

FELLOWSHIP IN NON INVASIVE CARDIOLOGY (FNIC)

I. GOALS

At present Physicians and Pediatricians are not in a position to do Echocardiogram and its interpretation. They do not have extensive knowledge of arrhythmias and its management. They do not have experience to run a TMT unit. These are all essential in today's clinical practice. This proposed course will give them an opportunity to learn all aspects of Non-invasive Cardiology. This will also help in setting up ICCU, Echo and TMT units at District and Taluka places.

II. OBJECTIVES

The following objectives are laid out to achieve the goals of the course. These objectives are to be achieved by the time the candidate completes the course. The objectives may be considered under the subheadings

- 1 Knowledge
- 2 Skills
- 3 Human values, ethical practice and communication abilities.

1. **Knowledge:** Fellowship in Non-Invasive Cardiology course gives sufficient exposure to the candidates to acquire full knowledge of a) Clinical Cardiology b) Echocardiography c) Cardiac emergencies in ICCU d) TMT and Holter Monitoring e) Sound scientific knowledge for teaching and research in the subject of Cardiology.

2 Skills:

After successful completion of Fellowship in Non-Invasive Cardiology the candidate

- a) Should be able to do Echocardiogram and its interpretation
- b) Should be able to diagnose and manage all cardiovascular diseases.
- c) Should be able to diagnose and manage all cardiac emergencies in ICCU.
- d) Should be able to set up and manage ICCU, TMT and Echo units independently.

3. Human values, Ethical practice and Communication abilities

Adopt ethical principles in all aspects of his/her practice, professional honesty and integrity are to be fostered. Care is to be delivered irrespective of the social status, caste, creed or religion of the patient.

Develop communication skills, in particular the skill to explain various options available in management and to obtain a true informed consent from the patient.

Provide leadership and get the best out of his team in a congenial working atmosphere.

Apply high moral and ethical standards while carrying out human or animal research.

Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed,

Respect patient's right and privileges including patient's right to information and right to seek a second opinion.

III. DURATION OF THE COURSE

One Year

IV. ELIGIBILITY

- a) Candidate must have passed MD or DNB in General Medicine or Pediatrics
- b) Selection of candidates will be as per the rules and regulations of KLE University

V. COURSE CONTENTS:

- 1 **Basics of CVS** a) Functional Anatomy of the Heart b) Normal Physiology of CVS
- 2 **Patient Evaluation:** a) History and clinical Examination b) Electrocardiogram c) Chest Roentgenogram d) Stress Test e) Holter Monitoring
- 3 **Echocardiogram:** a) Principles and applications b) M-mode Echocardiogram c) Two Dimensional Echocardiogram d) Three Dimensional Echocardiogram e) Doppler Echocardiogram f) Colour flow g) Transesophageal Echocardiogram h) Contrast Echocardiogram i) Echo in Aortic valve diseases j) Echo in Mitral valve diseases k) Echo in other valve diseases l) Echo in Pulmonary Hypertension m) Prosthetic valve Echo n) Echo in Infective Endocarditis o) Echo in IHD p) Echo in Cardiomyopathy q) Echo in Congenital Heart Diseases r) Echo in Cardiac masses, Thrombi and Tumors s) Echo in Pericardial disease t) Echo assessment of LV and RV Function
- 4 **Basic Clinical Cardiology:** a) Coronary artery disease b) Hypertension c) Valvular Heart disease d) Congenital Heart disease e) Cardiomyopathy f) Pericardial Disease
- 5 **Rhythm and Conduction Disorders:** a) Approach to the patient b) Mechanisms of Cardiac arrhythmias and conduction disturbances c) Atrial Arrhythmias d) Supra ventricular Tachycardia e) Ventricular Arrhythmias f) Bradyarrhythmias

- 1 **ICCU Management:** a) Acute Myocardial Infarction b) Unstable Angina c) Acute LVF d) Cardiac Arrest e) Other Cardiac Emergencies f) Temporary pacing
- 2 **Others:** a) Nuclear Cardiology
- 3 **Recent Advances in Echocardiogram:** a) Myocardial Contrast Echo b) Other Recent advances in the field of Echocardiogram

VI. TEACHING AND LEARNING ACTIVITIES

A) Theoretical Teaching:

- 1 **Lectures:** Lectures are to be kept to a minimum. Certain selected topics can be taken as lectures. Lectures may be didactic or integrated.
- 2 **Journal Club:** Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book the relevant details. The presentations would be evaluated using check list and would carry weightage for internal assessment. A time table with names of the students and the moderator should be announced in advance.
- 3 **Subject Seminar:** Recommended to be held once a week. All the PG students are expected to attend, actively participate in discussion and enter in the Log Book relevant details. The presentations would be evaluated using check list and would carry weightage for internal assessment. A time table for the subject with names of the students and the moderator should be announced in advance.
- 4 **Case Discussion:** Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book details. The presentations would be evaluated using check list and would carry weightage for internal assessment. A time table for the case presentation with names of the students should be announced in advance.
- 5 **Ward Rounds:** Ward rounds may be service or teaching rounds. a) Service Rounds: Postgraduate students should do service rounds every day for the care of the patients. Newly admitted patients should be worked up by the post graduate student and presented to the faculty members the following day.

b) Teaching Rounds: Every unit should have 'grand rounds' for teaching purpose at the bedside. A diary should be maintained for day-to-day activities by the post graduate students.

Entries of (a) and (b) should be made in the Log Book.

- 1 **Clinico-Pathological Conference:** Recommended once a month for all post graduate students. Presentation to be done by rotation. Presentations will be assessed using checklist. If cases are not available due to lack of clinical postmortems, it could be supplemented by published CPCs.

