

## **VGH Interventional Cardiology Fellowship Program**

### **1. Introduction:**

The VGH interventional cardiology training program is a competitive, high-volume, fellowship training program that instructs trainees on a broad spectrum of percutaneous interventional techniques to manage coronary, structural, and extra-cardiac diseases. Typically, 2 to 4 interventional trainees are accepted annually for a 2-year fellowship program. One-year advance training positions are available for selected candidates with prior basic interventional cardiology training experience.

The VGH Interventional Cardiology program is very active clinically and participates in primary PCI 24/7, and a full-spectrum of coronary, structural, and extra-cardiac interventional procedures. We have 2 cardiac catheterization laboratories and perform ~4000 diagnostic coronary angiograms annually, and ~1500 PCI annually. We have a 3rd catheterization laboratory for structural and extra-cardiac interventional procedures. We also have a specialty program focus on pulmonary hypertension.

Interventional trainees in our program perform ~1000 coronary procedures (~400-500 coronary PCI) yearly via both femoral and radial accesses, and are regularly exposed to adjunctive contemporary coronary devices such as IVUS, OCT, FFR, and rotational atherectomy. Advance trainees are involved in complex coronary interventions (e.g. antegrade and retrograde CTO techniques), structural interventions (e.g. TAVI, valvuloplasty, LAA closure ASD closure, and PFO closure), and extra-cardiac interventions (e.g. carotid stenting, renal artery stenting, and lower extremity arterial stenting). Trainees actively participate in on-call duties for primary and rescue PCI. Furthermore, interventional trainees are expected to be actively involved in interventional research, manuscript writing, clinical case presentations, and teaching and mentorship of general cardiology residents. In addition, interventional cardiology fellows are strongly encouraged to participate in 1-2 month rotations in cardiac CT angiography at VGH to obtain Level 2 certification.

The VGH Interventional Cardiology Fellowship program has successfully trained 38 interventional fellows since 1993.

### **2. Administrative Structure:**

Dr Saw is the interventional fellowship training director at VGH since 2007. She is responsible for (1) screening, interview and selection of candidates, (2) providing guidance on fellowship training and expectations, (3) teaching and evaluation, and (4) research/academic mentorship. Final selection of candidate is based upon evaluation and consensus from all VGH interventionists through in-person interviews. Candidates are selected based upon their clinical (diagnostic angiogram, prior PCI exposure), research, academic, and teaching experience. There is annual review of fellows' performance regarding their technical skills, patient management, knowledge base, and

academic output. Final graduation from the program is through consensus evaluation from the VGH interventionists.

### **3. Resources:**

There are 3 VGH interventionists (Dr Fung, Saw, and Wood) and 4 SPH interventionists (Dr Aymong, Boone, Carere, and Webb) who work and help train our interventional fellows at VGH. This provides a breath of experience from different practices between a broad group of invasive cardiologists. As well, Dr Brunner provides pulmonary hypertension management exposure.

Our interventional fellows perform a high volume of procedures annually: ~1000 angiogram procedures/yr, of which ~400-500 are interventional procedures (including coronary stenting, structural and extra-cardiac procedures). This provides a wide spectrum of cases, from simple to complex anatomy, different pathophysiology (e.g. CAD, spontaneous coronary artery dissection, congenital heart disease, valvular heart disease, and peripheral arterial disease).

We mandate our interventional fellows to obtain CMPA coverage throughout the course of their fellowship. A small stipend monthly is given to ensure that such insurance coverage is obtained. Our fellows are on-call in evenings and weekends to further expose them to acute STEMI and critically ill patients.

### **4. Educational Program:**

Interventional fellows are taught on a daily basis when working in the cathlab, with high technical teaching exposure on coronary angiography and PCI (including structural and extra-cardiac cases). They are given graduated responsibility and independence in the cathlab according to their technical safety and skills capability. They are first-operators for angiographic and interventional procedures, including complex procedures provided they have proven competency and safety.

From academic perspective, our fellows are expected to be involved in research projects and related paper writing. They are provided with guidance on research study design, collection of data, data analysis, and manuscript preparation, writing, and revision. Manuscripts include research projects, case reports, and review articles.

We have weekly interventional rounds to review interesting and complex cases. There is also monthly journal club and review of relevant contemporary papers and interventional topics. There are combined (VGH and SPH) monthly rounds, and also M & M rounds a few times per year.

