

CURRICULUM FOR NON INVASIVE CARDIOLOGY

FELLOWSHIP PROGRAMME

Objectives

The non-invasive cardiology Laboratory at National Heart Institute offers a one year clinical Fellowship in Non-invasive Cardiac Imaging. This Fellowship will lead towards advanced expertise in echocardiography and other modalities used in the Non invasive cardiology laboratory. The Fellow's major day to day responsibilities will be the facilitation, performance and interpretation of trans thoracic and trans oesophageal echocardiograms and guidance of house staff in the diagnosis and management of cardiovascular indoor and outdoorpatients. They will also be learning emerging techniques in echocardiography, Doppler and Intra-operative Echocardiography on a case by case basis. Fellows will also be trained in exercise and pharmacological stress testing as well as in supervision and interpretation of TMT, Holter, and Electrocardiography.

Training Programme Structure

a) **Equipment**

Training will be done through high end sophisticated Echocardiography machines viz. iE33 Philips, Philips CX 50, Holter Monitoring system with Recorders, ECG machines, Stress Systems etc.

b) **Modalities**

- Echo : Trans thoracic echocardiography
Trans oesophageal echocardiography
Stress Echocardiography
Dobutamine Stress Echo
3D Echocardiography
Pediatric Echocardiography
- Doppler Arterial - Carotid & Renal
Venous
- Holter
- TMT
- Electrocardiography
- Use of Echo / Non invasive cardiology in Emergency / ICU settings

Protocols

- a) Echocardiography - From basic to advanced methods of diagnosis including M-Mode, 2-D Echo, 3 D Echo / Doppler, TEE & Stress Echo will be covered. In National Heart Institute, approximately 300 TTE, 10 TEE and 100 Stress Echocardiography are being performed in a month.
- b) Cardiac Arrhythmia - diagnosis and monitoring through Holter & Ambulatory BP monitoring.

Responsibilities

Residents are expected to possess and acquire

a) Medical Knowledge

- 1) To understand the basics of setting up a non invasive cardiology unit including knowledge of the equipment.
- 2) To become familiar with the modalities and protocols followed in the unit (e.g. Stress Echo, TMT).

- 3) To understand how to program the controls and to obtain data from the various equipment.
- 4) To interpret and analyse the displayed data and quantitative information obtained and to apply them to clinical cases.
- 5) To understand and use the obtained information in deciding patient's medical or surgical management.

b) Practice based learning and improvement

- 1) To apply the evolving clinical literature to improving patient care practices.
- 2) To identify areas for improvement and implement strategies to enhance knowledge, judgment, skills, attitudes and processes of care.
- 3) Analyze and evaluate practice experiences and implement strategies to continually improve the quality of their clinical practice.

c) Hands on experience in evaluating a broad spectrum of cardiac diseases including:-

- 1) Obtaining a good echocardiographic examination and understanding the physics and technique involved.
- 2) Expertise in visualizing the various views and modes including 2D, 3D Echo and contrast Echo by practical experience
- 3) Comprehensive non invasive hemodynamic assesement through Doppler Echo and Color Flow Imaging.
- 4) TDI, strain imaging and dysynchrony assesement.
- 5) Functional assesement of heart and diagnosing systolic and diastolic dysfunction.
- 6) Valvular heart disease, coronary artery disease and ischemic heart disease
- 7) Pulmonary hypertension

8) Prosthetic valve evaluation & diagnosis of infective endocarditis.

9) Cardiomyopathy & pericardial disease

10) Tumors & masses of the heart

11) Disease of the aorta and peripheral vessel

12) Congenital heart disease

13) Stress Echo and pharmacological stress testing

14) Vascular imaging

15) Echocardiography in ICU

d) Vascular Medicine Services

1) Care for patients with vascular disease and diagnosis of diseases of peripheral vascular system

2) Learn non invasive techniques for evaluating peripheral venous and arterial circulation - In NHI, approximately 70 peripheral / carotid / renal arteriograms and venograms is being performed in a month.

e) Electrocardiography Lab.

1) Learn to read a wide variety of complex tracing dealing with disorders of cardiac rhythm, acute myocardial infarction or ischemia, and congenital heart disease

2) Review 24 hour ambulatory monitoring recordings and interpret signal - averaged electrocardiograms.

f) Interpersonal and communication skills

- 1) Develop interpersonal interactions and communication skills that enable them to establish and maintain professional relationships with patients, families, and other members of healthcare teams.
- 2) Learn to provide effective consultation to other physicians and healthcare professionals.
- 3) Interact with consultants and referring physicians in a respectful and appropriate manner.
- 4) Maintain comprehensive, timely and legible medical records.

Duration of the course – One year

Summary

Responsibilities of the Fellows

- Learn to perform & interpret Echocardiograms with a qualified non invasive cardiologist.
- Learn to perform and interpret stress testing assisted by a qualified non invasive technician.
- Prepare case presentations to be done one to two times per month.
- Provide an end of month summary of interesting cases.
- Assisting in performing of trans oesophageal echo, contrast echo & stress echocardiogram as needed.
- Handle bedside referrals.
- Learn the content of the non invasive teaching modules.
- Perform & Interpret Echo & Stress test and to review their findings.
- To prepare presentation for Echo conferences / CME / Seminars and learn the contents of Echo learning modules thoroughly.

