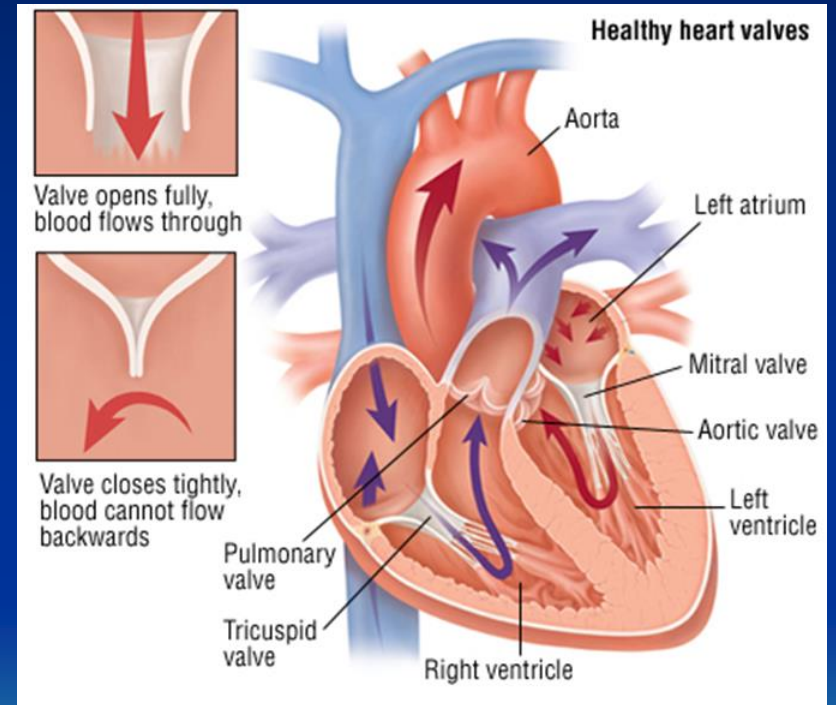
Cardiac surgeon A plumber



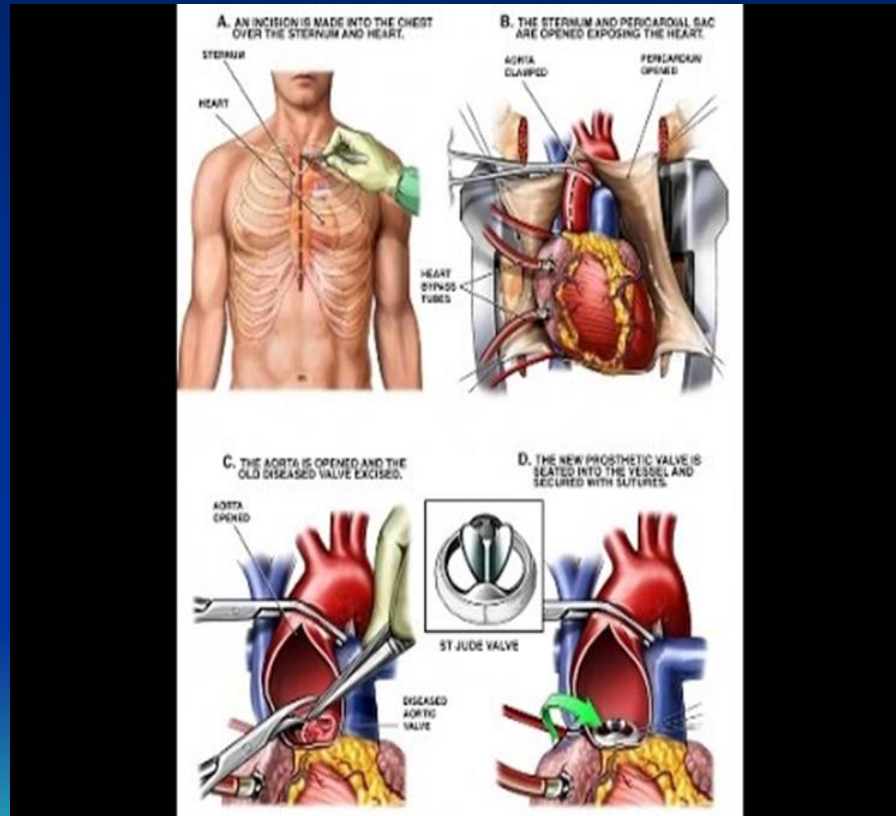
CABG



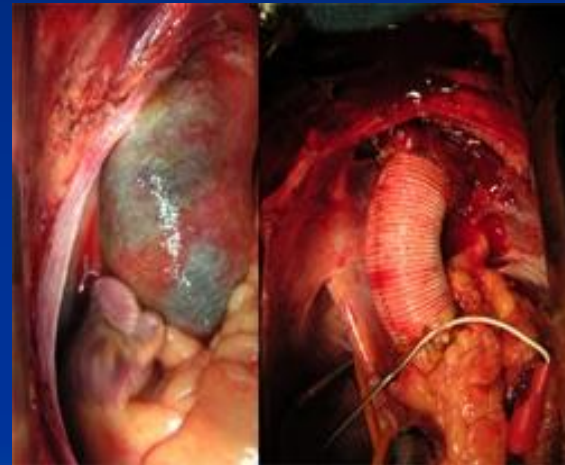
Heart Valve Replacement / repair



Aortic Valve Replacement



Aortic dissection repair

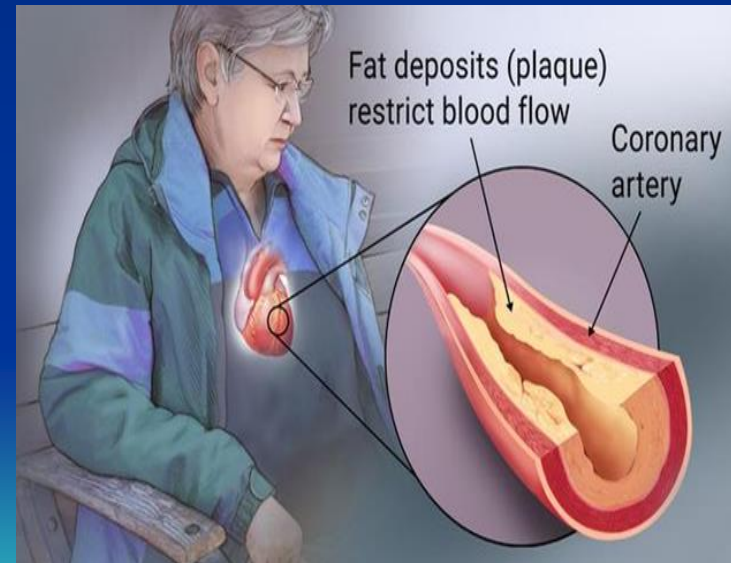
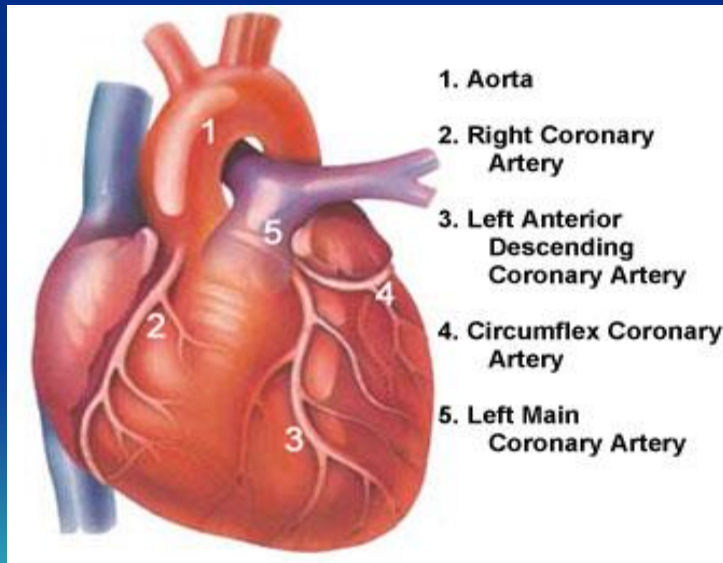


Coronary Artery Disease (CAD)

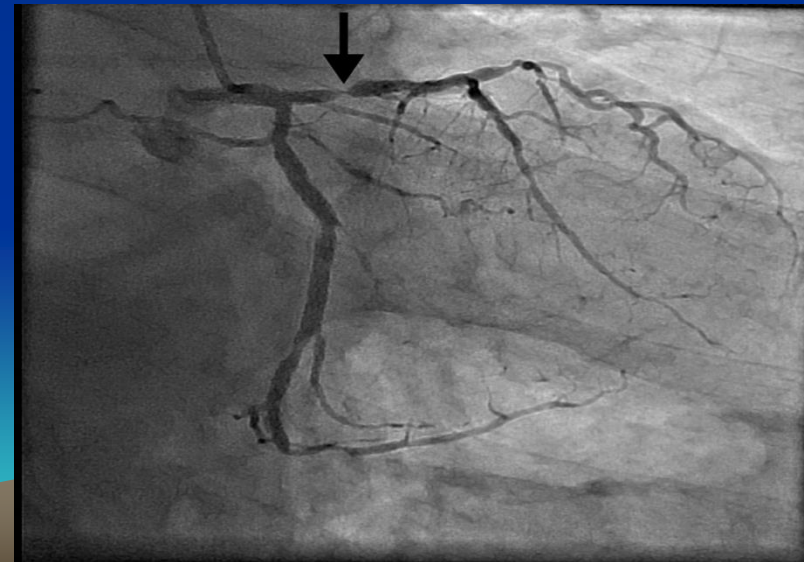


Coronary artery disease

- CAD is the most common type of heart disease
- Leading cause of death in the United States
- Plaque builds up and narrows the coronary arteries, decreasing blood supply to the heart
- Symptoms: chest pain, shortness of breath, heart attack, sudden death

