KERALA UNIVERSITY OF HEALTH SCIENCES

THRISSUR – 680 596, KERALA

CURRICULUM & SYLLABUS OF

POST GRADUATE MEDICAL SUPER SPECIALITY COURSES
(Doctor of Medicine/ Magister of Chirurgery)

(2010-11 Admission onwards)

Doctor of Medicine (D. M.)

i) DM Cardiology
ii) DM Medical Gastroenterology
iii) DM Medical Oncology
iv) DM Nephrology
v) DM Neurology
vi) DM Pulmonary Medicine
vii) DM Paediatric Oncology

i) DM - CARDIOLOGY

OBJECTIVES

The goal of post graduate medical education in cardiology — DM (Doctor of Medicine) CARDIOLOGY — is to provide competent cardiologists who shall recognize the health needs of the community and carry out professional obligations ethically and in keeping with the objectives of national health policy. They shall have mastered most of the competencies in cardiology that are required for the cardiology practice at the tertiary levels of health care system. They shall also have acquired the basic skills in teaching of the medical and paramedical professionals. The major components of the curriculum shall be theoretical knowledge, practical and clinical skills, thesis skills, attitude skills and training in research methodology.

TRAINING PROGRAM

The training program will aim to give the candidate a sound training of cardiac diagnosis and management. During the period of training they shall take part in all the activities of the department including ward rounds, lectures, seminars, teaching assignments, laboratory studies, surgical session and other duties assigned to them by the Head of the Department.

All candidates shall work as full time residents during the period of training.

The training program shall be updated as and when required. The training shall include:-

a) Active involvement in the diagnosis and management of patients both in the outpatient, coronary care unit and the wards.

b) Participation in lectures, seminars, journal clubs, clinical group discussions etc.

c) Participation in research work in cardiology.

d) Exposure to basic and advanced diagnostic, therapeutic and laboratory techniques.

e) Exposure to biomedical statistics as applicable to basic research methodology

f) Post graduate students shall maintain log books of the work carried out by them. The log books shall be checked and assessed every 6 months by the faculty members, with a view to assure the progress the candidate has made and spot the inadequacies if any.

SYLLABUS – THEORY

Adequate knowledge should be obtained in the following fields of Cardiovascular Medicine:

1) **Applied anatomy** including embryology and development, functional anatomy of heart and great vessels, systemic and pulmonary circulations, histology of cardiovascular structures, biology of vessel wall.

2) **Applied Physiology**: Cardiac cycle, circulatory hemodynamics, cardiac contractility, pulmonary circulation, coronary circulation, blood pressure, biocontrol mechanisms, electrophysiology, cardiac failure, acid base balance, hemostasis & coagulation pathways, and sports physiology.

3) **Applied Pathology**: Congenital heart disease, classification and pathophysiology, rheumatic fever, valvular lesions, myocarditis, cardiomyopathies, pericarditis, constrictive pericarditis, bacterial and infective endocarditis, viral agents in heart disease, autoimmune mechanisms, coronary artery disease, myocardial infarction, hypertensive heart disease, pulmonary embolism, pulmonary hypertension, extrinsic heart diseases, cardiac tumors, electron microscopy in heart disease.

4) **Applied Pharmacology**: Principles of drug therapy, cardiac glycosides, antihypertensive, diuretics, antianginals, inotropic agents, antibiotics, antiarrhythmic agents, anticoagulants, anti-platelet drugs, fibrinolytic agents and other drugs used for cardiovascular drug therapy

5) **Microbiology** relevant to cardiovascular infections and related entities.

6) **Cardiovascular Molecular Biology and Genetics**: Genetics of various Cardiovascular Diseases & Tissue regeneration of cardiovascular system & stem cells.

7) **Cardiovascular Investigations**: The candidate shall obtain adequate knowledge on simple and advanced cardiovascular investigations: electrocardiography (ECG), exercise stress testing, Holter recording, Signal averaged ECG echocardiography (including transesophageal), chest radiograph in cardiovascular disease, nuclear cardiology, cardiovascular magnetic resonance, computed tomography of the heart and blood vessels, C and blood vessels, cardiac catheterization: coronary angiography and coronary intravascular

imaging, hemodynamic measurements, cardiac electrophysiology testing, pacemaker, ICD and CRT evaluation.

8) **Cardiovascular Diseases**: They should develop firm understanding of the following cardiovascular diseases : acute & chronic heart failure, end-stage heart disease, arrhythmias, sudden death, syncope, hypotension, shock, cardiac arrest and sudden cardiac death; atherosclerotic cardiovascular disease, ST-elevation myocardial infarction, unstable angina and non ST-elevation myocardial infarction, chronic coronary artery disease, rheumatic fever, valvular heart diseases, risk factor management for atherothrombotic disease, systemic hypertension, lipoprotein disorders, diseases of aorta, peripheral arterial diseases, prevention and management of stroke, heart disease associated with diabetes & metabolic syndrome, cardiomyopathies, myocarditis, cardiovascular abnormalities in HIV-infected individuals, toxins and the heart, tumors of heart, pericardial diseases, traumatic heart disease, pulmonary embolism, pulmonary hypertension, sleep disorders and cardiovascular disease; cardiovascular disease in women, pregnancy and other special populations; cardiovascular disease in endocrine disorders, rheumatic diseases, cancer, neurological disorders, renal disease, autonomic disorders, exercise related cardiovascular disorders and circulatory assist devices, catheter –based percutaneous cardiovascular interventions, fundamentals of cardiac surgery, anesthesia and non-cardiac surgery in patients with heart disease, preventive cardiology including nutrition management & exercise-based comprehensive cardiac rehabilitation & psychiatric behavioral aspects of cardiovascular disease.

They should develop concepts of economics and cost-effectiveness in cardiology and assessment and improvement of quality of cardiac care delivered.

SYLLABUS-PRACTICALS

The training pattern during the 3 year period shall be approximately as follows:

1. Ward and outpatient work : 6 months
2. ICCU training : 6 months
3. Invasive and non invasive lab training : 20 months
4. Cardiac surgery training : 2 months
5. Posting to an external center of excellence : 1 to 2 months

(The duration and choice of the center shall be decided be the Head of the Department).

During the period of practical training, the candidate should have acquired:

1. Adequate training in physical evaluation of the patients in the CCU, wards and outpatient settings by eliciting history and physical findings and synthesizing diagnosis and differential diagnosis, planning relevant investigations, prognostication and management

2. Adequate training in performing and/or interpreting various cardiovascular investigative modalities

3. Adequate exposure to catheter- based percutaneous interventions like angioplasty, stenting, valvuloplasty, congenital heart disease interventions, electrophysiologic studies and ablations and pacemaker implantations.

4. Exposure to cardiac surgery.

5. Teaching experience by taking class and demonstration for undergraduate, postgraduates and paramedical professionals

SCHEME OF EXAMINATION

Theory:

Part A Basic Sciences Paper I. Basic Sciences (embryology, anatomy, pharmacology, physiology, pathology, microbiology, molecular biology and genetics) **.**

Part B

Paper 1 - Clinical Cardiology
Paper 2 - Cardiac Investigations and Therapeutics
Paper 3 - Recent Advances in Cardiology

B. Practical

The practical examinations shall consist of:
1. Clinical:- One Long case –
Two Short cases –

A thorough evaluation of the candidates in all cases touching upon the various aspects like history taking, physical findings elicitation, and discussion of the problem, diagnosis, investigation and management should be done. Ward rounds for evaluating the candidate's ability to assess and manage day to day problems, performance of investigations may also be conducted.

2. Ward Rounds & Spotters:

3. Discussion on spotters (10 to 20) covering ECG, X-ray, electrophysiology, echocardiography, angiography, diagnostic and interventional hardware, pat.hology specimens, cardiovascular computed tomography, cardiovascular magnetic resonance

4. Viva voce: Shall cover all branches of cardiology

DM NEONATOLOGY

CONTENTS

A) BASIC SCIENCES

- Basic genetics
- Fetal and neonatal immunology
- Mechanism of disease/s
- Applied anatomy and embryology
- Feto-placental physiology
- Neonatal adaptation
- Thermo-regulation
- Development and maturation of lungs respiratory control, lung functions, ventilation, gas exchange, ventilation perfusion.
- Physiology and development of cardiovascular system, developmental defects, physiology and hemodynamics of congenital heart disease.
- Fetal and intrauterine growth.
- Development and maturation of nervous system, cerebral blood flow, blood brain barrier, special senses.
- Fetal and neonatal endocrine physiology
- Developmental pharmacology
- Developmental hematology,
- Development of liver functions and bilirubin metabolism
- Renal physiology
- Physiology of gastrointestinal tract, sucking, swallowing, digestion, absorption.
- Fluid and Electrolyte balance.
- Metabolic pathways pertaining to glucose, calcium and magnesium
- Biochemical basis of inborn errors of metabolism

B) GENERAL TOPICS

- Research methodology
- Biostatistics
- Ethics in perinatology/neonatology
- Principles of education (objectives, curriculum, assessment and use of media)
- Computer, informations technology, internet

- PER1NATOLOGY
- Perinatal and neonatal mortality, morbidity, epidemiology.
- High risk pregnancy: detection, monitoring and management.
- Fetal monitoring, clinical, electronic; invasive, and non-invasive
- Intrapartum monitoring and procedures
- Assessment of fetal risk, and decision for termination of pregnancy
- Diagnosis and management of fetal diseases

- Medical diseases affecting pregnancy and fetus, psychological and ethical considerations
- Fetal interventions.
- Fetal origin of adult disease

NEONATAL RESUSCITATION

NEONATAL VENTILATION
BLOOD GAS AND ACID BASE DISORDERS NEONATAL

ASSESSMENT AND FOLLOW UP

- Assessment of gestation, neonatal behaviour, neonatal reflexes
- Developmental assessment, detection of neuromotor delay, stimulation techniques
- Growth monitoring
- Immunization

CARE OF LOW BIRTH WETGHT BABIES

C) BODY SYSTEMS

i) Respiratory system

- Neonatal airways: physiology, pathology; management
- Pulmonary diseases: Hyaline membrane disease, transient tachypnea, aspiration pneumonia, pulmonary air leak syndromes, pulmonary hemorrhage, developmental defects
- Oxygen therapy and its monitoring
- Pulmonary infections
- Miscellaneous pulmonary disorders.

ii) Cardiovascular system

- Fetal circulation, transition from fetal to neonatal physiology
- Examination and interpretation of cardiovascular signs and symptoms
- Special tests and procedures (Echocardiography, angiography)
- Diagnosis and management of congenital heart diseases
- Rhythm disturbances
- Hypertension in neonates
- Shock: pathophysiology, monitoring, management.

