

Saudi Council for Health Specialties

SAUDI BOARD OF INTERNAL MEDICINE

الهيئة السعودية للتخصصات الصحية
Saudi Commission for Health Specialties



Prince Sultan Cardiac Center (PSCC)

Cardiac Electrophysiology & Pacing

Training Program

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- I. Introduction.
- II. General Scope.
- III. Admission Requirements.
- IV. Training Requirements.
- IV. Structure of the Training Program.
- V. Vacations, Holidays and On-Call.
- Vii. Evaluation.
- VIII. Certification.
- IX. Training Center Accreditation Requirement.

I. INTRODUCTION

During the past two decades the speed of progress in diagnostic methodologies and management of patients with cardiac rhythm disorders has been most remarkable, from the introduction of new diagnostic techniques and therapeutic modalities, including the use of cardiac implantable electrical devices (CIEDs) and the application of other interventional ablative techniques and pharmacologic treatments to manage complex cardiac arrhythmias, to the advances in non-invasive methodologies such as cardiac mapping and anatomic studies, etc. Accordingly, Clinical cardiac electrophysiology and cardiac pacing have merged into a common cardiac subspecialty discipline.

The increased need for Saudi Cardiologists to serve the ever increasing number of patients with cardiac problems has stimulated the creation of a formal Fellowship program in Electrophysiology and pacing auspices of the Saudi Board of Internal Medicine. This program is designed to produce fully trained, certified and competent electrophysiologists.

II. GENERAL SCOPE

The purpose of the Prince Sultan Cardiac Center (PSCC) Adult Cardiac Electrophysiology Training Program is to provide the Saudi Cardiologists all the necessary training during a period of 2 years to wards acquisition of Saudi Board in Adult Cardiac Electrophysiology. The fellows receive preparation to enable them to provide optimal care and consultation for patients with cardiac rhythm problems. The trainee will be certified as Adult Cardiac Electrophysiologists after successful completion of the training program and passing the required examinations.

Objectives:

The program shall provide adequate training in:

- Basic electrophysiology (anatomy, physiology, biochemistry, pharmacology).
- Diagnosis of arrhythmias (surface ECG, Holter monitors, autonomic studies, invasive electrophysiological studies including cardiac mapping and laboratory safety).
- Treatment of arrhythmias (basic pharmacokinetic and pharmacodynamics, cardiac implantable electrical devices including pacemakers, implantable cardioverter-defibrillators (ICDs), cardiac resynchronization therapy (CRT) devices, implantable hemodynamic monitors(IHMs), and implantable loop recorders (ILRs) and ablation techniques,
- Management of special conditions (syncope, sudden cardiac death. etc.).

III. ADMISSION REQUIREMENTS:

To be admitted to the Adult Cardio-electrophysiology Training Program, and individual must:

1. Possess a Saudi Specialty Certificate in Internal Medicine or its equivalent as approved by the Saudi Council or has successfully completed the written component of the Saudi Specialty Certificate in Internal Medicine.
2. Possess a Saudi Subspecialty Certificate in Adult Cardiology approved by the Saudi Council or has successfully completed the written component of the Saudi Specialty Certificate in Adult Cardiology.
3. Licensed to practice medicine in Saudi Arabia.
4. Provide a written permission from the sponsoring institution of the candidate allowing him to participate in full time training for the whole program period (2 years).

5. Signature of obligation to abide by the rules and regulations of the Training Program and the Saudi Board.
6. Pass successfully the interview for the particular subspecialty.
7. Provide three letters of recommendation from consultants with whom the candidate has recently worked with.
8. Registration as a trainee at the Saudi Council for Health Specialties.

