# M.Ch

## Cardio-Vascular and Thoracic Surgery

program

Department of
Cardio Vascular and Thoracic Surgery

## CONTENT

## A. Aims and Objectives

**Overview:**

The institute offers 3-year course for obtaining degree in Mch Cardio-Vascular & Thoracic surgery**.**

**Eligibility:**

Candidates should meet the following requirements to be eligible to apply for the course

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| 1) Indian Citizen |
| 2) Must have the following degrees from Indian Medical Council recognized universities |
| a) M.B; B.S with valid registration to any accredited medical council |
| b) M.S General Surgery or Diplomate of National Board in General Surgery |
| 3) Age below 35 yrs on the date of examination |
| 4) Should not have more than 2 attempts to pass any examination, and the total number of attempts overall (including all examination) should not be 3 |
| 5) Should not have any registered or pending criminal cases against him or her |

**Goal:**

The programme aims to provide sound knowledge in Pre operative evaluation, and post-operative management of patients having of cardiovascular and Thoracic diseases requiring surgery. In addition candidates will receive graded and supervised operative experience so that they are trained to become competent Cardio-Vascular and Thoracic surgeons.

**Duties and responsibilities**

During the training period, the trainee shall work as a full time resident under the head of the division. 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.

**Programme Objectives**

The purpose of training programmes in the specialty of CVTS is to produce competent individuals, who are able to meet the health care needs of the Society in Relation to Cardio vascular & Thoracic diseases.

Specific objectives of the programme

1. To train to perform elective and emergent Cardiovascular & Thoracic surgery procedures
2. To have scientific approach to Cardio vascular & Thoracic illness to be able to decide on optimal therapeutic strategy ranging from the risk factor modifications, medical interventional and surgical options appropriately
3. To be able to develop interdisciplinary partnership with, cardiologist, radiologist, etc

## SPECIFIC LEARNING OBJECTIVES:

### Postgraduate training-Theoretical training, practical and clinical training

i. To develop knowledge levels and to hone skills to handle elective and emergent problems in the field of Cardiovascular & Thoracic surgery.

ii. To expose and train individuals to plan and operate on Cardiovascular & Thoracic surgery procedures

iii. To provide of equip skills to diagnose, plan, treat and to follow-up Cardiovascular & Thoracic surgery patients.

iv. To update recent knowledge and to keep in pace with rapid advances in the progress of techniques.

v. To sensitize the trainee to newer learning methods and research tools & to encourage clinical research.

vi. To publish Papers in indexed journals e.g., Article, short papers, short case reports, clinical reviews, research papers during the training period.

**THEORITICAL TRAINING:**

- To impart training in theory and practices in Cardiovascular & Thoracic surgery.
- To conduct monthly audit.
- To take part in departmental academic programme and interactive sessions.

**PRACTICAL TRAINING:**

- To expose the trainee to diagnose and work-up outpatient cases.
- To plan and prepare inpatient for major surgical procedures.
- To conduct interactive ward rounds and to assess the trainee with regard to clinical skills.
- Objective in the operating room is to infuse confidence and impart surgical skills in a graded manner.
- The first year candidate would be exposed to operate on minor surgical procedures.
- The second and third year candidates would be trained to assist critical procedure and finally to independently operate major procedure under supervision faculty.

**Competence expected at end of training**

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| • **Professionalism** | • Demonstrate a commitment to their patients, profession, and community<br>• Consistently apply ethical principles<br>• Is accountable for their own decisions and actions<br>• Maintain appropriate relations with patients<br><br>**Recognize medico-legal issues**<br>• Identify ethical expectations that impinge on the most common medico-legal issues<br>• Recognise the principles and limits of patient confidentiality<br>• Apply appropriate national / state regulations<br>**Demonstrate a commitment to their patients, profession, and community through participation in profession-led regulation**<br>• Employ a critically reflective approach to their practice<br>• Acknowledge and learn from mistakes<br>• Participate in peer review |

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| **Scholar / Teacher** | • Access and interpret relevant evidence<br>• Integrate new learning into practice<br>**Critically evaluate medical information and its sources, and apply appropriately to practice decisions**<br>• Draw on different kinds of knowledge in order to weigh up patients' problems in terms of context, issues, needs and consequences<br>• Describe the principles of critical appraisal<br>• Critically appraise new trends in surgery<br>**Facilitate the learning of patients, families, trainees, other health professionals, and the community**<br>• Collaboratively identify the learning needs and desired learning outcomes of others<br>• Describe principles of learning relevant to medical education<br>• Provide effective feedback<br>**Contribute to the development, dissemination, application, and translation of new medical knowledge and practices**<br>• Select and apply appropriate methods to address a research question<br>• Describe the principles of research ethics<br>• Conduct a systematic search for evidence |

