



# Building a Robotic CABG program

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## Robotic CABG center

- Review traditional approaches vs minimally invasive techniques
- Types of minimally invasive CABG
- Alignment of the hospital system
- Surgeon/team proficiency



## Robotic CABG center

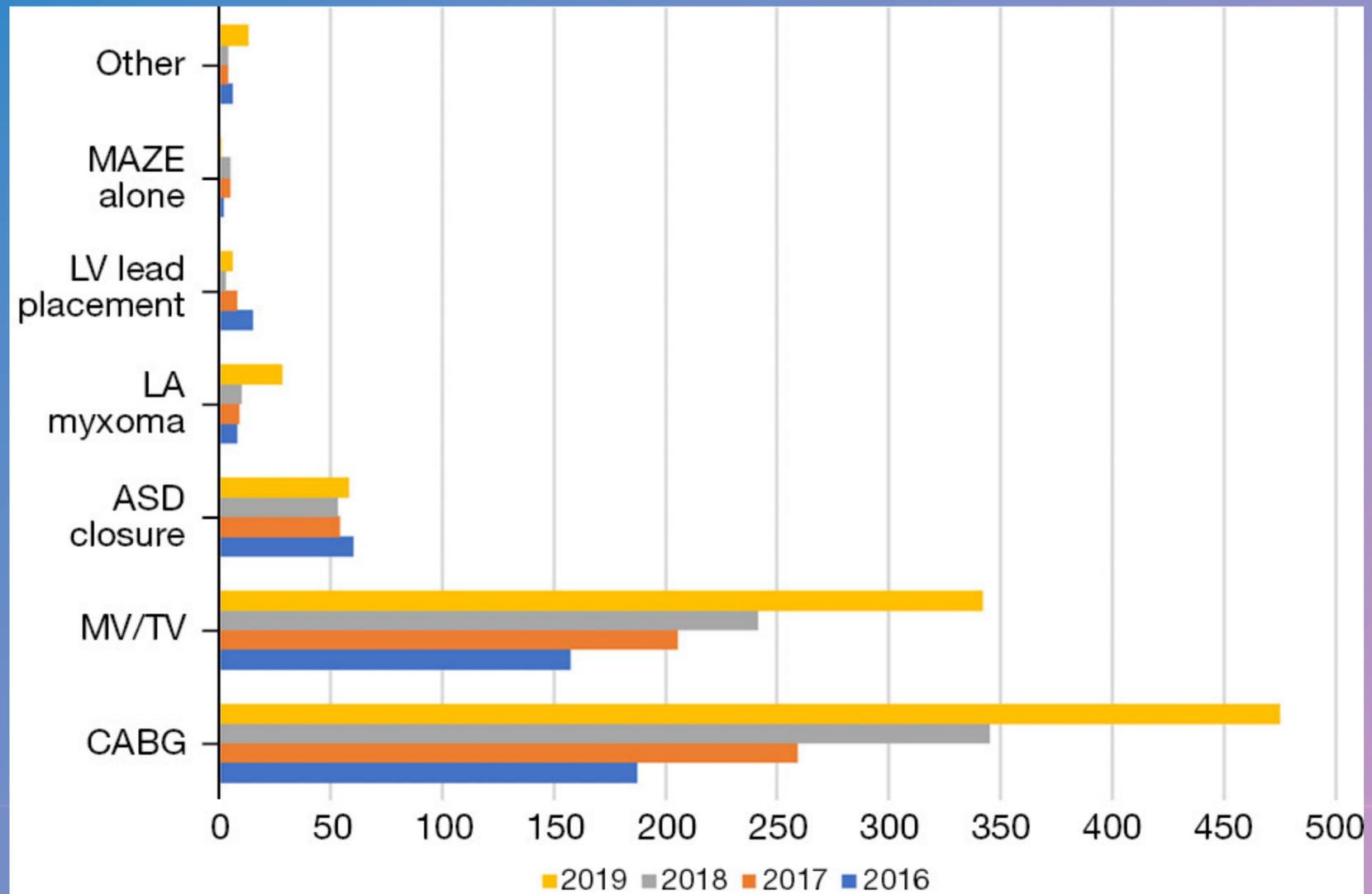
- Resurgence in the interest in minimally invasive CABG
- Long term benefit of LITA-LAD and BITA
- Hybrid approaches to coronary revascularization



# Sternotomy



# Growth of minimally invasive centers



# Robotic CABG center

- Types of minimally invasive CABG
- LAST (Left anterior small thoracotomy) MIDCAB, MICSCAB
- Video Assisted MIDCAB (endoACAB)
- TCRAT (Dresden technique)
- RADCAB (Robotically assisted CABG)
- nrTECAB
- TECAB



# MICS (Minimally Invasive Cardiac Surgery)

Randomized controlled trial comparing outcomes of minimally invasive direct coronary artery bypass to off pump median sternotomy.

