AMRITA
VISHWA VIDYAPEETHAM

AMRITA SCHOOL OF MEDICINE

Program for
M. Ch CVTS

(Revised with effect from 2016-2017 onwards)

Contents

Program Outcomes (PO)

PO1: Fundamental knowledge on the subject.

PO2: Effective communication skills.

PO3: Knowledge in professional ethics.

P04: Leadership qualities and team work.

PO5: Problem Analysis and solving skills.

PO6: Basic knowledge on research methodology.

PO7: Higher Technical skills and competencies.

PO8: Employability

PO09: Higher earnings

Program Specific Outcomes (PSO)

PSO1: Ability to understand & know about cardiopulmonary bypass machine safe and effectively

PSO2: Basic knowledge about the principles and operations of all perfusion related devices.

PSO3: Basic knowledge on evaluation of a patient planned for a cardiovascular surgical intervention & interpretation of various cardiovascular imaging

PSO4: Core knowledge on cardiopulmonary perfusion

PSO5: Understanding of ECMO and LVAD devices

PSO6: Performing various basic cardiothoracic surgical procedures

SYLLABUS

1. APPLIED ANATOMY

Regional and developmental –chest wall, diaphragm lungs, mediastinum, oesophagus, heart, pericardium, great vessels and branches: congenital anomalies.

2. APPLIED PHYSIOLOGY

Respiration, pulmonary functions tests, assisted ventilation, blood pressure, cardiac output, heart sounds, murmurs, regional circulation, cardiac metabolism, acid-base balance, fluid and electrolyte balance, extracorporeal circulation, assisted circulation hypothermia, oesophageal function, and gastro oesphageal reflux.

3. APPLIED PATHOLOGY

Thoracic injuries, chest wall tumours, intrapleural and pulmonary suppuration, pulmonary tubemalosis, lung tumours, pericarditis, diaphragmatic hemia, congenital and acquired lesions of the heart and great vessels, benign and malignant structures of the oesophagus, reflux oesophagitis, pulmonary embolism.

4. APPLIED BACTERIOLOGY

Pulmonary infections, infective endocarditis, infections following open-heart surgery

5. CARDIOVASCULAR ENGINEERING

Concept of flow, pressure gradient and its relationship to flow, heart as a pump, efficiency of the heart, efficiency of valves, prosthetic heart valves, haemodynamic assessment, extacorporeal circulation, types of blood oxygenators, heat exchangers and

bubble traps, ventricular assist devices, materials, in cardio-vascular application, biocompatibility

6. CLINICAL AND OPERATIVE SURGERY

Of chest walls, pleura, pericardium, heart, great vessels, oesophagus, mediastinum and diaphragm. All aspects of surgery of Congenital and Acquired disorders in these areas.

TRAINING PROGRAMME

The training programme shall aim to provide sound knowledge in diagnostic and investigative aspects of cardiovascular and thoracic surgery for the candidate. It will provide practical training in clinical and operative surgery including open heart surgery.

1. During the training period, the candidate shall work on fulltime resident basis under the head of the Department of Cardiovascular and Thoracic Surgery. He shall take part in all activities of the department including participation in seminars, conferences, teaching assignment, operating sessions, experimental surgery and other duties that may be assigned to him by the Head of the Dept.

2. The programme of training will be divided as follows:
   (a) Four months: - Clinical work in inpatient and outpatient section methods of workup and follow up in thoracic and cardiovascular surgery. During this period, the candidate will be posted to seven days period of an Introductory course and for courses in Research Methods, Biostatics.

(7 sessions of 2 hours each). The syllabi for these programmes is given in Schedule A.

(b) One Month: Assignment to medical cardiology, cardiac catheterization Laboratory, CCU. During this period, the candidate will receive good grounding in cardiac diagnosis, heamodynamics and cardiac monitoring,, pulmonary function,

(c) Ten months: Clinical cardiovascular and thoracic surgery, workup of surgical patients, pre-operative and postoperative care, interpretation of X-ray angiogram, blood gas determination, endoscopy.

(d) Six months: During this period, the candidate shall act as first assistant to the Head of the Department, and other senior surgeons in major operations including open heart procedures. He will receive progressively greater responsibility for independent performance of major surgical procedures. He will be responsible for preparation of operation notes and postoperative intensive care.

(e) One month (Optional): During this period, the candidate shall be posted to the animal research laboratory of the Institute or spend time for his research projects. During this period he / she may independently perform cardiovascular procedures for grant funded projects of his / her own or for ongoing projects. The posting may terminate earlier on satisfactory completion of procedures.