IV. TRAINING REQUIREMENTS:

1. Training is a full time commitment, trainees shall be enrolled in continuous full time training for the whole period of the program (2 years).
2. Training is to be conducted in institutions accredited for training by the Saudi Board of Internal Medicine and the subspecialty of Adult Cardiac Electrophysiology.
3. Training shall be comprehensive and includes inpatient, outpatient, non-invasive and invasive diagnostic and therapeutic electrophysiological procedures.
4. Trainees shall be actively involved in patient care with gradual progression of responsibility.
5. Trainees shall abide by training regulations and obligations set by the Saudi Board of Internal Medicine.

V. STRUCTURE OF THE TRAINING PROGRAM:

A) Disease Mechanisms

i- Basic Electrophysiology

Fellows will be trained to possess an understanding of the basic cellular and molecular mechanisms of electrophysiology. These concepts include the cellular and molecular bases for electrical function of the heart under normal and pathophysiologic conditions, the mechanisms responsible for the development of arrhythmias, and the actions of antiarrhythmic drugs. Also the fellows will be familiar with the identification of the molecular basis of inherited arrhythmias and role of specific ion channel mutations in the genesis of arrhythmias

ii- Basic Pharmacokinetics and pharmacodynamics & Laboratory Safety

Electrophysiology fellows will be trained to understand pharmacokinetics and pharmacodynamics which are essential concepts in understanding therapeutic drug delivery.

Electrophysiology fellows will be trained to be aware of laboratory safety as related to radiation exposure to patients, self, and other staff, and the risks and prevention of transmissible disease.

B) Clinical Practice

i- Cardiology Wards, Outpatient Clinics and Consultation:

The candidate should spend 3 months in 1st year and 3 months in 2nd year of training to cover arrhythmia patients in these areas.

- 1) Building on the knowledge and skills and clinical judgement already acquired in general medicine and cardiology, including a thorough grasp of the concepts of the diagnostic process through history, physical examination and investigation, the fellow will develop the more specific requirements demanded in the management of cardio-arrhythmias.
- 2) **The fellow will work in the designated "team" alongside the residents in daily rounds, teaching rounds, etc. participating in the on-call schedules as specified.**
- 3) **The fellow will participate in the decisions made concerning a particular patient's management, with increasing levels of independence, but always subject to supervision by the consultant electrophysiologist. The fellow will prepare management plans for individual patients, including pre- and post-procedural managements as deemed appropriate.**
- 4) As the on-call electrophysiology fellow, he will participate in the receipt, action and follow-up of consultation requests from other specialties.
- 5) Fellows will attend the arrhythmic outpatient clinics as scheduled; cases will be discussed there with the consultant cardiologist.

C) Diagnosis Of Arrhythmias (6 months)

I. Surface ECG of Arrhythmias

Fellows will be trained to meet competency requirements for ECG interpretation and are expected to be fully familiar with the indications and performance of a variety of noninvasive ECG tests.

- A. Surface ECG interpretation – **[5000 cases required]-**
 1. Evaluation of normal and abnormal intervals
 2. Recognition of myocardial infarction and evidence of ischemia
 3. Metabolic/drug effects
 4. Conduction disturbances
 5. Identification of accessory AV connection location
- B. **Noninvasive ECG tests**
 1. Ambulatory ECG recordings – *[400 cases required]*
 2. Exercise testing for the presence of arrhythmias *[50 cases]*

II. Autonomic studies [Tilt table testing] - [25 cases required]

Electrophysiology fellows will be trained to be able to list the indications for tilt table test studies; perform the study; interpret the data derived from such study; indicate the sensitivity and specificity of these findings; and integrate these findings into the clinical care of the patient

III. Invasive Electrophysiologic Evaluation - [150 cases required]

Electrophysiology fellows will be trained to be able to list the indications for invasive electrophysiologic studies; perform a comprehensive electrophysiologic study; interpret the data derived from such studies; indicate the sensitivity and specificity of these findings; and integrate these findings into the clinical care of the patient

D) Treatment Of Arrhythmias (18 moths)

I. Ablation of Supraventricular Tachycardia - [75 cases required]

Electrophysiology fellows will be trained to be able to recognize which patients should undergo radiofrequency ablation and to have the knowledge of endpoints for ablation. They will also learn the techniques of ablation, including mapping, knowledge of newer mapping technologies, retrograde access to the left atrium and ventricle including Atrial fibrillation ablation.