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| **Health Advocacy** | • Respond to individual patient health needs<br>• Identify the health needs of an individual patient<br>**Promote health maintenance of patients**<br>• Advise patients (and their families) on ways to maintain and/or improve their health<br>**Respond to the health needs of the community**<br>• Describe the health needs in the practice communities that they serve<br>• Identify opportunities for advocacy and health promotion and respond appropriately<br>• Identify the determinants of health in the populations including barriers to access to care and resources<br>**Promote health maintenance of colleagues**<br>• Describe the ethical and professional issues inherent to working in teams<br>**Look after their own health**<br>• Take responsibility to ensure that when they are on duty, or on call, that they are at optimal level of performance<br>**Advocate for improvements in health care**<br>• Identify points of influence in the health care system and its structures<br>• Describe the role of the medical profession in advocating collectively for health and patient safety |

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| **Management and Leadership** | • Manage and lead clinical teams<br>• Is respectful of the different kinds of knowledge and expertise which contribute to the effective functioning of a clinical team<br>• Communicate with and co-ordinate surgical teams to achieve an optimal surgical environment<br>• Manage their practice and career effectively<br>• Use time management skills appropriately<br>• Maintain accurate and up-to-date patient records<br>• Serve in administration and leadership roles, as appropriate<br>• Chair or participate effectively in monthly audit |
| **Collaboration** | • Work in collaboration with members of interdisciplinary teams where appropriate<br>• Collaborate with other professionals in the selection and use of various types of treatments assessing and weighing the indications and contraindications associated with each type<br>• Effectively work with other health professionals to minimise interprofessional conflict and maximise patient care<br>• Demonstrate a respectful attitude towards other colleagues and members of |

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| | interprofessional teams<br>• Develop a care plan for a patient in collaboration with members of an interdisciplinary team<br>• Recognise the need to refer patients to other professionals<br>• Initiate the resolution of misunderstandings or disputes |

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| **Communication** | • Develop rapport, trust and ethical therapeutic relationships with patients and families<br>• Establish positive therapeutic relationships with patients and their families<br>• Respect patients confidentiality, privacy and autonomy<br>• Respect patient diversity and difference (including gender, age, religion, culture, ...<br>**Accurately elicit and synthesize relevant information from patients, families, colleagues and other professi**onals<br>• Gather information about a health condition and also about a patient's beliefs, concerns, expectations and illness experience<br>• Identify when a patient is likely to interpret information as bad news and adjust their communication accordingly<br>**Accurately convey relevant information and explanations to patients and families, colleagues and other professionals**<br>• Communicate information to patients (and their family) about procedures, potentialities, and risks associated with surgery in ways that encourage their participation in informed decision making |

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| | • Communicate with the patient (and their family) the treatment options, potentials, complications, and risks associated with the use of drugs<br>• Appropriately adjust the way they communicate with patients to accommodate cultural and linguistic differences<br>**Develop a common understanding (with patients, families, colleagues and other professionals) on issues, problems and plans**<br>• Discuss relevant information with patients (and their family) in ways that encourage their participation in informed decision making<br>• Encourage patients to discuss and question<br>• Effectively identify and explore problems to be addressed from a patient encounter |

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| **Medical Expertise** | **Establish and maintain clinical knowledge, skills and attitudes appropriate to their practice**<br>● Basic Sciences<br>● anatomy<br>● biology<br>● pathology, particularly oncology<br>● immunology<br>● microbiology and antibiotics<br>● pharmacology<br>● physiology<br>● genetics, particularly neonatal<br>● Pre-operative, intra-operative, and post-operative care and assessment in particular<br>● DVT prophylaxis<br>● Fluid and electrolytes<br>● Wound care<br>● Haemostasis |
| **Clinical Decision Making** | • Recognize the symptoms of, accurately diagnose, and manage common problems in their area of expertise<br>• Manage patients in ways that demonstrate sensitivity to their physical, social, cultural, and psychological needs<br>• Use preventative and therapeutic interventions |

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| | effectively<br>• Manage the critically ill patient<br>• Effectively manage complications<br>**Perform a complete and appropriate assessment of a patient**<br>• Take a history, perform an examination, and arrive at a well-reasoned diagnosis<br>• Efficiently and effectively examine the patient<br>**Organise diagnostic testing, imaging and consultation as appropriate**<br>• Appraise and interpret radiographic investigations against patient's needs including<br>• Plain radiographs<br>• Ultrasound<br>• Echocardiography<br>• angiography<br>• CT<br>• MRI |

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| **Technical Expertise** | • Safely and effectively perform appropriate surgical procedures<br>• Consistently demonstrate sound surgical skills<br>• Demonstrate procedural knowledge and technical skill at a level appropriate to their level of experience<br>• Approach and carry out procedures with due attention to safety of patient, self, and others<br>• Analyze their own clinical performance for continuous improvement |
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## B. Syllabus