iii) Gastrointestinal system

- Disorders of liver and biliary system.
- Bilirubin metabolism
- Neonatal jaundice: diagnosis, monitoring, management, phototherapy, exchange transfusion.
- Kernicterus
- Prolonged hyperbilirubinemia.
- Congenital malformations
- Necrotising enterocolitis

iv) Nutrition

- Fetal nutrition
- Physiology of lactation
- Breast feeding
- Lactation management, breast milk banking, maternal medications and nursing
- Feeding of Low Birth Weight
- Parenteral nutrition
- Vitamins and micronutrients in newborn health

v) Renal system

- Developmental disorders
- Renal functions
- Fluid and electrolyte management
- Acute renal failure (diagnosis, monitoring, management).

vi) Endocrine and metabolism

- Glucose metabolism, hypoglycemia, hyperglycemia
- **Calcium disorders**
- Magnesium disorders
- Thyroid disorders
- Adrenal disorders
- Ambiguous genitalia
- Inborn errors of metabolism

vii) Hematology

- Physiology
- Anemia
- Polycythemia
- Bleeding and coagulation disorders
- Rh hemolytic disease

viii) Neurology

- Clinical neurological assessment

- Neonatal seizures
    - Intracranial hemorrhage
    - Neuro-physiology, EEG, BERA etc.
- Brain imaging
- Hypoxic ischemic encephalopathy
- Neuro-muscular disorders
- Degenerative diseases
- CNS malformation

ix) Surgery and orthopedics

- Diagnosis of neonatal surgical conditions
- Pre and post-operative care
- Neonatal anesthesia
- Metabolic changes during anesthesia and surgery
- Orthopedic problems

x) Neonatal infections

- Intrauterine infections
- Superficial infections
- Diarrhea
- Septicemia
- Meningitis
- Osteomyelitis and arthritis
- Pneumonias
- Perinatal HIV
- Miscellaneous infective disorders including HBV and Candidemia

xi) Neonatal Imaging

- Xrays, ultrasound, MRI, CT Scan etc.

xii) **Neonatal ophthalmology**

- Developmental aspects
- Retinopathy of prematurity
- Sequelae of perinatal infections

xiii) Neonatal ENT disorders

) **Neonatal dermatology**

D) **TRANSPORT OF NEONATES**
E) **NEONATAL PROCEDURES**
F) **ORGANIZATION OF NEONATAL CARE**
G) **COMMUNITY NEONATOLOGY**

- Vital statistics, health system;
- Causes of neonatal, perinatal death
- Neonatal care priorities and National programmes
- Neonatal care at primary and secondary levels
- Role of different health functionaries

H) OTHER TOPICS OF CONTEMPORARY IMPORTANCE

II

TRAINING PROGRAMME

- Learning in DM neonatology will essentially be self-directed and will take place while working in various areas and through interactions in the rounds.
- Following minimum formal sessions are recommended in order to facilitate and supplement the efforts of the faculty and students :
  - Journal club(once a week)
  - Perinatal round(once a week)
  - Seminar(once a week)
  - Clinical case discussion (once a week)
  - Perinatal audit(once a month)
  - Research review(once a month)
  - Neonatal surgery(once a month)

- In addition, sessions on imaging, pathology, microbiology, biostatistics/epidemiology as well as interdepartmental seminars may be undertaken.
  - Candidates will be required to follow up and document long-term (1 year or more) course of at least 15 babies during the DM course.

Academic	**Training**	**Procedure / skills**
FIRST YEAR		
Seminars Case presentation Project work	Case records Ward rounds Communication skills Computer skills NRP Human lactation management Research Methodology External Posting: (latter part)*Opthalmolology* *Pediatric Surgery*	Resuscitation Procedures Equipment — handling and trouble shooting Care of normal newborn level 1 and II care

SECOND YEAR		
Seminars Journal review Interdepartmental Perinatal round Conferences/ CME	Research methodology Pedagogy workshop Teaching UG's/PG's communication skills Community program External Posting: *Perinatology, Cardiology,* *Community Neonatology* *Developmental Neonatology,*	Prenatal counselling Genetic counselling Management under supervision NFC Procedures Level II and III care
THIRD YEAR		
Treatment planning Publication Research	External Posting: *Research during* I^{st} *part of 3 year* Organization of Neonatal unit Infection control Leadership and organization - CME / Conference - Quiz - Community programs - Equipment purchase	Independent management of NICU neonate Followup Counselling

III.
Practical training (postings and roster) with respect to clinical material as applicable to the course.

POSTINGS

a. **Overview**

The total period of DM course is 36 months. Of this, 30 months would be exclusively in clinical Neonatology. The remaining 6 months would be used for essential rotation and research activity.

b. **Newborn services**

The candidates will have at least 30 months of posting in the newborn services. The candidates must get adequate exposure to neonatal follow up, neonatal emergencies, delivery room care of neonates and acquisition of practical skills (specified in Annexure I).

c. **Essential Rotations : (6 months)**

- Perinatology — Obstetrics (Dept. of Obstetrics-Gynecology): **1 month**
- Neonatal surgery*: **1 month**

(Candidate should have been directly associated with the management of at least 10 neonatal surgical patients. He/ She should have observed the operative procedures and the post-operative management of all these patients. These cases must be documented in the log book)

- Community neonatology, Ophthalmology, Child development / rehabilitation * **: 6 weeks**

(Ophthalmology: Candidate should have observed at least 50 ROP evaluations and assisted the ophthalmologist during these procedures and viewed ROP stages thru the "observation ophthalmoscope" whenever feasible. Any other neonatal ophthalmological problems seen should be appropriately documented.)

(Community Neonatology should be done in association with the field visits of the community medicine program)

(Child development attachment would involve observing developmental evaluation and intervention therapy --- and assisting the developmental therapist during these sessions. Follow-up and evaluation of 15 high risk Neonates till the age of] year must be documented in conjunction with the developmental therapist and the activities of the Dept. of Developmental Pediatrics)

- Radiology*,Cardiology*: **2 weeks**
- Research #:**2 months**

* The rotation could be done as designated physician for specific rotations while continuing to work in the Neonatal ICU.
# This period would be used for research work. The candidate would be doing once a week NICU duties during this period and exempted from all other routine clinical work.
Log book entries for essential rotation:

The tenure of the course and the elective postings should be utilized by the candidates to familiarize themselves through consultation and self learning, the essentials of genetics, perinatal pathology, anesthesiology, epidemiology / biostatistics, basic sciences, informatics and education technology etc.

Academic	Training	Procedure / skills
FIRST YEAR		
Seminars Case presentation Project work	Case records Ward rounds Communication skills Computer skills NRP Human lactation management Research Methodology External Posting: (latter *part)Opthalmolology, Pediatric Surge?),*	Resuscitation Procedures Equipment — handling and trouble shooting Care of normal newborn level 1 and II care
SECOND YEAR		
Seminars Journal review Interdepartmental Perinatal round Conferences/ CME	Research methodology Pedagogy workshop Teaching UG's/PG's communication skills Community program External Posting: *Perinatology, Cardiology, Community Neonatology Developmental Neonatology,*	Prenatal counselling Genetic counselling Management under supervision NFC Procedures Level II and III care
THIRD YEAR		
Treatment planning Publication Research	External Posting: *Research during 1[3.1] part of 3 year* Organization of Neonatal unit Infection control Leadership and organization - CME / Conference - Quiz - Community programs - Equipment purchase	Independent management of NICU neonate Followup Counselling

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ii. DM – MEDICAL GASTROENTEROLOGY

Introduction

The syllabus in case of DM training should be dynamic. Trainees should acquire overall knowledge in Gastroenterology not only by reading standard textbooks, but also should keep abreast of new knowledge dealing with Gastroenterology, Hepatology, Pancreatology and related Basic Sciences and Epidemiology by reading monographs, peer reviewed journals and latest guidelines of the major gastrointestinal and hepatology societies. The training should also focus on the local problems.

TEACHING

The training program should include close supervision of clinical work and assessment in the initial period followed gradually by greater delegation of responsibility. Log book should be maintained and staged evaluation on a semester basis during the 3 years of training.

a) Clinical Teaching

Emphasis should be laid on training at work. The trainees should provide supervised outpatient and in-patient care. The consultations coming from the sister departments, surgical departments, paediatrics and Gynecology can be utilized to train the candidates. The trainees would be following a residency system. They should also embark upon basic research.

Trainees must be exposed to clinical features, clinical data analysis, investigative work-up, clinical decision making, emergency care and ethical aspects of all common diseases in the field of gastroenterology and hepatology.

Clinical case presentations by trainees and ward rounds with faculty must serve as important media for training in the art of eliciting history and physical signs, synthesis of information, decision making and treatment of the patients.

b) Procedures on patients

Several diagnostic and therapeutic procedures are done on patients in the speciality of gastroenterology, most prominent of them being endoscopic procedures. They have to be taught to the trainees in a graded manner. They would be given hands on training in endoscopic procedures and Doppler ultrasound. Prior to introducing the trainees to the endoscopic and Doppler ultrasound procedures, an exam would be conducted to assess the theoretical proficiency of the candidate in all the matters related to these procedures.

Proposed list of minimum number of procedures

	Procedures	***No.***
i	Upper GI Endoscopy	100
ii	Side Viewing duodenoscopy	25*
iii	Endoscopic variceal ligation	5
iv	Injection treatment	5
v	Full length colonoscopy	25
vi	Polypectomy	5
vii	Endoscopic retrograde cholangio-pancreatography	25*
viii	Doppler ultrasound scans	100
ix	Ultrasound scan guided procedures	25
* May observe		

c) Imaging and laboratory

Diagnostic techniques like radiological and other imaging and laboratory techniques relevant to patients with gastroenterological diseases must receive attention. Trainees must be exposed to the theory behind these techniques and must be demonstrated all the tests. This may be organized either by arranging periodic workshops or through rotation in different areas performing these techniques. Trainees need to be familiarized with interpretation of these data.

d) Didactic and theoretical teaching

Teaching may be organized as seminars and journal clubs the trainees should be encouraged to present the topics under active supervision by the faculty. Emphasis must be placed on review of recent information by the trainees and improvement of their critical faculties. Attempts must be made to cover all particularly common gastroenterological diseases and those that gain importance through recent research and information in pathogenesis, diagnosis and therapy. These topics should be organized in such a way that every trainee gets exposed to most of these areas during his training. The schedule of teaching would be structured in such a way that during the first six months the trainee would be strengthening his clinical gastroenterology, doppler ultrasound exposure would be given in the second half of first year. The training in endoscopy would start from the second year. Posting in the various peripheral centres as part of Community gastroenterology would also start from the second year. In the final year , the candidates would be given independent charge of ward , ICU and endoscopy. Integrated teaching with the other departments should be achieved to address the common problems of interest. The collaborations should be at both horizontal and vertical levels.

e) Basic sciences

DM trainees ought to be familiar with basic science aspects of techniques and diseases that they encounter such as molecular biology, biochemistry, physics, etc. The candidates should be exposed to animal experiments in the department of Pharmacology