II. Cardiac implantable electrical devices (CIEDs) - [25 Pacemakers, 25 ICD, 25 dual-chamber devices, 25 CRT devices required]

Electrophysiology fellows will be trained about technical and clinical instruction in Cardiac implantable electrical devices and how to perform clinical assessment, patient selection, ICD & CRT devices implantation, and follow up of patients with cardiac arrhythmias.

III. Cardiac implantable electrical devices revisions/replacements - [30 CIEDs]

IV. Cardiac implantable electrical devices interrogations/programming – [100 ICDs, 100 pacemakers].

E) Research:

- i. Fellows must become familiar with the principles and methodologies of research.
- ii. Fellows are encouraged to participate in ongoing research in the electrophysiology service in 2 projects during the 2 years period.
- iii. Fellows will be encouraged to undertake their own research projects, and submit the results in seminars or publish them in local or international journals.
- iv. The research work will be assessed by the local director of the training centre.
- v. The fellow will be expected to attend Outpatient Clinic, On-Calls and consultation clinics while conducting research.

VI. VACATIONS, HOLIDAYS AND ON-CALL

1. Fellows are entitled for four weeks vacation annually and a maximum of 10 days for both Eid holidays and emergency leave.
2. Sick and maternity leave shall be compensated for during or at the end of training.
3. On call duty shall be an average of one every three to four nights (minimum of 7 calls per month, 24 hours per call). Fellows are expected to perform regular duty the day after call and ensure continuity of care for their patients.

VII. EVALUATION

- A. In each year, performance will be monitored and assessed with a written report from the Consultant in-charge of each area of training.
- B. The candidate will be assessed by the regional supervisory committee at the end of each year with an exam which may include a written or clinical component or both. If the candidate passes the evaluation, then he will be promoted to the next level. If the candidate however fails the evaluation, he will continue with the training program on the

same level and will be allowed 2 attempts within the next year of the training program. Should the candidate still fail, he will then be dismissed from the program.

C. Final Examination includes:

- a. Written examination;
 1. MCQ
 2. Clinical data interpretation

Candidates are required to pass the written examination before sitting for the clinical/oral exams.

Candidates who fail the examination are allowed to reset for the exam as specified in the Council General Examinations by-laws.

b. Oral

All exams are subject to the rules specified in the Council General Examinations by laws.

IX. CERTIFICATION

Upon completion of the required training and passing the final examination, the certificate of **Board/COMPETANCY** in Adult Cardiac Electrophysiology will be conferred upon the candidate.

X. TRAINING CENTER ACCREDITATION REQUIREMENT

As available in Prince Sultan Cardiac Center (PSCC), for a hospital to be accredited to offer Fellowship training program in Adult Cardiac Electrophysiology or to participate in such training, the following requirements must be fulfilled:

A) Facilities and faculties

1. Separate Electrophysiology (EP) service
2. Dedicated, well-equipped Electrophysiology lab(s)
3. At least two full-time consultant electrophysiologists
4. Arrhythmia/EP Electrophysiology technicians & nurses
5. Pacemaker/ICD/CRT devices follow-up clinic
6. Arrhythmia clinic
7. Non invasive Arrhythmia/EP services (Holter monitor, event monitors, tilt table testing..etc)
8. Availability of bioengineering service
9. Availability of cardiothoracic surgery in the training center

B) The Center should perform (PER YEAR)

1. Diagnostic EP studies: more than 150 cases.
2. Ablation: more than 75 cases
3. Pacing: more than 100 cases
4. ICD/CRT devices: more than 100 cases
5. Tilt table test: more than 25
6. Holter monitor: more than 1000 cases