

**University of Toronto**  
**University Health Network – Toronto General Hospital**

**Advanced Heart Failure incorporating, MCS, HF and Transplantation Fellowship**  
**Outline**

There is an established (10 year history) 12 – 24 month specialty fellowship, devoted to clinical Heart Function and Transplantation available at the University of Toronto, University Health Network Toronto General Hospital site. References regarding fellowship from previous fellows are available on request.

The purpose of the fellowship as detailed herein, is to allow the candidate to acquire and develop the necessary skills to function as a specialist in Cardiac Heart Failure and Transplantation management.

*Prerequisites for admission to the fellowship will be*

1. Completion of adequate (minimum of two years) postgraduate training in the field of Cardiology, at an institution or institutions with a cardiac surgical academic program and cardiology academic program.
2. Fulfillment of Provincial Licensure requirements as a trainee

*Applications for this fellowship position are to be directed to:*

Dr H. Ross, Fellowship Program Director of Heart Failure and Transplantation at the University of Toronto, at the following address

Funding will be addressed after the complete application has been received.

### **Clinical Rotations**

The experience will focus on achieving an advanced level of knowledge of the areas of heart failure and pre-/post-transplant management. Specific learning objectives for these 8 months are provided separately. Specialized aspects of care (specifically mechanical circulatory support device therapy-MCSD) will be taught on a longitudinal basis throughout the heart function and transplant months. Heart function/Transplant months will include inpatient care, HFC weekly (Mon, Tues and Wed am), transplant clinic (Thurs am), and rounds held once weekly (Thursday 7 am). In addition amyloid clinic (every other Thursday afternoon), iron overload cardiomyopathy clinic (once per month) are available. Preoperative assessment of the cardiac patient for kidney pancreas or liver transplantation clinics run every other week. Attendance at MOT grand rounds is expected. Donor call, donor management, retrieval of the donor organ, and perioperative management of the transplant recipient may be incorporated longitudinally to ensure adequate experience is gained. Some of these responsibilities may at times be shared with the advance practice nurses (APN) and rotating core cardiology trainees. Pathology: During your HF/Tx clinical time, the trainee will be expected to spend one week per month reading biopsies with Dr. Butany being exposed to endomyocardial biopsy preparation (H&E, EM, IF) and reviewing histologic specimens along with the responsible pathologist reading these specimens.

### **Laboratory Rotation**

A 2 week period is offered specifically devoted to laboratory methods associated with heart failure and transplantation in addition to the ongoing longitudinal experience.

1) HLA lab: This will include hands on experience with HLA typing, antibody screening and crossmatch techniques as well as review of cases that are being studied in the lab. At the end of the period the trainee will be expected to understand the different methodologies used for Ab screening and crossmatching, and apply the results to pre and post transplant risk assessment.

### **Pediatric Heart Failure and Transplantation**

A one-month period is offered devoted to pediatric heart failure and transplantation.

During this period, the trainee will be attached to the Pediatric Cardiac Transplantation/Heart failure team, based at The Hospital for Sick Children (HSC). The trainee will be given appropriate clinical care responsibilities as determined by the pediatric cardiac transplant and heart failure fellowship program.

### **Transplant Infectious Disease**

This experience will include dedicated time on the Transplant Infectious Disease service including both an inpatient and outpatient experience if desired. Exposure to microbiology and virology laboratory techniques will also be an option.

### **Surgical, Critical Care and Mechanical Circulatory Support**

This experience will be conducted longitudinally, and will require the following experience to be completed: coordination and discussion of surgical management of heart

transplantation (5 cases); assessment of patients for VAD support (4 cases); Monitoring of the patient on VAD, including management of coagulation status (3 cases);

### **Elective**

Options for the elective month will include cardiac imaging (functional and specialized echocardiography techniques, MRI, Stress echocardiography), and/or catheter hemodynamic and endomyocardial biopsy studies in this population. Depending on the elective it may run concurrently with clinical duties. Although the candidate will not perform these studies or procedures on an independent basis, he/she may assist with these where the opportunity permits. Other potential elective rotations of interest to the individual can be discussed and taken into consideration.

### **Teaching**

Weekly to bi weekly seminars will take the form of topical discussions in regards to specific objectives provided to the trainee. Protected time and registration for attendance at the annual Toronto Heart Failure Summit will be provided.

The candidate will be expected to conduct monthly teaching sessions for the core fellows, and nurse practitioners. This may take the form of a case presentation and scholarly review of the literature, a journal club review, or a didactic teaching session

### **On-Call Responsibilities**

On-call responsibilities will amount to a maximum of two weeks and one weekend (10 calls) monthly for the Heart Failure and the Heart Transplant services concurrently, second call or call from home. Donor call may be a possible option if deemed appropriate to the trainees level of experience and future career goals. Call will be done from home and scheduled one month in advance to meet all Ontario training requirements. Provisions will be made for the candidate to go home at 12:00 postcall as necessary. If you are funded through the MOT transplant service then there is a mandatory 1 in 7 in house call.

