

## CARDIOTHORACIC ANESTHESIA CORE ROTATION

*The Cardiothoracic rotation has been designed to offer the opportunity for residents in general anesthesia training to gain experience in planning and executing an anesthetic that considers patients with coronary artery, valvular and lung disease. At the completion of the rotation the resident will have a basic knowledge of the pathophysiology of coronary atherosclerotic disease, valvular heart disease, and pulmonary disease and apply these concepts when individualizing an anesthetic plan for a patient under going coronary artery bypass, repair or replacement of a heart valve, insertion of ventricular assist devices and pulmonary wedge resection or pneumonectomy. There should be an understanding of the indications of invasive monitoring as well as for transesophageal echocardiography and the need for vasoactive and inotropic pharmacology.*

### Goals

#### Patient Care

- Demonstrate a plan for anesthesia for cardiac surgery with CPB
- Demonstrate a plan for anesthesia for cardiac surgery without CPB

#### Medical Knowledge

- Understand cardiac anatomy (vasculature, chambers, echo) and pulmonary anatomy (bronchoscopic anatomy)
- Understand cardiovascular and pulmonary physiology (including OLV)
- Understand pharmacology of vasoactive drugs (incl HPV, NO, oxygen)
- Understand indications for and risks of CABG, valve repair/replacement, redo sternotomy, pericardial window/pericardiectomy, and assist devices; open vs. thoracoscopic lung resection (including pneumonectomy), mediastinoscopy (including anterior mediastinal mass)
- Understand the role of premedication
- Understand indications for and risks of invasive monitoring
- Understand indications, risks, and complications of regional anesthesia for postop pain management
- Understand care and use of bronchoscopes, CPAP devices, PEEP devices

#### Interpersonal and Communication Skills

- Communicate a cardiothoracic anesthesia plan to patients
- Communicate a plan to nursing staff and surgeons and perfusionists, including eliciting their participation as necessary

#### Professionalism

- Residents must demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population. Residents are expected to:
  - Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society that supercedes self-interest;

- accountability to patients, society, and the profession; and a commitment to excellence and on-going professional development
- o Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices
- o Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities
- o Demonstrate care and compassion with patients, and responsiveness to patient concerns regarding cardiothoracic anesthesia

#### Practice Based Learning and Improvement

- Pursue current evidence to apply to cardiothoracic anesthesia
- Assess experiences for ways to improve patient care
- Understand the role of information technology in anesthesiology practice
- Utilize information technology to inform professional practice
- Understand Evidence Based Medicine theory and practice
- Understand the role of reflection in clinical performance
- Demonstrate reflective clinical performance
- Exhibit metacognitive and life long learning skills
- Educate other health professionals

#### System Based Learning

- Understand the multidisciplinary organization and space utilization associated with safe, timely and successful performance of cardiothoracic anesthesia

### **Objectives**

#### Patient Care

- Create and defend a plan for anesthesia for cardiac surgery with CPB
- Create and defend a plan for anesthesia for cardiac surgery without CPB
- Create and defend a plan for anesthesia for a thoracic surgical procedure
- Select the appropriate drug
- Explain role of premedication
- Interpret and explain, indications for and risks of invasive monitoring
- Describe the functions the cardiopulmonary bypass machine
- Explain the-care and use of bronchoscopes, CPAP devices, PEEP devices

#### Medical Knowledge

- Explain the cardiac anatomy (vasculature, chambers, echo) and pulmonary anatomy (bronchoscopic anatomy)
- Describe cardiovascular and pulmonary physiology (including OLV) for each cardiac or pulmonary pathology or disease process
- Discuss pharmacology of vasoactive drugs (incl HPV, NO, oxygen)

- Explain indications for and risks of CABG, valve repair/replacement, redo sternotomy, pericardial window/pericardiectomy, and assist devices; open vs. thoracoscopic lung resection (including pneumonectomy), mediastinoscopy (including anterior mediastinal mass)
- Explain indications, risks, and complications of regional anesthesia for postop pain management
- Describe the care and use of bronchoscopes, CPAP devices, PEEP devices

#### Interpersonal and Communication Skills

- Explain a cardiothoracic anesthesia plan to patients that include the risks and possible complications
- Explain a plan to and elicit help from nursing staff, surgeons, perfusionists and obtain other medical specialty consultation when indicated.