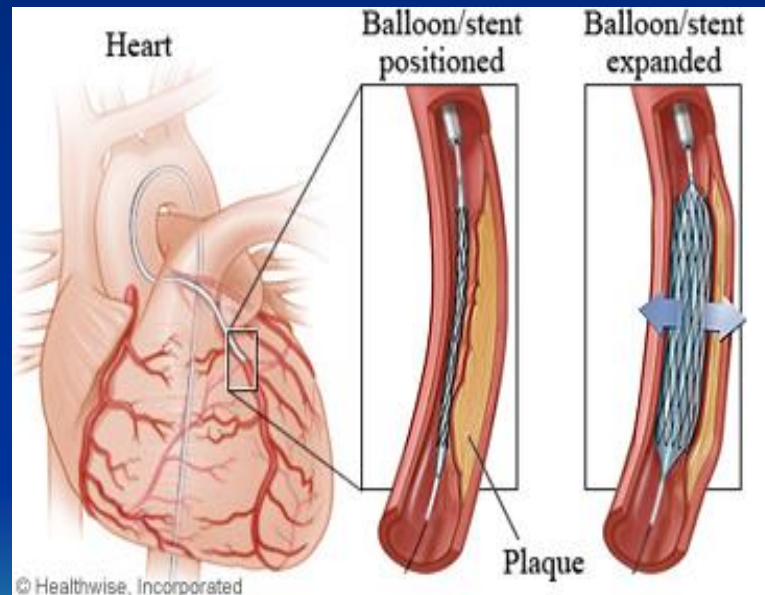


Cardiac catheterization



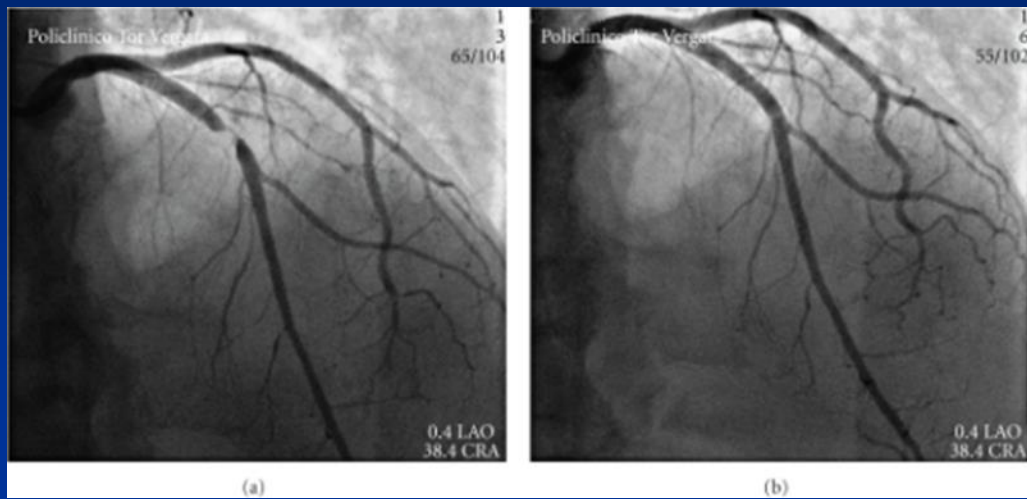
Treatment option

Percutaneous coronary intervention (PCI)-Stent placement

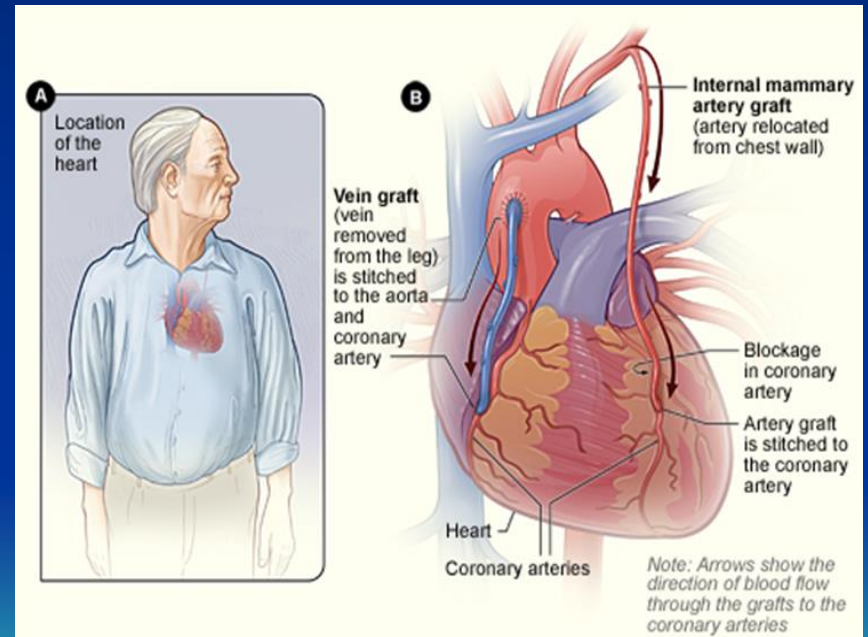






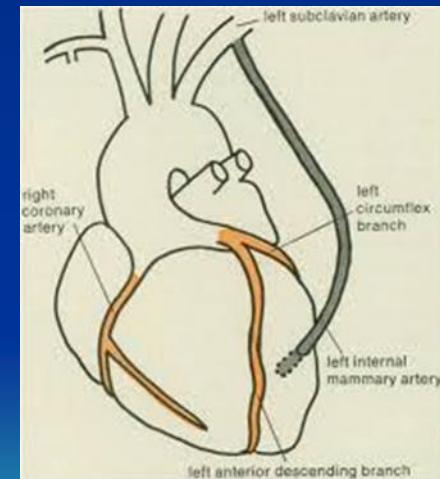
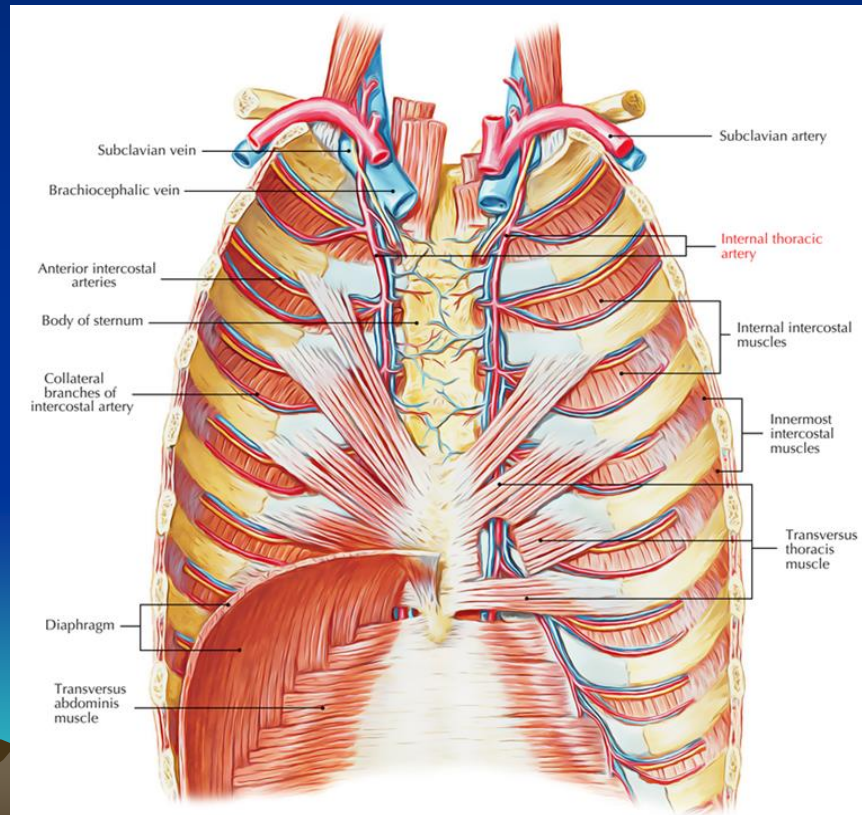


Coronary artery bypass grafting surgery (CABG)



History of CABG

- Pre-cardiac catheterization time
- Attempt to treat ischemic heart disease started in 1950s: implantation of IMA to myocardium in 1950



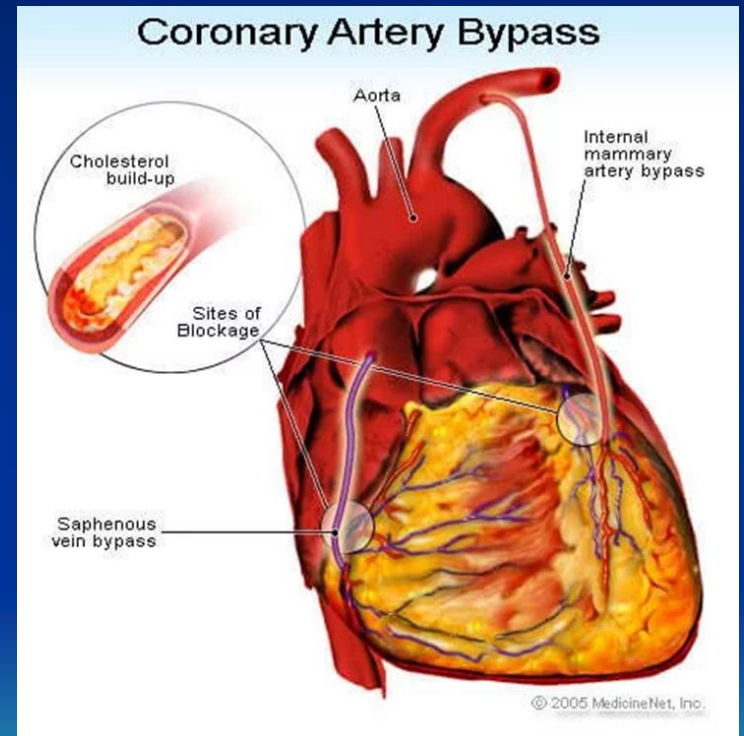
Not successful until cardiac catheterization in early 1960s