Significantly lower in the minimally invasive group.

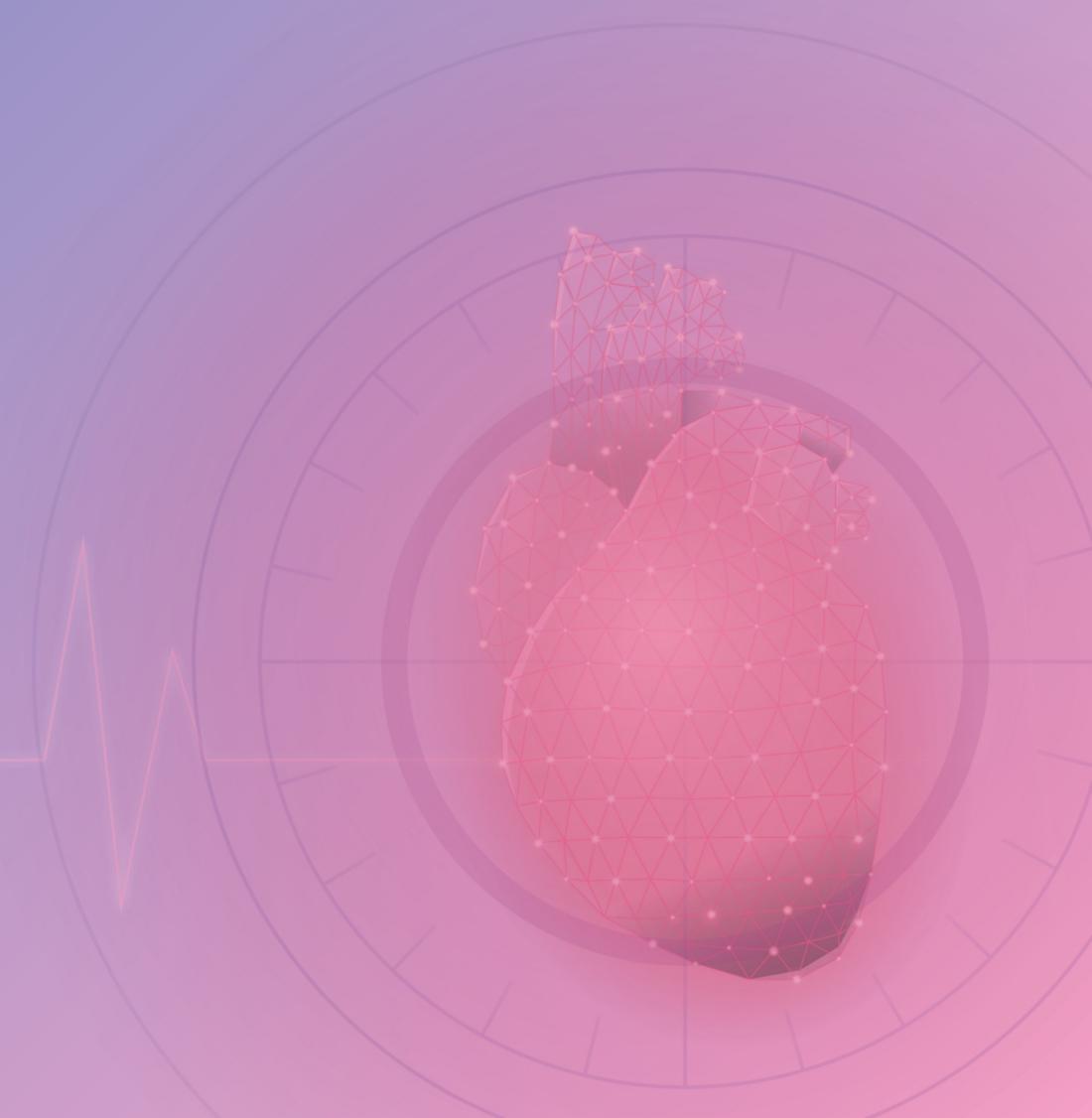
Surgical bleeding  
Post-op observation days  
Surgery time  
Cardiac shock  
Death

