

**Saudi Council
for
Health Specialties**

**SAUDI BOARD
OF
INTERNAL MEDICINE**

الهيئة السعودية للتخصصات الصحية
Saudi Commission for Health Specialties



Prince Sultan Cardiac Center (PSCC)

Adult Interventional Cardiology

Training Program

1434 / 2013

1. Introduction
2. Overview of Goals and Objectives
3. Program Faculty
4. Structure of Program
5. Facilities and Resources
6. Conferences
7. Procedures
8. Syllabus by Topic
9. Suggested Reading
10. Evaluation Process: Fellows, Faculty and Program

1. Introduction

The Interventional Cardiology Fellowship at the Prince Sultan Cardiac Centre operates within the Adult Cardiology Department, fully integrating three interventional fellows into structured teaching, educational, research and clinical care missions of the department. The goal is to educate and train three interventional fellows per year so that they may develop into highly skilled and capable physician leaders in education, research and clinical care.

The program provides clinical opportunities, including a comprehensive depth and breadth of procedures under the direct supervision of the full-time interventional cardiologists, so that the fellows become proficient in all requisite devices and techniques by the end of the year-long training. Moreover, fellow involvement in both pre-procedure and post-procedure care, including the inpatient consultative and outpatient ambulatory services, respectively, completes the compressive training.

The program also develops a strong sense of scientific enquiry and teaching with regularly scheduled educational activities including case presentation and journal clubs. In addition, fellows participate actively in clinic research, including clinical trials, case reports, case series and original research.

The program is committed to providing extremely close mentorship, focusing both on personal and professional growth and well-being of interventional fellows and assisting in career choices and placement at the end of the year.

At the conclusion of training, fellows will be competent to practice as independent operators in the field of interventional cardiology and will have achieved competency in the medical knowledge, patient care, professionalism and interpersonal and communications skills.

2. Overview of Goals and Objectives

a) Goals:

- 1) To develop competence in the performance of basic and advanced Coronary angiography.
- 2) To develop competence in the performance of basic and advanced hemodynamic assessment, including right and left heart catheterization for complex disease states.
- 3) To develop the clinical knowledge necessary to diagnose and manage the breadth of cardiovascular conditions seen in invasive cardiology practice, including valvular, myocardial, coronary, vascular and pericardial conditions.
- 4) To develop and acquire technical skills in international techniques including angioplasty by radial and femoral approach, stent placement intravascular ultrasound, fractional flow reserve and OCT.
- 5) To understand normal and abnormal physiology as it pertains to cardiac catheterization.
- 6) To advance the science and practice of cardiovascular medicine through the conduct and participation in clinical research.
- 7) To develop effective interpersonal and communication skills to include procedure-related discussion with patients and families as well as physician colleagues.
- 8) To develop effective communication skills regarding formal teaching through the preparation of teaching materials, speaking formally to small and large groups of medical personal including physician colleagues.
- 9) To develop interpersonal skills as they relate to working within a multidisciplinary team toward comprehensive and compassionate patient care.
- 10) To acquire clinical and technical skills in a progressive fashion, with increasing responsibility under appropriate supervision, in order to ultimately function as an independent operator trained in all aspects of interventional cardiology, with a commitment and ability to provide compassionate, professional and comprehensive care.

b) Objective 1

Acquire and demonstrate medical knowledge about cardiovascular pathophysiology and catheter-based interventions:

- 1) Organize, attend and lead the weekly cardiac catheterization meeting on Monday 12:30, including interventional cardiology topic, case presentation and Journal club.
- 2) Prepare and present in a local meeting such as the SACIG group, Saudi Heart Association and international meetings.

c) Objective 2

Acquire and demonstrate knowledge about clinical diagnosis and the management of cardiovascular disease relating to the field of interventional cardiology.