TIME TABLE

The training would be a residency programme spanning a duration of 3 years. The pattern of training in each of the semester would be as follows

1st year

Clinical ward posting including ICU
Initiating Research process
Human Rights information
Awareness about right to information
Development of communication skills both in the vernacular and English language
Ethical training
Defining brain death
Counseling for organ transplantation
Computer orientation
Initiating Doppler ultrasound scan under supervision

2nd year

Change of posting to a busier ward with greater responsibility
Independent OPD and Doppler ultrasound scanning
Initiating Oesophagogastro duodenoscopy under supervision
Organising CME, workshops and seminars

3rd year

Change of posting – Independent charge of the wards
Independent Oesophagogastro duodenoscopy and ultrasound scan based procedures
Teaching (Inter and intradepartmental)
Organising CME, workshops and seminars
Outside posting
Organising CME, workshops and seminars

Recommended Core Syllabus

Basic Sciences

1. Immune system of the gastrointestinal tract (GIT) and its importance in various GI disorders

2. Molecular biology in relation to GIT
3. Genetic diagnosis of relevant conditions.
4. Genetic diseases of the GIT and the liver
5. Gene therapy
6. GI tumors and tumor biology
7. Gastrointestinal hormones in health and diseases
8. Embryology of the gut, liver, pancreas and congenital anomalies
9. Oncogenes

Miscellaneous

1. Upper and lower gastro-intestinal bleeding
2. Gastrointestinal tuberculosis
3. HIV and the GIT, hepatobiliary and pancreatic systems
4. GIT and liver in systemic diseases
5. Cutaneous manifestations of GI diseases
6. Vascular diseases of the GIT
7. Gastrointestinal side effects of drugs especially NSAIDs
8. Gastro-intestinal symptoms physiology and interpretation
9. Nausea, vomiting
10. Pain abdomen
11. Diarrhoea
12. Constipation
13. Dysphagia
14. Jaundice

Oesophagus

1. Basic anatomy, histology and physiology
2. Congenital anomalies
3. Motility of the oesophagus and motor disorders
4. Mechanism of deglutition and dysphasia
5. Approach to a patient with dysphasia
6. Gastro-oesophageal reflux disease
7. Tumors of the esophagus
8. Oesophageal webs, membranes and diverticulum
9. Management of benign and malignant esophageal strictures
10. Oesophagus and systemic diseases
11. Infectious diseases of the esophagus
12. Foreign bodies in the oesophagus and stomach
13. Oesophageal perforation
14. Drug induced oesophagitis

Stomach

1. Anatomy, histology, functions
2. Physiology of acid and bicarbonate secretion in health and diseases
3. Defence mechanisms against acid and pepsin
4. Gastroduodenal motor function in health and diseases.
5. Gastritis (nonspecific and specific)
6. Helicobacter pylori infection
7. Peptic ulcer
8. Dyspepsia
9. Stress and stomach
10. Gastric hypersecretory states including Zollinger Ellison syndrome
11. Ulcer complications and their management
12. Surgery for peptic ulcer
13. Post gastrectomy complication
14. Bezoars
15. Tumors of the stomach
16. Diverticula and hernia of the stomach

Small Intestine

1. Anatomy, blood supply, histology
2. Motility of the small intestine
3. Congenital anomalies
4. Normal absorption of the nutrients
5. Intestinal electrolyte absorption and secretion
6. Malabsorption syndromes

Pathophysiology, manifestations and approach

7. Celiac sprue
8. Infection related diseases

a. Intestinal microflora in health and diseases
b. Tropical sprue
c. Whipple's disease
d. Infectious diarrhoea and food poisoning
e. Parasitic diseases

9. Small intestinal ulcers
10. Short bowel syndrome and intestinal transplantation.
11. Eosinophilic gastroenteritis
12. Food allergies
13. Intestinal obstruction and pseudo-obstruction
14. Short bowel syndrome
15. Acute appendicitis
16. Malrotation of the gut
17. Bezoars
18. Management of diarrhoea
19. GI lymphomas

20. Small intestinal tumors
21. Small intestinal transplantation

Colon

1. Basic anatomy blood supply, histology and functions
2. Motility of the colon and disorders of motility
3. Congenital anomalies
4. Megacolon
5. Constipation
6. Colonic pseudo-obstruction
7. Fecal incontinence
8. Antibiotic associated diarrhoea
9. Inflammatory bowel disease

    a. Ulcerative colitis
    b. Crohn's disease
    c. Indeterminate colitis
    d. Ileostomies and its management

10. Diverticular disease of the colon
11. Radiation entero-colitis
12. Colonic polyps and polyposis syndromes
13. Malignant diseases of the colon
14. Other inflammatory diseases of colon including

    a. Solitary rectal ulcer syndrome
    b. Diversion colitis
    c. Collagenous and microscopic colitis
    d. Non specific ulcerations of the colon
    e. Malakoplakia
    f. Pneumatoses cystoids intestinalis

15. Hemorrhoids
16. Diseases of the anorectum

Pancreas

1. Anatomy, physiology, blood supply, developmental anomalies
2. Physiology of the pancreatic secretion
3. Pancreatic function tests
4. Acute pancreatitis
5. Recurrent acute pancreatitis
6. Chronic pancreatitis
7. Malignancies of the pancreas (Exocrine and endocrine)
8. Cystic fibrosis and other childhood disorders of the pancreas

9. Hereditary pancreatitis
10. Pancreatic transplantation

Biliary Tree

1. Anatomy, Physiology
2. Physiology of bile formation and excretion
3. Enterohepatic circulation
4. Bilirubin metabolism.
5. Approach to a patients with jaundice
6. Gallstones, its complications, and management
7. Acute acalculous cholecystitis
8. Miscellaneous disorders of the gallbladder
9. Acute cholangitis
10. Benign biliary structure
11. Benign and malignant neoplasms of the biliary system.
12. Endoscopic management of biliary obstruction.
13. Motility and dysmotility of the biliary system and sphincter of Oddi dysfunction
14. Congenital diseases of the biliary systems

Liver

1. Anatomy, physiology, blood supply
2. Functions of the liver
3. Microcirculation of liver
4. Liver function tests
5. Portal hypertension

    i. Extrahepatic portosplenic vein obstruction
    ii. Non cirrhotic portal fibrosis
    iii. Cirrhosis

6. Acute viral hepatitis
7. Chronic hepatitis
8. Fulminant hepatic failure
9. Subacute hepatic failure
10. Cirrhosis of liver
11. Ascites
12. Hepatorenal syndrome
13. Autoimmune liver disease
14. Metabolic liver disease
15. Sclerosing cholangitis- primary and secondary
16. Primary biliary cirrhosis
17. Hepatic venous outflow tract obstruction
18. Fibrocystic diseases of the liver
19. Wilson's disease

20. Hemochromatosis
21. Liver in porphyria
22. Hepatic tumors
23. Infections of the liver
24. Liver in pregnancy
25. Liver in congestive heart failure
26. Liver biopsy
27. Liver transplantation and artificial liver support

Peritoneum and Retro peritoneum

1. Ascites
2. Chronic peritonitis
3. Budd-Chiari syndrome
4. Malignant ascites
5. Diseases of the retroperitoneum

Nutrition

1. Normal nutritional requirements
2. Assessment of nutritional status
3. Protein energy malnutrition
4. Manifestations and management of nutritional deficiency and excess
5. Nutritional support in various GI disorders (malabsorption, acute and chronic pancreatitis, inflammatory bowel disease)

Geriatric gastroenterology
Pregnancy related GI and hepatologic disorders
Paediartric gastroenterology
Vascular Diseases of the GI Tract

GI Radiology :- Reading and interpreting the common x-ray films including
_ X-ray films of the abdomen
_ Barium studies, ultrasound examination
_ CT scans, MR scans and angiography and ERCP films

GI Pathology:-Reading and interpreting histological slides of common gastrointestinal and liver diseases.

Endoscopic Training:-Endoscopic training is an integral part of training in super specialty of gastroenterology. A trainee is supposed to have knowledge of instruments and its application.

i. Endoscopes
ii. Accessories
iii. Sterilization of endoscopes and accessories

iv. Electrosurgical instrument
v. Keeping of endoscopes and accessories

Examination
Part A
Paper I Basic Sciences
Part B
Paper II – Principals and practice of gastroenterology
Paper III – Principals and practice of gastroenterology
Paper IV – Recent activities in gastroenterology
Practicals
Ward Rounds
Viva Voce

iii) DM Medical Oncology

GOAL

Provide specialized training in medical Oncology, including Hospital based oncology practice, Community Oncology development and Community intervention Strategies.

Instill the concept of wholesome management of a cancer patient.

Instill team spirit by involving the radiation oncologist, surgical oncologist, Nuclear medicine & allied imaging departments, palliative care specialists & pathologists as team players in all patients and other departments as & when necessary.

OBJECTIVES

At the end of the training program the candidate should have: -

1) Basic Scientific Principles – The trainee should have clear concepts regarding the basic principles of Biology of normal cells, basic processes of carcinogenesis, gene structure, expression and regulation, cell cycle and interaction with therapy, tumor cell kinetics, tumor cell proliferation, tumor immunology and molecular techniques.

2) Basic Principles in the Management and Treatment of Malignant Diseases – The trainee at the end of training program, should be thorough with the basic principles of malignant disease management including clear understanding of pathologic techniques, serum markers, cell membrane and DNA markers, TNM staging systems, Indications forclinical, radiographic and nuclear medicine procedures, response assessment.

3) Management and Treatment of Individual Cancers and their associated complications – After completion of the training program the trainee should be well versed with the

management of all human cancers, chiefly Head and neck, Lung, Gastrointestinal, genitourinary, gynecological, breast, mesenchymal, skin, endocrine, neurological and hematological malignancies. He also needs to be competent in managing pediatric oncology patients.

4) Psychosocial Aspects of Cancer – The trainee should become skillful in handling cultural issues, spiritual conflicts, adaptive behavior, coping mechanisms, communication.

5) Patient Education – The trainee should learn to consciously involve in educating the patients in matters of genetic counseling (screening and assessment of risk), health maintenance (Diet, smoking, alcohol consumption), long term complications, risk of treatment induced cancer, endocrine dysfunctions.

6) Bioethics, Legal, and Economic Issues – The trainee should be fully proficient in dealing with issues of taking informed consent for research activities, ethical conduct of medical research, legal issues (Life support and its withdrawal), cost efficiency and professional attitude.

7) Skills – During the training period the trainee should imbibe and develop the skills of anticancer agent administration (Prescribing, administering, Handling and disposal of chemotherapeutic and biologic agents), clinical procedures (bone marrow aspiration, biopsy, lumbar punctures, abdominal and thoracic paracentesis), ommaya reservoir management. He should be capable of treating pain & other symptoms associated with advanced malignancies.