Yang M et al. Clinical Effect and Prognosis of Off-Pump Minimally Invasive Direct Coronary Artery Bypass. Med Sci Monit 2017;23:1123-28  
doi:10.12659/msm.902940



# Robotic CABG center

- Mortality
  - 1.5% off pump
  - 1.5% on pump
  - 1.7-2.6 (number of vessels/grafts)
- CVA 1.4-2.1%
- Length of stay (0.6 days shorter)
- Return to activity 2-3 weeks



## Robotic CABG center

- Parallel growth
- Surgeon/Team competency
- Hospital acceptance-center of excellence





## Robotic CABG center

- Surgeon
- Hospital admin
- Chief of Department



## Robotic CABG center

- Collaboration
- Surgeon
- Anesthesiologists
- ICU/Critical care
- Nurses

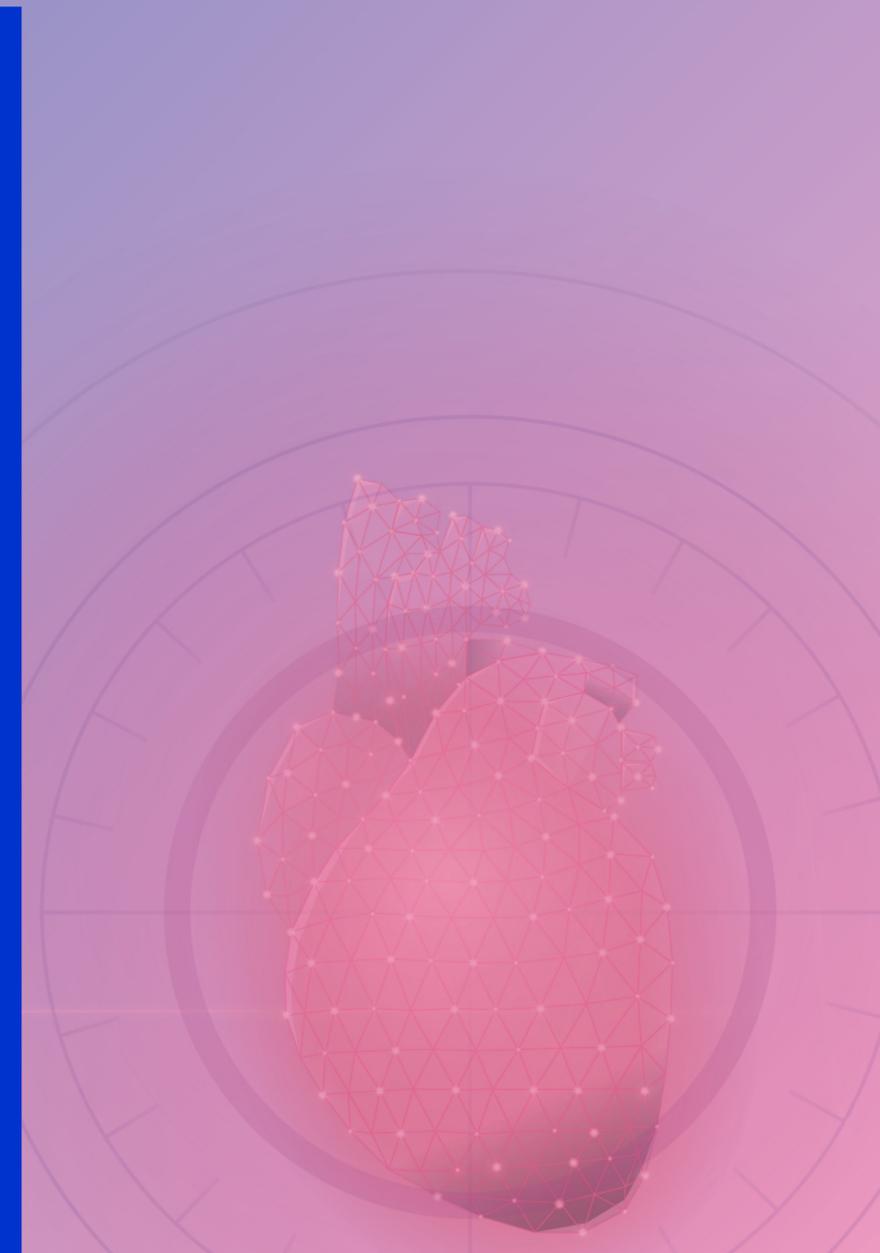


## Surgeon steps for robotic proficiency

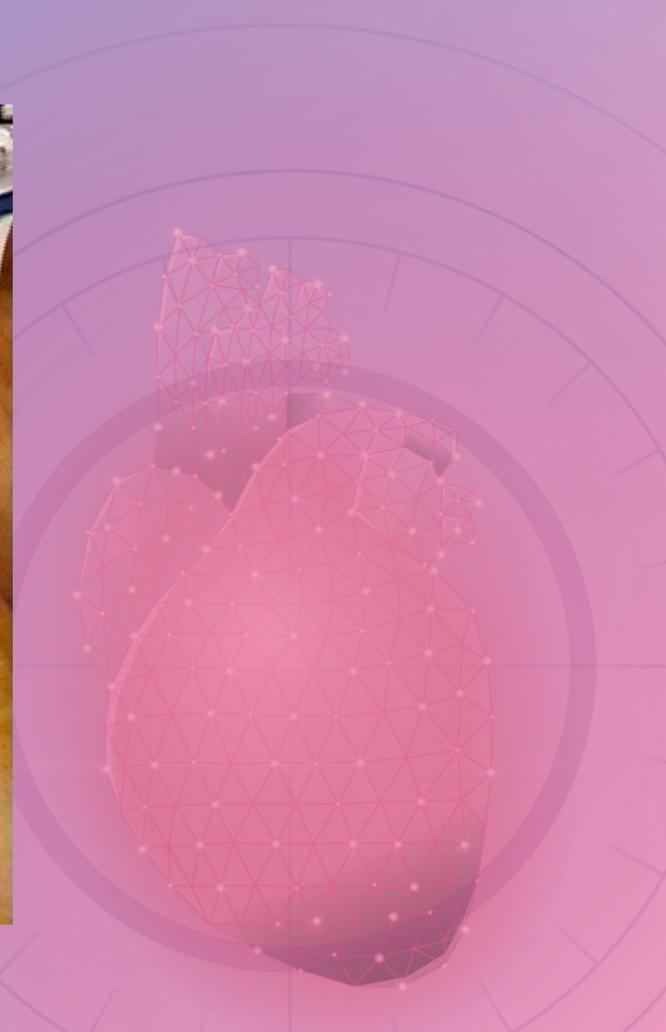
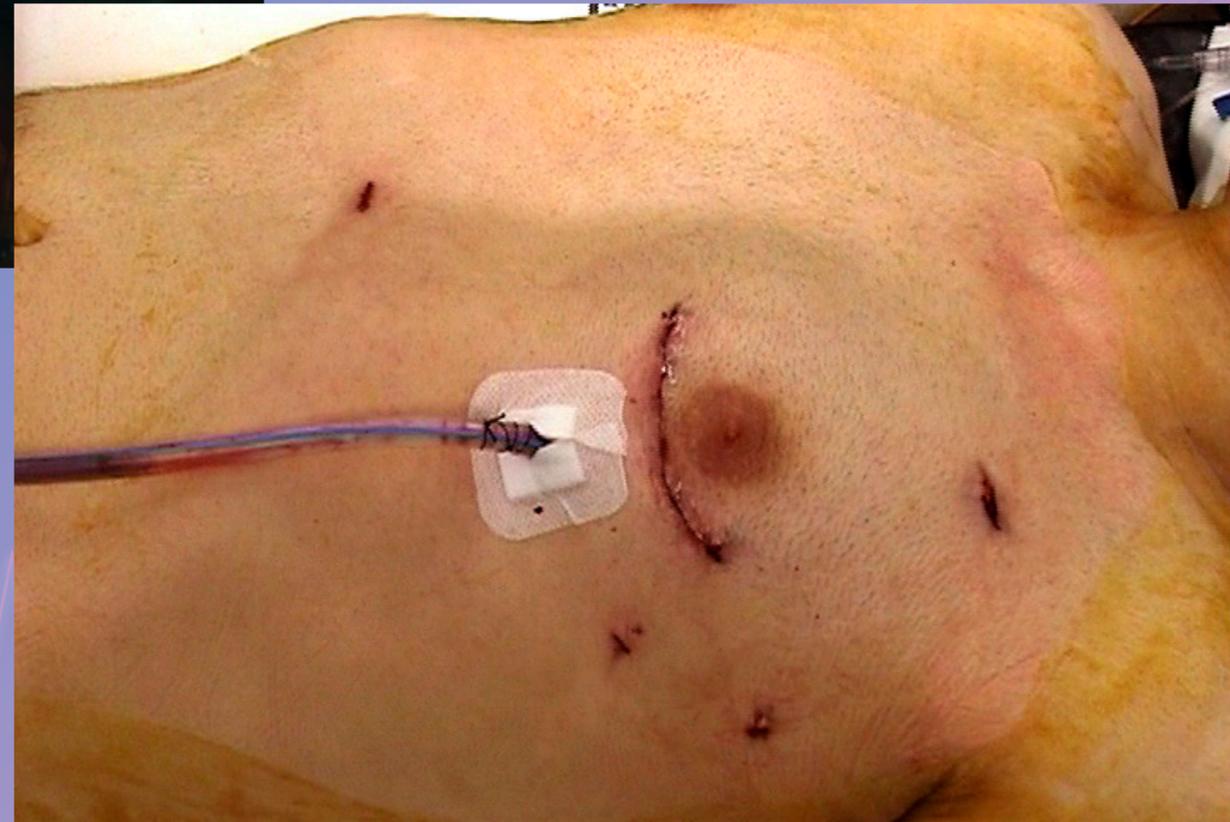
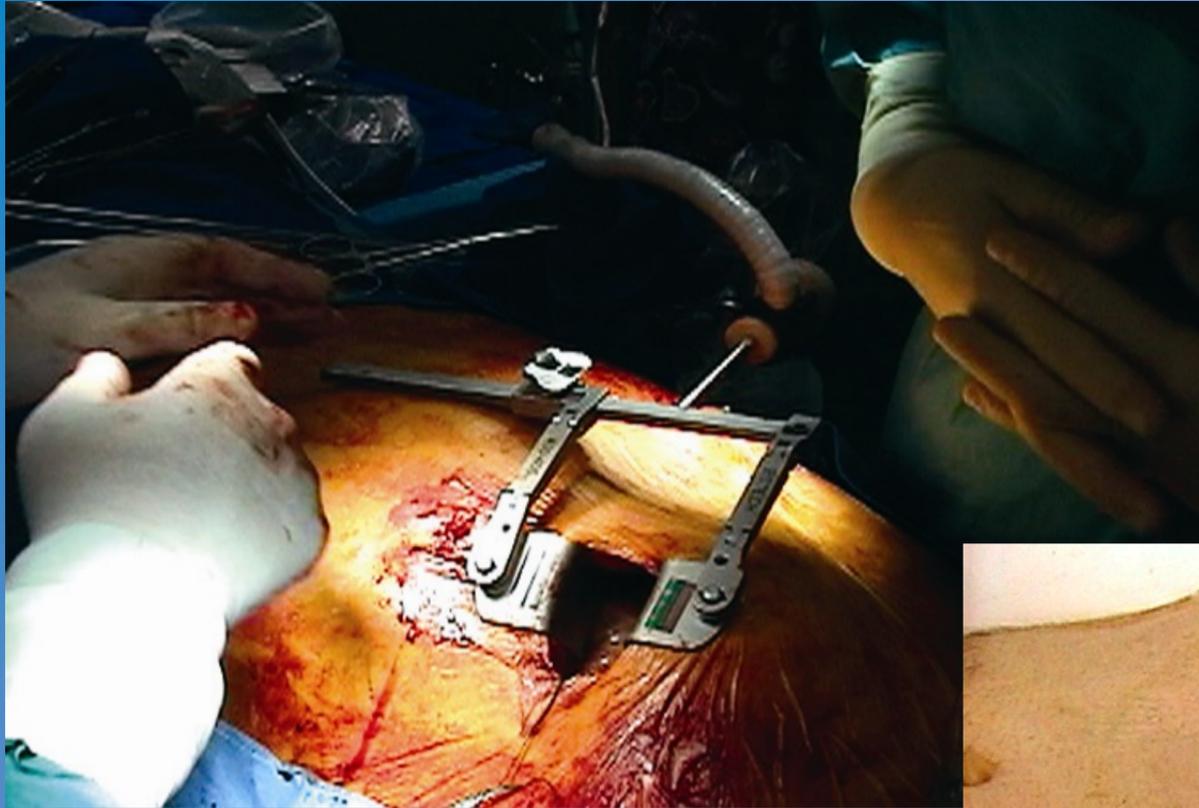
- Have a good proficiency in off-pump CABG, multi-arterial CABG and skeletonized internal thoracic arteries harvest;
- Robotic training. Skeletonized LITA harvesting during sternotomy cases;
- Single-vessel robotic MIDCAB;
- Cadaver training in robotic TECAB;
- Team simulation in TECAB;
- Proficiency in peripheral cardiopulmonary bypass (CPB) and myocardial protection;
- Single vessel robotic TECAB;
- Multi-vessel robotic TECAB.

