

SNS COLLEGE OF ALLIED HEALTH SCIENCE
Affiliated to The Tamil Nadu Dr MGR Medical University, Chennai



DEPARTMENT OF CARDIOPULMONARY PERFUSION CARE
TECHNOLOGY

COURSE NAME: CPB and Perfusion Technology

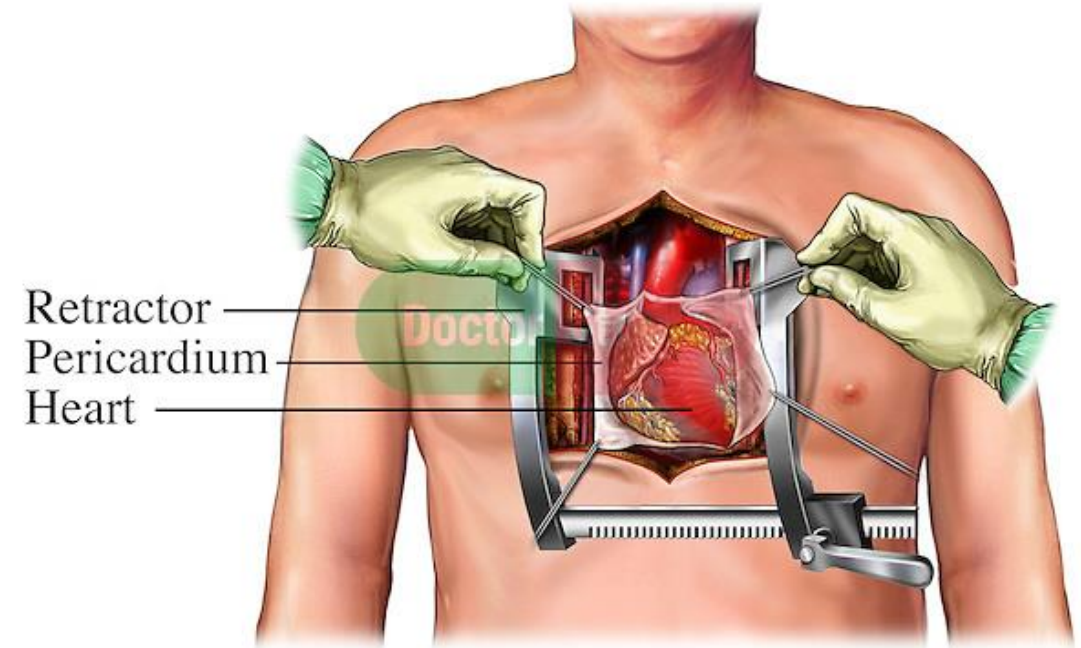
UNIT : I

TOPIC : Conduct of Bypass

FACULTY NAME: Mrs. Saranyaa Prasath

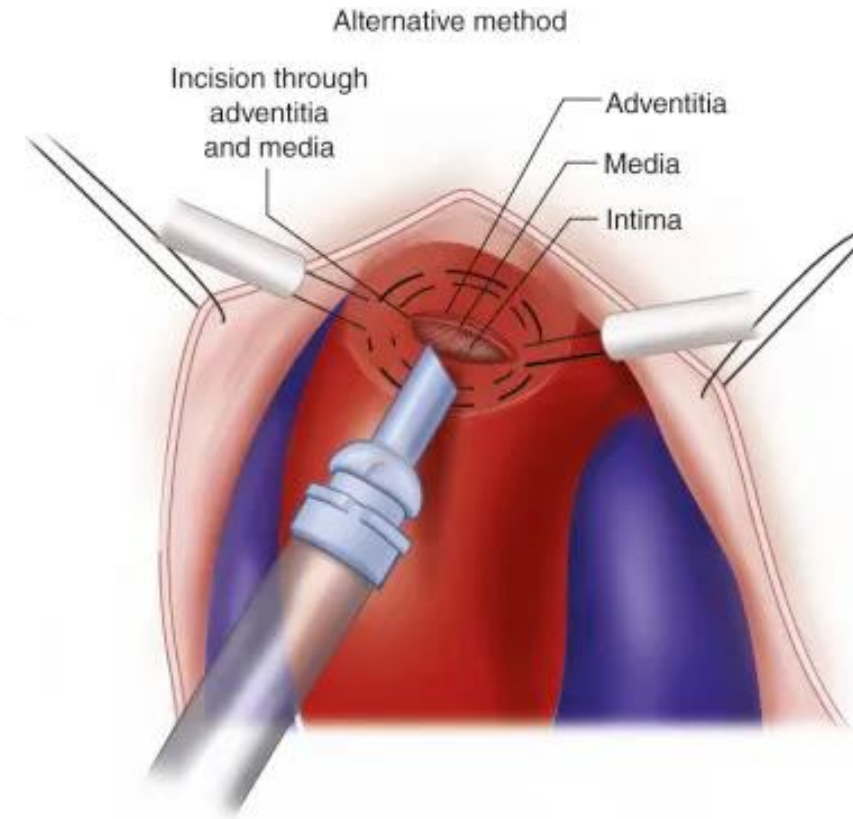
Empathize — Case Study Introduction

- **Patient:** 58-year-old male undergoing open heart surgery requiring cardiopulmonary bypass (CPB)