### Theoretical Knowledge to be acquired at 18 months training

Topics covered include:

**CARDIAC SURGERY**

**Fundamentals**

Surgical Anatomy of the Heart

Cardiac Surgical Anatomy and Physiology

Cardiac Embryology

Cardiac Surgical Pharmacology

Pathology of Cardiac Surgery

Cardiac Surgical Imaging

Risk Stratification and Co morbidity

Statistical Treatment of Surgical Outcome Data

**Perioperative/Intraoperative Care**

Preoperative Evaluation for Cardiac Surgery

Cardiac Anesthesia

Transfusion Therapy and Blood Conservation

Deep Hypothermic Circulatory Arrest

Myocardial Protection

Postoperative Care of Cardiac Surgery Patients

Cardiopulmonary Resuscitation

Temporary Mechanical Circulatory Support

Late Complications of Cardiac Surgery

**Cardiopulmonary bypass**

History

Equipment

Physiology and pathology

Hematology

Clinical applications

Cardiopulmonary bypass in neonates, infants and children

**Pathophysiology**

Atherosclerosis

Coronary artery disease

Valvular heart disease

Rheumatic fever

Aortic aneurysm

Aortic dissection

Congenital heart disease

Congestive Heart failure

Pericardial diseases

**Immunobiology of Heart and Heart-lung transplantation**

**Thoracic Surgery**

**The Lung, Pleura, Diaphragm and Chest Wall**

Anatomy of the Thorax

Embryology of the Lungs

Ultrastructure and Morphometry of the Human Lung

Cellular and Molecular Biology of the Lung

Surgical Anatomy of the Lungs

Anatomy of the Thoracic Duct and Chylothorax

Lymphatics of the Lungs

Pulmonary Gas Exchange

Mechanics of Breathing

**Thoracic Imaging**

Radiographic Evaluation of the Lungs and Chest

Computed Tomography of the Lungs, Pleura, and Chest Wall

Magnetic Resonance Imaging of the Thorax

Positron Emission Tomography in Chest Diseases

Radionuclide Studies of the Lung

**Diagnostic Procedures**

Laboratory Investigations in the Diagnosis of Pulmonary Diseases

Molecular Diagnostic Studies in Pulmonary Disease

Bronchoscopic Evaluation of the Lungs and Tracheobronchial Tree

Invasive Diagnostic Procedures

Video-Assisted Thoracic Surgery as a Diagnostic Tool

**Assessment of the Thoracic Surgical Patient**

Pulmonary Physiologic Assessment of Operative Risk

Preoperative Cardiac Evaluation of the Thoracic Surgical Patient

**Anesthetic Management of the General Thoracic Surgical Patient**

Preanesthetic Evaluation and Preparation

Conduct of Anesthesia

The Shared Airway: Management of the Patient with Airway Pathology

Anesthesia for Pediatric General Thoracic Surgery

**Postoperative Management of The General Thoracic Surgical Patient**

General Principles of Postoperative Care

Mechanical Ventilation of the Surgical Patient

**Embryology and anatomy**

Lung

Trahceobronchial tree

Diaphragm

Pleura

**Lung cancer**

Epidemiology and Carcinogenesis

Screening for Long Cancer:  Challenges for Thoracic Surgery

Pathology of Carcinoma of the Lung

Present Concepts in the Molecular Biology of Lung Cancer

Clinical Presentation of Lung Cancer

Radiologic Evaluation of Lung Cancer

Diagnosis and Staging of Lung Cancer

**Mediastinum**

**Anatomy**

The Mediastinum, Its Compartments, and the Mediastinal Lymph Nodes

The Thymus

Mediastinal Parathyroids

Neuogenic Structures of the Mediastinum

**Noninvasive Investigations**

Radiographic, Computed Tomographic, and Magnetic Resonance

**Investigation of the Mediastinum**

Radionuclide Studies of the Meciastinum

Mediastinal Tumor Markers

**Pathology of mediastinal tumors**

**Vascular Surgery**

**Applied Anatomy**

Regional and developmental - of Aorta and arteries and branches.

Exposure of blood vessels at every body part in the chest, abdomen, and neck,

Veins in extremities and inferior vena cava.

**Applied Physiology**

Blood pressure, Cardiac output, regional circulation especially those of subsystem and peripheral in the extremities, carotid arteries and cerebral circulation.

**Applied Pathology**

Pathology of diseases of Aorta, Arteries,

Pathology of Deep Venous thrombosis, AV malformation.

