UCSD DEPARTMENT OF ANESTHESIOLOGY

LEARNING OBJECTIVES FOR CARDIOTHORACIC ANESTHESIOLOGY III, UCSD MEDICAL CENTER

The UCSD CA-3 heart rotation is designed to provide senior anesthesiology residents the opportunity to further their development and education in Cardiac Anesthesia. It presupposes two months of Cardiac Anesthesia training during the CA-1 and/or CA-2 year. Prior to the rotation, it is expected that the residents will have substantial experience in the perioperative care and anesthesia for a wide variety of patients, including those having cardiac surgery. It also is a prerequisite that the Core Competency Goals for the UCSD Introductory Cardiac Anesthesia Rotation have been met. Residents on the CA-3 rotation can expect to be involved in complex cardiac surgeries, as well as other highly complex clinical situations.

I. PATIENT CARE

1. The residents will demonstrate advanced skills in the preoperative evaluation, formulation of anesthetic plan, anesthetic care, and immediate postoperative care in patients receiving
   a. Coronary Artery Bypass Grafting, off-pump and on-pump
   b. Valvular surgery
   c. Pulmonary Thromboendarterectomy

2. The residents will be introduced to highly complex cardiac surgeries, including
   a. Lung Transplantation
   b. Heart Transplantation
   c. Aortic Reconstruction

3. The residents will further develop their skills in
   a. Invasive Hemodynamic Monitoring
   b. Transesophageal Echocardiography
   c. Hemodynamic assessment and management
   d. Dysrhythmia management

II. MEDICAL KNOWLEDGE

The resident will be able to discuss:

1. Anesthetic considerations in Heart Transplantation
   a. Safe, stable anesthetic induction
   b. Cardiac protection techniques
   c. Post-CPB management
      i. hemodynamic support
      ii. isoproterenol use rationale

2. Anesthetic Considerations in Lung Transplantation
   a. Lung isolation techniques
   b. Indications for use of CPB
   c. Examination of the Pulmonary Veins with TEE
   d. Fiberoptic bronchoscopy for assessment of suture lines, pulmonary toilet.

3. Anesthetic Considerations in Aortic Reconstruction
   a. Diagnosis and description of aortic tears using TEE
b. Arterial access choices depending on the anatomy of injury

4. Management of Coagulation disorders
   a. Heparin Induced Thrombocytopenia
      i. alternatives to heparin: tirofiban, argatroban, bivalirudin
   b. Antithrombin III Deficiency
   c. Post-CPB bleeding diathesis
   d. Pharmacology of Aprotinin, Aminocaproic Acid, Tranexemic Acid

5. Advanced management of pulmonary hypertension-pharmacology of nitric oxide, milrinone, prostaglandins

6. Understanding of newer developments in cardiac anesthesia
   a. LVAD and RVAD cardiac support
   b. Intraaortic balloon pump support
   c. Ischemic and pharmacologic cardiac preconditioning
   d. Perioperative glucose management strategies

III. PRACTICE BASED LEARNING AND IMPROVEMENT

1. During the rotation the residents will evaluate their own practice, with the goal of improvement, as well as the medical literature. They will become familiar with outcome studies regarding myocardial preconditioning, aggressive glucose management, newer management strategies for atrial fibrillation, and emerging genetic techniques for perioperative prognostication and risk reduction. They will learn to apply their findings to their own scientific, “evidence-based” practice. There will be monthly Cardiac Journal Club sessions, as well as monthly TEE conferences, that the CA-3 resident will be required to attend.

IV. INTERPERSONAL AND COMMUNICATION SKILLS

1. The residents will further develop their communication skills, both with surgical colleagues (in no type of surgery is close communication with surgeons more important than in cardiac anesthesia) and patients. Cardiac surgical patients, in the preoperative period, are extremely vulnerable. Residents will further develop sensitivity to the fact that the patients suffer from a life-threatening illness, and are about to undergo life-threatening surgery. They will also further develop their skills in interacting with the patients’ family, which is potentially at risk for a devastating personal loss.

V. PROFESSIONALISM

1. Residents will further develop their professionalism, and, in particular, their sense of the “etiquette of the heart room”. This will include a sensitivity to the high pressure environment of the heart room and the social and emotional needs of the surgical team at various times of the surgery.

VI. SYSTEMS-BASED PRACTICE

1. The residents will further develop understanding of cardiac anesthesia in the larger context of cardiac care in the hospital, community, and nation. Principles of cost containment (drugs, ICU length of stay, for example) will be studied. Also, the changing population of cardiac surgical patients resulting from the increased use of less invasive procedures by cardiology will be
appreciated. The potential contributions of the cardiac anesthesiologist to the entire perioperative experience will be appreciated. These include preoperative preparation, intraoperative management, and postoperative hemodynamic, respiratory, and pain management.