- **Challenges:** Maintaining stable circulation, avoiding air embolism, ensuring metabolic and hemodynamic stability
- Emphasize patient safety and surgical field visibility



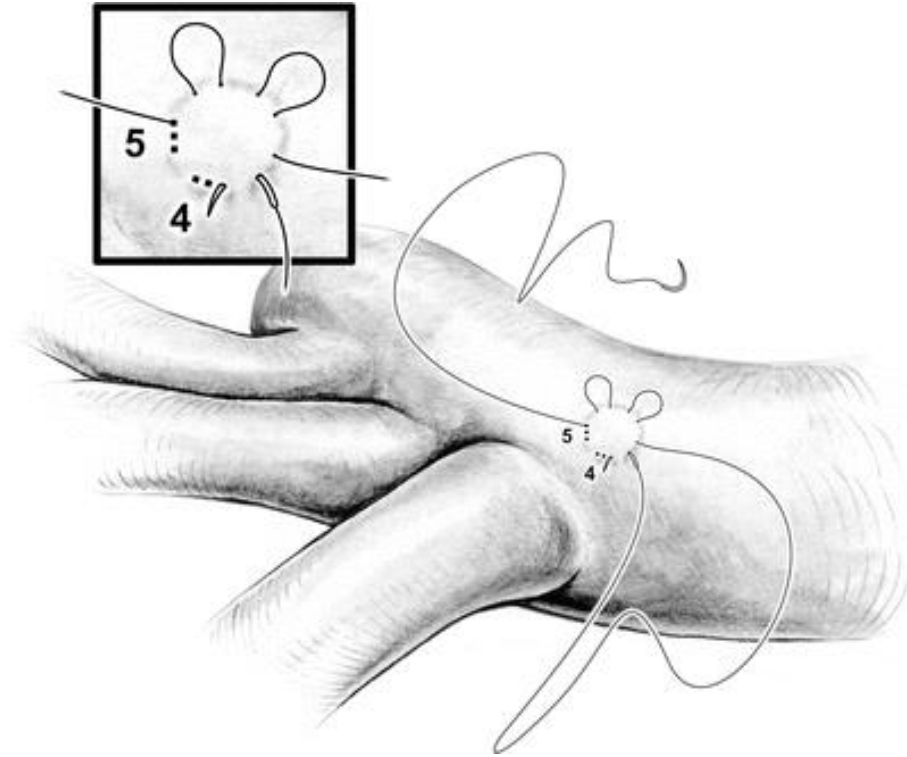
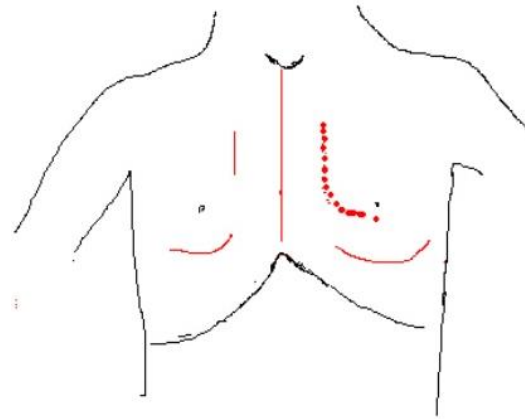
Define — Key Challenges in Conducting Bypass

- Need for precise anticoagulation (heparin) for safe cannulation
- Proper cannulation: arterial and venous to ensure effective blood flow
- Maintaining sterility and system integrity
- Monitoring for air embolism, pressure, and flow stability