Balkhy HH, Nisivaco S, Kitahara H, et al. Robotic Multivessel Endoscopic Coronary Bypass: Impact of a Beating-Heart Approach With Connectors. *Ann Thorac Surg* 2019;108:67-73. [Crossref] [PubMed]

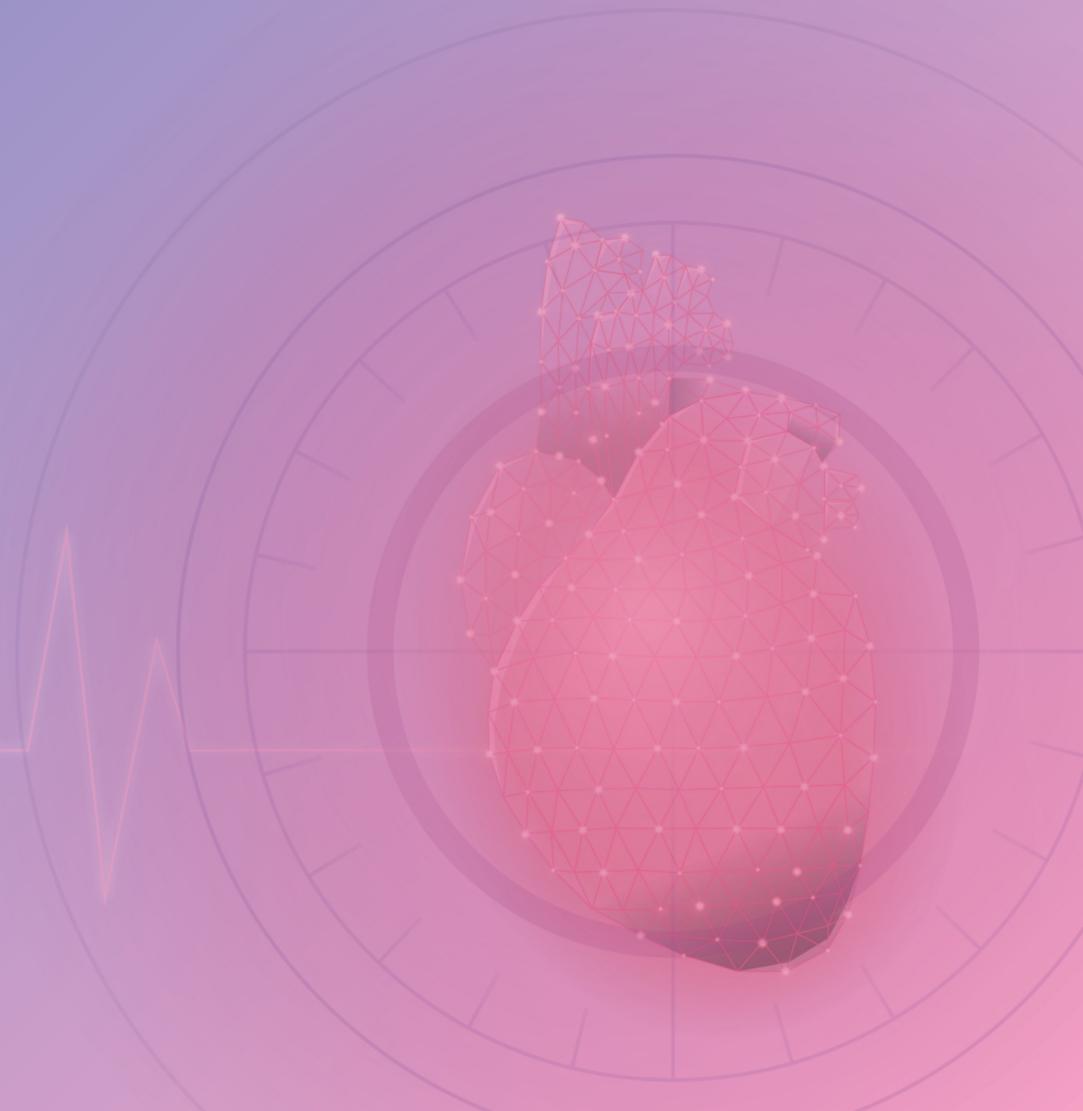
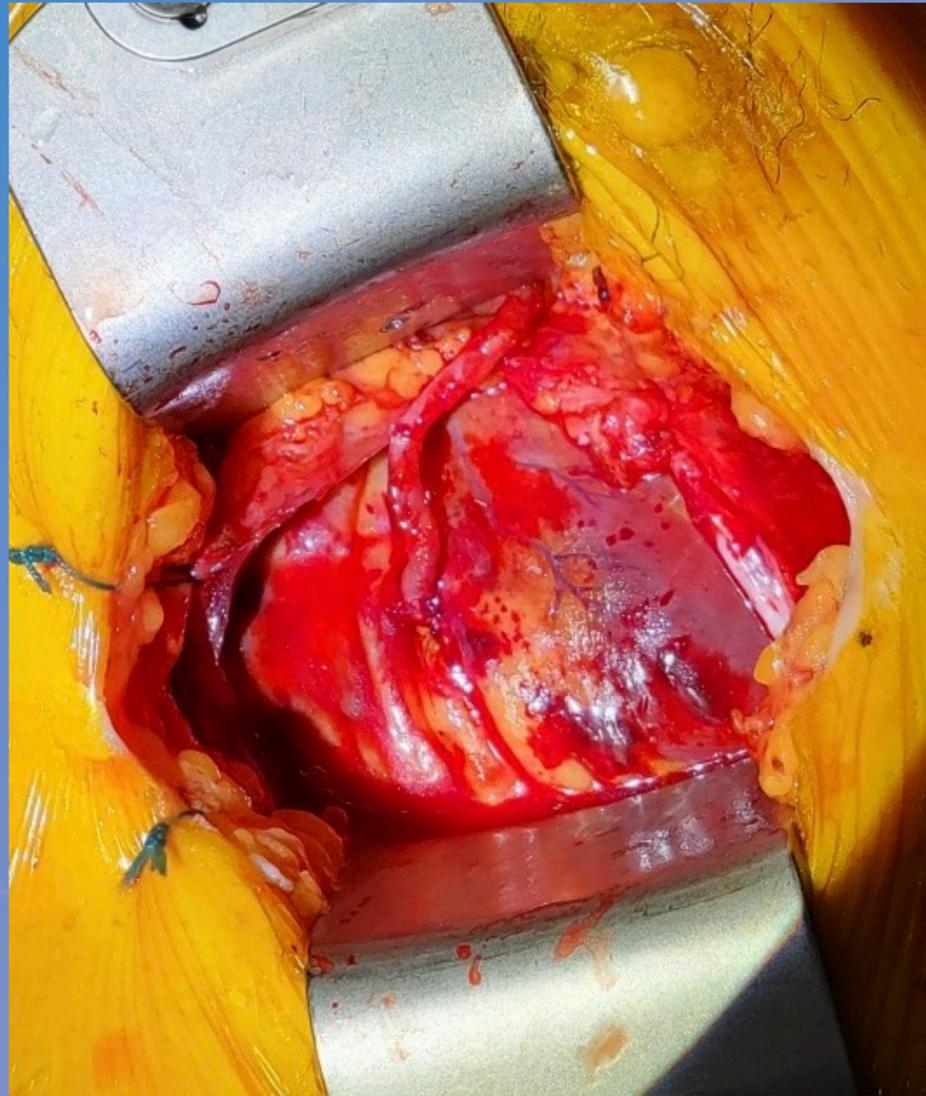
## Patient Positioning for robotically assisted CABG



