

## Complex Adult Cardiac and Valve Surgery

**Location:** McGill University Health Centre

**Number of fellowship positions:** 1 fellow.

**Duration:** 1 year fellowship

**Name of hospitals involved in training & % time spent by the fellow in each**

**institution:** 100% of the trainee's time will be at the McGill University Health Centre, specifically at the Royal Victoria Hospital.

**Name of the Fellowship Program Director:** Dr. Benoit de Varennes.

**Background:** McGill University and the McGill University Health Centre have developed a strong expertise in complex cardiac surgery using innovative repair and replacement techniques for structural valve disease and cardiac failure. In particular, the institution has been a leader in mitral valve repair, aortic valve repair, aortic valve replacement using percutaneous techniques, and mechanical support of the failing heart.

The practice of cardiac surgery has continued to move away from coronary artery disease and become more focused on valvular pathology and treatment of the failing ventricle. In addition, there is a growing impetus to address these problems using minimally invasive techniques via smaller incisions, different anatomical approaches, and even percutaneous routes. The advent of the Hybrid operating room which is equipped to do both open and closed cardiac surgical procedures, underlines the shift in the practice and the shift in the required skills set.

The traditional skills of cardiac surgeons using open techniques for coronary artery disease and valve replacement are no longer sufficient to treat all patients but there will continue to be a need for very competent cardiac surgeons trained in the traditional manner and this continues to be the focus of residency training. The growth in cardiac surgery, however, will come from minimally invasive approaches and approaches using the percutaneous routes. This skill set requires a focused year of training to understand the pathology and physiology of cardiac disease from the perspective of repair rather than replacement, and a focus on interventional catheter-based techniques for percutaneous approach present at McGill University and the McGill University Health Centre.

**Research activity:** Fellowship candidates will be required to do 25% of their time towards clinical research during their 1-year fellowship. This could be part of epidemiological reviews of the Cardiac Surgery database of nearly 10 000 patients, on going clinical trials in mitral valve repair, percutaneous aortic valve replacement (TAVI), and quality of life studies. As is presently the case in the Resident Training Program, the fellow will be assigned a research supervisor and will be required to have three Research Committee meetings over the year to follow progress of work.

**Publications:** Publications and presentations at international and national meetings are a requirement of the fellowship. As is presently the case in the Resident Training Program, the fellow will be supported to attend one meeting per year.

**Mission:** The mission of the fellowship training is to provide the necessary experience in valve repair, percutaneous replacement, and catheter-based skills to practice cardiac

surgery in a hybrid setting.

**Outline how intended fellowship will enhance residency training:** The fellowship will provide support the residency training program in terms of workload, call and in terms of knowledge transfer and technical skills training. The fellow will also be expected to teach on the wards, during rounds, and in the operating room.

**Names of the Teaching Faculty:**

Dr. Benoit deVarennes [Division Head, Cardiac Surgery, McGill University] Complex adult cardiac surgery with emphasis on mitral valve repair both at the acquired and congenital levels. Percutaneous valve implantation

Dr. Renzo Cecere [Head, Mechanical Heart and Transplantation] Repair and support of the failing ventricle using valve repair, and mechanical support, short and long term, inserted using open and minimally invasive techniques.

Dr. Kevin Lachapelle [Program Director, Cardiac Surgery, McGill University] Adult cardiac surgery with emphasis on aortic valve repair and minimally invasive approach to aortic valve replacement using catheter-based skills.

Dr. Patrick Ergina [Cardiac Surgeon, McGill University Health Centre] Adult cardiac surgery with emphasis on minimally invasive approach to coronary artery disease and revascularization.

Dr. Joe Martucci [Interventional Cardiologist, McGill University Health Centre]. Catheter based interventions for structural heart disease

Dr. Nicola Piazza [Interventional Cardiology, McGill University Health Centre]. Catheter-based interventions for structural heart disease

**Academic Facilities:**

The fellow will have access to the same facilities for clinical and academic pursuits as do the residents. This includes web access to on-line journals via McGill, access to video library via CTSnet, cardiac surgery training curriculum through the Thoracic Surgery Directors Association and the Program Director, access to both the adult and pediatric, as well as the adult database at the McGill University Health Centre, access and training at the McGill Medical Simulation Centre.