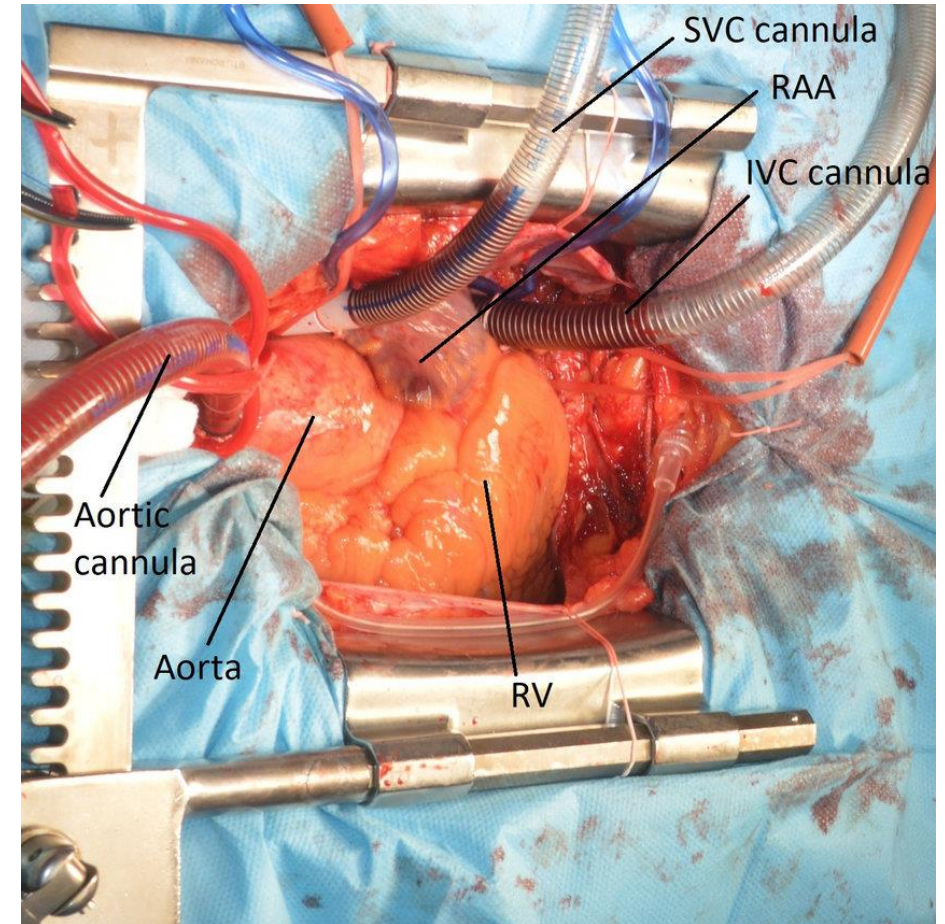
Ideate — Stepwise Approach to Conduct Bypass

- Sternotomy or thoracotomy for surgical access
- Pericardial retraction to optimize view and work area
- Placement of purse-string sutures for cannulation stability
- Systemic heparinization and ACT monitoring
- Aortic and venous cannulation techniques



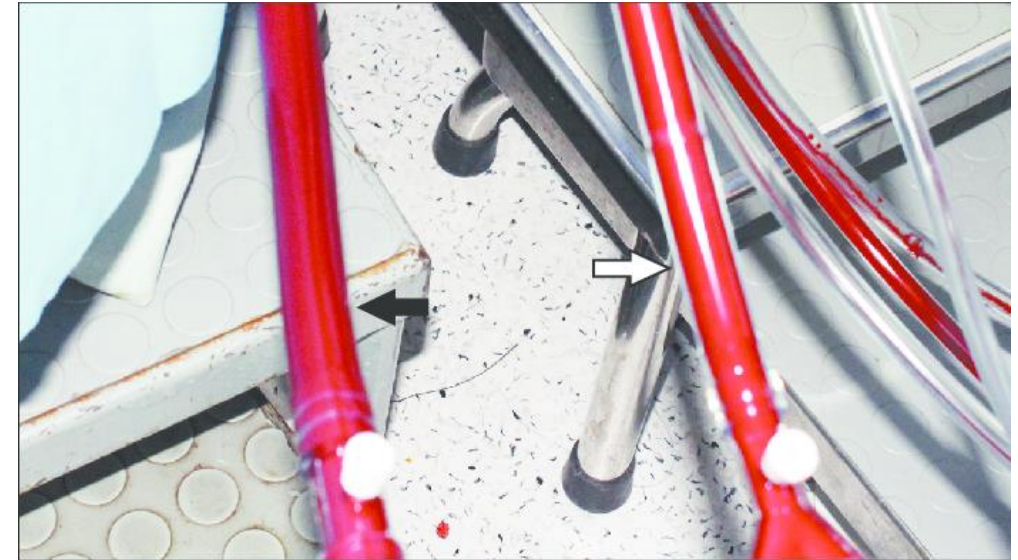
Prototype — Initiation of CPB

- Prime circuit, deair thoroughly, and assemble near patient
- Initiate arterial pump and unclamp venous line slowly to avoid air lock
- Monitor pressure (10 mm Hg equal to aortic pressure) and venous return
- Monitor oxygenator and temperature control systems