Normal coronary arteries on the left side of the heart



Normal coronary arteries on the right side



Great advances in 1970s. Conduit developed: IMA, SVG, Radial artery



Arterial Grafts for CABG

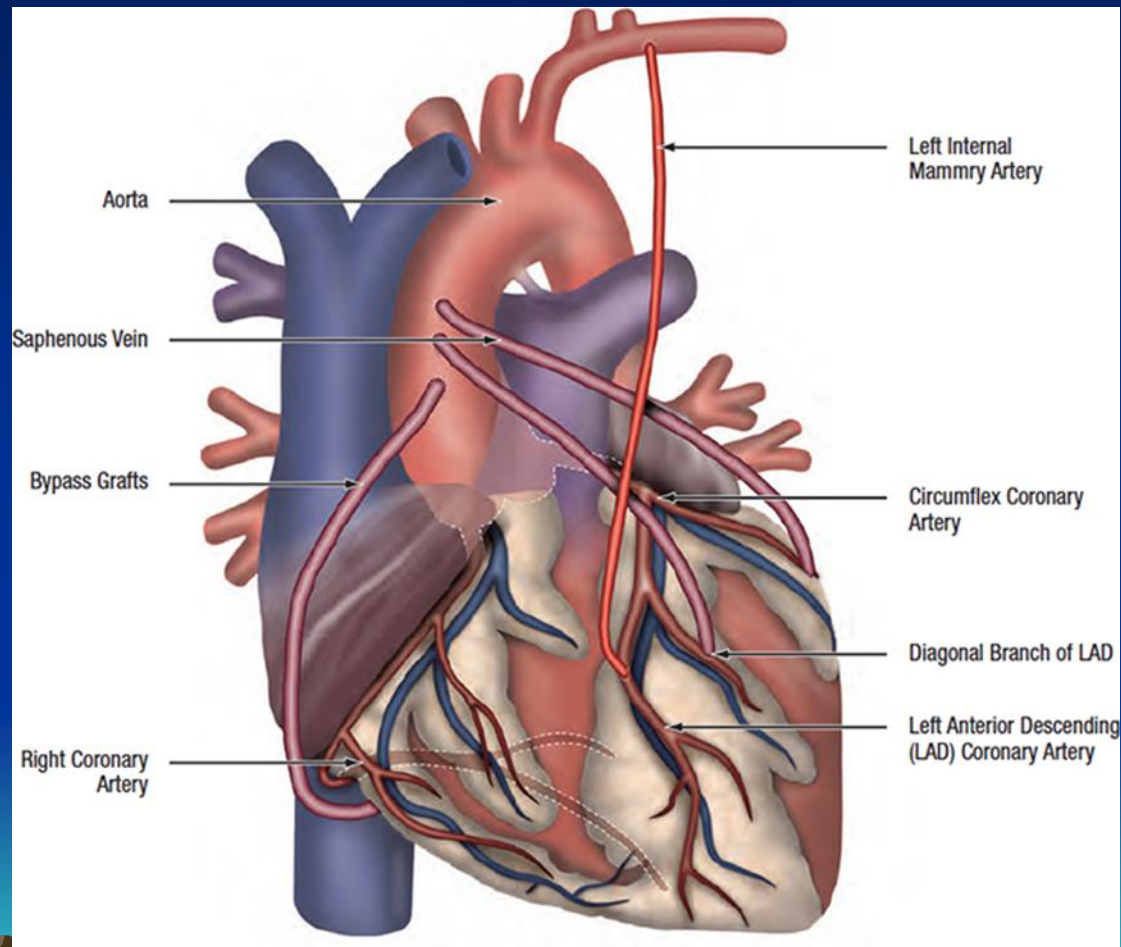
Internal Mammary Artery



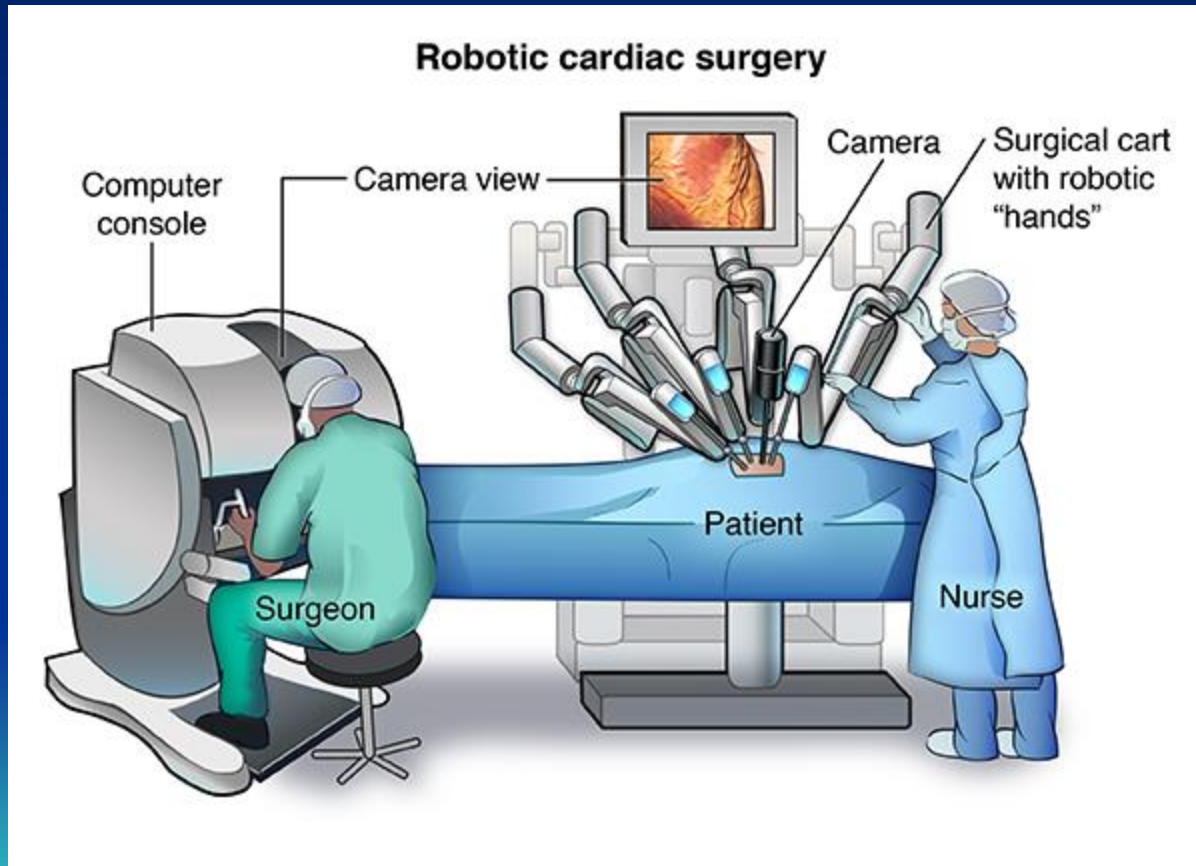
Radial Artery



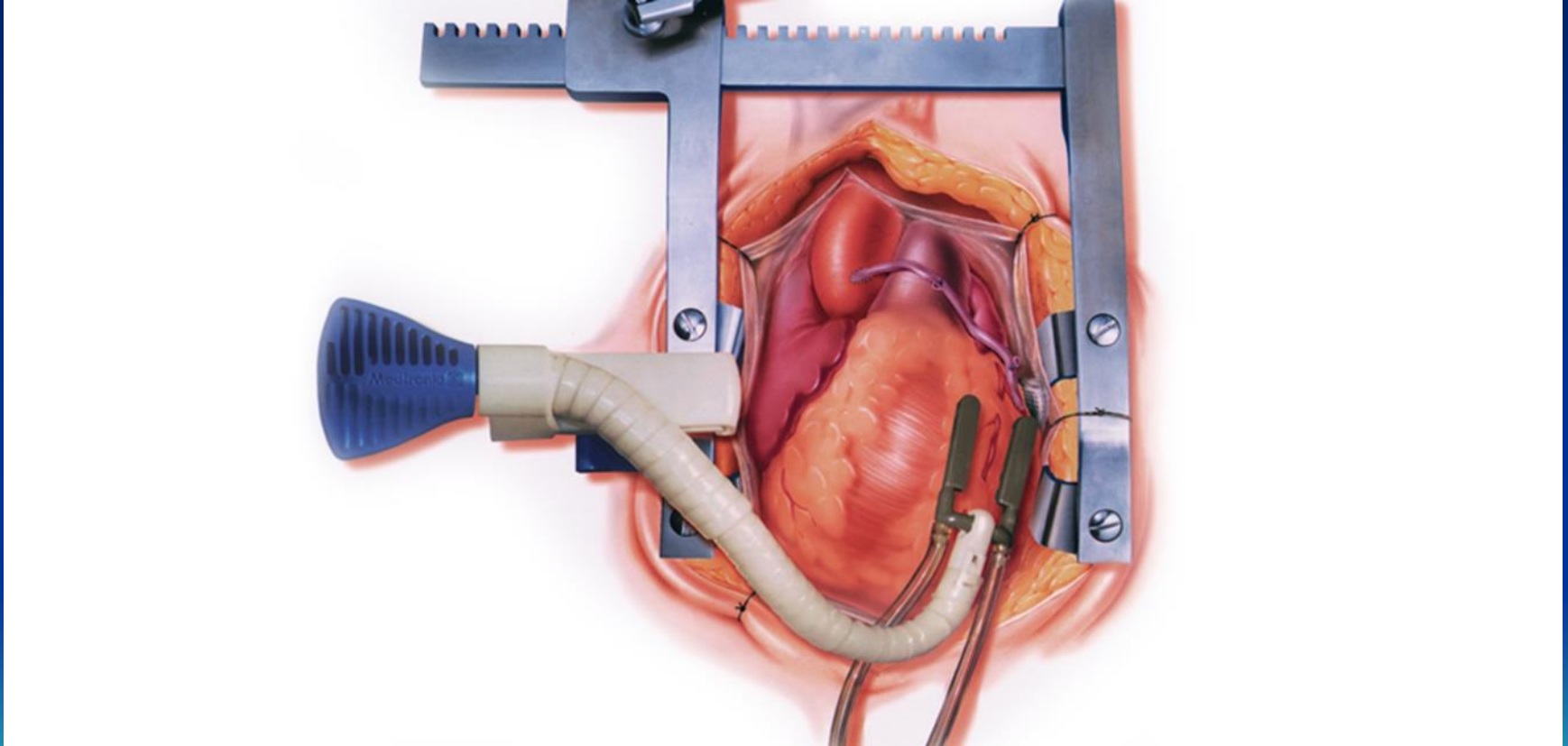
1980s Prevalence of CABG increased and safety improved



1990s New techniques: Minimally invasive approach, robotic assisted surgery



Beating Heart CABG



Outcome of CABG

- Operative mortality
- Improved LV function
- Improved life quality
- Improved survival
- Importance of Postoperative care