8)Community responsibilities – He should be well versed with community aspects of cancer screening including cancer registry and other aspects of preventive oncology. He should become competent to plan and implement community intervention strategies and should be well trained to link up with the existing health care system and be able to address screening, early detection and health awareness issues.

9) Constant development – He should be aware of the recent developments in the field of Medical Oncology, chemotherapeutics, preventive oncology, molecular biology.

SKILLS

As a part of 'Hands on training', the following are the minimum stipulated requirements to be fulfilled by the candidate at the end of three-year training period in Medical Oncology. The candidate will maintain a logbook and take signatures of the concerned consultant involved in each case.

Region	*Level*	*No of Cases*	*Treatment*
Head and Neck	Supervised	20	Multidisciplinary Management of head and neck cancers
	Independently	30	
Breast	Supervised	30	Chemotherapy protocols
	Independently	50	
GI Cancers	Supervised	20	Chemotherapyfor major GI malignancies
	Independently	30	Like Ca stomach, Ca pancreas, Colorectal and hepatobiliary cancer
Gynecology Cancer	Supervised	10	Chemotherapy for gynaecological tumors
	Independently	30	
Skin and Sarcomas	Supervised	10	Chemotherapy protocols
	Independently	25	
Hematological	Supervised and independently (AML/ALL/ Lymphomas)		
Germ Cell tumors			
Radiotherapy	Should have assisted in planning and treatment execution of at least 5 malignancies of different sites including at least one brachytherapy plan		

COURSE CONTENTS

Basic Science

- Lectures on basic sciences as relevant to oncology;
  - Topics: see syllabus (**Annexure 1**)

Clinical Experience

- Clinical work including chemotherapy, daily patient management, management of patients on chemotherapy and palliative care for advanced malignancy patients.
- Weekly multi-disciplinary seminar so as to cover the topics of Malignancies of Head & Neck, Gastrointestinal tract, Thorax, Bones & soft tissue sarcomas, Breast, Skin, Gynecologic oncology and other miscellaneous sites - over a 36-month period.
- Once a month journal club presentation.
- Attendance to at least one oncology conference every year.
- Involvement in clinical trials.
- A research project (thesis).
- Teaching and Learning activities like Seminar, Symposium, Guest lectures etc.
- Compulsory attendance toat least 2 oncology CME's during the period of three years.

Diagnostic Skills

- He should carry out diagnostic procedures like bone marrow aspiration and biopsy, Lumbar Puncture, thoracocentesis etc..

Chemotherapy Treatment – aware of protocols and regimens:

As mentioned in the table on skills.

Training Period

- The proposed duration of the course will be 3 years.

THESIS

- The candidate will carry out one prospective study during his training period. The study will have to be presented before the scientific and ethics committees before initiating. The topic for thesis will be decided within the first 6 months and the study will have to be completed six months before completion of the three-year tenure.
- The study should be of a high caliber, worthy of Publication in an indexed journal.

METHODS OF TRAINING

Year-wise structure of Training Program: The candidate will spend major part of the first and last year in the parent department (Medical oncology).

Postings in other departments (Radiation oncology, Pathology, Molecular Lab, Pain and Palliative care) will be done in co-ordination with those departments.

Rotation and Posting in other departments

The candidate would spend the 3 years with the following structured rotation:

Number of months	Department
24 months	Medical Oncology
3 months	Radiation Oncology
3 months	Molecular Biology & Basic Science Lab
2 months	Pain and Palliative Care
1 month	Radiology
3 months	Rotation to another Cancer Institute (optional and on a reciprocal basis)

The candidates will be full time residents of the institutions and will perform the duties and responsibilities of a full time physician in oncology.

Theory & Practical Examination

Internal assessment of the candidates: This will be done on a continual basis by the faculty with respect to the overall objectives of the course, and specifically with respect to their treatment skills, time spent with patients in pre & post treatment assessments, planning Chemotherapy, seminars, journal club & tumour board presentations.

Examination :

Part A

Paper 1: Basic science as applied to Medical Oncology.

A final examination will be conducted at the end of the course by internal and external examiners. It will consist of four theory papers (3 papers x 100 marks each)

Part B

Paper 1:

Medical Oncology – I (Breast, Gynaec , Genito-urinary, GI and Pediatric malignancies)

Paper 2:

Medical Oncology – II (Head & Neck, Thorax, skin, soft tissue & bone, lymphomas and miscellaneous)

Paper 3:

Recent advances in oncology and palliative care

Practicals

Ward Rounds

Vivavoce

- ***Logbook***

Maintenance of a logbook of cases worked up, assisted, done, administered, Chemotherapy and palliative care cases.

Annexure 1:

DM MEDICAL ONCOLOGY

SYLLABUS: -

1. Essentials of Molecular Biology- Principles, Genomics and Cancer, Signal transduction, Immunology, Cytogenetics, Cell Cycle, Apoptosis, Invasion and metastases, angiogenesis and Carcinogenesis: Genetics, viral, physical and Chemical. Genomics and Proteomics, Destabilization of the Cancer Genome, Telomeres, Telomerase, and Cell Immortalization, Cancer Stem Cells.
2. Epidemiology-epidemiological methods, descriptive and analytical epidemiology.
3. Principles of Cancer management; Surgical Oncology, Medical Oncology, Radiation Oncology and Biologic Therapy.
4. Cancer Therapy.
5. Pharmacology of Cancer Biotherapeutics - Interferon Interleukin, Hormonal therapy, Differentiating agents, monoclonal antibodies, anti angiogenic factors.
6. Clinical Trials.
7. Cancer prevention, Tobacco related cancers, diet, chemo prevention.
8. Cancer screening.
9. Cancer Diagnosis – Molecular pathology and Cytology, Imaging, Endoscopy, Laparoscopy.
10. Specialized techniques- vascular access, isolated perfusion, and Intensity Modulated Radiation therapy.
11. Systemic Oncology:
    - i. Head and Neck Cancer
    - ii. Lung Cancer
    - iii. Mediastinal neoplasm
    - iv. Gastrointestinal tract cancer
    - v. Cancers of Genitourinary system
    - vi. Gynecologic cancer
    - vii. Breast cancer
    - viii. Endocrine Malignancies

ix. Musculoskeletal tumours
x. Sarcomas of the Soft Tissue
xi. Mesothelioma
xii. Cancer of the skin
xiii. Malignant Melanoma
xiv. Central nervous system malignancies
xv. Pediatric malignancies
xvi. Lymphomas and Leukemia's

12. Paraneoplastic syndromes.
13. Cancer of the unknown primary.
14. Peritoneal carcinomatosis.
15. Cancer in immunosuppressed host.
16. Oncological emergencies – SVC syndrome, spinal cord compression, metabolic emergencies, urology emergencies.
17. Treatment of metastatic cancer-brain, lung, bone, liver, malignant Effusions and ascites.
18. Haemopoetic therapy-transfusion, grown factors, autologous and Allogenic stem cell transplantation.
19. Infection in the cancer patient.
20. Supportive care and quality of life-pain management, nutritional support, sexual problems, genetic counseling, psychological issues, community resources, care of the terminally ill patient.
21. Adverse effects of treatment –nausea and vomiting. Oral complications, pulmonary toxicity, cardiac toxicity, hair loss, gonadal dysfunction, recurrence, miscellaneous toxicity.
22. Rehabilitation of cancer patients.
23. Oncology nursing including various access routes.
24. Ethical Issues in Oncology.
25. Societal Issues in Oncology
26. Information systems in Oncology.
27. Alternative methods in Cancer treatment.
28. Newer approaches in Cancer treatment- Gene therapy, Molecular therapy, Cancer vaccines, image guided surgery, heavy particles in Radiation therapy, Focused Ultrasound, RNA Inhibition, Charged Particle Therapy, Robotic Surgery, Nanotechnology
29. Reconstructive surgery.

The following is the list of journals for the proposed D.M. course in Medical Oncology.

S. No.	Journal Title	Freq.	Publisher
1.	Clinics of North America	Q	W.B. Saunders
2.	Journals of Clinical Oncology	BM	W.B. Saunders
3.	Lancet Oncology	M	Elsevier Science
4.	Nature Clinical Practice Oncology	M	Nature
5.	Indian Journal of Cancer	Q	Medknow Publishers
6.	Gynecologic Oncology	M	Elsevier Science
7.	Annals of Oncology	10/Yr	Elsevier Science
8.	CA: a cancer journal for clinicians	BM	Lippincott Williams and Wilkins
9.	Cancer Treatment Reviews	BM	W.B. Saunders
10.	Journal of Experimental & Clinical Cancer Research	Q	Regina Elena Institute for Cancer Research (Italy)
11.	Cancer Control	BM	Mosfitt Cancer Centre and Research Institute
12.	Cancer	30/yr	John Wiley & Sons
13.	British Journal of Cancer	SM	Churchill Livingston
14.	Acta Oncologica	8/yr	Taylor and Francis
15.	Current Problems in Cancer	BM	Elsevier Science
16.	Current Opinion in Oncology	BM	Elsevier Science

Abbreviations used

W	Weekly
M	Monthly
SM	Semi monthly
BM	Bimonthly
Q	Quarterly
I	Indian
F	Foreign

iv) DM Nephrology

AIMS AND OBJECTIVES

The programme aims at training a Physician in the specialty of Nephrology encompassing the related knowledge, skills, research methodology and attitudes which will enable him/her to function as an independent clinician/consultant, a teacher or a research scientist.

During the period of training the candidate is expected

1. To acquaint himself/herself with the past and current literature on relevant aspects of basic, investigative and clinical nephrology.

2. To acquire performance skills for diagnostic and therapeutic procedures and interventions.

3. To diagnose, plan and interpret investigations and treat various acute and chronic kidney ailments by relevant therapeutic methods.

4. To identify, frame and carry out research proposals in the specialty.

5. To acquire thorough knowledge of internal medicine and allied general and clinical disciplines to ensure appropriate and timely referrals.

6. To acquaint with relevant education delivery system to be able to function as a health education

The Department should have adequate regular permanent faculty, renal pathology, Hemodialysis, Peritoneal dialysis, CRRT, CAPD programmes and regular renal transplantation, this is an indispensible for starting DM course in Nephrology.

At the end of the training period for the degree of DM in Nephrology, a candidate should be able to give advanced specialist training in the field of clinical investigations and management of Nephrological diseases.

METHOD OF TRAINING

The training of the post graduate for the DM degree course shall be on a residency pattern with assigned responsibilities of patient care. The participation of the students in all facts of the training process shall be insisted upon.

1. Nephrology wards	-12 months (split it into 1st yr & 2nd yr)
2. Dialysis	-12months (split it into 1st yr & 2nd yr)
3. Transplantation	-10 months (in the 3rd year)
4. Radiology, Urology,	- 1 month
Outstation posting	- maximum period of 2 months

Nephrology ward posting

Candidate is expected to acquire the ability of case taking and healthy personal relationship with the patient, Investigate and manage the patient under the guidance of a Postgraduate Teacher.