#### Professionalism

##### **CA-1**

- Demonstrates responsibility and physical and mental attentiveness in a positive and constructive manner
  - o Copes with diversions, and minimizes distractions while maintaining vigilance
  - o Initiates interactions with patients, colleagues and peers using respectful communication and conscientious behaviors
  - o Arrives for clinical and learning responsibilities in a timely and punctual fashion; prepared to perform tasks, explain reasoning and reasoning process
  - o Employs electronic/technology and communication devices in a timely fashion to support patient care and teamwork
  - o Answers pages in a timely manner
  - o Completes all rotations with a rating of satisfactory or better
- Demonstrates willingness to show consideration and appreciation for patients and co-workers
  - o Interacts with colleagues and peers in a respectful and conscientious manner
  - o Identifies respectful interactions
  - o Values patients leadership role in their own care
  - o Responds to questions, requests for information, follow-up, and other communication in a timely manner
- Exhibits compassion, empathy and support in patient care and professional interactions
  - o Appreciates patient vulnerability
  - o Communicates in an open, inclusive manner ensuring appropriate patient care and teamwork
  - o Acknowledges diversity while providing equanimity in patient care and therapeutic and work relationships
  - o Initiates interactions and manages exchanges with patients, colleagues and peers using respectful communication and conscientious behaviors

- Demonstrates truthful and ethical standards in professional interactions and conduct
  - o Adheres to departmental and university policies and procedures
  - o Exhibits honesty in record keeping and medical records
  - o Presents information, concerns, and suggestions without bias or for personal gain
  - o Reports concerns, errors, or potential problems to attending
  - o Informs patients and appropriate caregivers about care and care options using HIPAA and PARQ
  - o Demonstrates an understanding of the value of continuing education and life-long learning through membership to professional organizations including OMA & ASA

## CA-2

- Demonstrates responsibility and physical and mental attentiveness in a positive and constructive manner
  - o Initiates interactions and manages exchanges with patients, colleagues and peers using respectful communication and conscientious behaviors
  - o Arrives for clinical and learning responsibilities punctually, and prepared to explain and defend reasoning
  - o Attends to causes of diversions and distractions, while maintaining vigilance
  - o Employs electronic/technology and communication devices in a timely fashion to enhance and support patient care and teamwork
  - o Answers pages in a timely manner
  - o Completes all rotations with a rating of satisfactory or better
- Demonstrates willingness to show consideration and appreciation for patients and co-workers
  - o Promotes patients' leadership role in their own care
  - o Initiates exchanges among colleagues and peers to develop respectful and conscientious teamwork
  - o Promotes and encourages respectful interactions
  - o Responds to questions, requests for information, follow-up, and other communications in a timely manner
  - o Communicates in an open, inclusive manner ensuring appropriate patient care and teamwork
- Exhibits compassion, empathy and support in patient care and professional interactions
  - o Appreciates patient vulnerability and provides reassurance as needed
  - o Promotes communication among peers and co-workers to create open, inclusive interactions ensuring appropriate patient care and teamwork
  - o Attends to the needs of diverse groups and individual dynamics while providing equanimity in patient care and therapeutic and work relationships
  - o Directs and manages exchanges with patients, colleagues and peers

- using respectful communication and conscientious behaviors
- Demonstrates truthful and ethical standards in professional interactions and conduct
  - o Adheres to departmental and university policy and procedures
  - o Educates patients and appropriate caregivers about care and care options using HIPAA and PARQ
  - o Exhibits honesty in record keeping and medical records
  - o Analyzes and responds appropriately to ethically challenging situations
  - o Presents and receives information, concerns, and suggestions without bias or for personal gain
  - o Demonstrates an understanding of the value of continuing education and life-long learning through membership to professional organizations including OMA & ASA

#### Practice-Based Learning and Improvement

- Select specific evidence based medicine materials related to cardiothoracic anesthesia
- Examine previous and current OR experiences for ways to improve patient care

#### Systems-Based Practice

- Explain multidisciplinary organization and space utilization associated with safe, timely and successful performance of cardiothoracic anesthesia

### **Instructional Methods**

- Residents will be assigned to the Cardiac OR cases by the rotation chief.
- Residents will discuss their preanesthetic workup, monitoring plan, anesthetic and postoperative plan with their attending anesthesiologist the day prior to the scheduled case.
- Intraoperative didactic teaching

### **Assessment and Evaluation**

Evaluation of the resident will be done by the Cardiac Anesthesiology faculty in accordance with departmental guidelines and will be reflected in the resident evaluation for the period in which the rotation was performed. Biweekly formative assessment will be given to the resident by Cardiac Anesthesiology faculty, and an end of rotation summative evaluation will be performed by the specialty rotation chief.

## References and Resources

*Cardiac Anesthesia*, Third Edition, Hensley and Martin  
*Manual of Cardiac Anesthesia*, Second Edition, Thomas  
*Cardiac Anesthesia*, Third Edition, Kaplan  
*Anesthesia*, Fifth Edition, Miller, R.  
*A Practical Approach to Transesophageal Echocardiography*, Perrino and Reeves  
*Drugs for the Heart*, Opie  
*Heart Physiology*, Opie  
*Heart Disease*, Sixth Edition, Braunwald