Heart valve disease

The first successful heart valve replacement in 1960 by Dr. Albert Starr

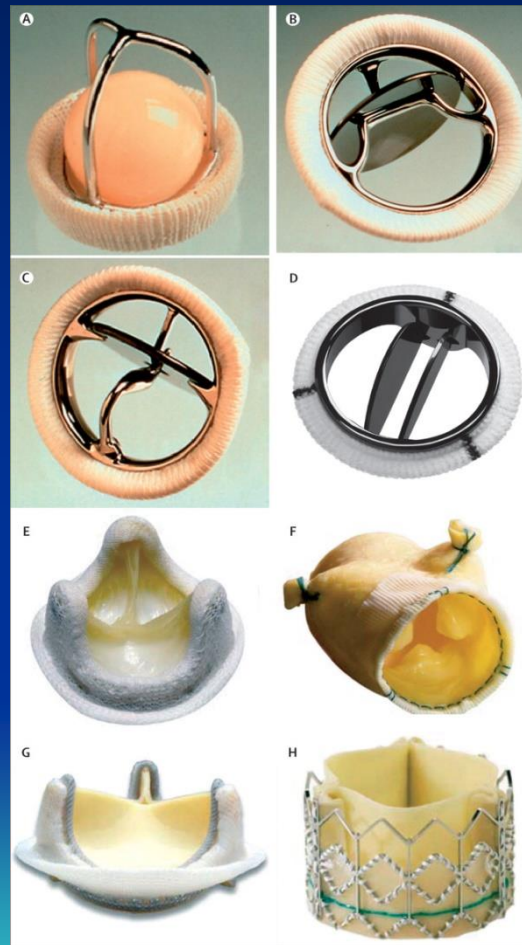


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UNIVERSITY

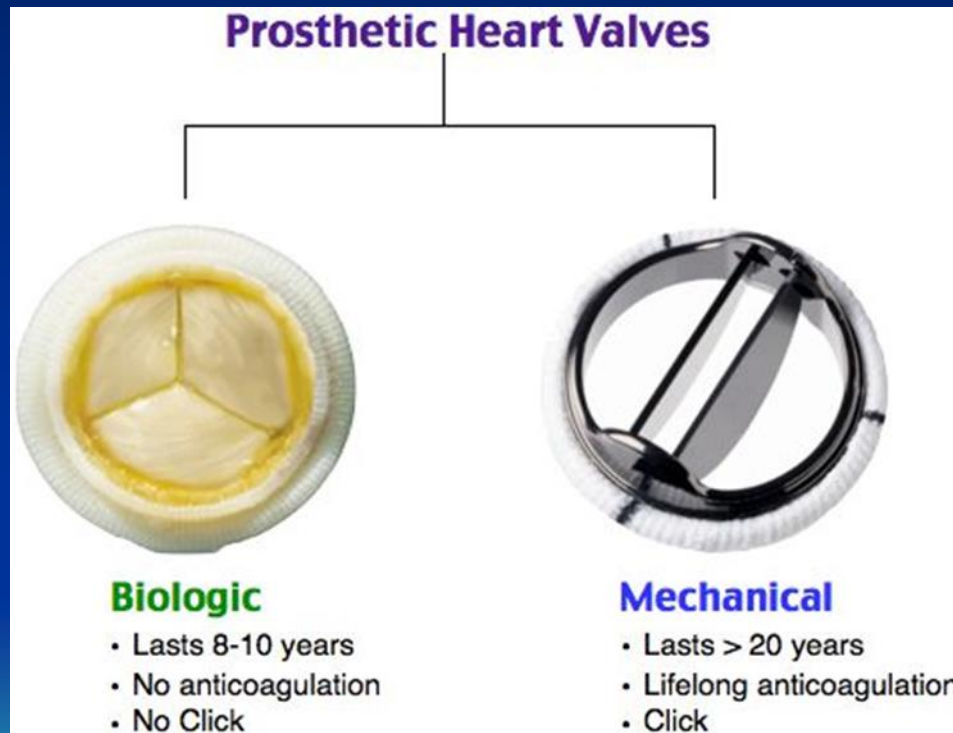




Type of Artificial Heart Valve



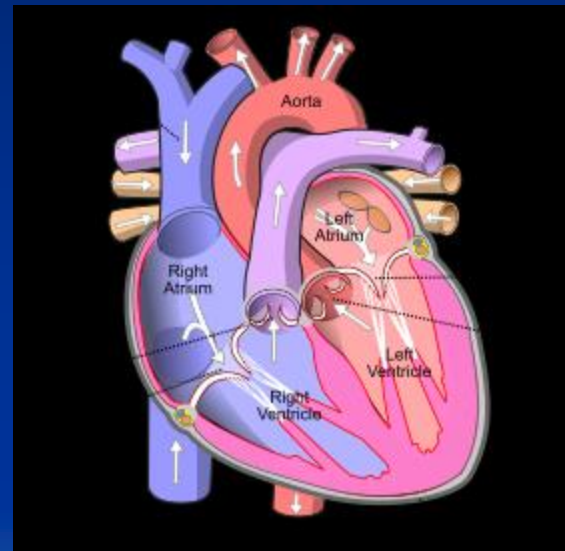
Main type of heart valve prosthesis

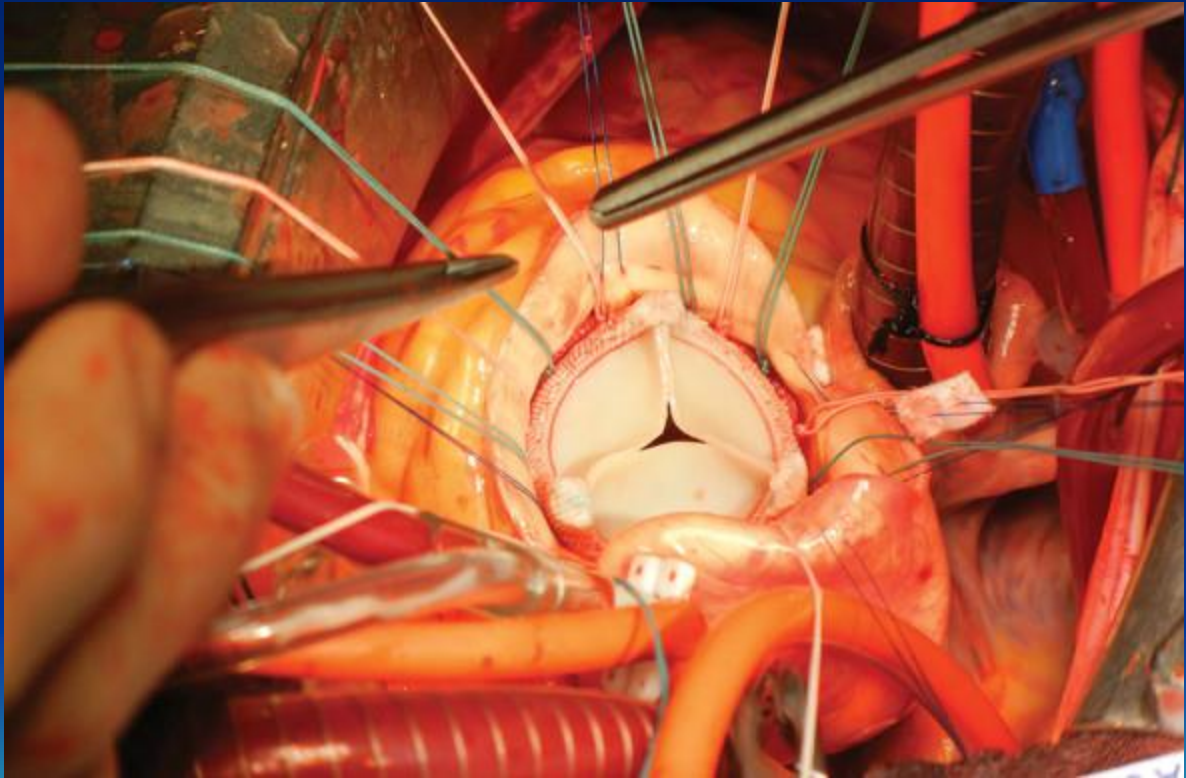


Aortic Valve Replacement

Indication:

- Aortic valve stenosis
- Aortic valve insufficiency
- Aortic valve endocarditis

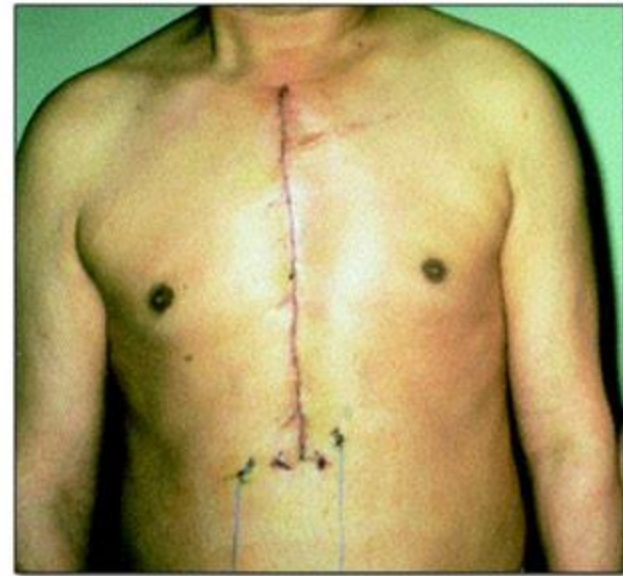




Minimally invasive AVR



Minimally invasive aortic
valve replacement



Traditional sternotomy

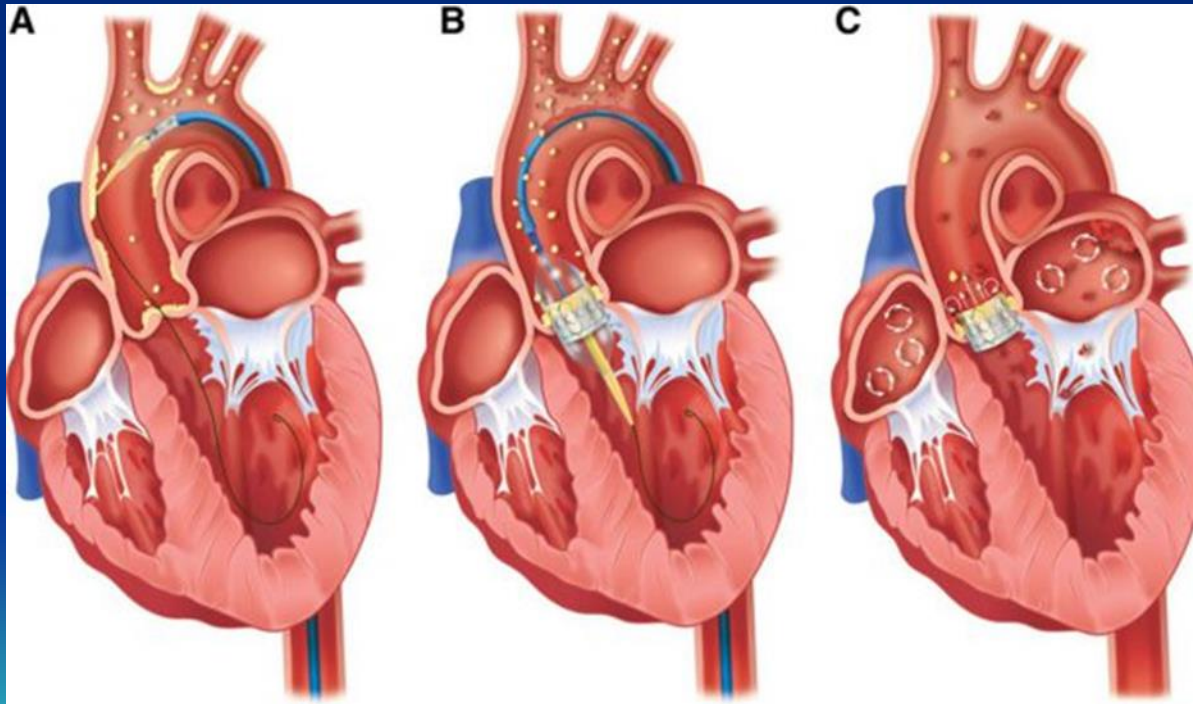
Advantage of minimally-invasive approach