2 Inter Departmental Meetings: Recommended particularly with departments of Cardiac Surgery, Pathology and Radio-Diagnosis at least once a month. These meetings should be attended by post-graduate students and relevant entries must be made in the Log Book.

Pathology: Interesting cases shall be chosen and presented by the post-graduate students and discussed by them as well as the senior staff of Pathology department. The staff of pathology department would then show the slides and present final diagnosis.

Radio-Diagnosis: Interesting cases and the imaging modalities should be discussed. Emphasis should be given for the radiological differential diagnosis.

Cardiac Surgery: Interesting cases and important topics related to the field should be discussed .

- 1 **Mortality Meeting:** The mortality meeting should be conducted in the department every month. The post graduate students should prepare the details regarding the cause of death after going through the case records in detail, and should present during the mortality meeting. The death records will be discussed in detail during this meeting.
- 2 **Teaching Skills:** Post graduate students must teach under graduate students (eg. Medical Nursing) by taking demonstrations, bedside clinics, tutorials, lectures etc. Assessment is made using a checklist by medical faculty as well as by the students. Record of their participation is to be kept in Log Book. Training of postgraduate students in Education Science and Technology is recommended.

10. Continuing Medical Education Programmes (CME) : Recommended that at least one state level CME programme should be attended by each student during the course.

- 1 **Conferences:** Attending conference is compulsory. Post graduate student should attend at least one national and one state level conference during the course.
- 2 **Research Activities:** The candidate shall furnish proof of having undertaken the original research work of higher order. The research work shall be performed by the student during his/her study period under the supervision of the postgraduate teacher. This work shall be submitted to the university six months prior to the date of final examination as a proof of his/her research work.

OR The

candidates shall publish at least one research paper in a national indexed journal.

OR The candidate shall present at least one research paper in a conference at national or international level.

Candidate will have to actively participate in the following programmes

Journal Club	06
Bed side clinics	12

B. Clinical /Practical Training: The following list gives the minimum number of procedures to be carried out independently by the candidate. Echocardiogram 200 including 10 Dobutamine Stress Echocardiogram, 10 Transesophageal Echocardiogram, 5 Contrast Echocardiogram, 10 Ambulatory BP) TMT 50 Holter Monitoring 10

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The duration of training in each area is determined by the Head of the department of Cardiology. In general includes. it

a) Echocardiogram	Room	8 months
b) ICCU		2 months
c) TMT and Holter recording ,	Ambulatory BP	1 month
d) Cath Lab		1 month

VII. OTHER CRITERIA TO BE FULFILLED FOR THE FELLOWSHIP COURSE

1. Internal Evaluation:

During the course, the department will conduct one test at the end of six months. The test may include the written papers, practicals/ clinicals and viva-voce. Records and marks obtained in such tests will be maintained by the head of the department and will be sent to the University when called for.

Results of all evaluations should be entered into P.G.'s diary and departmental file for documentation purpose. Main purpose of periodic examination is to ensure clinical expertise of students with practical and communication skills and balance broader concept of diagnostic and therapeutic challenges.

2. Maintenance of Log Book:

Every candidate shall maintain a Log book/work diary and record his/her participation in the training programme conducted by the department such as Journal review, seminars, etc. Special laboratory procedures if any, conducted by the candidate and all the procedures performed by the post graduate students should be entered in the Log Book. All the daily activities including the ward round and the routine procedures performed on day to day basis should be entered in the Log book and it should be verified and signed by the faculty member. The Log book shall be scrutinized and certified by the Head of Department and Head of Institution, and presented in the University practical/clinical examination.

VIII. SCHEME OF EXAMINATION: Paper - 1: Echocardiography and Congenital Heart Disease 100 Marks **Paper - 2:** Ischemic Heart Disease and Arrhythmias and all other topics of Non-Invasive Cardiology 100 Marks **Case Presentation + Viva Voce** 200 Marks

Total number of marks 400 Marks

A) Theory (2 papers of 100 Marks each) = 200 Marks Type of question papers (Each paper will have): 2 Long Questions of 20 Marks each = 40 Marks 6 Short Essay Questions of 10 Marks each = 60 Marks

Total = 100 Marks

B) Practical Examination = 200 Marks

Case Presentation (1 Long Case & 1 Short Case) = 150 Marks Viva- Voce = 50 Marks

C) Maximum Marks

Theory	Practical	Viva	Grand Total
200	150	50	400

There will be one external and one internal examiners. All examiners will have to be DM/DNB qualified teachers of DM Cardiology.

IX. DECLARATION OF RESULTS :

- a) Passing criteria: 50% marks in both theory and practical examination separately.
- b) Declaration of Class: 50% and above pass, 65% and above First Class, 75% and above Distinction.
- c) A candidate who fails will have to appear for reexamination in the following academic year without repeating the course or courses of instruction.

X. RECOMMENDED BOOKS (LATEST EDITION)

Sl. No.	Name of the Book/Title	Author	Publisher Name & Place of publication
1	The Heart	Hurst	Mc.GrowHill Company USA
2	Heart Disease	Braunwald zipes, Libby	W.B. Saunders Company Philadelphia, USA
3	Clinical Recognition of Congenital Heart Disease	Joseph K. Perlof	Saunders's USA
4	Marriott's Electrocardiography	Galen S. Wagner	B.I Waverly Pvt. Ltd. New Delhi

XI. RECOMMENDED JOURNALS

Sl. No.	Name of the Journal
1	American Heart Journal
2	Indian Heart Journal
3	Journal of American college of Cardiology
4	Journal of Indian college of Cardiology
5	American Journal of Cardiology
6	British Heart Journal
7	Journal of Indian Academy of Echocardiography