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Rotation Name	Cardiothoracic Anesthesia – Rotation 2

COURSE OVERVIEW

Course Overview (75 – 100 words describing the course)
The overall goal of this rotation is to provide an advanced understanding of the perioperative management of patients undergoing routine and advanced cardiothoracic procedures. Under the direct supervision of an attending anesthesiologist, during this 4 week rotation, the CA2 resident with acquire the knowledge and technical skills to practice cardiothoracic anesthesia in a safe and compassionate manner and achieve the objectives as outlined under the 6 core competencies. As outlined below, the resident will expect to expand their knowledge beyond Cardiothoracic Anesthesia – Rotation 1, and will also be expected to demonstrate greater dependence in decision making and care of the cardiac surgery patient. All case experience will be logged with ACGME Toolbox. The evaluation method will include evaluation via E-value as well as mid and end rotation feedback by the rotation director and an end of rotation oral board examination. The residents will perform an evaluation of the rotation as well.

LEARNING OBJECTIVES

Examples of verbs to be used in stating the learning objectives:

Knowledge	***Knowledge Recall***	define, repeat, list, name, restate, identify, report
	Knowledge Analysis	distinguish, differentiate, analyze, calculate, compare, relate, categorize
	Knowledge Synthesis	compose, propose, design, formulate, construct, organize
	Knowledge Application	interpret, apply, employ, illustrate
Skills	Demonstrate (a procedure)	
	Perform (a physical exam)	
	Determine the presence of (a finding)	
	Use (lab tests)	
	Point out (a physical finding)	
	Keep track of (lab data)	
	Practice (a technique)	
Attitudes	Show consideration (for patient comfort)	
	Show respect (for colleagues)	
	Pay attention (to patient concerns)	
	Express point of view	
	Express satisfaction in doing a particular activity	

Patient Care: Residents must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health.

	After successful completion of this rotation the resident will be able to:	Methods of Evaluating Competency
Objective 1	Gather data (including cardiac catheterization, echocardiography, laboratory data) and document a history and physical exam that adequately represents the patient's clinical presentation and formulate an appropriate management plan	❍ Direct observation/Faculty Feedback
Objective 2	Devise and carry out a detailed and specific anesthetic plan to minimize anesthetic risk for patients with the following pathophysiology: aortic aneurysms and dissections, heart failure requiring ventricular assist device placement, heart failure requiring heart transplant, lung failure requiring lung transplantation	❍ Direct observation/Faculty Feedback
Objective 3	Devise and carry out a detailed and specific anesthetic plan to minimize anesthetic risk for patients undergoing the following surgeries: video assisted thoracoscopic surgery, thoracotomy, mediastinoscopy, esophagectomy, tracheal resection, anterior mediastinal mass excision, and pneumonectomy	❍ Direct observation/Faculty Feedback
Objective 4	Perform timely, organized and efficient preparation of all equipment, supplies and medications	❍ Direct observation/Faculty Feedback
Objective 5	Perform the placement of invasive monitoring with minimal staff direction and supervision	❍ Direct observation/Faculty Feedback
Objective 6	Identify common anatomical structures on TEE	❍ Direct observation/Faculty Feedback
Objective 7	Perform the successful initiation of and separation from cardiopulmonary bypass with minimal assistance	❍ Direct observation/Faculty Feedback
Objective 8	Select the appropriate pharmacological or mechanical support during and upon separation from cardiopulmonary bypass (ie, intraaortic balloon pump, cardiac pacing, ventricular support device)	❍ Direct observation/Faculty Feedback
Objective 9	Determine the need for and successfully place a lumbar spinal drain for neuroprotection in thoracic aorta surgery	❍ Direct observation/Faculty Feedback
Objective 10	Provide perioperative care of the patient undergoing thoracic aortic surgery including management of partial bypass	❍ Direct observation/Faculty Feedback

Objective 11	Transport critically ill patients to and from the operating room safely	❍ Direct observation/Faculty Feedback
Objective 12	Successfully place and manage lung isolation with double lumen tubes and bronchial blockers, including management of hypoxemia	❍ Direct observation/Faculty Feedback
Objective 13	Perform thoracic epidural placement and devise intraoperative and postoperative pain management plan	❍ Direct observation/Faculty Feedback
Objective 14	Perform paravertebral block and catheter placement and devise intraoperative and postoperative pain management plan	❍ Direct observation/Faculty Feedback
Objective 15	Demonstrate appropriate handling of fiberoptic bronchoscopy equipment in performing therapeutic and diagnostic bronchoscopy in the patient undergoing thoracic surgery	❍ Direct observation/Faculty Feedback
Objective 16	Demonstrate appropriate use of airway device exchange catheters	❍ Direct observation/Faculty Feedback

Medical Knowledge: Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological and social-behavioral sciences, as well as the application of this knowledge to patient care.