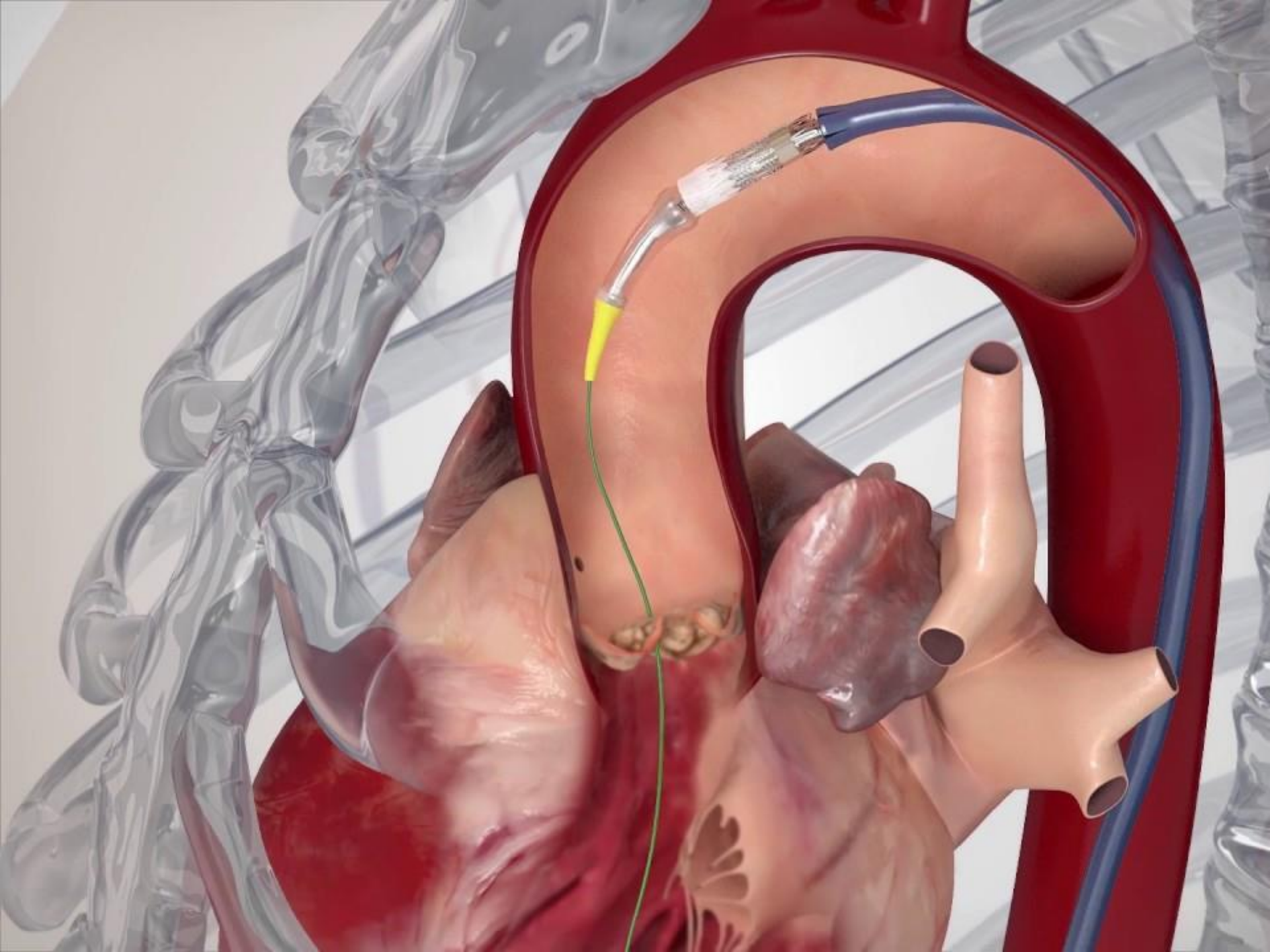
- Less blood loss
- Less pain after surgery
- Short ICU stay
- Short hospital stay
- Quick recovery
- Low incidence of sternal wound infection
- Cosmetic

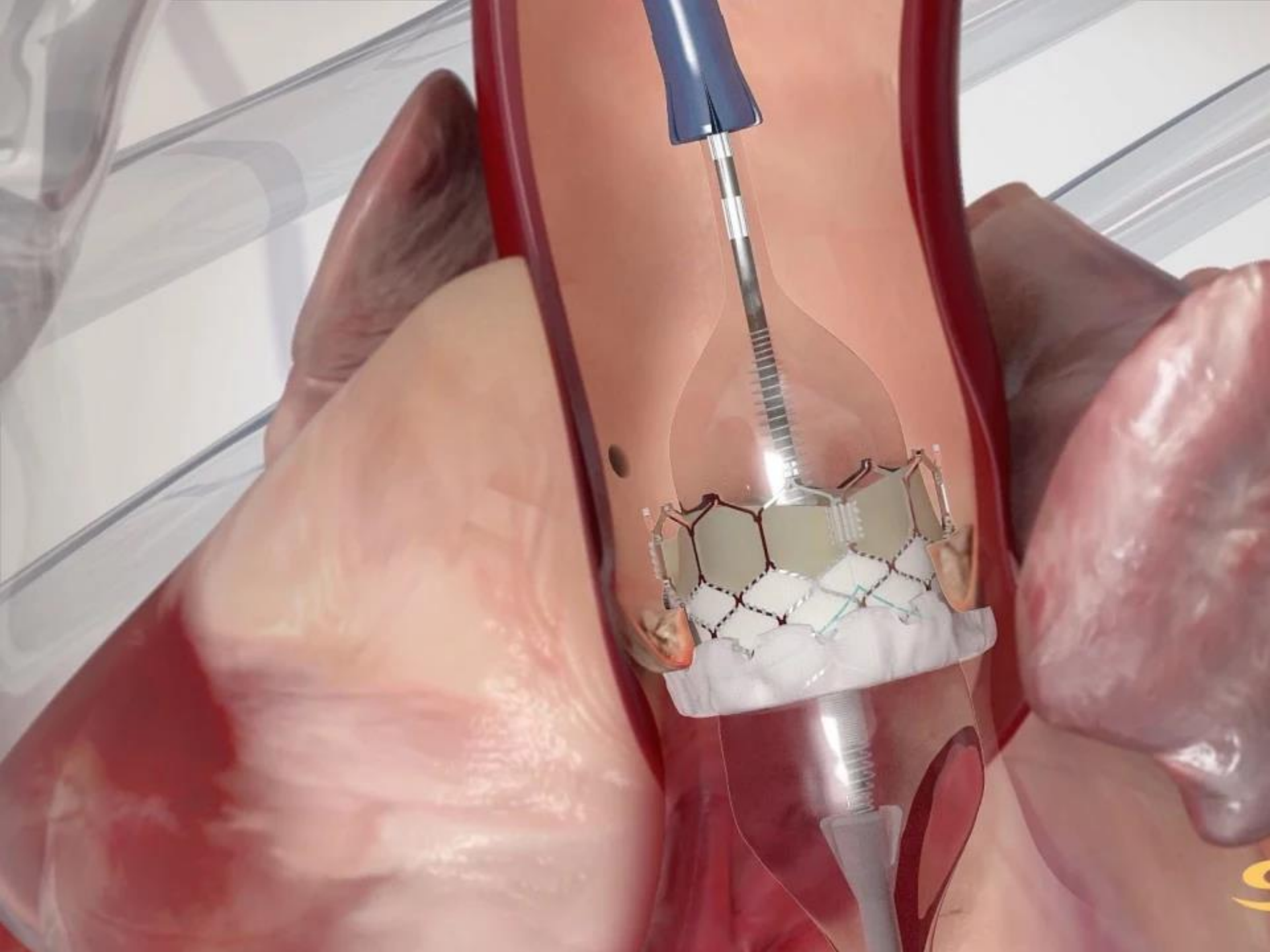


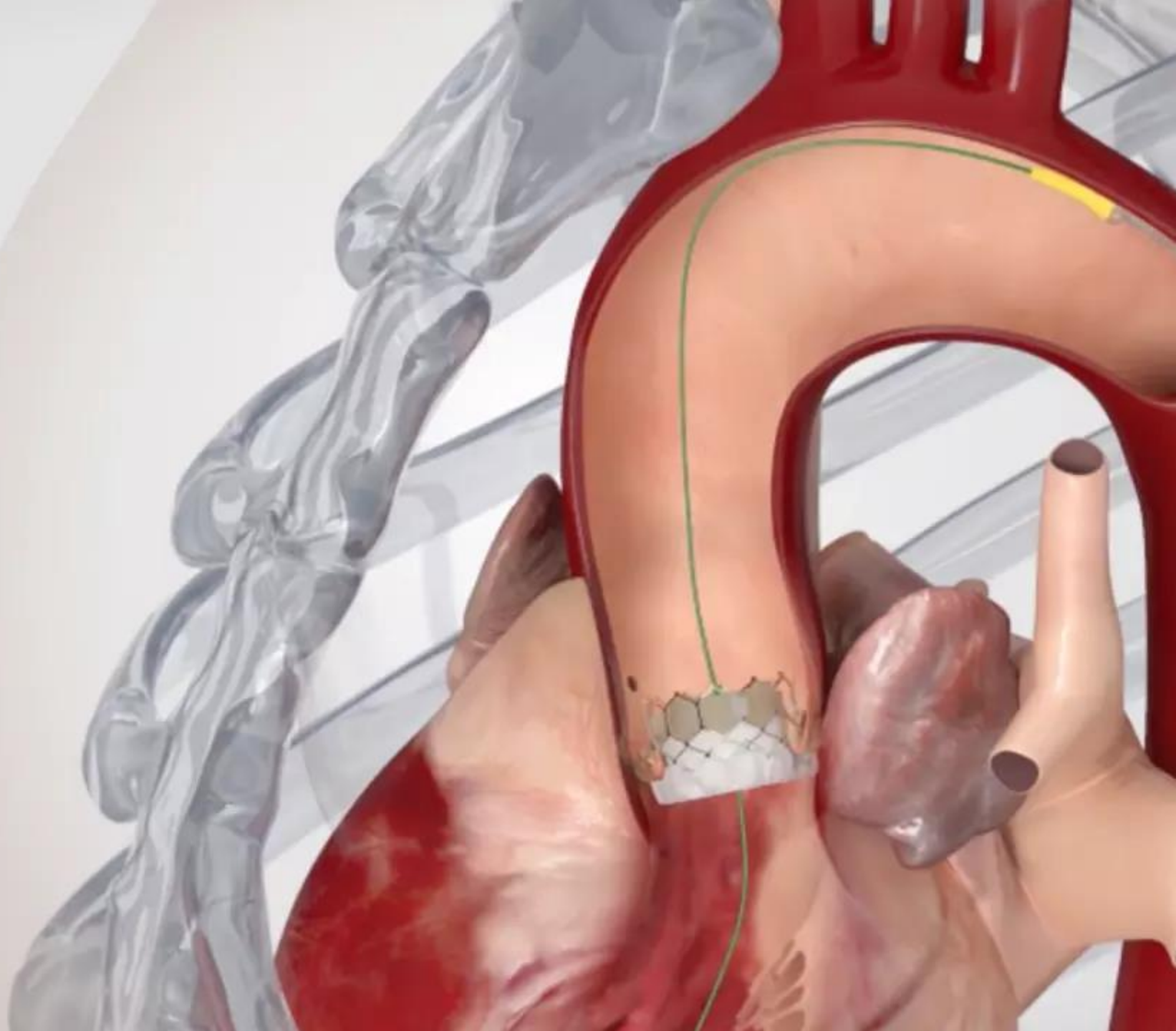
Transcatheter Aortic Valve Replacement (TAVR)