- 1) Perform a directed history and physical examination.
- 2) Manage pre-procedure clinical situations, including consenting of patients, dye allergy, medication compliance and indications / contraindications to the planned procedure.
- 3) Understand the role of invasive testing and techniques within the larger health care system, as well as alternatives to invasive management, and the comparative effectiveness and cost effectiveness of various approaches to clinical care.
- 4) Diagnose and manage post-procedure complications including access site complication (radial and femoral).
- 5) Follow patients after angioplasty until discharge to understand post-procedure medical management.
- 6) Maintain a regular outpatient clinic.

d) Objective 3

Acquire and demonstrate technical proficiency and knowledge in Performance of catheter-based procedure.

- 1) Perform right and left heart basic and advanced catheterization under direct supervision of interventional cardiology attending.
- 2) Assist and then progress to independent operator in cardiovascular interventions under direct supervision of interventional cardiology attending.
- 3) Perform closure device procedures under the direct supervision of interventional cardiology attending.
- 4) Understand and show proficiency in the indications and use of various procedures including intravascular ultrasound, fractional flow reserve and optical coherence tomography (OCT).
- 5) Perform and master radial approaches in both angiogram and angioplasty.
- 6) Perform pericardiocentesis and transvenous pacemaker placement.

e) Objective 4

Acquire and demonstrate understanding of the risks and benefits of individual procedures and the alternatives to these procedures, including no invasive therapy when appropriate, and demonstrate ability to communicate these effectively.

- 1) Discuss the risks and benefits of procedures orally and written to patients and their families under the direct supervision.
- 2) Maintain good communications with physician colleagues regarding the plan of procedure.

f) Objective 5

Develop and / or actively participate in a research project in interventional cardiology.

3. Program Faculty

The interventional Cardiology fellowship Program is comprised of three key faculty members. As such, there is ample supervision for all procedures, clinical care, educations, teaching and research requirements. In addition, the experience is strengthened by the relationship with 7 voluntary faculty who provide additional expertise, case volume, and teaching in coronary intervention.

4. Structure of Program

The interventional cardiology fellowship program is structured as a 12-month block of training in the procedural and clinical care aspects of interventional cardiology. Four weeks (1 month) of vacation time is included. Fellows participate in outpatient clinic sessions, and inpatient consultations on unique interventional procedures throughout the 12-month period. In addition, fellows are expected to actively participate in on-going clinical research activities throughout the years integrated into their clinical training, toward publication and / or presentation of original research. At all times, fellows are under the direct supervision of the interventional cardiology faculty.

Fellows participate in invasive call on a 1-in-3 schedule, taking call entirely from home. Interventional fellows also serve as back-up for general cardiology fellows, specifically dealing with invasive procedures as necessary while on call.

The interventional fellows' major responsibility will include the assessment of pre-admission clinic patients being referred for cardiac cath. The interventional fellow will be expected to review the patient's history and physical and make sure all of appropriate blood work has been obtained and is within the standard values for performing interventional procedures. The history and physical and laboratory data will be reviewed by the attending physician.

The interventional fellow will be expected to assess the rotational fellows in angiogram and to participate in percutaneous interventions per day. Fellows will provide preliminary reports

of procedure and post-procedural orders. The fellow must do post-cath rounds on the same day or next day before discharge.

Interventional fellows shall perform procedures as first assistant then primary operator under the direct attending supervision, to fulfil the requirement for coronary interventional procedures. At all times, fellows will participate in the pre-procedure and post-procedure management, including medical decision-making, indications and contraindications of procedures, in addition to intra-procedural decision-making (techniques, choice of equipment, alternatives). Fellows will also supervise the general cardiology fellows in basic diagnostic angiography and hemodynamic assessment procedures.

5. Facilities and Resources

Interventional fellows perform procedures in four dedicated state-of-the-art cardiac cath. labs, fully integrated with the latest technologic advancements including IVUS, FFR and OCT among other.