	After successful completion of this rotation the resident will be able to:	Methods of Evaluating Competency
Objective 1	Discuss left and right heart failure including: etiologies; functional classifications; signs and symptoms; treatments	❍ Direct observation/Faculty Feedback ❍ Oral presentation/quiz
Objective 2	List the indications for the following heart failure surgeries: biventricular pacemakers, AICDs, ventricular remodeling surgery, ventricular assist devices (VAD)	❍ Direct observation/Faculty Feedback ❍ Oral presentation/quiz
Objective 3	List the different classifications of VADs including indications, complications, surgical techniques for placement	❍ Direct observation/Faculty Feedback ❍ Oral presentation/quiz
Objective 4	Describe the following regarding intra-aortic balloon pumps: indications and contraindications; proper placement; arterial waveforms of proper and improper timing of assistance; complications; and weaning	❍ Direct observation/Faculty Feedback ❍ Oral presentation/quiz
Objective 5	Discuss the following principles of aortic aneurysms and dissections: classifications; management of ascending aortic dissections and aneurysm; management of descending aortic dissections and aneuryms	❍ Direct observation/Faculty Feedback ❍ Oral presentation/quiz
Objective 6	Describe the following principles of congenital heart disease (CHD): normal neonatal and infant cardiopulmonary physiology and transition to adult circulation; incidence of CHD and coexisting syndromes; classification and pathophysiology of common congenital heart lesions (ASD, VSD, AV canal, TEF, transposition, TAV, hypoplastic heart syndrome)	❍ Direct observation/Faculty Feedback ❍ Oral presentation/quiz
Objective 7	Differentiate the anesthetic considerations of the common CHDs and basic goals of common corrective surgeries including: systemic to pulmonary shunts, cavopulmonary shunts, BT shunts and ECMO	❍ Direct observation/Faculty Feedback ❍ Oral presentation/quiz
Objective 8	Discuss the anesthetic management for the patient undergoing heart transplantation including: management of reoperations and VADs; indications and outcomes; common complications including right heart failure	❍ Direct observation/Faculty Feedback ❍ Oral presentation/quiz
Objective 9	Explain the principles of anesthesia for the following cardiac procedures: cardiac tamponade, intracardiac tumors, and pulmonary embolectomy	❍ Direct observation/Faculty Feedback ❍ Oral presentation/quiz
Objective 10	Describe the rationale, advantages, selection criteria, techniques and anesthetic management of off pump CABG (OPCAB) and minimally invasive direct CABG (MIDCAB)	❍ Direct observation/Faculty Feedback ❍ Oral presentation/quiz