(f) Fourteen months: During this period, the candidate shall be posted to clinical service to round out his experience. He will receive opportunities to independently perform procedures such as Cannulations, putting patients on Cardiopulmonary Bypass and weaning them from it, Taking down LIMAs, Mitral Valve procedures) ligation of PDA, aortic bypass grafts, endoscopies, lung resections, and a minimum of 15 simple open heart operations like ASD closures, & Mitral valve replacement .

Note: - The exact duration and timing of posting for a particular activity will be decided by the Division of Academic Affairs in consultation with the HOD at the commencement of each year. As far as possible postings for research and visit to other centre, will be made toward the second half of the second year of training.

A copy of the report of all the procedures performed shall be submitted by the candidate to the Head of the Department in the form of a logbook at least six weeks before the final examination. The HOD will certify the completion of the minimum number of procedures specified. He will point out deficiency, if any and give his recommendations with reasons as to whether the candidate should be allowed to sit in the examination or not. The logbook will be forwarded within a week of receipt by the HOD to the Division of Academic Affairs. Towards the conclusion of this period, the candidate shall have carried out a minimum 50 cardiovascular and thoracic procedures including minimum of five open-heart operations.

COURSES

Course 1 (M5CV1) Applied Anatomy and Physiology
CO1: Ability to use and study various cardiovascular drugs.
CO2: Basic understanding of physiology of cardiac disease
CO3: Statistical data analysis

APPLIED ANATOMY

Regional and developmental –chest wall, diaphragm lungs, mediastinum, oesophagus, heart, pericardium, great vessels and branches: congenital anomalies.

APPLIED PHYSIOLOGY

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Course 2 (M5CV2) Applied Pathology and Microbiology and Cardiovascular Engineering
CO1: Ability to initiate a research project
CO2: Understanding microbiological & pathological aspects of cardiac disease
CO3: Newer device developments in the field of cardiovascular surgery

APPLIED PATHOLOGY

Thoracic injuries, chest wall tumours, intrapleural and pulmonary suppuration, pulmonary tubemalosis, lung tumours, pericarditis, diaphragmatic hemia, congenital and acquired lesions of the heart and great vessels, benign and malignant structures of the oesophagus, reflux oesophagitis, pulmonary embolism.
Esophageal diverticulae

Tracheo esophageal fistula
Thymoma

APPLIED BACTERIOLOGY

Pulmonary infections, infective endocarditis, infections following open-heart surgery

CARDIOVASCULAR ENGINEERING

Concept of flow, pressure gradient and its relationship to flow, heart as a pump, efficiency of the heart, efficiency of valves, prosthetic heart valves, haemodynamic assessment, extacorporeal circulation, types of blood oxygenators, heat exchangers and bubble traps, ventricular assist devices, materials, in cardio-vascular application, biocompatibility

Course 3 (M5CV3) Clinical Cardiovascular and thoracis surgery
CO1: Ability to handle cardiac emergencies
CO2: Ability to perform various elective cardiac surgical procedures
CO3: Mangment of post operative patients

CLINICAL AND OPERATIVE SURGERY

Of chest walls, pleura, pericardium, heart, great vessels, oesophagus, mediastinum and diaphragm. All aspects of surgery of Congenital and Acquired disorders in these areas.
Post operative care of the patient
Total parenteral nutrition in post operative period
Post operative rehabilitation of the patient

Course 4 (M5CV4) Cardiovascular and Thoracis Surgery Including recent Advances
CO1: Development of innovative techniques.
CO2: Cost effective management.

CO3: Researching newer devices & techniques

Knowledge of latest research articles , about latest innovative techniques and its application in current scenario , Cost effective measures for management and research into newer devices and techniques of cardiovascular and thoracic Surgery

Soft Skills (M5CV5) Elective Course

CO1: Ability to conduct research work.
CO2: Competency to work as a team leader.
CO3: Effective communication with patients and relatives.
CO4: Attitude to be a lifelong learner and ethical practitioner.

SCHEME OF EXAMINATIONS

Towards the end of 36 months

Paper 1 3 Hours 9 Short essay type question on Applied Anatomy, and Applied Physiology

Paper II 3 Hours 9 Short essay type questions on Applied Pathology and microbiology and Cardiovascular engineering

Paper III 3 Hours Short essay type questions (20 min) on clinical cardiovascular and Thoracic Surgery

Paper IV 3 Hours Short essay type question (20 min) on Cardiovascular And Thoracic Surgery including recent advances

Clinical: One long case - 45 minutes
Four short cases - 1 hour

Practical: Surgical pathology}
Operative Surgery}
Cardiac and Thoracic}
Radiology
ICU Rounds } - 60 to 90 minutes

Viva Voce