FDA approved for moderate to high risk patients undergoing open heart surgery











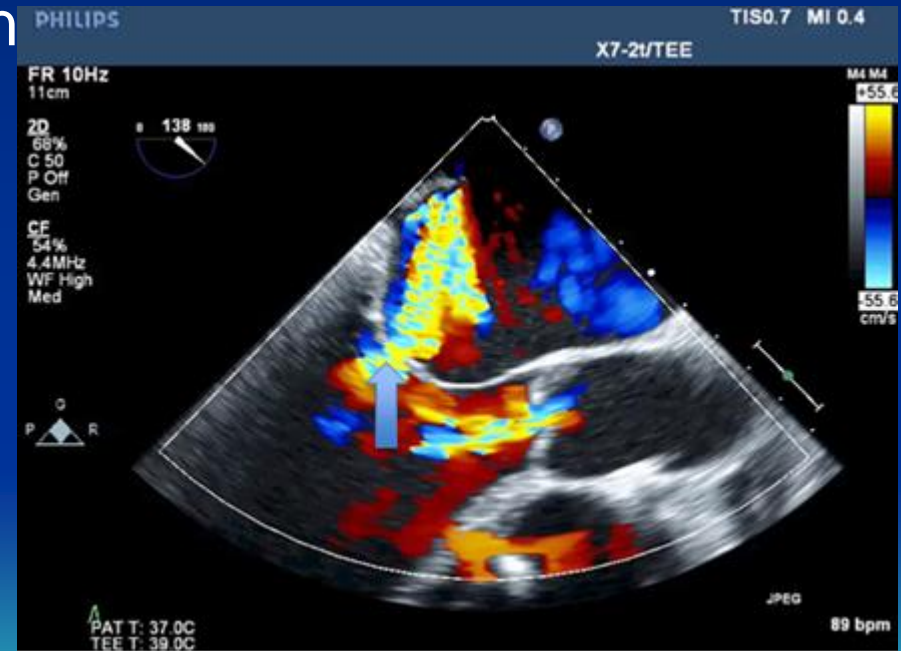
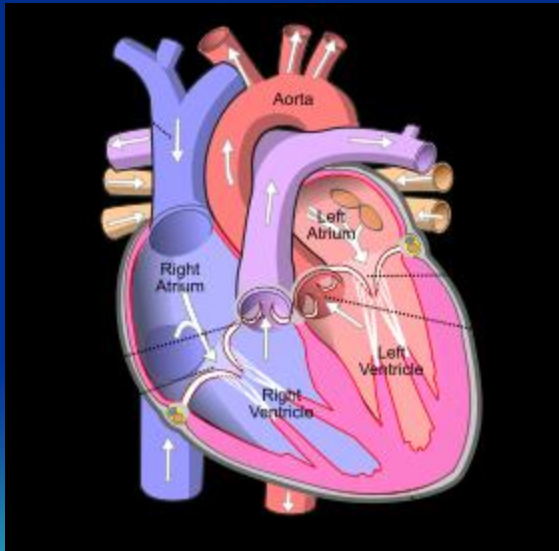
Advantage of TAVR

- No need of open heart surgery
- Short operating time
- Less blood loss
- Less pain after surgery
- Quick recovery
- Long-term outcome?

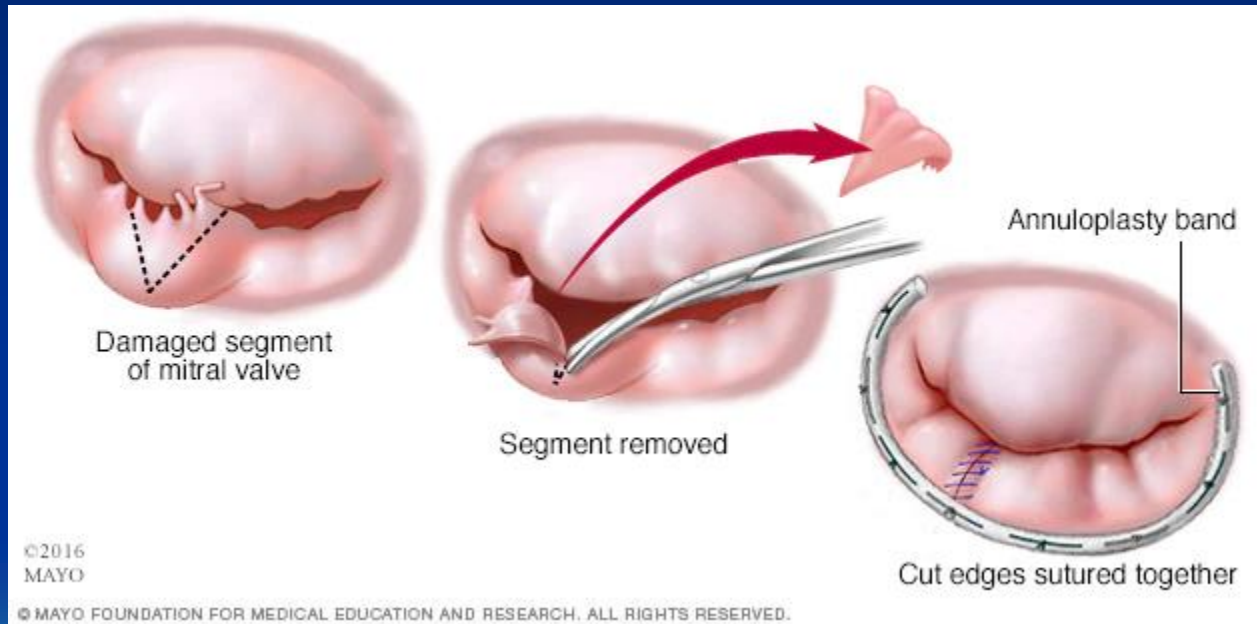


Mitral valve repair

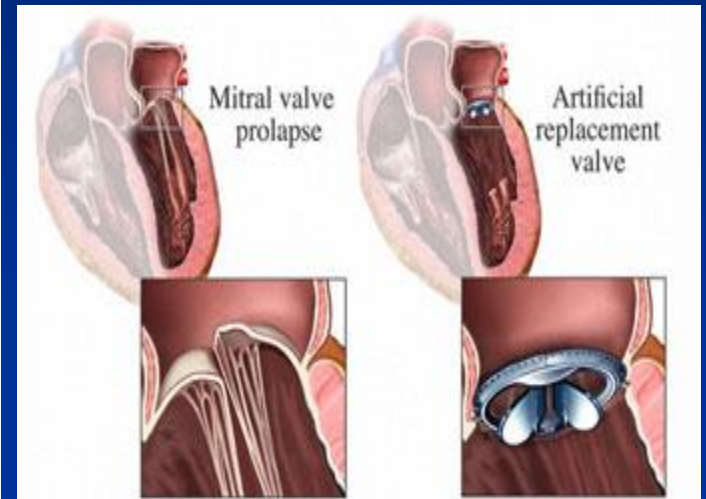
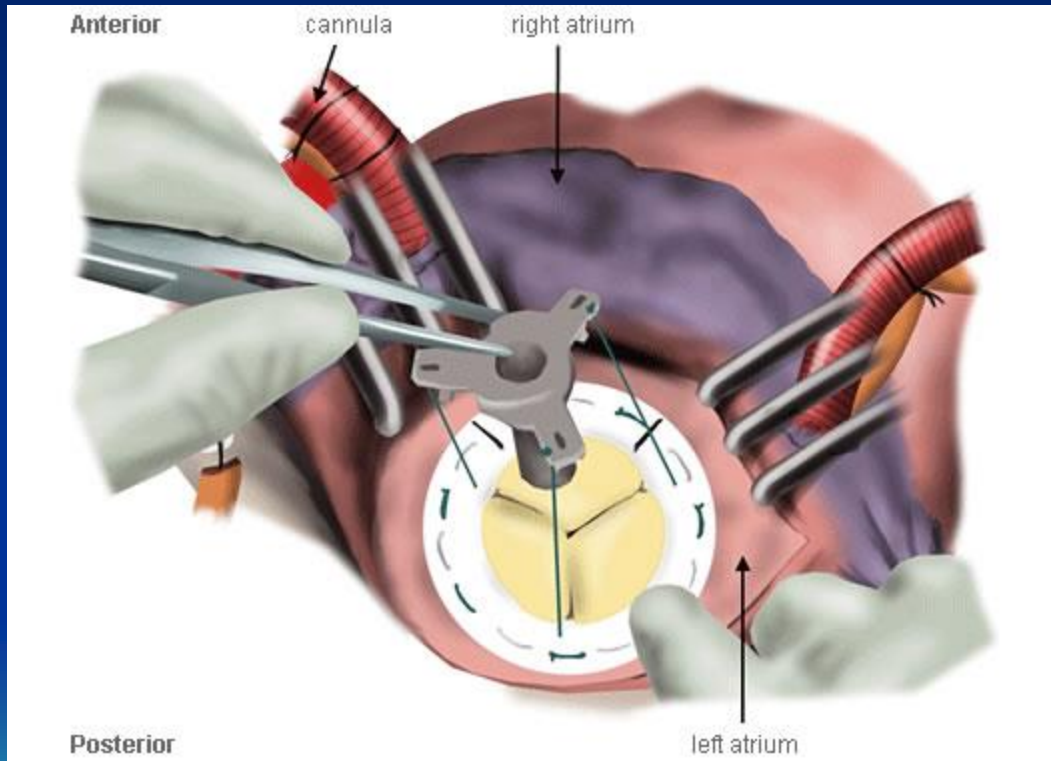
- Indication:
 - Mitral valve stenosis
 - Mitral valve regurgitation