**Applied Bacteriology**

Infection in Vascular Surgery, prosthetic graft infection, primary and secondary aorto-enteric fistula

**Cardiovascular Engineering**

Concept of flow,pressure gradient,heart as pump,prosthetic heart valves,extracorporeal circulation,biocompatibility,materials in cardiovascular application,medical physics,electronics in transucers,clinical monitoring and medical imaging

**Biostatistics**

Methodology and design of clinical research

Statistical Inference

Biostatistics for clinical Research-sample size, statistical approach, statistical significance, sensitivity, specificity,Univariate and multivariate analysis, acturial survival

## Theoretical Knowledge to be acquired at 36 months training

### Ischemic Heart Disease

Indications for Revascularization

Myocardial Revascularization with Percutaneous Devices

Myocardial Revascularization with Cardiopulmonary Bypass

Myocardial Revascularization without Cardiopulmonary Bypass

Myocardial Revascularization with Carotid Artery Disease

Myocardial Revascularization after Acute Myocardial Infarction

Minimally Invasive Myocardial Revascularization

Coronary Artery Reoperations

Transmyocardial Laser Revascularization and Extravascular Angiogenesis Techniques to Increase Myocardial Blood flow

Surgical Treatment of Complications of Acute Myocardial Infarction: Postinfarction Ventricular Septal Defect and Free Wall Rupture

Ischemic Mitral Regurgitation

Left Ventricular Aneurysm

### Valvular Heart Disease

Aortic Valve Replacement with a Mechanical Cardiac Valve Prosthesis

Bioprosthetic Aortic Valve Replacement: Stented Valves

Stentless Aortic Valve Replacement: Autograft/Homograft

Stentless Aortic Valve Replacement: Porcine and Pericardial

Aortic Valve Repair and Aortic Valve-Sparing Operations

Surgical Treatment of Aortic Valve Endocarditis

Minimally Invasive Aortic Valve Surgery

Percutaneous Aortic Valve Interventions

Mitral Valve Repair

Mitral Valve Replacement

Surgical Treatment of Mitral Valve Endocarditis

Minimally Invasive and Robotic Mitral Valve Surgery

Percutaneous Catheter-Based Mitral Valve Repair

Tricuspid Valve Disease

Multiple Valve Disease

Reoperative Valve Surgery

Valvular and Ischemic Heart Disease

**Diseases of the Great Vessels**

Aortic Dissection

Ascending Aortic Aneurysms

Aneurysms of the Aortic Arch

Descending and Thoracoabdominal Aortic Aneurysms

Endovascular Therapy for the Treatment of Thoracic Aortic Disease

Pulmonary Embolism and Pulmonary Thromboendarterectomy

Trauma to the Great Vessels

**Surgery for Cardiac Arrhythmias**

Cardiac Rhythm Disturbance

Interventional Therapy for Atrial and Ventricular Arrhythmias

Surgical Treatment of Atrial Fibrillation

Surgical Implantation of Pacemakers and Automatic Defibrillators

**Other Cardiac Conditions and Operations**

Adult Congenital Heart Disease

Pericardial Disease

Cardiac Neoplasms

Hypertrophic Obstructive Cardiomyopathy

Heart Failure

**Critical Care**

**Transplant and Circulatory Support**

Heart Transplantation

Mechanical Circulatory Support & Total Artificial Heart

Nontransplant Surgical Options for Heart Failure

Tissue Engineering for Cardiac Valve Surgery

Stem Cell-Induced Regeneration of Myocardium

## CONGENITAL HEART SURGERY

Atrial Septal Defect and Partial Anomalous Pulmonary Venous Connection

Total Anomalous Pulmonary Venous Connection

Cor Triatriatum

Unroofed Coronary Sinus Syndrome

Atrioventricular Septal Defect

Ventricular Septal Defect

Congenital Sinus of Valsalva Aneurysm

Aortico-Left Ventricular Tunnel

Patent Ductus Arteriosus

Ventricular Septal Defect with Pulmonary Stenosis or Atresia

Pulmonary Stenosis or Atresia and Intact Ventricular Septum

Tricuspid Atresia and Management of Single-Ventricle Physiology

Ebstein Anomaly

Truncus Arteriosus

Aortopulmonary Window

Origin of Right or Left Pulmonary Artery from Ascending Aorta

Anomalies of the Coronary Arteries

Congenital Aortic Stenosis

Coarctation of the Aorta and Interrupted Aortic Arch

Aortic Atresia and Other Forms of Hypoplastic Left Heart Physiology

Congenital Mitral Valve Disease

Vascular Ring and Sling

Complete Transposition of the Great Arteries

Double Outlet Right or Left Ventricle

Congenitally Corrected Transposition of the Great Arteries and Other Forms of Atrioventricular Discordant Connection

