

# Cardiac Anesthesia Fellowship

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## Introduction

The Cardiac Anesthesia Fellowship is typically a one-year program designed to train anesthesiologists in all aspects of the cardiac surgical patient including pre-operative assessment /optimization, intra-operative management, and immediate post-operative care. Our goal is to train outstanding clinical anesthesiologists who are comfortable treating patients with a wide variety of complex cardiac problems including valvular heart diseases, critical coronary artery disease, severe ventricular dysfunction, and aortic pathology. Upon completion of the program, the Fellow will be familiar with the use of invasive monitoring and transesophageal echocardiography (TEE) for diagnosis and to guide intra-operative / post-operative therapy in these patients. Fellows will be expected to complete a clinical research project of sufficient quality to be considered for presentation at a major meeting (IACTA) or a publication in a peer-reviewed journal.

## Overview & Objectives

**Clinical and Research Fellowship:** This involves one day (20%) of research time with the remainder as clinical responsibilities. The fellowship focuses on training the Fellow to be proficient in all aspects of cardiac anesthesia including emerging technologies and trends in the specialty. The Fellow will be expected to become familiar with current literature in cardiac anesthesia and transesophageal echocardiography, and participate in a research project. Faculty from within the Department of Anesthesia, as well as collaborators from the Departments of Medicine and Surgery are available to serve as mentors and to offer expertise in a wide range of research topics.

The Fellow is encouraged to present his/her work at national and international meetings. Hospital-based research rounds and didactic lectures on study design, statistical analysis, and grant and manuscript preparation are available to the Fellow.

The Fellow can expect an average of two days per week of cardiac procedures and other procedures as outlined above. Call will be assigned in the cardiac and CVICU. Further more, the Fellow should be flexible with respect to potential availability after hours if “once a year / lifetime” cases arise.

**Perioperative TEE:** The Fellow will participate in an intensive one-month rotation on intra-operative TEE. The rotation will include dedicated study/reading time and the opportunity to perform/interpret studies during daily cases. Our center performs about 250 TEE's per year. Studies will be supervised by anesthesiologists.

**Blood Management:** The Fellow will learn about basic and advanced peri-operative blood management techniques during cardiac surgery.

## **Clinical Responsibilities**

Throughout the fellowship, the Fellow will gain further proficiency in, and exposure to, peri-operative evaluation and intra-operative management of elective and emergency cardiac patients undergoing primary and repeat revascularizations, valve replacements and repairs, and combination procedures.

In the first month, the Fellow will be closely supervised one-on-one by anesthesiologists during cardiac operations. Following successful completion of the first month, the Fellow will be given graduated responsibility with increasing independence. An anesthesiologist will always be immediately available when cases are underway in the cardiac surgical operating rooms. However, the Fellow will be expected to function independently without direct supervision in non-cardiac anesthesia settings (coverage is always available).

The training program includes a six-week rotation in the Cardiovascular Intensive Care Unit (CVICU), which complements intra-operative care. The Fellow will gain experience in all aspects of immediate post-operative care, including the management of peri-operative dysrhythmias, acute and chronic heart failure, fluid and electrolyte balance, uses of cardiac assist devices and other ICU topics. While in the CVICU, the Fellow is expected to participate in active patient care, rounds, teaching of junior staff, and CVICU overnight call (part of the cardiac surgery resident / fellow call schedule).

## **Peri-operative Transesophageal Echocardiography – Responsibilities**

Although there will be guidance and teaching, the Fellow will be responsible for his/her background learning of TEE. Reading materials and videos will be made available either through handouts or loans to the Fellow. The formal echo rotation will be one month in duration and will provide most of the hands-on education for the Fellow. Anesthesia echo on call will provide one-on-one supervision. There will also be mandatory regular seminars and echo case discussions throughout the year. The Fellow will be expected to present an interesting case at the end of the echo rotation, with mentoring by the echo-anesthesiologist. The Fellow, if available, will be encouraged to attend all operating room cases where TEE is involved, except when other clinical duties interfere or by discussion with the echo anesthetist involved. The Fellow is expected to become familiar with the location of equipment and the proper maintenance and cleaning of the equipment. Attendance and participation in bi-weekly “Cardiac Anesthesia / TEE Rounds” is mandatory and the Fellow will be expected to present interesting TEE cases at least four times during the year.