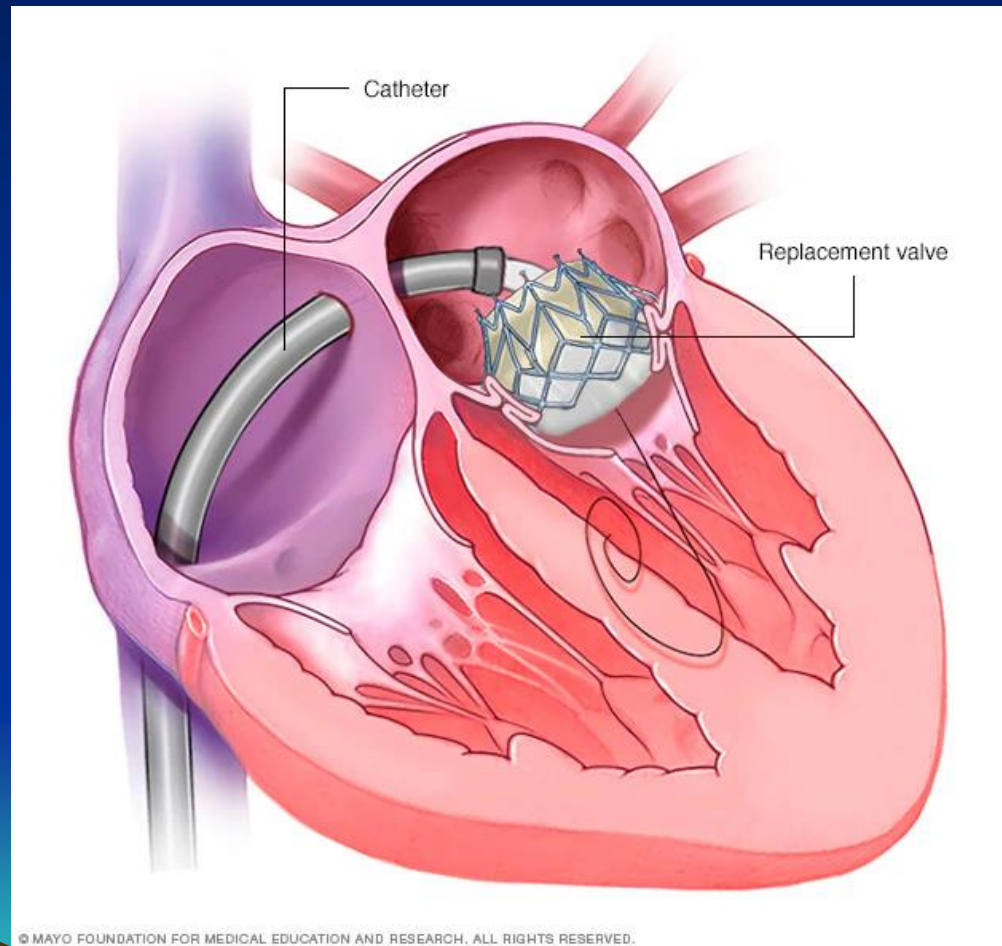
Mitral Valve Repair



Mitral Valve Replacement



Transcatheter Mitral Valve Replacement

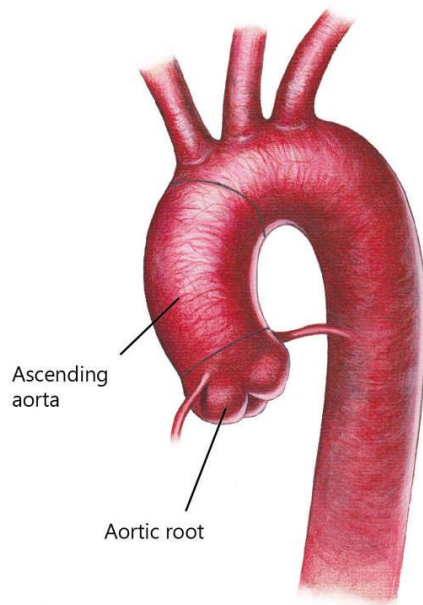


Aortic aneurysm

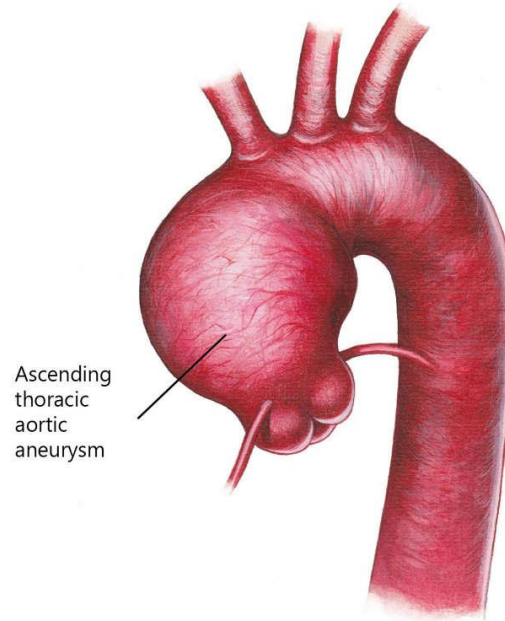
Supra-commissural replacement of the ascending aorta

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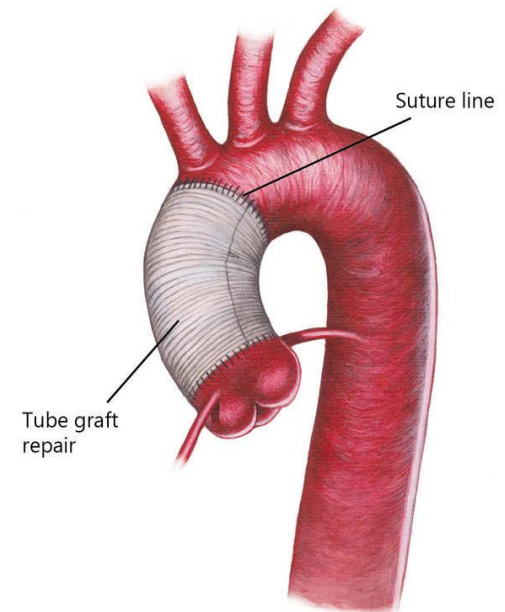
Normal Aorta



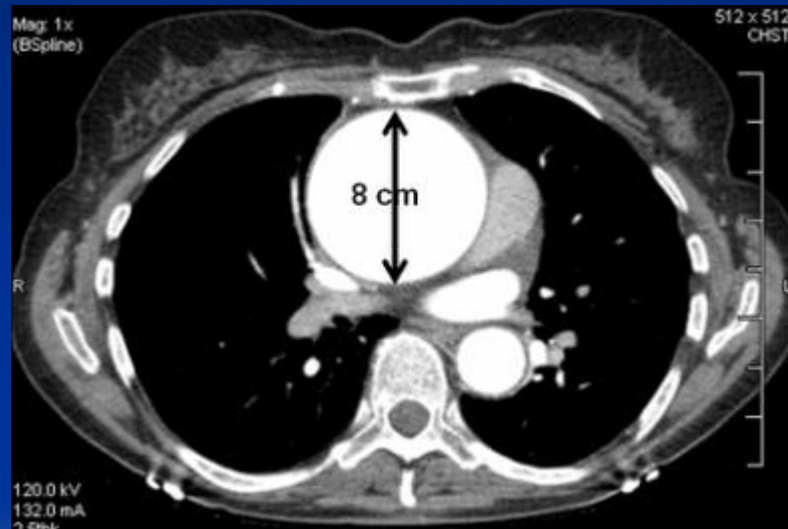
Before Surgery



After Surgery



Aortic aneurysm

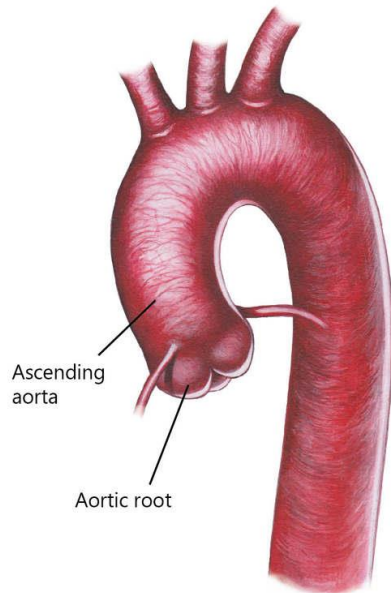


Aortic Root Aneurysm

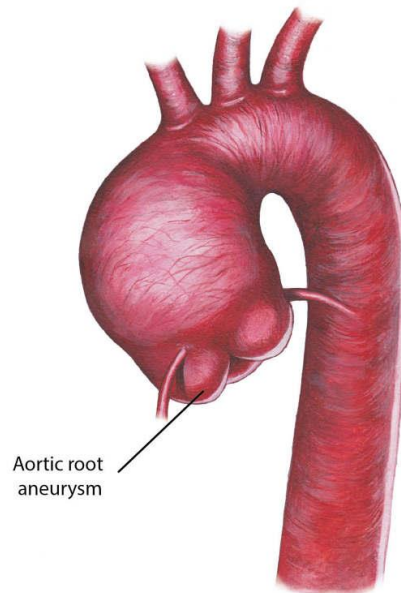
Mechanical Composite Root Replacement and Hemiarch Reconstruction

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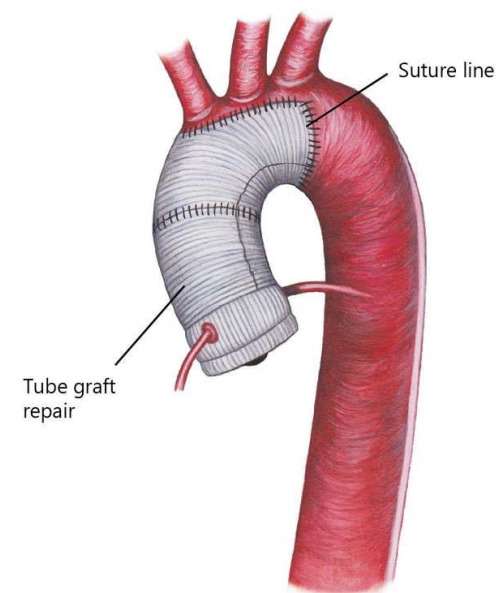
Normal Aorta