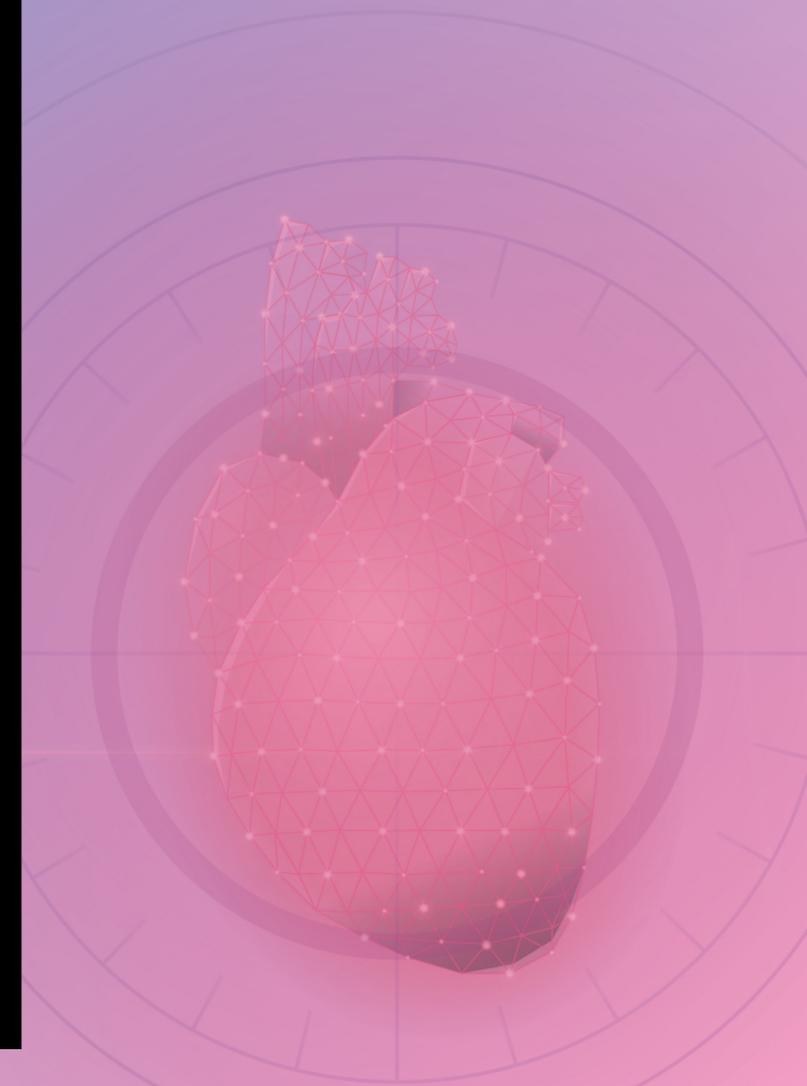
# Least Invasive... Minimal Trauma



# Mini-thoracotomy LITA-LAD

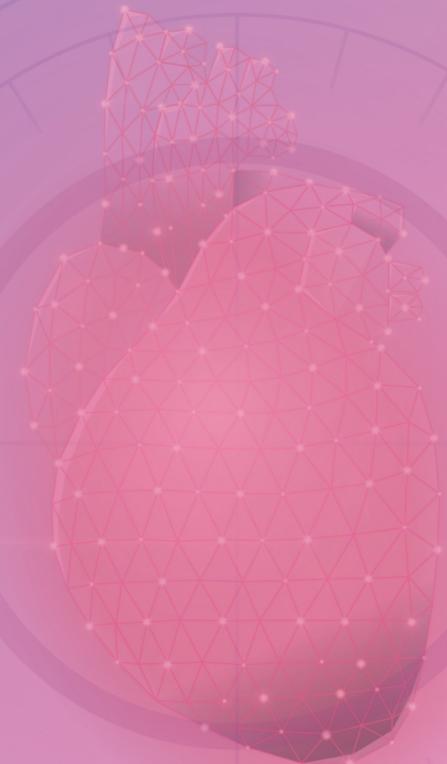


# Robotic LITA takedown



# Robotic CABG center

- Future considerations
  - Expand hybrid cases
  - Total arterial revascularization
  - Mentoring of young surgeons
  - Improvement in technology





# Building a Robotic CABG program

Questions?