**Fellow Duties and Responsibilities:**

The fellow will share responsibilities with the senior and/or chief resident of the service with regards to on-call. As instituted in the training program, this call will be no more than 1 in 3 from home. The fellow will be directly supervised by the attending surgeon and will not be the senior supervisor of the senior or chief residents.

The operative/interventional responsibilities will be distributed between the Cardiac Surgery theatre and the Interventional Suite in the catheterization laboratory. There will be one-two days/week on heart valve repair techniques, one day/week on catheter-based interventions for structural valve disease, one day/week for assisting and teaching residents on routine cardiac surgical cases and one day/week for clinical-based research activities. The total operative experience therefore at the Royal Victoria Hospital will be

3 operating days per week. This will not affect the senior or chief resident exposure to adult cardiac surgical cases. Due to the complex nature of these interventions the Senior and Chief residents are rarely primary surgeons. They will continue to be first and second assistants with delegated tasks for each complex procedure, as is the present situation.

While at the Royal Victoria Hospital, the fellow will participate in all of the Cardiac surgery Teaching activities including Monday 5:30 p.m. Teaching Rounds, Thursday morning Service Rounds, Technical Skills training 4 times a year and Combined Cardiac Surgery/Cardiology Rounds 6 times a year at noon on Fridays. The fellow will be responsible for presentation at Morbidity and Mortality Rounds, all cases for which he was involved and responsible. In addition, the fellow will attend the Structural Valve Clinic on Thursday 9:00 a.m. and attend bi-weekly TAVI rounds Wednesday 7:30 a.m. While at the Royal Victoria Hospital, the fellow will take call in concert with the other senior and chief residents, and will not have operative priority apart from the O.R. for which the fellow is assigned. As with the senior and chief residents, the fellow will be expected to teach on regular ward rounds to both the junior residents and students. The fellow will have complete support of the Program Director as well as the Program Coordinator in the same fashion as the residents. As with the residents, the fellow will be subsidized to attend one North American meeting per year up to \$1,000. It is also expected that the fellow will have one research project per year to be determined by the Fellowship Program Director.

## **Goals and Objectives**

### **Preamble**

The goals and Objectives of the Fellowship are an extension of the Goals and Objectives of Training of the Cardiac Surgery Training Program of McGill University and those of the Specialty Requirements of the Royal College of Physicians and Surgeons of Canada ([http://rcpsc.medical.org/residency/certification/training/cardiac\\_surgery\\_e.pdf](http://rcpsc.medical.org/residency/certification/training/cardiac_surgery_e.pdf)) It is important that the fellow be familiar with these as there is an expectation that the objectives of training have been, for the most part, previously attained by the fellow. This document will be reviewed with the fellow by the Program Director prior to commencement

## **MEDICAL EXPERT**

### **Knowledge**

- Aortic valve anatomy pathology in health and disease
- Aortic stenosis and treatment modalities and results for both open and percutaneous approaches
- Approach and results of Open, trans femoral, trans aortic, and trans subclavian route to aortic valve replacement
- Catheters, wires, dilators used for percutaneous approaches
- Classification of aortic regurgitation and types of associate repairs
- Valve sparing, root remodeling , leaflet repair
- Mitral valve anatomy and pathology in health and disease
- Classification of mitral valve regurgitation with types of associated repair
- Mitral valve ring, chordal replacement, re-implantation, sliding plasty

- Pathophysiology of the failing ventricle
- Device selection for supporting the failing ventricle
- Indications for intervention on valvular disease
- Appropriate selection of incisions and open vs closed approach for minimally invasive techniques
- Appropriate patient selection for various procedures
- Indications for intervention on the failing ventricle in acute and chronic states
- Advantages and disadvantages of Scoring systems to evaluate risk
- Radiation safety
- Function of a hybrid intervention room

### **Skills**

The fellow will be able to:

- Perform various incisions and approaches for minimally invasive cardiac surgery
- Place and navigate catheters in the arterial system, using best practice
- Crimp the aortic valve
- Accurately position the aortic valve using radiography and echo
- Implant percutaneous aortic valve using radiography from the femoral, apical or thoracic approach
- Address complication of the aorta, femoral and subclavian arteries
- Address complications related to valve migration
- Insert percutaneous and placement of right and left ventricular assist devices.
- Insert mitral valve rings
- Place artificial chords
- Re-implant chordae
- Sliding leaflet plasty
- Perform valve sparing surgery
- Perform aortic valve leaflet reduction

### **COMMUNICATOR:**

- Obtain cardiac history from patients and their relatives in the elective and emergency condition.
- Supervise junior residents in history and physical examination.
- Lead scheduled daily rounds with a combined team of nurses, residents and students.
- Write clear notes, including pre-operative indications for surgery and post-operative reports at least every other day.
- Make sure an appropriate discharge summary has been performed either by the medical student or the junior resident, and is appropriately sent to the referring cardiologist and family doctor.
- Communicate directly with attending staff members on problems with patients as well as with the ICU attending and staff.

### **COLLABORATOR:**

- Work with multidisciplinary teams on the ward, in the operating room, and in the ICU.

- Co-ordinate and identify social concerns regarding patients and consult appropriately with allied health care professionals, including social workers, physiotherapists, occupational therapists.
- Advise attending staff appropriately and consult medical specialists and allied health care professionals when needed.
- Run and co-ordinate multidisciplinary rounds on the ward.

#### **MANAGER:**

- Attempt to use evidenced based medicine during management of patients and refer to appropriate literature.
- Record, along with data collectors, complications on the service according to the Division of Cardiac Surgery standards. These will be presented at Morbidity and Mortality Rounds.
- Prepare to run Morbidity and Mortality Rounds and present on specific topics and review literature.

#### **HEALTH ADVOCATE:**

- Involve patients and families in primary and secondary prevention of coronary artery disease.
- Counsel the patients appropriately under exercise, diet, rehabilitation, and smoking sensation.
- Insure that the patient has appropriate follow-up with cardiologist, Wound Clinic or cardiac surgeon.
- Be sure the patient understands the risks and benefits of cardiac medications, including Coumadin.
- Make sure the patient understands the issues of prevention regarding thrombosis and bleeding in a patient with mitral valve repair or replacement.
- Be able to appropriately prescribe lipid lowering medications.

#### **SCHOLAR:**

- Develop a self directed reading and consulting strategy with other professionals.
- Contribute to Service Rounds via presentations and knowledge gained through case experiences and literature.
- Be responsible for teaching junior residents and medical students on the service as well as allied health care professionals. This would occur, when appropriate, during daily rounds and organize at least once a week 'walk around rounds' with members of the service.
- Do regular reading around specific cases, and when appropriate perform a literature review.
- Participate actively in all scheduled rounds.

#### **PROFESSIONAL:**

The fellow will become an example to other members of the team and promote the following:

- Deliver the highest quality care with integrity, honesty and compassion.

- Exhibit appropriate personal and interpersonal professional behavior.
- Practice medicine ethically consistent with the obligations of a physician.

### **Curriculum:**

The curriculum is based on clinical exposure, rounds and selected topics, interdisciplinary meetings, simulation training, clinical research and personal study with readings.

### **Clinical exposure:**

- 40 percutaneous aortic valve replacements
- 100 mitral valve repairs
- 20 aortic valve repairs
- 10 percutaneous ventricular support

### **Rounds:**

Teaching rounds      Monday 17:30 Service rounds Thursday 7:30

Journal club            6x /year

Cardiology rounds    4x /year

TAVI rounds            alternating Wednesday 7:30

Cath Rounds            Friday 7:00

Dobell visiting professor Day

Stikeman Visiting Professor Day

### **Clinical research**

Clinical research project with work over one year and presentation at national meetings

### **Simulation training**

Simulation-based exposure to training in catheter-based skills.

- Learning basic procedures, manipulation of catheters, minimizing radiation