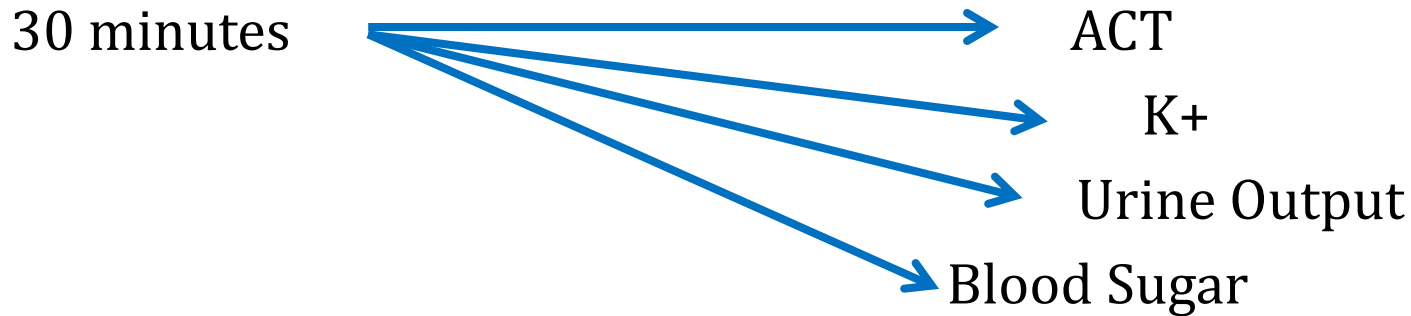
Test — Intraoperative Monitoring and Adjustments

- Continuous monitoring of arterial line color (bright red), pressure, and flow rates
- Regular arterial blood gas analysis (initial, 5 minutes after start, then every 30 minutes)
- Temperature gradient management for cooling and rewarming
- Cardioplegia delivery and myocardial protection monitoring



Case Study Focus — Patient Monitoring and Response

- Observed stable pump flow, maintained MAP 50–90 mm Hg
- Cardioplegia administered every 30–40 minutes for myocardial protection
- Decision points for temperature gradients and acid-base balance correction
- Successful cardiac arrest and deairing process.



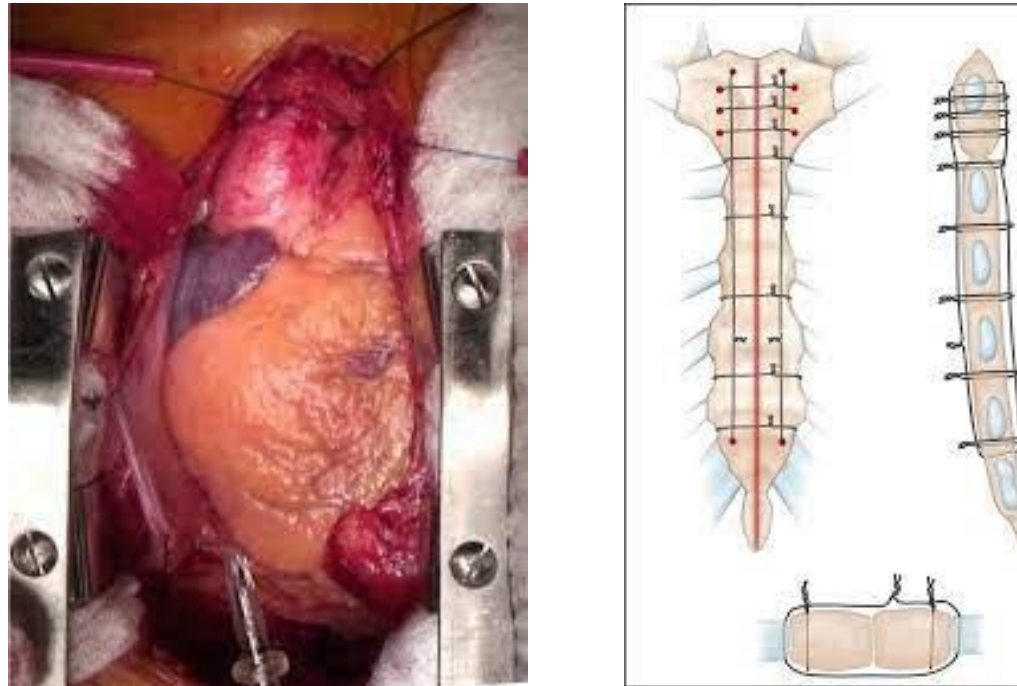
Weaning and Decannulation Protocol

- Criteria: Stable sinus rhythm, normal contractility, optimal temperature (rectal 35°C, nasopharyngeal 37.5°C)
- Weaning from CPB while monitoring hemodynamic closely
- Protamine administration to reverse heparin safely
- Decannulation and safe return of blood from reservoir

