BRANCH - II D.M. CARDIOLOGY

OVERVIEW AND OBJECTIVES:

Clinical cardiology training

Candidates shall be trained specifically in the art of bed side diagnosis. Curriculum is aimed to improve the overall clinical acumen in problem solving. Candidates will gain specific and focal management skills in all common clinical cardiology problem solving.

Specific skills

Candidates after completion of course will gain medical communication and presentation skills, will have knowledge about Bio informatics with specific reference to cardiology. Candidates will be encouraged to develop skill in organizing workshops, CMEs and conferences. They will be allowed to attend national cardiology conferences and take part in competitive exams conducted by national and other academic bodies. They will be encouraged to use computer freely for internet access to cardiology journals, take part in cardiology journal club and to utilise Microsoft office tools for powerful presentation. They will be allowed to take part in group discussion and panel discussion to gain confidence and develop skill in discussing cardiology related topics. Candidates will gain knowledge about organization and management of coronary care unit. They will be encouraged to undertake research activities and will be given proper training in biostatistics and in writing scientific papers.

SYLLABUS / COURSE CONTENT:

1. Applied Anatomy: Heart and great vessels, congenital anomalies; development of heart.

2. Applied Physiology: Cardiac cycle, cardiac output, pressure and volume loops, cardiac contractility, pulmonary circulation, coronary circulation, blood pressure, cardiac failure, acid base balance. Autonomic control of heart and vasculature, pulmonary function tests and their application to cardiology, interpretation of data on PET.

3. Applied Pathology: Congenital heart disease, rheumatic fever and lesions, myocarditis, cardiomyopathies, pericarditis, constrictive pericarditis, infective endocarditis, coronary artery disease including myocardial infarction, hypertensive heart disease, pulmonary embolism, cardiac tumors.

4. Applied Pharmacology: Cardiac glycosides, anti-hypertensives, diuretics, drugs for coronary artery disease, betablockers, calcium channel blockers, inotropic agents, antibiotics, antiarrhythmic agents, metabolic modulators, antiarrhythmics, recent advances in pharmacology pertaining to cardiology.

5. Cardiovascular Imaging: Chest x-ray, ECG, Echo, Nuclear medicine imaging, MRI, CT scan, PET scan.

6. Hemodynamics and interventions: Cardiac catheterization, oxymetry, hemodynamics, angiogram, interventional procedures in cardiology practice.

7. Clinical Cardiology: Coronary artery disease, Rheumatic heart disease, Congenital heart

disease and other paediatric cardiac disorders, Pericardial diseases, Cardiac arrhythmias, Heart failure, Peripheral vascular disorders, Pulmonary thromboembolism and pulmonary hypertension. Systemic hypertension, Systemic diseases involving heart, Heart muscle diseases, Traumatic heart disease, Tumors of heart, Genetics, molecular biology and immunology related to cardiology, Geriatric heart disease, General anaesthesia and non cardiac surgery in patients with heart disease, Pregnancy and heart disease, Epidemiology and preventive cardiology

Non-invasive Techniques

To perform and interpret various non invasive techniques including:
1. Electrocardiography
2. Radiography – routine and specialized areas like CT and MRI
3. Stress testing – tread mill test, stress related and other nuclear techniques
4. Holter monitoring for arrhythmias and ischemic disorders
5. Head up tilt test
6. Echocardiography – M-mode, Two dimensional, Doppler, color flow imaging, transesophageal echocardiography and echo directed hemodynamic studies.
7. Pacemaker followup and interpretation of pacemaker ECGs and trouble shooting.
8. Interpretation of results of nuclear cardiac imaging, CT angiograms and Cardiac MRI.

Invasive Cardiology

1. Experience in cardiac catheterization to calculate and interpret various hemodynamic parameters
2. Right and left heart cath and coronary angiography procedures in adults and children
3. To perform temporary pacemaker insertion.
4. To assist in various interventions including valvuloplasty, pacemaker implantation, Angioplasty, device implantation and interventions in congenital heart disease
5. Electrophysiology: To interpret electrophysiological data and assist in electrophysiology procedures, permanent pacemaker implantation.

MINIMUM EXPERIENCE TO BE GAINED:

1. Echocardiography – Transthoracic 1000 cases
2. Transesophageal echocardiography – 25 cases
3. Temporary pacing – 20 cases
4. Diagnostic coronary angiography – 50 cases
5. Right heart catheteristation – 10 cases
6. Number of holter ECGs analysed – 50 cases
7. Number of Permanent pacemaker assisted – 5 cases
8. Number of Angioplasty assisted – 5 cases

SPECIAL POSTING:

Cardiac Surgery 1 month
Nuclear Cardiology 1 month
Pediatric Cardiology 2 months
Coronary care unit 6 months - candidates will manage patients with acute coronary syndromes and assist in primary angioplasties.

