

Cardiothoracic Anesthesiology Fellowship
Department of Anesthesiology and Pain Medicine
University of California, Davis Medical Center

Introduction

The Department of Anesthesiology and Pain Medicine provides comprehensive services for all surgical procedures performed at UC Davis Medical Center, a 450+ bed academic medical facility that serves as the main clinical teaching and research site for the UC Davis School of Medicine. The Cardiothoracic Anesthesiology section currently consists of five full time, fellowship trained, TEE certified attendings with diverse backgrounds and experience and provides anesthetic services for cardiac, thoracic and major vascular procedures.

Goals and Objectives

The Cardiothoracic Anesthesiology Fellowship curriculum provides 12 months of training dedicated to mastering the principles, practices, and techniques of cardiothoracic anesthesia, adhering to guidelines outlined by the UC Davis Health System, Department of Anesthesiology and Pain Medicine, the American Society of Anesthesiologists and the Accreditation Council for Graduate Medical Education. The training will consist of at least six months in the main operating room providing anesthesia to patients undergoing cardiac procedures, one month of thoracic anesthesia, one month in surgical intensive care unit, one month dedicated to transesophageal echocardiography and 2-4 weeks of Non-OR procedures including the electrophysiology and cardiac catheterization laboratories.

Upon completion of the one-year program, the cardiothoracic anesthesiology fellow will have acquired substantial clinical experience and expertise in the management of patients with cardiac and thoracic diseases undergoing cardiac and thoracic operations. The fellow will graduate as an expert in the perioperative management of patients with complex cardiothoracic diseases, and with skills in advanced cardiac monitoring including successful completion of the requirements for certification in perioperative transesophageal echocardiography set by the National Board of Echocardiography.

The objective of **this ACGME accredited program** is for the fellow to become an expert consultant, scholar and teacher of cardiothoracic anesthesiology.

Core Competencies – Learning Objectives

By the end of training curriculum, the fellow will be required to demonstrate competency in the 6 areas listed below as they pertain to patients with cardiac and thoracic diseases:

- [Patient Care](#): Compassionate, appropriate and effective for the treatment of health problems and the promotion of health.
Patient care that is safe, timely, effective, efficient, equitable and patient-centered.

- [Medical Knowledge](#): Familiar with established and evolving biomedical, clinical and cognate (e.g. epidemiological and social-behavioral) sciences, and the application of this knowledge to patient care.

What we need to know to provide patient care that is safe, timely, effective, efficient, equitable and patient-centered.

- [Interpersonal and Communication Skills](#): Effective information exchange and teamwork with patients, their families, and other health professionals.

What we need to say to provide patient care that is safe, timely, effective, efficient, equitable and patient-centered.

- [Professionalism](#): Manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.

How we must act to provide patient care that is safe, timely, effective, efficient, equitable and patient-centered.

- [Systems-Based Practice](#): Manifested by actions demonstrating awareness and responsiveness to the larger context and system of health care, and the ability to effectively call on system resources to provide care that is of optimal value.

Who we depend on and who depends on us to provide patient care that is safe, timely, effective, efficient, equitable and patient-centered.

- [Practice-Based Learning and Improvement](#): Investigation and evaluation of their own patient care, appraisal, and assimilation of scientific evidence and improvements in patient care.

How we must improve.

Curriculum of Training

Consistent with the program requirements established by the ACGME, the following curriculum will be provided through lectures, seminars, conferences and workshops as necessary to supplement clinical experience in the following areas:

- a) Embryological development of the cardiothoracic structures;
- b) Pathophysiology, pharmacology, and clinical management of patients with cardiac disease, including cardiomyopathy, heart failure, cardiac tamponade, ischemic heart disease, acquired and congenital valvular heart disease, congenital heart disease, electrophysiologic disturbances, neoplastic and infectious cardiac diseases;
- c) Pathophysiology, pharmacology, and clinical management of patients with respiratory disease, including pleural, bronchopulmonary, neoplastic, infectious and inflammatory diseases;
- d) Pathophysiology, pharmacology, and clinical management of patients with thoracic vascular, tracheal, esophageal, and mediastinal diseases, including infectious, neoplastic and inflammatory processes;

- e) Non-invasive cardiovascular evaluation: electrocardiography, transthoracic echocardiography (TEE), stress testing and cardiovascular imaging. (TEE education will be based upon the training objectives for advanced perioperative echocardiography of the American Society of Echocardiography and the Society of Cardiovascular Anesthesiologists outlined in “Guidelines for Training in Perioperative Echocardiography”.);
- f) Cardiac catheterization procedures and their diagnostic interpretation, invasive cardiac catheterization procedures, including angioplasty, stenting, transcatheter laser treatments and mechanical ablations;
- g) Non-invasive pulmonary evaluation, pulmonary function tests, blood gas and acid-base analysis, oximetry, capnography and pulmonary imaging;
- h) Preanesthetic evaluation and preparation of adult cardiothoracic patients;
- i) Pharmacokinetics and pharmacodynamics of medications prescribed for medical management of adult cardiothoracic patients;
- j) Perianesthetic monitoring (non invasive and invasive): intraarterial, central venous, pulmonary artery, mixed venous saturation and cardiac output;
- k) Pharmacokinetics and pharmacodynamics of anesthetic medications prescribed for cardiothoracic patients;
- l) Extracorporeal circulation, including myocardial preservation, effects of CPB on pharmacokinetics and pharmacodynamics, cardiothoracic, respiratory, neurological, metabolic, endocrine, hematological, renal, and thermoregulatory effects of CPB and coagulation/anticoagulation before, during, and after CPB;
- m) Pharmacokinetics and pharmacodynamics of medications prescribed for management of hemodynamic instability: inotropes, chronotropes, vasoconstrictors and vasodilators;
- n) Circulatory assist devices, intra-aortic balloon counterpulsation, left and right ventricular assist devices and biventricular assist devices;
- o) Pacemaker insertion and modes of action;
- p) Cardiac surgical procedures: minimally invasive myocardial revascularization, valve repair and replacement, pericardial, neoplastic procedures, and heart and lung transplantation;
- q) Thoracic aortic surgery: ascending, transverse, and descending aortic surgery with circulatory arrest, CPB employing low flow and or retrograde perfusion;
- r) Esophageal surgery for varices, neoplastic disease, colon interposition, foreign body removal, stricture and tracheoesophageal fistula;
- s) Pulmonary surgery: thoracoscopic or open, lung reduction, bronchopulmonary lavage, one-lung ventilation, lobectomy,

pneumonectomy and bronchoscopy: endoscopic, fiberoptic, rigid and laser resection;

- t) Postanesthetic critical care of adult cardiothoracic surgical patients;
- u) Perioperative ventilator management: intraoperative anesthetic, and critical care unit ventilators and techniques;
- v) Pain management of adult cardiothoracic surgical patients;
- w) Research methodology and statistical analysis;
- x) Quality assurance and improvement;
- y) Ethical and legal issues;
- z) Practice management.

Clinical Duties and call

Clinical duties are consistent with ACGME duty hour guidelines. The fellow will initially be on call every 4th day (overnight call is taken from home) and then transition out of the call rotation as their role in the supervision of anesthesiology residents rotating through cardiothoracic service increases.

The Application and Interview Process

Applications should be submitted 10-12 months in advance of candidate's desired appointment. *Please see attached application form for details and requirements.* Applications are generally reviewed in September and October, followed by interviews as necessary. A final selection is usually made before the end of the calendar year.