

Interventional Cardiology Fellowship Bridgeport Hospital Yale New Haven Heart Institute

1. GOALS OF THE PROGRAM

1.1 Objectives

The main objective of the Fellowship Training Program in Interventional Cardiology is to provide an academically and clinically rigorous training program in Interventional Cardiology. The aim of the program is to provide the trainee with fundamental pathophysiologic principles and clinical knowledge, procedural skills, clinical judgment, professionalism, and interpersonal skills required as a subspecialist in interventional cardiology. This training will allow trainees to function as highly competent subspecialists. During training in interventional cardiology the resident's clinical experience will provide opportunities to diagnose, select therapies, perform coronary interventional procedures, and manage and judge the effectiveness of treatment(s) for both inpatients and outpatients with cardiovascular disease.

1.2 Program Duration

The fellowship program includes one trainee for the one- year training program. All residents entering this program must have completed An Accreditation Council for Graduate Medical Education (ACGME) – accredited cardiovascular disease program or its equivalent. The interventional residency is therefore typically reserved for those residents beginning at least their fourth year of cardiovascular training.

2. EDUCATIONAL OBJECTIVES AND CURRICULUM OF THE TRAINING PROGRAM.

2.1 Clinical Experience Overview

2.1.1 Duty Hours

Each resident will not spend more than 80 hours per week, on average, caring for patients during a four-week rotation in compliance with the policy of the general medical educational committee. Throughout the year, on average, each resident will have at least one weekend day (24 hours) free from clinical duties. Moonlighting activities at the institution will be

monitored by the Program Director for inclusion in the duty hour calculation according to hospital policy. The Duty Hours Policy can be found at the back of the curriculum Appendix A, which includes the Moonlighting Policy.

2.1.2 Patient Population

The program is designed to provide a high level of clinical training and exposure to the following areas: observation and management of therapeutic coronary interventions, progressive responsibility for the management of acutely and chronically ill cardiac patients, and teaching (medical students, medical residents, and more junior cardiovascular disease residents). Bridgeport Hospital (BH) serves as a primary care hospital for Southwestern Connecticut and as a tertiary care center for surrounding counties. The patients from this large catchment area represent a wide variety of both common and rare cardiovascular disorders and therefore provide a wide – ranging experience and exposure to varying cardiac conditions in a demographically diverse population. Our patient population includes a predominantly African-American and Hispanic inner city group, as well as a diverse community-based group representing all financial strata. Women are well represented.

2.2 Clinical Experience

The program provides a twelve - month period of clinical training in coronary interventional procedures, as well as a year - long experience in a longitudinal ambulatory clinic. BH currently has digital Philips and GE cath labs (including one swing lab). By the end of 2007, we will have replaced both labs with state of the art digital flat panel labs. The BH Cardiac Catheterization Laboratory (Dr. Mitchell Driesman, Director) performs greater than 2500 diagnostic cardiac procedures, as well as greater than 1000 interventional procedures annually. BH employs all modalities of state- of- the- art percutaneous intervention, including balloon angioplasty, coronary stenting, intravascular ultrasound, rotational atherectomy, manual and rotational thrombectomy, distal protection devices, pressure wire evaluation, and coronary brachytherapy. Exposure to investigational devices and novel adjunctive therapies is also available. Experience in peripheral vascular and carotid interventions is afforded. Cardiothoracic surgery is available on-site at all times and our cardiothoracic surgeons routinely attend cath conferences and morbidity and mortality rounds. The outpatient ambulatory clinic is located at the BH medicine clinic. Residents will therefore have ample clinical experiences that provide them the opportunity to acquire knowledge of the indications, risks, limitations, sensitivity, specificity, predictive accuracy, and appropriate techniques for evaluating and follow up for patients with a variety of cardiac disorders, including but not limited to:

- a. Chronic ischemic heart disease
- b. Acute ischemic syndromes (ACS)
- c. Valvular heart disease
- d. Peripheral vascular and cerebrovascular disease

Residents will have the opportunity to perform a minimum of 250 coronary interventional procedures over the 12- month training period. In addition, the residents will build on their previous skills obtained in the general cardiovascular residency in the interpretation and performance of:

- a. Coronary arteriograms
- b. Ventriculography
- c. Cardiac hemodynamics
- d. Intravascular ultrasound (IVUS)
- e. Intracoronary pressure recording
- f. Femoral and brachial/radial cannulation of normal and abnormally located coronary ostia.
- g. Application and use of balloon angioplasty, coronary stents, and other commonly used interventional devices commonly used in percutaneous coronary intervention (PCI) procedures.