Dialysis posting

Trainee is expected to do the canulations, making access for different extracorporeal treatments, peritoneal catheter insertions and renal biopsy procedures under the guidance of a postgraduate teacher

Renal Transplantation posting

Trainee is expected to do the donor, recipient evaluation, perfusion procedures of transplantation, Brain death criteria and diagnosis, Counselling for organ transplantation, ICU care of recipients and follow up of the transplant recipients under the cover of a post graduate teacher.

During the training period he/she is expected to participate in a public meeting where renal diseases are discussed for the common people.
During the training period he/she is expected to take classes for undergraduates, postgraduates, nursing students, and trainees of dialysis technology.

Clinical training schedule will include the following:

- Bedside rounds - daily
- Mortality meeting - once a week
- Seminar - once in two weeks

- Grand rounds - once a week
- Journal club - once in two weeks
- Renal histology conference - once in two weeks
- Clinical case discussion - once a week
- Transplant meeting - once a week
- Nephro-urology conference - once a week
- Nephro-radiology conference - once a week
- Out patient nephrology care including renal transplant clinic

Didactic Lectures

A minimum of 15-20 lectures/year covering the recent advances in all aspects of renal diseases would be delivered by consultant faculty. In addition, candidates will be required to attend the complete, short term basic and clinical courses on

1. Bio-statistics
2. Research methodology and experimental lab medicine relevant to Nephrology
3. Use of Computers in Medicine
4. Bio ethics, ethical issues in transplantation including "Human Organ Transplant Act"

Interventional Procedures

A candidate will be required to have achieved proficiency in performing and supervising hemodialysis, peritoneal dialysis and renal biopsies. He would be expected to have performed a minimum of 50 renal biopsies, 300 hemodialysis including CVVHD, CRRT and 50 peritoneal dialysis. The candidate would be expected to involve and be trained in all aspects of CAPD programme. The candidate would also be expected to have inserted at least 50 internal jugular, 50 femoral and 50 subclavian vascular access catheters. The candidate would maintain record of all the procedures/ interventions in a log book, which would be certified by the Head of the department.

Investigative work-up

The candidate is expected to perform routine urine examination and ultrasonography. In addition he/she must familiarize himself/herself with the following investigations:

Laboratory:

- Electrolyte and acid base analysis
- Renal function tests
- Auto analyzer functioning
- Renal pathology interpretation including immuno-fluoresence and electron microscopy.

Radiological:

- Intravenous urography
- Micturating cystourethrography
- Digital subtraction angiography
- Selective renal angiography and interventional angioplasty and stenting
- Selective renal venography
- Doppler studies
- Antegrade and retrograde pyelography
- CT imaging
- Magnetic resonance imaging

Nuclear Medicine:

- Various renal isotope imaging and functional techniques
- Urodynamic studies

Microbiology:

- Viral, Bacterial and funal cultures, Serological and PCR techniques

Immunological test:

- ANCA, ANA, anti DsDNA, complement, anit GBM ab, cryogloblin, immunoelectrophoresis

Tissue typing:

- Cross match, serological typing, molecular HLA typing, PRA

Renal function testing

- Renal plasma flow, GRF
- Renal concentrating, diluting capacity
- Micro albuminuria
- Proteinuria measurement
- Urinary acidification
- Renal sodium and potassium handling

SYLLABUS-THEORY

1. Anatomy and embryology of the kidney.
2. Physiology of the Kidney.
3. Basic and advanced investigations in renal diseases
4. Fluid and Electrolyte disorders
5. Basic knowledge of Immunology
6. Basic knowledge of Renal Pathology

7. Basic knowledge of Renal therapeutics
8. Basic training in Renal Radiology
9. Kidney diseases in children
10. Hereditary & congenital kidney diseases
11. Kidney diseases in Pregnancy
12. Kidney diseases in Pregnancy
13. Glomerular diseases
14. Interstitial diseases
15. Hypertension & Vascular diseases
16. Kidney disorders in geriatricsgy
    i. Infections of Kidneys
    ii. Acute Kidney injury
    iii. Chronic Kidney diseases
    iv. Sytemic diseases & Kisney
    v. Dialytic therapies
    vi. Renal Transplantation
    vii. Drugs and Kidney
    viii. Urological diorders.

SUGGESTED BOOKS AND JOURNALS

Following books and journals are suggested for reading. Latest edition should be made available in central/departmental library.

Book Editor

1. The Kidney- Brenner and Rector
2. Diseases of kidney and urinary tract- Schrier and Gottschalk
3. Heptinstall's Pathology of the kidney- J Charles Jennets
4. Hand book of dialysis - Daugirdas
5. Kidney Transplantation - Peter Morris
6. Oxford Text Book of Nephrology -Alex davision, Stewart Cameron et al
7. Massry and Glassock's Text Book of Nephrology
8. The Kidney- Physiology and Pathophysiology DW Seldin and G Giebisch
9. Immunological Renal Diseases- EG Neilson and WG Couser.
10. Comprehensive Clinical Nephrology-Jurgen Floege,Richard Jhonson ,john Feehally
11. Critical Care Nephrology- Ronco, Bellomo,Kellum
12. Comprehensive Pediatric Nephrology- Denis f geary, Franz Shaefer
13. Pediatric Nephrology-Ellis, William, Patrick Nerishigl
14. Text Book of Tramsplantation -Danowich
15. Principles & Prracticeof dialysis –William L Henrich

Journals of Nephrology

1. Kidney International
2. Nephrology Dialysis and Transplantation
3. Nature reviews in Nephrology
4. Amercan Journal of Kidney Diseases
5. Journal of American Soceity ofNephrology
6. Nephron
7 .Transplantation
8. Seminars' in Nephrology
9. Indian Journal of Nephrology
10. Electronic edition of Uptodate in Nephrology and Hypertension
11. Current opinion in Nephrology and Hypertension
12. New England J of Medcine

Examination :
Part A
Paper I Basic Sciences

Part B
Paper 2 – Clinical Nephrology
Paper 3 – Clinical Nephrology
Paper 4 – Recent advances in Nephrology
Practicals
Ward Rounds
Viva Voce

v. DM Neurology

OBJECTIVES

The course of DM Neurology is intended to train residents in

1. Medical Ethics.
2. Basics of Neurology.
3. Teaching skills to teach paramedical and medical professionals.
4. Clinical investigations.
5. Management of Neurological illness.
6. Research.

He/she should be able to work in the community, general hospitals, teaching hospitals and/or in tertiary care centres in keeping with the objectives of national health policy. This will be achieved through a closely supervised, graduated in service training programme,

involving practical training and education within the framework of the department of neurology and its related field.

TRAINING

All candidates shall work as full time residents (residency system) during the period of training. During the initial period they will be under close supervision followed gradually by greater delegation of responsibility.. During the period of training they shall take part in all the activities of the department including ward rounds, lectures, seminars, teaching assignments, laboratory studies, surgical session and other duties assigned to them by the Head of the Department or his representative. These activities are viewed as means of training. The training programme shall be updated as and when required at the discretion of the head of the department.

The training shall include:-

1. Active involvement in the diagnosis and management of patients both in the out patient, stroke unit, intensive care unit, and the wards.
2. Exposure to basic and advanced diagnostic, therapeutic and laboratory techniques.
3. Participation in Lectures, seminars, Journal clubs, clinical group discussions etc.
4. Participate in teaching of paramedical and medical students.
5. Exposure to biomedical statistics as applicable to basic research methodology.
6. Participation in research work in Neurology.
7. The consultations coming from the sister departments, surgical departments , paediatrics and Gynaecology can be utilised to train the candidates.
8. They should be trained in emergency care in Neurology particularly in the care of acute stroke with exposure to causality services.
9. Post graduate students shall maintain log books of the work carried out by them. The log books shall be checked and assessed (internal assessment) every 6 month by the faculty members, with a view to assure the progress the candidate has made and spot the inadequacies if any.
10. Periodic internal assessment at end of each semester.

Time table:

Residents are rotated between units once in 3 months.

First Year

Neuro-anaesthesia with special emphasis on airway protection and maintenace, intubation, different modes of ventilation, management of ventilator failure and ARDS.
Basics of research methodology.
Decide on the research project, get the clearance of research committee and ethics committee at the end of 3 months.
Basics of Plasma exchange. Initiate Plasma exchange under supervision.
Learn the protocol for thrombolysis for acute ischaemic stroke.

Brain death criteria and diagnosis.
Counselling for organ transplantation.
Computer orientation and maintenance of records both as hard and soft copy.
Right to information.
Ethics in Neurology
Theory of Peripheral nerves, myoneural junction, cranial nerves, with a view to learn nerve conduction studies during the last 3 months.
Start doing NCV and EMG under supervision
During the initial 3 months learn the tracts, and learn the theoretical basis of evoked potential studies.
Cerebral lobes and its functions.
Basic theory of normal wake and sleep EEG followed by abnormalities.
Theory and basics of CT scan brain, MRI brain and spine
Basics theory of Transcranial Doppler.

Second year:

Report EEG under supervision.
Introduction to transcranial Doppler under supervision.
Diseases diagnostic criteria, Scales used, treatment protocols in stroke, movement disorders, muscle diseases.
Muscle and nerve biopsy.

Diseases diagnostic criteria, Scales used, treatment protocols in peripheral nerve diseases, myoneural junction disorders, Dementia, Metabolic, nutritional and toxic disorders affecting nervous system.

Third year

Diseases diagnostic criteria, Scales used, treatment protocols in cerebellar degenerations, infections of the central nervous system, Demyelinating disorders of the central nervous system.

Diseases diagnostic criteria, Scales used, treatment protocols of the rest of the disorders in the syllabus.

PERIOD OF POSTINGS IN VARIOUS UNITS, DIVISION/DEPARTMENTS

The trainee will be posted in basically in Neurology department. Out station posting can be given for a **maximum of 2 months.** The out station posting will be according to the discretion of the head of the department looking at the deficiencies in the department or centre. Out side posting may be given for

1. Neuropathology,
2. Neuro anaesthesiology,
3. Electrophysiology,

4. Psychiatry,
5. Neurosurgery
6. Paediatric Neurology.

SYLLABUS-THEORY

1. Neuroanatomy:

   A. Anatomy of whole brain and spinal cord
   B. Anatomy of the cranial nerves, plexuses, peripheral nerves,and muscle
   C. Histology of:Cerebral hemispheres,Basal ganglia,cerebellum,Brainstem,Spinal cordPeripharal nerves, muscle and myoneural junction.
   D. Study of the section of various part of cerebral hemispheres, cerebellum, dienecephalon, brainstem, spinal cord etc.
   E. Blood supply of brain , spinal cord and anatomical regions of nervous system
   F. CSF formation , its pathway and related anatomy
   G. Anatomy of skull, craniocervical junction, vertebral column and rest of the skeletal system.
   H. Embryology: Development of the nervous system the skull, craniocervical junction and the vertebral column.