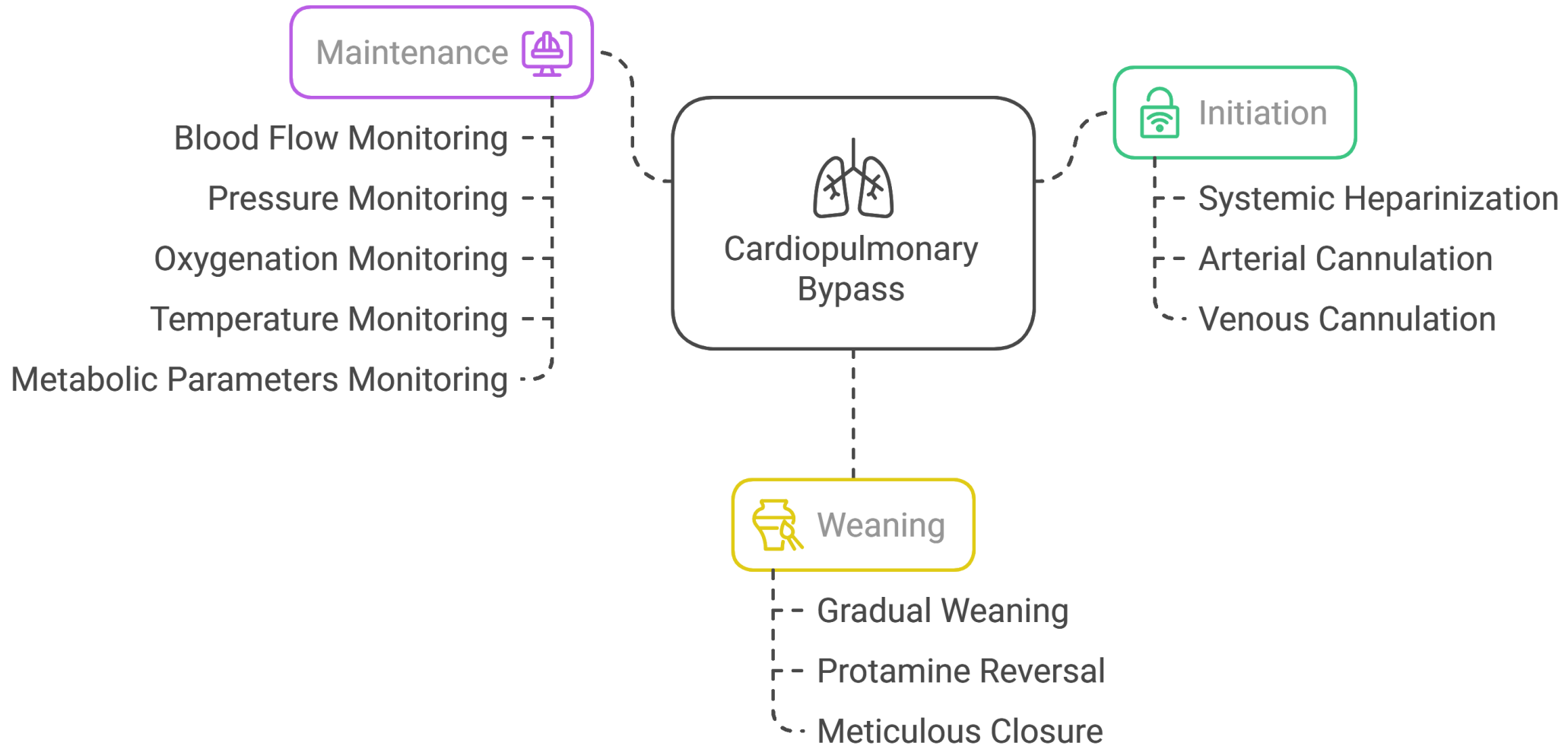


Closure and Post-Bypass Care

- Pericardial and sternal closure with hemostasis ensured
- Placement of drains to prevent blood accumulation
- Postoperative monitoring of cardiac function and bleeding



Summary



References

- Anil G. Tendolkar, "Cardiopulmonary Bypass Surgical Clinical Orientation,"
- "Sternal Closure," cthsurgery.com

THANK YOU