Objective 11	Describe the surgical approaches, selection criteria, advantages, anesthetic monitoring, and management issues of minimally invasive valve surgery (MIVS)	❍ Direct observation/Faculty Feedback ❍ Oral presentation/quiz
Objective 12	Discuss neuroprotection and CPB including: normal cerebral physiology; risks of neurological injury and cognitive dysfunction; methods of monitoring cerebral perfusion; cerebral ischemia prevention strategies; and indications and techniques for deep hypothermic circulatory arrest	❍ Direct observation/Faculty Feedback ❍ Oral presentation/quiz
Objective 13	Manage cardiac emergencies	❍ Direct observation/Faculty Feedback ❍ Oral presentation/quiz
Objective 14	Discuss anesthetic considerations for thoracic aortic disease including: classification of thoracic aortic aneurysms and dissections; coarctation of the aorta in the adult; partial heart bypass techniques; spinal cord protection	❍ Direct observation/Faculty Feedback ❍ Oral presentation/quiz
Objective 15	Define an advanced understanding of cardiopulmonary bypass including: rare diseases affecting CPB (HIT, antithrombin II deficiency, sickle cell disease, cold agglutinin disease, MH), CPB and the pregnant patient, management of the Jehovah's witness, and complex blood gas analysis (alpha stat/pH stat)	❍ Direct observation/Faculty Feedback ❍ Oral presentation/quiz
Objective 16	Discuss components of postoperative management of the patient undergoing cardiac surgery, including: mechanical ventilation; common complications; fast-tracking; pain management	❍ Direct observation/Faculty Feedback ❍ Oral presentation/quiz
Objective 17	Describe the surgical techniques and indications for the Ivor-Lewis and transhiatal esophagectomy and relevant anesthestic considerations in the perioperative period	❍ Direct observation/Faculty Feedback ❍ Oral presentation/quiz
Objective 18	Discuss the anesthetic concerns and management goals of a patient with an anterior mediastinal mass	❍ Direct observation/Faculty Feedback ❍ Oral presentation/quiz
Objective 19	Discuss the indications for cross table ventilation and the use of jet ventilation	❍ Direct observation/Faculty Feedback ❍ Oral presentation/quiz
Objective 20	Discuss the management of the patient undergoing mediastinoscopy including potential complications and monitoring concerns	❍ Direct observation/Faculty Feedback ❍ Oral presentation/quiz
Objective 21	List the guidelines for the management of regional anesthesia in the anticoagulated patient	❍ Direct observation/Faculty Feedback ❍ Written test

Practice-based Learning and Improvement: Residents must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning. Residents are expected to develop skills and habits to be able to meet the following goals:

- identify strengths, deficiencies, and limits in one's knowledge and expertise;
- set learning and improvement goals;
- identify and perform appropriate learning activities;
- systematically analyze practice using quality improvement methods, and implement changes with the goal of practice improvement;
- incorporate formative evaluation feedback into daily practice;
- locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems;
- use information technology to optimize learning; and,
- participate in the education of patients, families, students, residents and other health professionals.

	After successful completion of this rotation the resident will be able to:	**Methods of Evaluating Competency**
Objective 1.	Set learning and improvement goals for this rotation as well as future rotations	❍ Direct observation/Faculty Feedback ❍ Self Assessment
Objective 2.	Locate, assimilate and appraise evidence from scientific studies related to their patient's particular health issues	❍ Direct observation/Faculty Feedback ❍ Self Assessment
Objective 3.	Participate in the education of patients, families, students, residents and other health professionals	❍ Direct observation/Faculty Feedback ❍ Self Assessment
Objective 4.	Incorporate formative evaluative feedback into daily practice	❍ Direct observation/Faculty Feedback ❍ Self Assessment

Interpersonal and Communication Skills: Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals. Residents are expected to:

- communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds;
- communicate effectively with physicians, other health professionals, and health related agencies;
- work effectively as a member or leader of a health care team or other professional group;
- act in a consultative role to other physicians and health professionals; and,
- maintain comprehensive, timely, and legible medical records, if applicable.

	After successful completion of this rotation the resident will be able to:	**Methods of Evaluating Competency**
Objective 1.	Work and communicate effectively with all members of the care team, including but not limited to the preoperative staff, intraoperative nurses, perfusion, blood bank and laboratory staff, surgeons, anesthesia technicians, anesthesia providers, and post-operative ICU team	❍ Direct observation/Faculty Feedback ❍ Self assessment
Objective 2.	Effectively transfer patient care to the postoperative ICU staff and relay appropriate details of the patients history and intraoperative events and concerns	❍ Direct observation/Faculty Feedback ❍ Self assessment
Objective 3.	Describe the nature, risks and benefits of cardiovascular anesthetic options, and alternatives in a manner that is understandable to the patient and their family members	❍ Direct observation/Faculty Feedback ❍ Self assessment
Objective 4.	Allay, by interpersonal skills, patient and family member anxiety during the perioperative period	❍ Direct observation/Faculty Feedback ❍ Self assessment
Objective 5	Maintain comprehensive, timely and legible medical records	❍ Direct observation/Faculty Feedback ❍ Self assessment

Professionalism

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. Residents are expected to demonstrate:

- compassion, integrity, and respect for others;
- responsiveness to patient needs that supersedes self-interest;
- respect for patient privacy and autonomy;
- accountability to patients, society and the profession; and,
- sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