Double Inlet Ventricle and Atretic Atrioventricular Valve

` Anatomically Corrected Malposition of the Great Arteries

Atrial Isomerism

Critical Care

## THORACIC SURGERY

### Pulmonary Resections

Thoracic Incisions

General Features of Pulmonary Resections

Technical Aspects of Lobectomy

Sleeve Lobectomy

Pneumonectomy and Its Modifications

Tracheal Sleeve Pneumonectomy

Segmentectomy and Lesser Pulmonary Resections

Emphysema Surgery

Instruments and Techniques of Video-Assisted Thoracic Surgery

Video-Assisted Thoracic Surgery for Wedge Resection, Lobectomy, And Pneumonectomy

Median Sternotomy and Parasternal Approaches to the Lower Trachea and Main Stem

Bronchi

Extended Resection of Bronchial Carcinoma in the Superior Anterior Approach to Superior Sulcus Lesions

Complications of Pulmonary Resection

Management of Perioperative Cardiac Events

**Chest Wall**

Chest Wall Deformities

Infections of the Chest Wall

Thoracic Outlet Syndrome

Thoracoscopic Sympathectomy

Anterior Transthoracic Approaches to the Spine

Chest Wall Tumors

Chest Wall Reconstruction

**The Diaphragm**

Diaphragmatic Function, Diaphragmatic Paralysis, and Eventration of the Diaphragm

Pacing of the Diaphragm

Congenital Posterolateral Diaphragmatic Hernias and Other Less Common Hernias of the Diaphragm in Infants and Children

Foramen of Morgagni Hernia

Tumors of the Diaphragm

**The Pleura**

- Pneumothorax
- Parapneumonic Empyema
- Postsurgical Empyema
- Tuberculous and Fungal Infections of the Pleura
- Fibrothorax and Decortication of the Lung
- Thoracoplasty: Indications and Surgical Considerations
- Localized Fibrous Tumors of the Pleura
- Diffuse Malignant Mesothelioma
- Technique of Extrapleural Pneumonectomy for Diffuse Malignant Pleural Mesothelioma
- Uncommon Tumors of the Pleura
- Malignant Pleural Effusions
- Malignant Pericaradial Effusions

**Thoracic Trauma**

- Blunt and Penetrating Injuries of the Chest Wall, Pleura, and Lungs
- Barotrauma and Inhalation Injuries
- Acute Respiratory Distress Syndrome
- Management of Foreign Bodies of the Airway
- Diaphragmatic Injuries

**The Trachea**

- Tracheostomy
- Techniques of Resection and Reconstruction of trachea
- Management of Nonneoplastic Diseases of the Trachea
- Benign and Malignant Tumors of the Trachea
- Compression of the Trachea by Vascular Rings

**Congenital, Structural, and Inflammatory Diseases of the Lung**

Congenital Lesions of the Lung

Pulmonary Complications of Cystic Fibrosis

Congenital Vascular Lesions of the Lungs

Chronic Pulmonary Emboli

Bullous and Bleb Diseases of the Lung

Emphysema of the Lung and Lung Volume Reduction Operations

Bacterial Infections of the Lungs and Bronchial Compressive Disorders

Pulmonary Tuberculosis and Other Myocbacterial Diseases of The Lungs

Surgery for the Management of *Mycobacterium Tuberculosis* and Nontuberculous Myocbacterial Infections of the Lung

Thoracic Mycotic and Actinomycotic infections of the Lung

Pleuropulmonary Amebiasis

Hydatid Disease of the Lung

Pulmonary Paragonimiasis and Its Surgical Compliations

Solitary Pulmonary Nodule

Diffuse Lung Disease

Lung Transplantation

**Carcinoma of the Lung**

Surgical Treatment of Non-Small Cell Lung Cancer

Mediastinal Lymph Node Dissection

Endoluminal Management of Malignant Airway Disease

Basic Principles of Radiation Therapy in Carcinoma of the Lung

Radiation Therapy for Carcinoma of the Lung

Chemotherapy of Non-Small Cell Lung Cancer

Multimodality Therapy for Non-Small Cell Lung Cancer

Novel Systemic Therapy for Advanced Non-Small Cell Lung cancer

Small Cell Lung Cancer

Novel Strategies for Lung Cancer Immunotherapy

**Other Tumors of the Lung**

Carcinoid Tumors

Adenoid Cystic Carcinoma and Other Primary Salivary Gland-Type Tumors of the Lung

Benign Tumors of the Lung

Uncommon Primary Malignant Tumors of the Lung

Secondary Tumors of the Lungs

Lung Tumors in the Immunocompromised Host

**Mediastinum**

**Invasive Diagnostic Investigations and Surgical Approaches**

Cervical Substernal “Extended” Mediastinoscopy

Sternotomy and Thoracotomy for Mediastinal Disease

Posterior Mediastinotomy

Video-Assisted Thoracic Surgery for Mediastinal Tumors and Cysts And Other Diseases within the Mediastinum