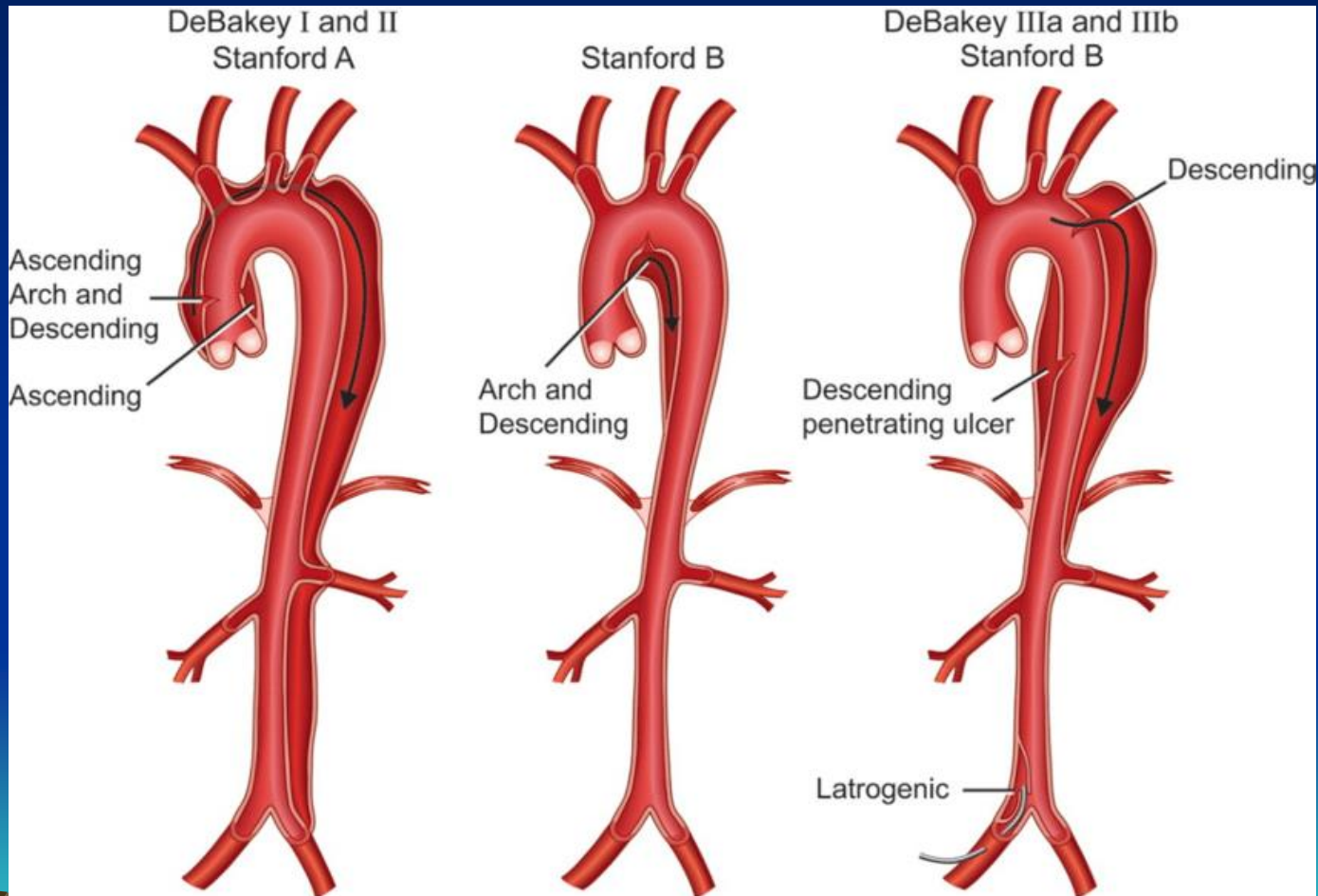
Before Surgery



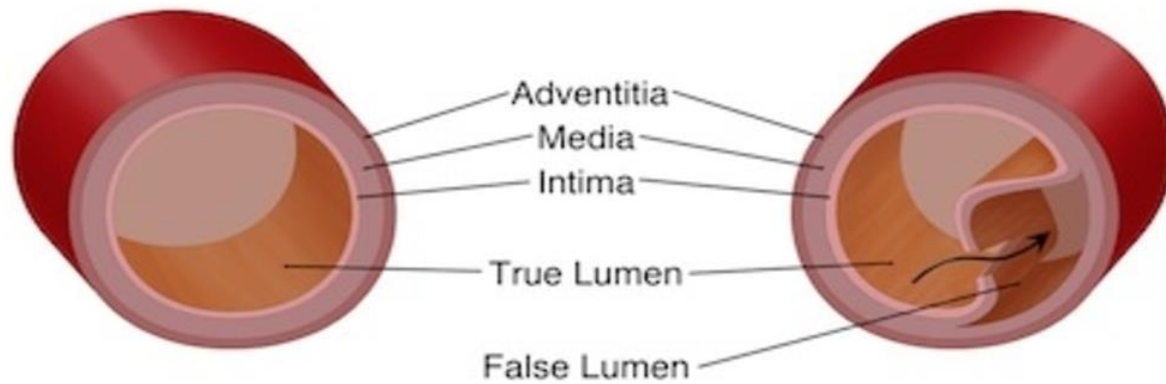
After Surgery



Aortic dissection



Aortic Dissection



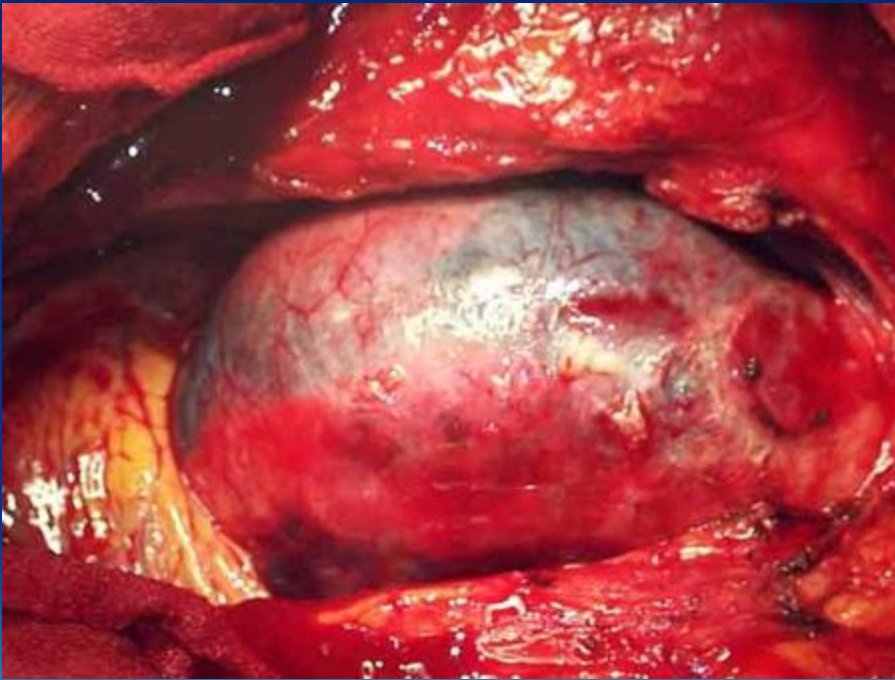
Normal

Dissected

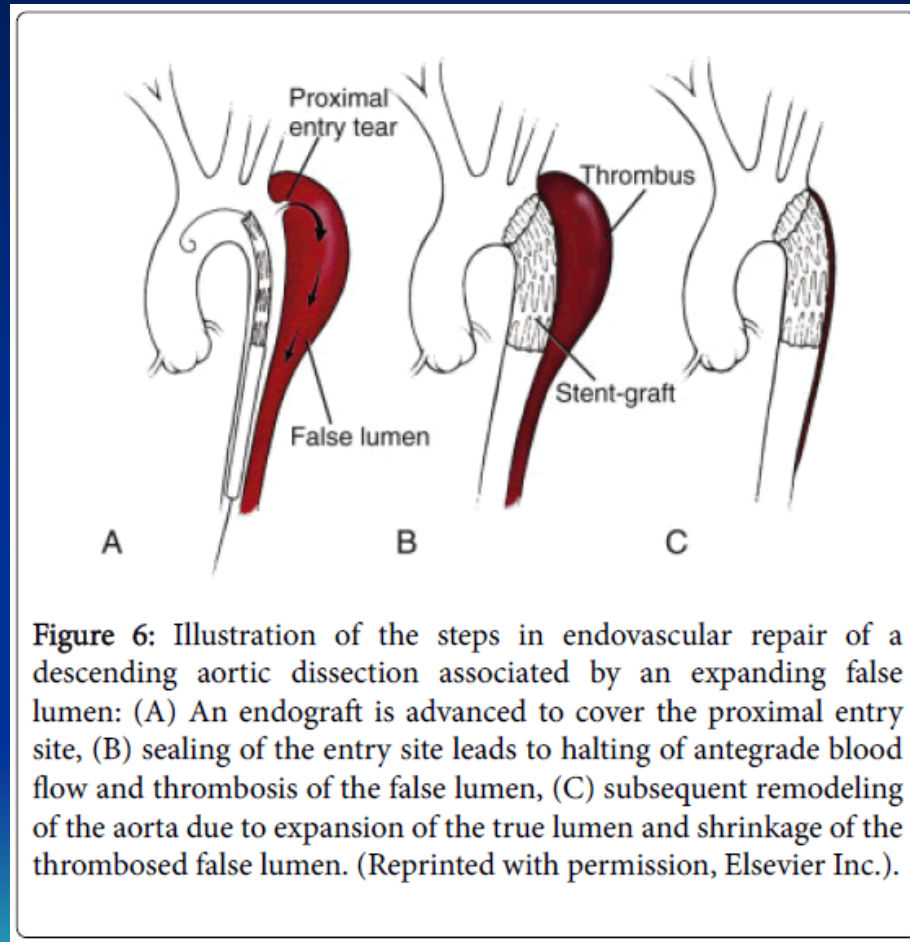
Type A Aortic Dissection



Type A Aortic Dissection



Type B Aortic Dissection



Sternal Wound Care

- Superficial Sternal wound infection
- Deep sternal wound infection



**Average Post-Op
Incision**



**Superficial
Sternal Wound
Infection**



**Deep Sternal
Wound
Infection**

Sternal Wound Care

- Wound culture
- Chest CT scan
- Start wide spectrum of antibiotics
- ID consultation
- Surgical debridement



Summary



Challenge of Cardiac Surgery

Coronary artery disease

- CAD is more and more treated with stent placement
- Surgical candidate is more complex, more demanding in good surgical skills
- The outcome of CABG in patients with multi-vessel disease, diabetes, decreased systolic function is better than that of PCI



Challenge of Cardiac Surgery

Heart valve disease

- Tissue valve is more widely used than mechanical prosthesis
- The outcome of mitral valve repair is better than mitral valve replacement
- Transcatheter heart valve replacement is the future of all heart valve replacement



Challenge of Cardiac Surgery

Type A Aortic dissection

- Emergency repair is the mainstay at present
- Endograft treatment is under investigation

Type B Aortic Dissection:

- Medical management
- Endograft or Surgical treatment for complicated dissection



Where will cardiac surgery go?

Minimally invasive procedure:

- Robotic assisted procedure
- Endograft
- Transcatheter valve



Will Open Surgical Procedure be Necessary?

Yes

In deed of skilled surgeon

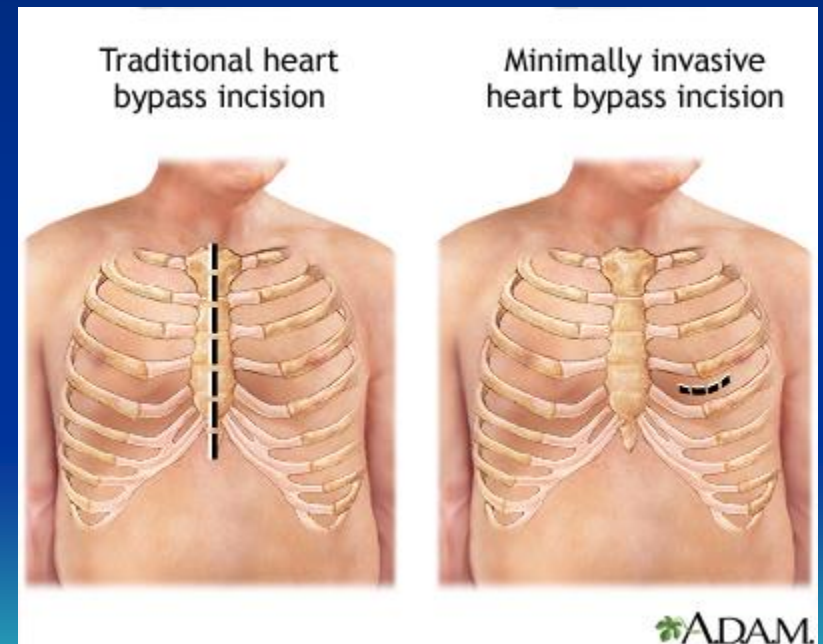
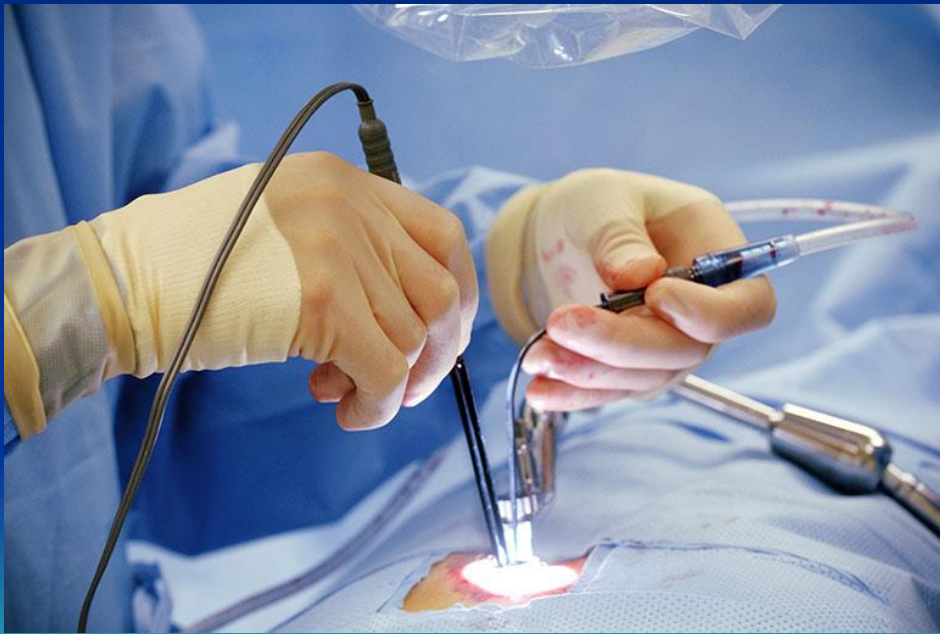
- Redo procedure
- Failure of transcatheter valve placement
- Failure of endograft procedure
- Endocarditis

Training



New Trend in Cardiovascular Surgery

New technology to accomplish most open heart procedure without sternotomy or thoracotomy



Thanks