	After successful completion of this rotation the resident will be able to:	**Methods of Evaluating Competency**
Objective 1.	Demonstrate compassion, integrity and respect for all members of the care team, the patient, and the patient's family	❍ Direct observation/Faculty Feedback ❍ Self assessment
Objective 2.	Show respect for patient privacy and autonomy	❍ Direct observation/Faculty Feedback ❍ Self assessment
Objective 3.	Express sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race and religion	❍ Direct observation/Faculty Feedback ❍ Self assessment

Systems-based Practice

Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care. Residents are expected to:

- work effectively in various health care delivery settings and systems relevant to their clinical specialty;
- coordinate patient care within the health care system relevant to their clinical specialty;
- incorporate considerations of cost awareness and risk-benefit analysis in patient and/or population-based care as appropriate;
- advocate for quality patient care and optimal patient care systems;
- work in interprofessional teams to enhance patient safety and improve patient care quality; and
- participate in identifying system errors and implementing potential systems solutions.

	After successful completion of this rotation the resident will be able to:	**Methods of Evaluating Competency**
Objective 1.	Develop cost-effective patient management decisions involving cardiac anesthesia patients without affecting the quality of patient care	❍ Direct observation/Faculty Feedback ❍ Self assessment ❍ Oral presentation/quiz
Objective 2.	Explain how the anesthetic plan (ie glycemic control, fast tracking, and management of blood component therapy) can impact patient outcomes and economic costs	❍ Direct observation/Faculty Feedback ❍ Self assessment ❍ Oral presentation/quiz
Objective 3.	Formulate patient care plans that take advantage of multidisciplinary team skills	❍ Direct observation/Faculty Feedback ❍ Self assessment ❍ Oral presentation/quiz
Objective 4.	Participate in identifying system errors and implement potential system solutions	❍ Direct observation/Faculty Feedback ❍ Self assessment ❍ Oral presentation/quiz

TEACHING METHODOLOGIES

Students on this rotation will be expected to learn and achieve the learning objectives through the following methodologies and activities:	
❍ Lecture - Fellow lecture series ❍ Lecture - Corresponding CA2/3 lecture series ❍ Intraoperative teaching ❍ Oral board examination	❍ Clinical Experience ❍ Assigned Reading Assignments ❍ Independent Study

PATIENT ENCOUNTERS

Residents on this rotation will be expected to work up and/or manage the minimum number of patients/cases with the specified conditions as listed below:

Number	Patient Condition / Case
20	Patients requiring cardiopulmonary bypass
10	Non-cardiac intrathoracic procedures including VATs, thoracotomies, mediastinoscopy, and esophageal surgery
5	Double lumen tube placement for VATs/thoracotomies
1	Bronchial blocker placement
3	Thoracic epidural placement
2	Paravertebral blocks
8	Fiberoptic bronchoscopy

FEEDBACK

Please identify when and how the student will receive feedback on his/her performance.	
Daily ❍ Verbal	Final ❍ Written ❍ Verbal ❍ Oral board examination

SUBMITTED BY _____

Today's date _____

SUGGESTED READING - Cardiac

Wk	Educational Topics	Reading from A Practical Approach to Cardiac Anesthesia
1	Weaning CPB to ICU – Issues/Problems	pp. 230-260
	Postoperative Management	pp.261-283
	TEE	pp. 142-162
	Advanced understanding of CPB	pp. 224-229, 559-586
	Surgery for valvular pathology	pp. 316-347
2	Aortic dissections and aneurysms	pp. 653-676
	Management of thoracic aortic disease	pp. 677-693
	Protection of the brain during cardiac surgery	pp. 625-649
3	Ventricular assist devices	pp. 587-603
	SVR and remodeling	pp. 517-527
	Off-pump and minimally invasive surgery	pp. 305-311, 348-373
4	Congenital heart disease	pp. 375-438
	Anesthesia for transplantation	pp. 439-462, 724-736

Suggested Reading – Thoracic

Wk	Educational Topic	Reading Material
1	Regional anesthesia and anticoagulation	ASRA Guidelines; Reg Anesth Pain Med 2010;35(1):64-101.
2	Review of esophageal surgery	Anesthesiologist's Manual of Surgical Procedures, pp 329-337