Mediastinal Infections, Overview of Mass Lesions in the Mediastinum and Control of Vascular Obstructing Symptomatology

Acute and Chronic Mediastinal Infections

Overview of Primary Mediastinal Tumors and Cysts

Diagnostic Investigation of Mediastinal Masses

Lesions Masquerading as Primary Mediastinal Tumors or Cysts

Excision of Hourglass Tumors of the Paravertegral Sulcus

Mediastinal Paragangliomas and Pheochromocytomas

Mesenchymal Tumors of the Mediastinum

Mediastinal Parathyroid Adenomas and Carcinomas

**Mediastinal Cysts**

Foregut Cysts of the Mediastinum in Infants and Children

Foregut Cysts of the Mediastinum

Gastroenteric Cysts and Neurenteric Cysts in Infants and Children

Mesothelial and Other Less Common Cysts of the Mediastinum

**Vascular Surgery**

Clinical vascular surgery

Endovascular intervention

Recent advances in Vascular & Endovascular Surgery Clinical and operative surgery of Aorta, all arteries, veins, inferior vena cava. Endo Vascular intervention like Angioplasty, Stenting, Endo Vascular stent graft repair of aneurysm of arteries and abdominal aorta.

Vascular medicine including prophylaxis, treatment of deep vein thrombosis and pulmonary embolism

## C. Practical, Clinical and Laboratory experience to be imparted at year I, year II, Year III

**Operative Experience**

The total operative experience must be recorded in the Trainee logbook, which will be assessed every six months by the programme director. It is emphasized that these numbers are only a general guide

**Year 1**

Assistant to 25 open Heart cases

Perform the following under supervision:

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| 1. | Sternotomy | 10 |
| 2. | Closure of Sternotomy | 10 |
| 3. | Vein harvest | 25 |
| 4 | Cannulation for cardiopulmonary bypass | 2 |

**Year 2**

First assistant at 50 open Heart cases

Perform the following under supervision:

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| 1. | Cannulation for cardiopulmonary bypass | 10 |
| 2. | Sternotomy and closure | 20 |
| 3. | ASD closure | 5 |

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| 4. | Proximal Anastomosis in CABG | 10 |
| 5. | Vein harvest | 25 |
| 6. | IMA harvests | 5 |

**Year 3**

First assistant at 100 Open Heart cases

Perform the following under supervision:

| | | |
|---|---|---|
| 1. | Proximal Anastomosis in CABG | 10 |
| 2. | IMA harvest | 15 |
| 3. | ASD Closure | 5 |
| 4. | MVR | 5 |
| 5. | AVR | 2 |

**Thoracic and Vascular surgery requirements in 3 yrs**

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| 1. | Asst to Major procedures | 25 |
| 2. | Perform Lobectomy/Pneumonectomy | 5 |
| 3. | Assistant to Major vascular Procedures | 10 |

## D. Recommendations of Texts and Journals

**Textbooks:**

- ***Cardiac Surgery: morphology diagnostic criteria, natural history, techniques, results and indications. Kirklin JW, Barrat-Boyes BG. Churchill-Livingstone***
- ***Text Book of Adult Cardiac surgery-Dr Lawrence Cohn***
- ***Surgery of the Chest. Sabiston, David C, Spencer. Saunders***
- ***Surgery for Congenital Heart Defects. Stark J, De Leval M. Saunders***
- ***Cardiopulmonary Bypass, Principles and Practice- Glenn P Gravelee***
- ***General Thoracic Surgery- Thomas W Shields***
- ***Vascular Surgery-Rutherford***
- ***Comprehensive Surgical Management of Congenital Heart Diseases-Richard Jonas***

**Journals*:***

- ***Annals of Thoracic Surgery***
- ***Journal of Thoracic and Cardiovascular Surgery***
- ***European Journal of Cardio-Thoracic Surgery***
- ***Asian annals***
- ***Circulation***
- ***JACC***
- ***Journal of Heart Valve disease***

## E. Describe the structure and role of academic program committee

Head of the Division

Programme – in – charge

Programme Coordinators

## F. Curriculums Modules

**Clinical training modules:** The training modules are developed so that the trainee will have a broad exposure to all spectrum of cardio thoracic and vascular surgery. Diseases of esophagus will not be covered in the training as well as in examination. All residents are expected to attend 1-day course every year to familiarize about Advanced trauma and life support class (ATLS)

**First year**

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| Adult cardiac Surgery-4 months |
| Pediatric cardiac surgery-4 months |
| Thoracic and Vascular surgery-2 months<br><br>**Elective Rotation** |
| i. Cardiology –1 month |
| ii. Perfusion-2 weeks |
| iii. BMT wing and AMC-2 weeks |