Trainees are also encouraged to participate in the evaluation and management of patients with peripheral vascular disease, including participation in diagnostic and therapeutic procedures for iliac, femoral, renal, carotid, and subclavian disease.

Because of the ample clinical experience provided, the trainee will acquire knowledge in clinical decision making including:

- a. The clinical importance of complete vs. incomplete revascularization in a wide variety of clinical and anatomic situations
- b. Strengths and limitations, both short - and long – term, of percutaneous vs. surgical and medical therapy for a wide variety of anatomic and patient subsets.
- c. Strengths and limitations, both short – and long – term, of differing percutaneous approaches for a wide variety of anatomic situations.
- d. Strengths and limitations of both mechanical vs. pharmacologic approach for acute myocardial infarction.
- e. The role of emergency bypasses grafting in the management of complications of percutaneous intervention.
- f. The role of randomized clinical trials and registries in clinical decision-making.
- g. The use and limitations of intra-aortic balloon counter pulsation (IABP) and other hemodynamic support devices (as available).
- h. The appropriate use of pharmacotherapy in the procedural, and post – procedural management of the PCI patient.
- i. Strengths and limitations of non – invasive and invasive coronary evaluation during the recovery phase after acute coronary syndromes and in chronic stable coronary artery disease.

All procedures are performed under the direct supervision of an attending interventional cardiologist. The interventional residents will be responsible for performing a pre-procedural history and physical examination and reviewing the relevant non-invasive studies and indications for the procedure with the attending. The resident's responsibilities will also include explaining the procedure to patient, obtaining informed consent, and performing the critical technical manipulations of the procedure, as well as all pertinent follow-up care including procedural documentation. Residents will be required to maintain a procedural log.

The trainee will demonstrate expertise in the following aspects related to the coronary intervention:

- a. Understanding the appropriateness of the procedure. There should be a clear understanding of the risk/benefit ratio of the planned intervention. Knowledge of co-morbid features that increase the risk of a procedure should be demonstrated.
- b. Obtaining informed consent. The trainee should communicate the risk and benefits of a procedure in a manner that is understood by the patient and address questions raised by the patient. In situations where the patient cannot give informed consent, the trainee should obtain consent from appropriate sources.
- c. Administering anesthesia. The trainee should demonstrate knowledge of the pharmacology of the medications used for conscious sedation, contraindications for their use, side effects, and the treatment of their side effects.

Residents will also be exposed to the complications of percutaneous coronary interventions (PCI), including but not limited to:

- a. Coronary dissection
- b. Thrombosis
- c. Acute or threatened closure
- d. Coronary spasm
- e. Coronary perforation
- f. "Slow or no-reflow"
- g. Cardiogenic shock
- h. Left main trunk dissection
- i. Cardiac tamponade
- j. Peripheral vessel occlusion/thrombosis
- k. Pseudoaneurysm

Residents will also have the opportunity to acquire experience in the bleeding complications associated with PCI, including but not limited to:

- a. Bleeding after thrombolytic therapy
- b. Heparin usage and dosing (both unfractionated and LMWH), including HIT
- c. Antiplatelet therapy (aspirin and clopidogrel)
- d. Glycoprotein IIb/IIIa usage and complications.

- e. Direct thrombin inhibitors (Bivalirudin, etc)

Residents will have ample clinical experience involving:

- a. Inpatient and outpatient consultation
- b. Care of patients in the coronary care unit (CCU), and emergency department (ED).
- c. Care of the patient before and after interventional procedures
- d. Outpatient follow-up of patients treated with interventions, devices, surgery, and/or medications.
- e. Indications for implantable defibrillator insertion and biventricular pacing in high-risk individuals (training in the implantation of these devices is not provided).