2. Neurophysiology:-Study related with functions of various Areas of the brain, spinal cord and peripheral nerves. Candidates should acquire a comprehensive knowledge in the electrophysiology especially in Electroencephalography, Electromygraphy and evoked potential studies.
3. Neuropathology:- Candidates should attend the Neuropathology department to acquire knowledge regarding the pathological aspects of various nervous system diseases and they must be able to report on the pathological slides.
4. Neuroradiology:-candidates should acquire knowledge in reading and reporting plain X-ray of the skull ,spine, CT scan, MRI, Transcranial Doppler, carotid doppler and DSA..They should also be aware about the advanced investigations like Isotop studies, SPECT and PET.
5. Neurogenetics:-Candidate should acquire sufficient knowledge in molecular genetics regarding the inheritance of various nervous system diseases and should have a scientific idea about the prenatal diagnosis and treatment of certain neurological inherited diseases.
6. Neurochemistry with specific reference to application in diseases in Neurology.
7. Neuropharmacology and its application in Neurology.
8. Disturbances of cerebrospinal fluid and its circulation.
9. Intracranial Neoplasms and Paraneoplastic Disorders
10. Infections of the Nervous System and Sarcoidosis
11. Viral Infections of the Nervous System, Chronic Meningitis, and Prion Diseases
12. Cerebrovascular Diseases
13. Craniocerebral Trauma
14. Multiple Sclerosis and Allied Demyelinating Diseases
15. Inherited Metabolic Diseases of the Nervous System

16. Developmental Diseases of the Nervous System
17. Degenerative Diseases of the Nervous System
18. The Acquired Metabolic Disorders of the Nervous System
19. Diseases of the Nervous System Caused by Nutritional Deficiency
20. Alcohol and Alcoholism
21. Disorders of the Nervous System Caused by Drugs, Toxins, and Other Chemical Agents
22. Diseases of the Spinal Cord
23. Electrophysiologic and Laboratory Aids in the Diagnosis of Neuromuscular Disease
24. Diseases of the Peripheral Nerves
25. Diseases of the Cranial Nerves
26. Principles of Clinical Myology: Diagnosis and Classification of Diseases of Muscle and Neuromuscular Junction
27. The Infectious and Inflammatory Myopathies
28. Electrophysiologic and Laboratory Aids in the Diagnosis of Neuromuscular Disease
29. The Muscular Dystrophies
30. The Metabolic and Toxic Myopathies
31. The Congenital Neuromuscular Disorders
32. Myasthenia Gravis and Related Disorders of the Neuromuscular Junction
33. Ion Channel Disorders: The Periodic Paralyses and Hereditary Nondystrophic Myotonias (Channelopathies)
34. Disorders of Muscle Characterized by Cramp, Spasm, Pain, and Localized Masses

Practical Training:

The candidate should gain adequate skill to elicit the clinical history and to pick up the physical findings,they should possess the ability to make the correct and complete diagnosis and competency to treat the cases,which include all the common as well as less common disease entities.

They shall have adequate exposure and hands on training in plasma exchange, Transcranial Doppler, Electromyography, Nerve conduction studies, Video EEG and sleep studies. Management of patients in intensive care unit, with special emphasis on thrombolysis in stroke, myaesthenic crisis, patients with AIDP, Encephalitis, Status epilepticus, Neuroleptic malignant syndrome etc.

Examination:
Part A
Paper I Basic Sciences
Part B
Paper II – Clinical Neurology
Paper III – Principles and practice of neurology
Paper IV – Recent advances in Neurology
Practicals

Ward Rounds Viva Voce

vi. DM Pulmonary Medicine

Introduction

GENERAL GOALS OF THE RESIDENCY TEACHING CUM TRAINING PROGRAM IN DM Pulmonary Medicine

The main goal of the training program is to produce pulmonary physicians with the necessary knowledge, skill and attitude to diagnose and manage in an effective manner, a wide range of clinical problems in Pulmonary Medicine as seen in the community or in secondary/tertiary care setting. Special emphasis is placed on the relatively common and treatable disorders. Possession of clinical skills required for making a diagnosis is given utmost importance.

As a result of training in Pulmonary Medicine, the physician should become competent in life saving interventions, the use of the various diagnostic tests, and interprets their results intelligently & promptly. In addition, trained pulmonary physician should possess knowledge and skills of all the relevant medical fields and appropriately deliver the required health care in these sectors. It is considered desirable for the post graduate residents from this specialty to be familiar with the fundamentals of research methodology also.

In order to be considered a competent Pulmonologist, a resident in Pulmonary Medicine must possess humanistic qualities, attitudes and behaviour necessary for the development of appropriate patient-doctor relationship.

SPECIFIC AIMS AND OBJECTIVES OF THE RESIDENT TRAINING PROGRAM (DM) IN PULMONARY MEDICINE

As a result of the training under this program, at the end of 3 years of postgraduate training, a resident must acquire the following knowledge, skills and competencies:

1. A thorough knowledge of pathological abnormalities, clinical manifestations, and principles of management of a large variety of medical conditions affecting respiratory system.

2. Skill and competence to choose and interpret correctly the results of the various routine investigations necessary for proper management of the patient. While ordering these investigations, a resident must be able to understand the sensitivity, specificity and the predictive value of the proposed investigation, as well as its cost-effectiveness in the management of the patient.

3. Skill and competence in interventions like endotracheal intubation, needle lung biopsy, bronchoscopy, needle thoracocentesis, Intercostal drain placement, pericardiocentesis, thoracoscopy, and various endobronchial procedures.

4. Skills and competence to perform commonly used diagnostic procedures, namely, pleural aspiration, pleural biopsy, lung biopsy, allergy testing, fine needle aspiration, polysomnography, ultrasonography and cardiopulmonary exercise testing.

5. Skill and competence to choose and interpret correctly the results of specialized investigations including radiologic, ultra-sonographic, biochemical, hemodynamic, electro-cardio graphic, electrophysiological, pulmonary functional, haematological, immunological, nuclear isotope scanning, arterial blood gas analysis results. polysomnographic and bronchoscopic results.

6. Skill and competence to provide consultation to other medical and surgical specialties and sub-specialties, whenever needed.

7. Skill and competence to function effectively in varied clinical settings, namely emergency/critical care, ambulatory care, out-patient clinic, in-patient wards.

8. Skill and competence to take sound decisions regarding hospitalization, or timely referral to other consultants of various medical sub specialties recognizing his limitations in knowledge and skills in these areas.

9. Proficiency in selecting correct drug combinations for different clinical problems with thorough knowledge of their pharmacological effects, side-effects, interactions with the other drugs, alteration of their metabolism in different clinical situations, including that in the elderly.

10.Skill and competence to advise on the preventive, restorative and rehabilitative aspects including those in the elderly, so as to be able to counsel the patient correctly after recovery from an acute or chronic illness.

14. Skill and competence to understand research methodology in Pulmonary Medicine and to undertake a critical appraisal of the literature published in various medical journals and be able to apply the same in the setting in which the resident is working.

15. Skill and competence to work cohesively in Resuscitation team along with paramedical personnel and maintain discipline and healthy interaction with the colleagues.

16.Skill and competence to communicate clearly and consciously, and teach other junior residents, medical students, nurses and other paramedical staff, the theory as well as the practical clinical skills required for the practice of Pulmonary Medicine.

Recommendations for D. M Pulmonary Medicine

(3 Year Post Doctoral Course)

There are 52 weeks in a year. Approximately 2 weeks are gazetted / restricted holidays. Therefore, for academic requirements 50 weeks per year are available. Hence, for a three year course 150 weeks are available. Out of these, 10 weeks in three years are not available for hospital work & academics due to conferences / CMEs / exchange programmes / thesis and case study writing.

Since this speciality demands a 24 hour service to the people, post graduates are required to work 8 hours a day and they are given a day off in a week.
Hours available per day

Six days in a week -8 hours-8 hours
Total number of hours per week- 8X6 -48 hours.
Total credit hours available for academics
(No of weeks X No of hours available /week = 150 X 48 = 7200 hrs)

The break up is proposed to be as follows :

A	Bedside teaching / Practicals. No of weeks(140) X No of working day / week (6) X No of hours available /day (6)	5040 hrs
B	Thesis / case study writing / conferences / CMEs programmes (No of weeks (10) X No of hours available /week (48))	480 hrs.
C	Theory No of weeks(140) X No of working day / week (6) X No of hours available /day (2)	1680 hrs
	Grand total	7200 hrs

A. Practical

1) **Skill stations**-140 X 6 hours = 840 hrs.
Duration 6 hrs / week
No of weeks 140.

Skill Stations: Includes all the bedside medical skills pertaining to Pulmonary Medicine

2) **Bed side Medical clerky**-140 X 30 = 4200 Hrs
Duration-5 Hrs / day.
-30 hrs / week.
Bed side Medical clerky includes case history taking, formulating a working diagnosis, ordering appropriate investigations, and accompanying the patient to the specialized investigation areas, interpretation of all the results and finally starting the treatment protocol for them.

It also lays emphasis on in field resuscitation and transportation of critically ill patients and continuing the care in the ER, ICU and various other places also.

B. Theory

Total Hours Available-1680 hours.

Besides interactive lectures theory includes Induction, documentation, Orientation, Journal Club, Internal Examination and Final Examination.