During cardiology posting the trainee shall familiarize and learn the following

1. Interventional cardiology including catheter skills, measurement of cardiac output, Qp, Qs, coronary angiogram views, basics of PTMC
2. Trans thoracic echocardiogram-various echocardiography views, familiarize with echo of congenital heart diseases, valvular heart diseases and ischemic heart diseases

At the end of perfusion posting the trainee should be able to assemble CPB circuit and should have helped senior perfusionist in 10 open-heart cases

The syllabi for BMT wing and AMC course is given separately

**Second year**

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| Adult cardiac surgery-6 months |
| Pediatric cardiac surgery-4 months |
| Thoracic and vascular surgery-2 months |

**Final Year**

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| Adult cardiac surgery-6 months |
| Pediatric cardiac surgery-4 months |
| Thoracic and Vascular Surgery-2 months |

## Mandatory credits

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| Publication | 5 |
| BMT | 3 |
| Statistics | 5 |
| Outstanding performance | 5 |
| Attending National Conference | 5 |

Outstanding performing resident in Cardiothoracic and vascular surgery is defined a resident who performs the topmost in internal assessment

| **CREDITS** | |
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| Operating room | 50 |
| Clinical work | 30 |
| Case presentations | 20 |
| Seminars | 25 |
| Journal club | 10 |
| Teaching Skills | 3 |
| Internal Examination (6x4) | 24 |
| Thesis | 15 |
| **TOTAL CREDITS** | **200** |

## Annexure 1 – Evaluation forms

### 1) EVALUATION FORM FOR PATIENT EVALUATION & MANAGEMENT / CLINICAL PRESENTATION 20 credits

Name of the student:

Name of the Faculty / Observer:

Date:

| Sl. No. | Items of observation during Presentation | Poor 1 | Below average 2 | Average 3 | Good 4 | Very good 5 |
|---|---|---|---|---|---|---|
| 1 | Completeness of history | | | | | |
| 2 | Accuracy of clinical signs | | | | | |
| 3 | Clarity of Presentation | | | | | |
| 4 | Assessment of problem and investigational plan | | | | | |
| 5 | Treatment plan | | | | | |
| 6 | Ability to defend diagnosis and plan | | | | | |
| 7 | Knowledge of the current and past literature | | | | | |
| | **Grand Total** | | | | | |

## 2. EVALUATION OF JOURNAL REVIEW PRESENTATIONS (10credits)

Name of the Student:

Name of the Faculty / Observer:

Date:

| Sl. No. | Items of observation during Presentation | Poor 1 | Below average 2 | Average 3 | Good 4 | Very good 5 |
|---|---|---|---|---|---|---|
| 1 | Extent of understanding of scope & objectives of the paper of the candidate | | | | | |
| 2 | To critically evaluate methods, analysis and interpretations of study | | | | | |
| 3 | Whether cross references have been consulted | | | | | |
| 4 | Whether other relevant publications consulted | | | | | |
| 5 | Ability to respond to questions on the paper / subject | | | | | |
| 6 | Ability to defend the paper | | | | | |
| 7 | Clarity of Presentation | | | | | |
| 8 | Audio – Visual aids used | | | | | |
| 9 | Ability to propose new research ideas based on study discussed | | | | | |
| | **Total Score** | | | | | |

**3. <u>EVALUATION OF SEMINAR/SHORT TOPIC / PROBLEM ORIENTED CASE DISCUSSION / MORTALITY PRESENTATIONS (25 Credits)</u>**

Name of the student:

Name of the Faculty / Observer:

Date:

| Sl. No. | Items of observation during Presentation | Poor 1 | Below average 2 | Average 3 | Good 4 | Very good 5 |
|---|---|---|---|---|---|---|
| 1 | Whether all relevant publications consulted | | | | | |
| 2 | Understanding of the subject | | | | | |
| 3 | Completeness of the preparation | | | | | |
| 4 | Clarity of presentation | | | | | |
| 5 | Current concepts coverage | | | | | |
| 6 | Ability to answer the questions | | | | | |
| 7 | Time scheduling | | | | | |
| 8 | Appropriate use of Audio – Visual aids | | | | | |
| 9 | Overall performance | | | | | |
| 10 | Any other observation | | | | | |
| | **Total Score** | | | | | |

## 4. EVALUATION OF CLINICAL WORK IN WARD / OPD (credit 30 )

Name of the student:

Name of the Faculty / Observer:

Date:

| Sl. No. | Items of observation during presentation | Poor 1 | Below average 2 | Average 3 | Good 4 | Very good 5 |
|---|---|---|---|---|---|---|
| 1 | Regularity of attendance and punctuality | | | | | |
| 2 | Presentations of cases during rounds | | | | | |
| 3 | Maintenance of case records | | | | | |
| 4 | Investigations work up | | | | | |
| 5 | Interaction with colleagues and supporting staff | | | | | |
| 6 | Teaching and training junior colleagues | | | | | |
| 7 | Bedside Manners | | | | | |
| 8 | Rapport with patients and family | | | | | |
| 9 | Counseling Patient's relatives for blood donation or postmortem and case follow up | | | | | |
| 10 | Overall quality of clinical work | | | | | |
| | **Total Score** | | | | | |

## 5.Evaluation of Clinical / Practical work for Credits system

| Sl. No | Items of observation during presentation | Absent 1 | Below average 2 | Average 3 | Good 4 | Excellent 5 |
|---|---|---|---|---|---|---|
| *1* | *Patient work up* | | | | | |
| 2 | Pre-op discussion/Planning | | | | | |
| 3 | Procedural data | | | | | |
| 4 | Preparation of devices/ gadgets | | | | | |
| 5 | Surgical skills | | | | | |
| 6 | Tissue respect | | | | | |
| 7 | Technique for asepsis/Haemostasis | | | | | |
| 8 | Attention to closure | | | | | |
| 9 | Alertness in O R | | | | | |
| 10 | Post op surveillance | | | | | |

## Annexure 2 –Log Book

Table 1: Academic activities attended

**Name:** **Admission Year:**

**College:**

| Date | Type of activity<br>Specify Seminar, Journal club, Presentation, UG teaching | Particulars |
|---|---|---|
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**LOG BOOK**

Table 2: Academic presentations made by the students

**Name:** **Admission Year:**

**College:**

| Date | Topic | Type of activity Specify Seminar, Journal club, Presentation, UG teaching |
|---|---|---|
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**LOG BOOK**

Table 3: Diagnostic and Operative procedures performed

**Name:** **Admission Year:**

**College:**

| Date | Name | I D No. | Procedure | Category O, A, PA, PI* |
|---|---|---|---|---|
| | | | | |
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**Key:**

O -Washed up and observed

A -Assisted a more senior surgeon

PA - Performed procedure under the direct supervision of a senior surgeon

PI -Performed independently

## Project work/Dissertation/ Thesis:

1. Dept. of CVTS require 1 projects to be completed during the 3 year MCh program which includes Retrospective/Prospective studies OR Studies or experiments in biomedical wing.
2. Final presentation of the project at end of 30 months
3. Thesis writing and submission of the project at end of 30 months for External Examiners' evaluation and its acceptance and will have a credit of 15 points.

**MODEL OVERALL ASSESSMENT SHEET**

**Name of the college:**

**Academic Year:**

| **Sl. No.** | **Particulars** | **Name of the student and Mean score** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **A*** | **B*** | **C*** | **D*** | **E*** | **F*** | **G*** | **H*** | **I*** | **J*** |
| 1 | Journal Review presentations | | | | | | | | | | |
| 2 | Seminars | | | | | | | | | | |
| 3 | Clinical work in wards | | | | | | | | | | |
| 4 | Clinical Presentation | | | | | | | | | | |
| 5 | Teaching skill practice | | | | | | | | | | |
| | **Total Score** | | | | | | | | | | |

Note:  Use separate sheet for each year.

The above overall assessment sheet used along with the log book should form the basis for certifying satisfactory completion of course of study, in addition to the attendance requirement.

**I. List monthly academic programs that will be conducted by department for curriculum implementation.**

| | |
|---|---|
| **Journal club** | **1** |
| **Seminar** | **1** |
| **Case presentations** | **1** |
| **Surgical audit** | **1** |

**Interdepartmental meetings**:

Cardiology-CVTS Cath meet once a week

Combined Anesthesia and CVTS- once a Month

Examination Process

Internal evaluation 200 Marks

**Part-I**

**Paper-I** – 3 hours- 9 short essay type questions on applied anatomy and physiology.- 100 Marks

**Paper –II**- 3 hours – 9 short essay type questions on applied microbiology and Pathology and cardiovascular engineering – 100 Marks

**Passsing minimum 50 % for each paper**

**Part –II**

*(At the end of passing 3rd year and after passing part –I)*

**Paper –I**- short essay type questions (20mins) on clinical cardiovascular and thoracic surgery. – 100 Marks

**Paper –II**- short essay type questions (20min) on cardiovascular and thoracic surgery including recent advances. – 100 Marks

**Practical examination**

Clinical: one long case- 45 mins. – 100 Marks

Four short cases- 1 hour. – 100 Marks

Practical: Surgical pathology - 25 Marks

Operative Surgery - 25 Marks

Cardiac and Thoracic radiology - 25 Marks

Viva voce - 25 Marks

To pass student needs 50% of Part I and Part II.