### **Meetings**

Each resident will be supported to one meeting per year – alternating between the HFSA, CCC, and ISHLT.

### **Research**

The trainee will be expected primarily to initiate, and conclude a minimum of one research project during the 12-month fellowship. This will be in an area of interest relevant to heart failure, cardiomyopathy and/or transplantation. Additional research work in related areas of investigation is encouraged, as are written case reports.

The candidate will be expected to attend weekly Heart Transplant Rounds and participate in a minimum of one scholarly presentation over the course of an academic year.

### **Evaluation**

No Royal College examination certification for the area of Heart function or Transplant exists in Canada. Therefore, the candidate will be expected to have acquired the knowledge and skills necessary to function in the role of a Staff Cardiologist who is able to coordinate the care of future Heart Failure and Transplant patients at the completion of the 12-month fellowship. Interim assessments of the candidate's progress will be made periodically by all of the supervisors concerned, and will be documented and discussed with the trainee. This evaluation will follow a similar format to that prescribed by the University of Toronto Postgraduate Training Office. The candidate will be required to meet the level of expectations in a minimum of 5 of 8 evaluations posted, to gain final acknowledgement for their year of training.

## **Fellowship Objective List**

### **1. Clinical Heart Failure**

- a. The clinical assessment of acute decompensated heart failure
- b. Differentiation of systolic and diastolic heart failure
- c. Neurohormonal mechanisms in heart failure
- d. Inotropic support in acute decompensated heart failure
- e. Ventilatory support in acute and chronic heart failure
- f. Fluid volume status and diuretic use in heart failure patients
- g. The mechanisms of beta blockers, and the application of beta blockers in heart failure patients
- h. The mechanisms of ACEi and the application of ACEi in heart failure patients
- i. Rehabilitation, nutrition and psychosocial aspects of heart failure management
- j. Echocardiographic measurements and heart failure progression.
- k. The prognosis, and determination of need for transplantation in Advanced HF
- l. The approach to, and initiation of palliative or compassionate care. Institution of advance care directives.
- m. Indications for mechanical circulatory support
- n. Perioperative management of the heart failure patient for non-cardiac surgery

### **2. Cardiomyopathy**

- a. The incidence, prevalence and demographics of cardiomyopathy and of heart failure
- b. The etiology and progression of myocarditis
- c. Diagnostic testing approach to acute myocarditis
- d. Management options in acute myocarditis
- e. Burnt out Hypertrophic cardiomyopathy (HCM) –prognosis and management
- h. ARVC – risks Sudden Death and heart failure
- i. Dilated cardiomyopathy: mechanisms and disease progression.
- j. Restrictive and noncompaction cardiomyopathy: mechanisms and disease progression – diagnosis, risks and management
- k. Genetic testing and genetic counseling in the cardiomyopathies
- l. Takasubo’s cardiomyopathy – diagnosis, outcomes, management
- m. Sarcoid/Amyloid cardiomyopathy – diagnosis, outcomes, management

### **3. Mechanical Circulatory Support**

- a. indications for VAD
- b. contraindications for VAD
- c. common complications post VAD implant
- d. long-term management of outpatient VAD patients

### **4. Heart Transplantation**

#### **Donor Selection/Management**

- a. Selection criteria/extended donor criteria
- b. Principles of organ retrieval and preservation

- c. Intraoperative surgical techniques-what the cardiologist needs to know.
- d. Early postoperative management. Fluid balance, bleeding, indications for reexploration

## **5. Heart Transplantation**

- a. Pre-transplant assessment
- b. Perioperative concerns relating to cardiac transplantation
- c. Perioperative and post-operative transplant recipient management
- d. Diagnosis and treatment of rejection
- e. Diagnosis and treatment of graft vasculopathy
- e. Diagnosis and treatment of post-transplant complications including but not limited to renal dysfunction, malignancies, infectious diseases, etc.
- f. Transplantation immunology
- g. Pharmacology of immunosuppressive drugs
- h. Management of the long-term care of transplant recipients
- i. Ethical issues relevant to transplantation

## **6. HLA laboratory (Dr. K. Tinckam)**

- a. To describe the HLA typing methods used and describe the basic immunogenetics and nomenclature of Class I and Class II HLA alleles
- b. To understand the differences between cell based and solid phase antibody screening, and how solid phase testing may be utilized in pre and post transplant testing.
- c. To perform virtual crossmatching where indicated and understand the limitations of the test.
- d. To understand the various crossmatch techniques and their role in risk assessment.
- e. To interpret patient files with consideration of HLA type, Ab screening results and crossmatching to determine a patient's risk profile.

## **7. Pathology (Dr. J. Butany)**

- a. Recognize common features of ACR/AMR
- b. Recognize common histopathologic features of DCM, Sarcoid, Amyloid, ARVC