### **4. Fellows Evaluation:**

Fellows are continuously being assessed daily when they are in the cathlab by the staff interventionists on their technical performance, patient management, and knowledge base. We have an annual in-person review with the interventional fellows regarding their performance, or more frequent if there are any challenges that arise during the year. Fellows are given constructive criticisms and directions to improve on their deficiencies. Performance evaluated includes: technical skills, patient management, knowledge base, peer/collegial interaction, and academic productivity. Explicit clinical and academic expectations for our fellows are provided (see next section).

## **5. Interventional Fellow Expectations:**

Candidates for our interventional fellowship program must have already completed core training in Internal Medicine and General Cardiology. As such, the expectations of fellows in our program are commensurate with their level of advance training and education. Fellows are expected to dispatch their medical and cardiology knowledge to manage peri-procedural patient-related issues at a "consultant" level when managing patients in the cardiac cath lab. Outside the laboratory, fellows are expected to be actively involved in research projects, manuscript writing (3-6 papers per year), rounds preparation and presentation. The following are guidelines and duties entrusted upon our fellows.

### **(a) Patient management pre- and post- angiography encompassing:**

- Clinical history, physical examination, procedural explanation and consent pre-procedure
- Management of access site and other post-procedural complications
- Management of in-hospital patients pre- and post-PCI
- Management of medications in-hospital and at discharge (ensuring prescriptions are provided comprehensively in an evidence-based fashion)
- The fellow who was involved with the patient's procedure will manage the patient's in-hospital care under the guidance of the involved interventionist. Fellows will delegate and handover their responsibilities to other fellows during their vacation or conference leaves, and for weekend coverage.

### **(b) Catheterization Procedural Coverage:**

- Collectively, interventional fellows are expected to cover both Lab 1 and 2 everyday
- The interventional fellow in lab 1 will also be involved with teaching of diagnostic cardiology residents rotating through the cardiac cathlab
- Advance fellows are expected to be involved with structural and extra-cardiac interventions in Lab 3
- The chief interventional fellow is responsible to organize cathlab and on-call coverage at least 1 month in advance

(c) Clinical Records:

- Fellows are expected to dictate/transcribe procedural reports within 48 hours of the procedure
- Fellows are expected to chart daily in-hospital notes and dictate discharge summaries promptly

(d) Rounds and teaching seminar preparations:

- Weekly interventional cardiology rounds are on Tuesday 7-8am. Each fellow is responsible to prepare and discuss one interesting case every week. Case discussions will continue if time permits after journal club and M&M sessions.
- Journal club to review contemporary studies once a month. Fellows will rotate monthly, and the responsible fellow is expected to select a study and review the topic in 30 minutes.
- M&M rounds are scheduled several times per year, fellows are expected to discuss with the attending interventionist and present the cases in detail.
- The chief fellow is responsible to delegate rounds and seminar presentations, and discuss with staffs and fellows for topics

(e) On-call Responsibilities:

- Fellows will rotate to cover on-call duties one weeknight evening and one weekend per month
- Fellows are responsible to trade with one another for on-call coverage during vacation periods
- Weekend on-call duty includes rounding on interventional patients on the cardiac ward

(f) Research Activities:

- Fellows are expected to be active and productive in research and other academic activities (e.g. teaching of cardiology residents)
- Fellows are expected to be involved in a minimum of 2 projects annually. Projects can vary from research studies, case reports, book chapters, and review articles
- Fellows are expected to submit at least 1 abstract to a national or international conference every year
- Fellows are expected to be involve in 3-6 manuscript preparation/writing annually

(g) Cardiac CT Angiography Rotation:

- Fellows are strongly encouraged to spend 1-2 months in the cardiac CT angiography rotation to obtain level 2 certification
- Interventional fellows during this rotation will be responsible to interpret all CTA performed daily and review with the attending cardiologist/radiologist
- Fellows are expected to review the patient's clinical history, manage the patient's rhythm, and be present during patient scanning
- Fellows are expected to review the CTA case library correlating to catheter coronary angiography

- Fellows are responsible for case presentations during the bi-monthly CT angiography rounds

(h) Vacation and Conference:

- UBC fellows and residents are allowed up to 4 weeks of vacation annually
- Fellows are encouraged to attend and present at national and international cardiology and interventional cardiology conferences
- The chief fellow must be notified of vacation/conference leave a minimum of 2 months in advance, as the chief fellow is responsible to ensure Lab 1 and 2 coverage during vacation and conference leaves
- An annual funding for conference/educational courses (receipts must be submitted) is available for fellows presenting at conferences

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