Curriculum

Total duration of training program **3 Years**

YEAR I

Introduction and preliminary posting in the Pulmonary Medicine	3 months
Respiratory Intensive Care Unit	3 month
General Medicine / Medical Intensive Care Unit	3months
Cardiology	2 months
Anaesthesiology	1 month

YEAR II

Pulmonary Medicine	3 months
Intensive Respiratory Care Unit	3 month
Paediatrics / PICU	3 months
Emergency Dept	2 months
Community Medicine	1 month

YEAR III

Pulmonary Medicine	6 months
Pulmonary Critical care	6month

Examination :
Part A
Paper I Basic Sciences
Part B
Paper II
Paper III
Paper IV
Practicals
Ward Rounds
Viva Voce

At the end of three years of training programme, a post graduate of DM Pulmonary Medicine should at least possess following skills

CLINICAL SKILLS

1 History taking & Physical examination: Analysis of data for clinical diagnosis
2 Knowledge about common clinical problems, Symptom complex, Diagnostic reasoning
3 Various investigations, interpretation
4 Interventional procedures
5 Critical care, Life saving procedures, Palliation and end of life decisions

COMMUNICATION SKILLS

I Professional Relationships
- A Patients and relatives
- B Colleagues/team work
- C Other staff

II Consultation Skills

II Record keeping

III Bereavement Care

- A Breaking bad news
- B Referral for counselling

MANAGERIAL SKILLS

I Policies/procedures (NHS, Hospital, Departmental)

II Staff management (planning, recruitment, appraisal)

III Equipment (choosing to ordering, medical physics)

IV Resource management/clinical budgeting

V Contracting/ setting standards, quality monitoring

VI Information technology/Health informatics

VII Clinical governance/audit, risk management

VIII Compliments/complaints

IX Medico-legal statements

X Committee Work

XI Liasing with other agencies (e.g. police, coroner)

XII Public Relations/media

XIII Major Incident planning/exercises

TEACHING SKILLS

I Lecture preparation

II Small Group techniques

III Presentation techniques

IV Teaching critique

V Departmental teaching programme

VI Professional Development (self-directed learning)

VII Teaching certificate expected

vii. DM Paediatric Oncology

PROPOSED ROTATIONAL TRAINING

Ist year	***Duration***
Paediatric Oncology Pathology Radiology	9 months 2 months 1 month
IInd year	***Duration***

Cancer Epidemiology & Statistics Cancer Research & molecular Lab methods Surgical Oncology Nuclear medicine Transfusion medicine Pain & palliative medicine Radiation Oncology BMT services	1 month 1 month 2 months 15 days 15 days 1 month 2 months 4 months
IIIrd year	***Duration***
BMT Pediatrics	2 months 10 months

PLAN FOR ASSESSMENT OF STUDENTS

1st assessment – at 1 ½ years	**Final assessment at 3rd year**
Part I Cancer Biology Pathology & molecular biology Clinical pharmacology Chemotherapeutic agents Epidemiology & biostatistics Basis of Surgical Oncology Basis of Radiation Oncology Radiodiagnosis Basics of Cancer.	**Part II written** Oncologic emergencies Infectious complications Clinical pathology & blood banking Hematological malignancies - ALL,AML, CML, MDS, NHL, HL. Solid tumors – Renal tumors, Neuroblastoma, germ cell tumors Soft tissue sarcoma, Bone tumors Retinoblastoma, CNS tumors Endocrine malignancies Rare tumors Hematopoietic stemcell transplantation Pain management Late effects of chemotherapy. **Part III Clinical exam.** Case examinations & VIVA.

PROPOSED SYLLABUS

I BIOLOGICAL BASIS OF CHILDHOOD CANCER

Epidemiology of childhood cancer
Childhood Cancer and Heredity
Molecular and Genetic Basis of Childhood Cancer
Biology of Childhood Cancer
Tumor immunology and Pediatric Cancer

II DIAGNOSIS AND EVALUATION OF THE CHILD WITH CANCER

Clinical Assessment and Differential Diagnosis of the Child with Suspected Cancer
Pathology and Molecular Diagnosis of Leukemias and Lymphomas
Diagnostic Pathology of Pediatric Malignancies

III PRINCIPLES OF MULTIMODAL THERAPY

General Principles of Chemotherapy
General Principles of surgery
Principles of Radiation Oncology
Infants and Adolescents with Cancer: Special Considerations
Hematopoietic Stem Cell Transplantation in Pediatric Oncology
Cancer Clinical Trials: Design, Conduct, Analysis, and Reporting
Regulating Patient Safety in Cancer Treatment
Cell and Gene Therapies – Role in pediatric oncology
Evolving Molecularly Targeted Therapies and biotherapeutics

IV MANAGEMENT OF COMMON CANCERS OF CHILDHOOD

Acute lymphoblastic leukemia
Acute Myelogenous leukemia
Chronic Leukemias of childhood
Myeloproliferative and Myelodysplastic Disorders
Hodgkin lymphoma
Malignant Non-Hodgkin Lymphomas in children
Lymphoproliferative Disorders and Malignancies Related to Immunodeficiencies
The Histiocytoses
Tumors of the Central Nervous System
Retinoblastoma
Tumors of the liver
Renal tumors
Neuroblastoma
Rhabdomyosarcoma and the Undifferentiated Sarcomas
Ewing Sarcoma Family of Tumors: Ewing Sarcoma of Bone and Soft Tissue and the Peripheral primitive Neuroectodermal Tumors
Nonrhabdomyosarcomatous Soft tissue sarcomas
Osteosarcoma

Germ cell tumors
Endocrine tumors
Management Of Infrequent Cancers of Childhood

V SUPPORTIVE CARE OF CHILDREN WITH CANCER

Oncologic Emergencies
Tumour Lysis Syndrome
Hematologic Supportive care for Children with Cancer
Infectious Complications in Pediatric Cancer patients
Nutritional Supportive care
Symptom Management in Supportive care
Nursing Support of the Child with cancer
Rehabilitation of the Child with cancer
Psychiatric and Psychosocial Support for the Child and Family
The other side of the Bed: What Caregivers can Learn from Listening to Patients and their families
Ethical Considerations in Pediatric Oncology

VI. OTHER ISSUES ARISING AT DIAGNOSIS, DURING TREATMENT, AND AFTER CESSATION OF THERAPY

Late effects of Childhood Cancer and Its Treatment
Educational Issues for Children with cancer
Palliative Care for the Child with Advanced Cancer
Financial Issues in Pediatric Cancer
Pediatric Cancer: Advocacy, Insurance, Education and Employment
Complementary and Alternative Medical Therapies in Pediatric Oncology
Pediatric Oncology in Countries with Limited Resources
Preventing Cancer in Adulthood: Advice for the Pediatrician
Resources for Children with Cancer, Their families, and Physicians
Role of Telemedicine in Pediatric Cancer care

Books suggested for reading

1. Pizzo, Philip A., ed. ; Poplack, David G. ed.Principles and practice of pediatric oncology 6TH Philadelphia : Lippincott Williams & Wilkins, 2011

2. Perry, Michael C. ed. The chemotherapy source book. 4th ed. Philadelphia : Lippincott Williams & Wilkins, 2008

3. Nathan, David G ed.; Orkin,Stuart H ed. Nathan and Oski's hematology of infancy and childhood. 5th ed. Philadelphia : W.B.Saunders,

4. Sutow , Wataru W ; Vietti , Teresa J ; Fernbach , Donald J. Clinical pediatric oncology. St. Louis : C.V. Mosby.

5. Pinkerton, C.R. ed. ; Plowman, P.N. ed. Paediatric oncology:Clinical practice and controversies. London : Chapman & Hall Medical.

6. Halperin, Edward C., ed. Pediatric radiation oncology. New York : Raven Press

Appendix for Academic Activities/Log Book

Model Evaluation Checklist

S l. No	Description
CHECKLIST- 1	*EVALUATION OF CLINICAL WORK*
CHECKLIST- 2	*EVALUATION OF CLINICAL CASE PRESENTATION*
CHECKLIST- 3	***EVALUATION OF SEMINAR PRESENTATION***
CHECKLIST – 4	*EVALUATION OF JOURNAL REVIEW PRESENTATION*
CHECKLIST-5	*EVALUATION OF TEACHING SKILL*
CHECKLIST- 6	*E V A L U A T I O N O F DISSERTATION PRESENTATION*
CHECKLIST- 7	*CONTINUOUS EVALUATION OF DISSERTATION*
CHECKLIST - 8	***OVERALL ASSESSMENT SHEET***

Model Table for log book

Sl . No	Description
TABLE 1	*ACADEMIC ACTIVITIES ATTENDED*
TABLE 2	***ACADEMIC PRESENTATIONS***
TABLE 3	*DIAGNOSTIC AND OPERATIVE PROCEDURES PERFORMED*

CHECKLIST- 1

EVALUATION OF CLINICAL WORK

Name of the Trainee: Date:

Name of the Faculty:

Sl. No.	**Items for observation during evaluation**	*Poor 0*	*Below Average 1*	*Average 2*	*Good 3*	*Very Good 4*
1.	*Regularity of attendance*					
2.	*Punctuality*					
3.	*Interaction with colleagues and supportive staff*					
4.	*Maintenance of case records*					
5.	*Presentation of cases*					
6.	*Investigations work -up*					
7.	*Bed - side manners*					
8.	*Rapport with patients*					
9.	*Counseling patients relatives for interventional procedures*					
10.	*Overall quality of clinical work*					
	Total score					

CHECKLIST - 2

EVALUATION OF CLINICAL CASE PRESENTATION

Name of the Trainee: *Date:*

Name of the faculty:

Sl. No	**Items for observation during presentation**	*Poor*	*Below Average*	*Average*	*Good*	*Very Good*
		0	*1*	*2*	*3*	*4*
1.	***Completeness of history***					
2.	***Whether all relevant points elicited***					
3.	***Clarity of presentation***					
4.	***Logical order***					
5.	***Mentioned all positive and negative points of importance***					
6.	***Accuracy of general physical examination***					
7.	***Whether all physical signs elicited correctly***					
8.	***Diagnosis: whether it follows logically***					
9.	***Investigations required*** ***In Relevant order***					
10	***Interpretation of Investigations***					
11	***Ability to discuss differential diagnosis.***					

12	***Discussion on management***					
	Grand Total					

CHECKLIST- 3

EVALUATION OF SEMINAR PRESENTATION

Name of the Trainee: Date:

Name of the Faculty:

Sl no	**Items for observation during presentation**	*Poor*	*Below Average*	*Average*	*Good*	*Very Good*
		0	*1*	*2*	*3*	*4*
1	***Whether other relevant publications consulted***					
2	***Whether cross - references have been consulted***					
3	***Completeness of Preparation***					
4	***Clarity of Presentation***					
5	***Understanding of subject***					
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					

CHECKLIST- 4
EVALUATION OF JOURNAL REVIEW PRESENTATIONS

Name of the Trainee: Date:

Name of the Faculty:

SI. No	Items for observation during presentation	*Poor*	*Below Average*	*Average*	*Good*	*Very Good*
		0	*1*	*2*	*3*	*4*
1.	***Article chosen***					
2.	***Extent of understanding of scope & objectives of the paper by the candidate***					
3.	***Whether cross-references have been consulted***					
4.	***Whether other relevant publications consulted***					
5.	***Ability to respond to questions on the paper/ subject***					
6.	***Audio - Visual aids used***					
7.	***Ability to discuss the paper***					
8.	***Clarity of presentation***					
9.	***Any other observation***					
	Total Score					

CHECKLIST-5

EVALUATION OF TEACHING SKILL

Name of the Trainee: *Date:*

Name of the faculty:

SI. No.	Items for observation	Strong Points	Weak Points
1.	***Communication of the purpose of the talk***		
2.	***Evokes audience interest in the subject***		
3.	***The introduction***		
4.	***The sequence of ideas***		
5.	***The use of practical examples and / or illustrations***		
6.	***Speaking style (enjoyable, monotonous, etc. Specify)***		
7.	***Attempts audience participation***		
8.	***Summary of the main points at the end***		
9.	***Ask questions***		
10.	***Answer questions asked by the audience***		
11.	***Rapport of speaker with his audience***		
12.	***Effectiveness of the talk***		
13.	***Uses AV aids appropriately***		