RECOMMENDED BOOKS

1. Heart Disease: Braunwald, 8th Edition
2. The Heart: Hursts, 12th Edition
3. Valvular Heart Disease: Dalan Alpert, 3rd Edition
4. Cardiovascular Medicine: Topol, 3rd Edition
5. Cardiology: Crawford, 3rd Edition
6. Clinical Examination: Joseph K. Perloff, 5th Edition
7. The science and practice of Paediatric Cardiology: Arthur Garson, 2nd Edition
8. Heart Disease in infants children and Adolescents: Moss and Adams, 6th Edition
9. Nada's Pediatric Cardiology: 2nd Edition
10. Practical Electrocardiography: Marriot: 10th edition
11. Cardiac Electrophysiology: Zipes and J Alife: 2nd Edition
12. Echocardiography: Harvey Feigenbaun, 6th Edition
13. Principles and Practice of Echocardiography: Arthur E. Weymen, 1st Edition
14. The Cardiac Catheterization Hand Book: Morton J. Kern, 4th Edition
15. Cardiac Catheterization Angiography and Intervention: William Grossman 7th Edition
16. The Book of Interventional Cardiology: Eric J. Topol, 5th Edition

PATTERN OF EXAMINATION

Theory – 4 papers, 100 Marks each, Duration: Three Hours each
Paper I : Basic Sciences 100
Paper II : Clinical Cardiology 100
Paper III : Hemodynamics therapeutics and intervention 100
Paper IV : Recent Advances 100

DISTRIBUTION OF MARKS :

MCQ Objective (Multiple Choice) 20 questions(20x1)	20 Marks
One Essay	20 Marks
Two Essays 15 Marks each (15 x 2)	30 Marks
Six Short notes 5 Marks each (5 x6)	30 Marks
TOTAL	**100 Marks**

PRACTICAL/CLINICAL AND ORAL EXAMINATION

NO. OF CASES	DURATION	MARKS
LONG CASE One	One Hour	100
SHORT CASES Two	One Hour (30 Mts. Each)	100
WARD ROUNDS Four	One Hour.	100
	TOTAL	**300**
Oral/ Viva Examination/Dissertation/Log Book		100
	GRAND TOTAL	**400**

Note: Not more than four candidates will be examined in Practical Examination per day

DISSERTATION: Approved - 25 marks /Not approved - No Marks

LOG BOOK : 25 marks

The Viva and Clinical Examination may be conducted on the same day, because all the candidates need not have to be present till the last day of the examination.

MAINTENANCE OF HAND WRITTEN LOG BOOK

a) Every Post-graduate candidate shall maintain a record of skills he/she has acquired during the training period certified by the various Heads of Departments where he/she has undergone training including outside the institution.

(b) 25 marks are given for maintaining the Log Book.

(c) When the candidates are sent for external posting the Log Book should be certified for that particular period by the concerned Head of the Department.

(d) The candidate should also be required to participate in the teaching and training programme of Post-graduate and intern students

(e) In addition, the Heads of the Departments shall involve their postgraduate candidates in Seminars, Journal Clubs, Group Discussions and participation in clinical, clinico-pathological conferences.

(f)) As of now each DM student prepares a thesis/dissertation during the course. It is recommended that the number of projects be increased to five - one dissertation, four short papers at least one of them should be prospective study and one of the papers must be submitted for publication in an indexed journal before completion of course. Special credit should be given for additional published case reports, published articles. Each candidate should write two reviews as the topics presented by him on seminars.

(g)) The Head of the Department shall scrutinize and certify the Hand Written Log Book every three months.

(h) At the end of the course, the candidate should summarise the contents and get the Hand Written Log Book certified by the Head of the Department.

(i) **Certified Hand written Log Book** should be submitted at the time of practical examination for the scrutiny of the Board of Examiners.

(j) The Handwritten Log Book should contain Journal Club details, Clinical Case presentations, Procedures assisted and done independently and Papers published. These details should be mentioned date wise.

DISSERTATION:

a) All candidates admitted to undergo D.M/M.Ch Post-graduate Higher Speciality Degree courses shall be assigned a topic for dissertation/thesis by the head of the concerned Unit and the title of the topics assigned to the candidates be intimated to the Controller of Examinations of this University by the Head of the Department through the Head of the Institution, before end of the first year for 3 years course and at the end of the 2nd year.

b) The dissertation/thesis shall be a bound volume of minimum 50 pages and not exceeding 75

pages of typed matter (Double line spacing and on one side only) excluding certification, acknowledgements, annexures and Bibliography

c) 4 copies of dissertation shall be submitted six (6) months prior to the commencement of the examinations on the prescribed date to the Controller of Examinations of this University.

d) Two copies are to be submitted as an electronic version of the entire dissertation in a standard CD format by mentioning the details and technicalities used in the CD format.

e) The concerned Professors/Readers are to supervise and to see that the Dissertations are done properly utilizing the clinical materials of their own department/institution. The students must learn the design and interpretation of research studies, responsible use of informed consent and research methodology and interpretation of data and statistical analysis. They should seek the help of qualified staff members in the conduct of research. They must learn to use the library and computer based research. This training will help them to develop skills in planning, designing and conduct of research studies.

EVALUATION OF DISSERTATION

a) The dissertation should be approved by the Professor of that branch and the same has to be forwarded to the Controller of Examinations by the Head of the Department through the Dean/Principal of that college six months prior to practical examination and examined by a set of two examiners

b) 25 marks are allotted for the dissertation

c) Dissertation and Log Book marks will be clubbed with practicals. If the candidate fails in the practical the same Dissertation/Log Book marks will be carried for the next examination.

d) Two copies of the evaluation report of the dissertation should be submitted by the examiners to the Controller of Examinations of this University.

Biomedical Aspects

To understanding the functional principles of various bio-medical equipments used for the invasive and non invasive cardiology.