In all clinical in-patient rotations, the interventional residents will interact with generalists and specialists in all areas, functioning as consultants for cardiovascular/interventional problems. Particularly close relationships are fostered with Cardiothoracic Surgery and Internal Medicine residents and staff. The resident is responsible for initially evaluating patients and formulating recommendations for treatment. This initial evaluation is then discussed with the attending, which bears final responsibility for patient management or recommendations for management. When responding to a request for consultation, the trainee is expected to provide a comprehensive evaluation of the patient's cardiovascular illness in a prompt and concise manner. The trainee should be able to enter a clear and legible document in the patient's record. Interactions with colleagues should be conscientious, respectful, responsible, punctual, and appropriate. The trainee should exhibit humanistic qualities when interacting with patients and their families and demonstrate integrity, respect, and compassion.

Ambulatory Experience

The goals of the ambulatory experience are to provide exposure, including both consultative and continuity experience, to outpatient interventional cardiology. The experience includes evaluation of patients for revascularization procedures (surgical and interventional), the follow-up of recently discharged patients, and the pre-procedural evaluation of patients. Routine cardiac care including risk factor modification (lipids, diabetes, hypertension, etc), management of arrhythmias, and routine post- MI care is addressed in the outpatient clinic. Residents spend one-half day per week at this office. The residents are under the supervision of an attending physician.

3.1 Didactic Instruction

The program will provide didactic instruction in the following areas:

- a. Detailed coronary anatomy, including coronary anomalies.
- b. Pathophysiology of restenosis following PCI.
- c. Physiology of coronary flow and its evaluation in the cath lab including fractional flow reserve and coronary flow reserve.
- d. The role of platelets and the clotting cascade in response to vascular injury.
- e. Radiation physics.

- f. Radiation biology and safety.
- g. Critical analysis of randomized clinical trials and registries in clinical decision-making.
- h. Intravascular ultrasound.
- i. Saphenous vein graft interventions.
- j. PCI pharmacotherapy
- k. Revascularization strategies in different patient populations and subsets.
- l. Contrast-induced nephrotoxicity and its prevention
- m. Vascular access.
- n. Vascular complications.
- o. Renal artery intervention.
- p. Carotid intervention.
- q. Gene Therapy/Angiogenesis.
- r. Percutaneous closure of patent foramen ovale and atrial septal defects.
- s. Congenital heart disease in the adult.
- t. Image acquisition and storage,
- u. The vulnerable plaque
- v. Coronary Brachytherapy
- w. Cardiogenic Shock
- x. Lipid therapy after revascularization
- y. Valvuloplasty

Teaching conferences: The Interventional didactic teaching conference is held each Wednesday from 7:30-8:30 a.m. Yale New Haven Hospital (in conjunction with Yale New Haven Hospital trainees). Cardiac Catheterization Conference is held at Bridgeport Hospital every Wednesday at noon. It is the responsibility of the interventional resident, to coordinate these sessions with an assigned attending physician. A quarterly morbidity and mortality conference is given in place of cath conference. Importantly, the interventional residents are provided the opportunity to attend the extensive core didactic lecture series of the general Cardiovascular Disease residency. Angiography and hemodynamic rounds are held on a regular basis with the interventional attendings.

4.1 Evaluation Process

4.1.1 Trainee evaluations

The cardiology trainee's clinical and technical competence is observed on a daily basis by the cardiology faculty, assessed in detail and documented in the trainee's record. Specifically, the trainee's competence in clinical judgment, clinical management, and consultation is assessed. In particular, technical competence in the performance of specialized percutaneous interventions is assessed by close supervision by an interventional faculty member during the performance of

such procedures. Finally, communication skills, humanistic qualities, professional attitudes and behavior, and commitment to scholarship are evaluated. A standardized evaluation form is completed by the supervising faculty twice yearly and is discussed with the trainee. (see appendix)

4.1.2 Feedback

The Program Director meets with each trainee on a twice-yearly basis to review his or her performance, and provide constructive feedback. Counseling and remedial assignments are provided when necessary.

4.1.3 Faculty and Program Evaluation

The trainees complete written evaluations of each faculty member involved in his/her clinical experience twice yearly. The form used for these evaluations is appended. The opinions of the trainee are conveyed to the faculty.

In addition to these forms, the trainee meets once each year with the Director of the Pulmonary or GI Fellowship Program. In this session, which is also attended by the trainees in the general cardiology fellowship, the trainees provide feedback on the hospital-based key faculty, and the program. This information is then summarized and given to the Program Director as an anonymous, composite evaluation.