### **Upon completion of the fellowship, the Fellow is expected to:**

- gain a basic understanding of the indications, contraindications and risks of peri-operative TEE;
- gain a basic understanding of the principles of 2D and Doppler echocardiography and an understanding of the physical principles of the echo machine;
- become familiar with recognizing normal cardiac structures and common pathological echocardiographic findings, i.e. LV function, regional wall motion abnormalities, degree of mitral regurgitation, aortic stenosis, etc. This includes the measurements of regurgitant flow, gradients and valve area calculations;
- be able to perform a routine monitoring TEE, including insertion of the TEE probe and gaining standard echo views, i.e. mid-esophageal 3-chamber, mid-esophageal 4-chamber, trans gastric short axis, etc;
- gain basic knowledge to provide a basis for further training in TEE and peri-operative cardiac anesthesia management;
- provide basic care for and maintenance of the TEE probe and machine (cleaning and storage);
- complete a case report or study for publication.

## Peri-Operative Blood Management

The Fellow will learn techniques to minimize the use of allogenic blood during cardiac surgery cases including pre-operative screening, pre-operative hemoglobin augmentation, pharmacologic therapy, use of cell salvage, perfusion strategies, acute normovolemic hemodilution, and post-operative hemoglobin management. The Fellow will be expected to see patients in the pre-operative clinic who refuse blood products for religious /personal reasons and to formulate a plan for their cardiac procedures.

## Goals

At the completion of the fellowship, successful Fellows will have achieved the following goals:

- 1) safe and skillful management of complicated cardiothoracic surgical patients, including proficiency in intraoperative transesophageal echocardiography;
- 2) completion of at least one research project in manuscript form and presentation of results at a national meeting; and
- 3) successful participation in residency education, including conducting didactic lectures and participation in specialty conferences.

## Curriculum

In addition to teaching in the operating room and during Cardiac Anesthesia/TEE Rounds, the Fellow will participate in weekly one-on-one/small group discussions with assigned staff on predetermined topics covering the entire spectrum of cardiac anesthesia. These sessions are intended to provide both practical knowledge and a review of current concepts covering all major topics including:

- CABG
- cardiac resynchronization therapies
- aortic valve repair/replacement
- mitral repair / replacement
- percutaneous valve replacement
- off-pump surgery
- minimally invasive cardiac surgery
- TMR
- MAZE procedures
- transfusion therapy
- peri-operative blood management in cardiac surgery
- emergency cases
- cardiac transplantation
- thoracic aneurysm surgery
- circulatory arrest
- myocardial/cerebral protection
- pharmacology
- pain management
- basic and advanced sessions on cardiopulmonary bypass
- IABP management
- VADs
- hemodynamic monitoring
- a complete overview of all major topics in peri-operative TEE

## **Clinical Activities**

All cardiac anesthesia attending have completed fellowships in cardiac anesthesia and/or intensive care. Furthermore, ninety per cent have completed advanced TEE training. The cardiac operating rooms are fully functional without residents or Fellows which allows significant flexibility for Fellow case selection. Our centre does between 250 pump cases and 350 OFCAB per year. The Fellow will have the opportunity to be involved in cases including: coronary bypass surgery, valve repair/replacements, Redo sternotomies, combined CABG/valve procedures, ventricular assist devices, cardiac transplantation, minimally invasive cardiac surgery, thoracic aortic surgeries, and cardiac resynchronization.

## **Methods of Evaluation**

- Direct feedback throughout the subspecialty training from faculty
- Assessment of presentations of a cardiac topics to staff and residents in didactic lectures and seminars.
- Assessment of Research Project
- Written evaluation of each Fellow on a three-month basis. These evaluations include attitude, interpersonal relationships, breadth of knowledge, manual skills, patient management, decision- making skills, and situational analysis. The Fellowship Director will meet each fellow individually to discuss their evaluations and allow the fellow to voice concerns or questions.
- The Fellow will evaluate each member at the end of the fellowship year.

## **Accreditation**

Certificates are given to Fellows who successfully complete the program.

## **Application Process**

### **Applicants**

Requirements for Application

Candidates must possess a medical degree from a recognized university and have completed Residency training in Anaesthesia.

### **Documents Needed**

- A copy of your medical degree
- A copy of your specialty certification in Anesthesia
- Up-to-date CV