6. Conferences

The interventional cardiology fellowship program provides its trainees with a series of didactic and interactive teaching conferences that, throughout the years, enhance and complete the learning experience. These include the following conferences:

- a. The weekly interventional meeting at Training institution
- b. Riyadh Chapter (SACIG), every 3 months
- c. Saudi Heart Association conference every year
- d. Interventional Meetings (Euro PCR, TCT, Gulf PCR, etc.)

7. Procedures

Interventional cardiology fellows are taught the full range of interventional procedures, achieving over 200 PCIs. All procedures are documented in the cath lab each individual fellows plus the manual logbook. Accrued numbers for each fellow are reviewed by the in-charge of the program every 3 months. Fellow evaluation visit until the year ends. Emphasis is placed on learning as secondary/assistant operator and then primary operator, and ultimately as an independent operator, all under direct attending supervision.

Interventional fellows typically graduate with proficiency in coronary intervention. Proficiency is determined by successful completion of the requisite number of procedures as primary operator with documented technical success and demonstration of pre-procedural, intra-procedural and post-procedural cognitive abilities in managing interventional patients.

The interventional procedures, taught in the cardiac catheterization laboratory include the following:

1. Angioplasty
2. Stent placement
3. Intravascular ultrasound
4. Angiojet thrombectomy
5. Chronic total occlusion intervention
6. Bifurcation stenting
7. Fractional flow reserve
8. OCT
9. Transvenous pacemaker
10. Impella ventricular assist device
11. Endomyocardial biopsy
12. Pericardiocentesis
13. Renal Artery denervation

8. Syllabus by Topic

- a) Role of platelet inhibitor Agents in CAD.
- b) Anticoagulants in Acute Coronary Syndromes and Coronary Intervention.
- c) Effects of medical therapies on acute MI and unstable angina pectoris.
- d) ACE inhibitor and Angiotensin Receptor Blockers.
- e) Thrombolytic intervention.
- f) Elective Coronary Intervention and Approach, Technique and Complications.
- g) PCI for unstable Coronary Artery Disease.
- h) Peri-procedural Myocardial Infarction and Emboli Protection.
- i) Percutaneous Intervention in Patients with prior Coronary Bypass Surgery.
- j) Ostial and Bifurcation lesions.
- k) Long lesions and Diffuse Disease.
- l) Instent Re-stenosis.
- m) Coronary Atherectomy – Directional and Extraction Techniques.
- n) Indication and Limitations of Coronary Stenting.
- o) Borderline lesion assessment by IVUS, FFR and OCT.
- p) Mitral valvuloplasty.
- q) Detection of vulnerable plaque.
- r) Management of complications of Percutaneous Intervention.
- s) TAVI.
- t) Mitral Clip.
- u) Renal denervation.

9. Suggested Reading:

- 1) Textbooks:
 - Grossman's Cardiac Catheterization, Angiography and Intervention.
 - Topol's Textbook of Intervention Cardiology.
 - Kern's Interventional Cardiology Handbook.

- Practical Handbook of Advanced Interventional Cardiology.
- 2) Key Journals:
- JACC – Cardiovascular Interventions.
 - Circulation: Cardiovascular Intervention.
- 3) General and Interventional Cardiology Websites.
- * www.theheart.org
 - * www.cardiosource.com
 - * www.tctmd.com
 - * www.uptodate.com

10) Evaluation Process: Fellows, Faculty and Program

- 1) Fellow Evaluation:
- The Fellow should be evaluated on an on-going basis due to the close and daily interaction with Faculty.
 - There is also daily interaction between Fellows and other voluntary and full-time Faculty, nurses, technicians and radiographers.
 - Every three months, Fellow evaluations and performance are reviewed by the Faculty of the Program in a written form.
- 2) Fellow Evaluation of Faculty.
- Fellow evaluations of the Faculty with regard to their teaching and other relevant issues, including the overall learning environment are reviewed every 3 months.
- 3) Fellow Evaluation of Program.
- Fellow evaluation of program should be done every 6 months including area of improvement and curriculum.