CHECKLIST-6
EVALUATION OF DISSERTATION PRESENTATION

Name of the Trainee: Date:

Name of the faculty / Observer:

Sl.No	**Points to be considered**	**Poor** ***0***	***Below Average 1***	***Average 2***	***Good 3***	***Very Good 4***
1.	***Interest shown in selecting topic***					
2.	***Appropriate review***					
3.	***Discussion with guide and other faculty***					
4.	***Quality of protocol***					
5.	***Preparation of Proforma***					
	Total Score					

CHECKLIST-7
CONTINUOUS EVALUATION OF DISSERTATION WORK

Name of the Trainee: Date

Name of the Faculty:

Sl. No.	**Items for observation during presentation**	**Poor**	***Below Average***	***Average***	***Good***	***Very Good***
		0	***1***	***2***	***3***	***4***
1.	***Periodic consultation with guide / co- guide***					
2.	***Regular collection of case material***					
3.	***Depth of Analysis / Discussion***					
4.	***Department presentation of findings***					
5.	***Quality of final output***					
6.	***Others***					
	Total score					

CHECKLIST - 8

OVERALL ASSESSMENT SHEET

Name of the College: Date:

Check List No	*PARTICULARS*								
		A	B	*C*	D	E	F	*G*	H	I
1.	*Clinical work*									
2.	*Clinical presentation*									
3.	*Seminars*									
4-	*Journal Review Presentation*									
5.	*Teaching skill practice*									
6.	*Dissertation work*									
	TOTAL									

Signature of HOD **Signature of Principal**

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

Key:
Mean score: Is the sum of all the scores of checklists 1 to 7
A, B,……: Name of trainees

LOG BOOK

TABLE 1

ACADEMIC ACTIVITIES ATTENDED

Name:

Admission Year:

College:

Date	**Type of activity - Specify Seminar, Journal club, Presentation, UG teaching**	**Particulars**

LOG BOOK

TABLE 2

ACADEMIC PRESENTATIONS MADE BY THE TRAINEE

Name :

Admission Year:

College:

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

LOG BOOK
TABLE 3
DIAGNOSTIC AND OPERATIVE PROCEDURES PERFORMED

Name

Date	*Name*	*OP No.*	*Procedure*	*Category O, A, PA, PI*

Key:

O - OBSERVED
A -ASSISTED A MORE SENIOR SURGEON

PA - PERFORMED PROCEDURE UNDER SUPERVISION
PI - PERFORMED INDEPENDENTLY

Magister of Chirurgery (MCh)

i. **MCh Surgical oncology**
ii. **MCh Cardio vascular and thorasic surgery**
iii. **MCh Plastic and reconstructive surgery**
iv. **MCh Genito urinary surgery**
v. **MCh Surgical Gastroenterology**
vi. **MCh Paediatric surgery**
vii. **MCh Neurosurgery**

i. MCh Surgical Oncology

The course objectives:

The three year surgical oncology course aims to develop a highly qualified and competent professional in the field of oncology who is capable of diagnosis, evaluation of patients in scientific manner and incorporate multi-disciplinary approach in the management of cancer. The candidate will be trained in the nuances of oncological sciences like imaging, pathological diagnostic methods, judicious use of neo-adjuvant and adjuvant therapies and all types of oncological surgeries except brain tumor surgery. Candidate is expected to gain basic knowledge in molecular oncology, clinical and translation research methodology, epidemiological sciences, biostatistics and preventive oncology apart from radiatiotherapy techniques, radiobiology and medical oncology.

Surgical oncologist can be aptly defined as an oncologist who is trained to evaluate, diagnose and perform all types of oncological surgeries. The leadership qualities should be inculcated into the candidate during the course of study so that he or she may be able to head a multi-disciplinary team in oncological practice.

At the end of the course the student should have acquired:-

(1) Broad understanding of the principles of Basic Medical Sciences related to oncology
(2) Ability and skills to perform and interpret investigative procedures
(3) Skills in the clinical diagnosis, planning of investigations and manage common cancers by judicious surgical techniques
(4) Capabilities to take independent decisions in emergency situations, perform required procedures and manage complications

(5) Competence in intensive care with practical knowledge of working with resuscitative and monitoring equipments
(6) Ability to critically appraise published literature, interpret data and to broaden his/her knowledge by keeping abreast with modern developments in surgical oncology and other areas of oncology
(7) Ability to search online, use information technology to his/her advantage and critically evaluate medical literature and draw his/her own conclusion.
(8) Ability to teach Post graduates, undergraduate and nursing students in the basic management of the cancer
(9) Ability to get acquainted with allied and general clinical disciplines to ensure appropriate and timely referral.
(10) Ability to conduct research.
(11) Ability to become a consultant and capability of organizing Multi-disciplinary oncology Departments.

PROFESSIONAL EXPOSURE RECOMMENDED

During the course of training, the candidate undergoes extensive training in following areas

1. Proper biopsy techniques
2. Appropriate use of diagnostic studies both scientifically and economically
3. Clinical reading of Xrays, CT scan,MRI and nuclear medicine studies
4. Endoscopic techniques- Upper GI, Colonoscopy, bronchoscopy, cystoscopy, nasopharyngoscopy, laryngoscopy
5. Research methodology
6. Major and minor Oncologic surgeries
7. Management of morbidity
8. Basic and advanced pathological techniques
9. Proper documentation and record keeping
10. Palliative care and pain management
11. Basic and advanced laparoscopic oncological surgeries

At the end of three years, the following procedures should be performed or assisted by the candidate.

Endoscopy:

Endoscopy	Minimum number to be performed
Direct laryngopharyngoscopy	30
Nasopharyngoscopy	20
Oesophagogastroduodenoscopy	50
Colonoscopy	30
Cystoscopy	20

Surgeries to assist and perform under guidance:

Major surgeries	Minimum number to assist	Minimum number to perform under supervision
Gastrectomy with extended lymph node dissection	10	5
Esophagectomy	10	5
Ilio-inguinal block dissection	5	3
Modified radical mastectomy	20	20
Breast conservation surgery	20	20
Neck dissections	20	10
Composite resections	20	5
Surgery for soft tissue sarcoma and bone tumors	15	5
Abdominoperineal resection/ LAR	20	10
Heaptobiliary-pancreatic resections	5	2
Uro-oncological resections	10	2
Lung resections	3	-

The clinical and academic programmes are considered most desirable for optimal training:

1. Journal club
2. Seminars
3. Clinical case discussions
4. Tumor board discussions/ Multidisciplinary board discussion
5. Mortality and morbidity audits

MANDATORY POSTING FOR MCh SURGICAL ONCOLOGY STUDENT:

First year:

After 9 months of General surgical oncology posting, each candidate should have rotational posting as follows

1 week in Pathology
1 week in tumor registry
1 week in community oncology
1week in nuclear medicine
1week in palliative care

Second year:

4 weeks posting in Medical oncology

4 weeks in radiotherapy
2 weeks in cancer research

Third year:

During third year, student should be sent to a reputed cancer centre within the state or outside the state for a period of one month(4 weeks) as an observer.

SYLLABUS :-

1. Essentials of Molecular Biology - Basic Principles, Genomics, Proteomics and Cancer, Cancer genome, Telomeres and Telomerase, Programmed cell death, Signal transduction, Immunology, Cytogenetics, Cell Cycle, Cancer stem cells, invasion and metastases, antigenesis
2.Principles of Oncology: Etiology of cancer, Tobacco Carcinogenesis, Cancer Susceptibility syndromes, Etiology of cancer- Viruses, Inflammation, Chemical factors, Physical factors, Dietary factors, Obesity and physical factors
3. Cancer Immunology
4. Basic Epidemiology - epidemiologic methods, descriptive and analytical epidemiology. Epidemiology of Cancer: Global cancer incidence, Changes in cancer mortality
5. Principles of Cancer management: Surgical oncology, Medical Oncology, Radiation Oncology and Biologic Therapy.
6. Principles of Health Services Research
7. Principles of Cancer Chemotherapy
8. Pharmacology of Cancer Biotherapeutics - Interforne interlukins, hormonal therapy, differentiating agents, monoclonal antibodies, antiangiogenic factors, antisense agents, preventive vaccines etc.
9. Clinical Trials
10. Cancer Prevention - tobacco related cancers, diet, chemoprevention etc
11. Tobacco – Global menace, dependence, treatment, legislation and preventive strategies
12. Cancer Screening
13. Cancer Diagnosis - Molecular pathology and Cytology, Imaging, Endoscopy, Laparoscopy, Nuclear medicine,
14. Specialised techniques in Cancer management- minimal access surgery, Vascular access, Isolated perfusion, intensity modulated radiation therapy, Interventional radiology, Radiofrequency thermal ablation, Functional imaging, Molecular imaging, Photodynamic therapy, recent advances in ablative techniques and biomarers.
15. Systemic Oncology:

i. Head and Neck Cancers
ii. Lung Cancer
iii. Medistinal neoplasms
iv. Gastrointestinal tract cancers
v. Cancers of Genitourinary system
vi. Gynaecologic cancers
vii. Breast cancer

viii. Endocrine Malignancies
ix. Musculoskeletal tumours
x. Mesotheloma
xi. Cancers of the skin
xii. Malignant Melanoma
xiii. Central nervous system malignancies
xiv Paediatric malignancies
xv. Lymphomas and leukemias
xvi. Plasma cell neoplasms

16. Pareneoplastic syndromes
17. Cancer of the unknown primary site
18. Peritoneal carcinomatosis
19. Cancer in immunosuppressed host
20. Oncologic emergencies - SVC syndrome, spinal cord compression,
Metabolic emergencies, urologic emergencies, increased intracranial tension etc
21. Treatment of metastatic cancer - brain, lung, bone, liver, malignant effusions and ascites.
22. Haemopoetic therapy - transfusion, grown factors, Autologous and Allogenic stem cell transplantation, cord blood stem cell transplantation
23. Infection in the cancer patient
24. Supportive care and quality of life - pain management, nutritional support, sexual problems, genetic counselling, psychological issues, community resources, care of the terminally ill patient.
25. Adverse effects of treatment – haematological toxicity, vascular events, nausea and vomiting. Oral complications, Pulmonary toxicity, cardiac toxicity, hair loss, gonadal dysfunction, second cancers, miscellaneous toxicity,Cancer Related Fatigue, Neurocognitive effects etc.
26. Communication to cancer patient
27. Rehabilitation of the cancer patient
28. Societal issues in Oncology
29. Complementary,Alternative and Integrative therapies
30. Oncology Nursing including various access
31. Ethical issues in Oncology
32. Information systems in Oncology
33. Alternative methods of cancer treatment
34. Newer approaches in cancer treatment - Gene therapy, molecular therapy, cancer vaccines, image guided surgery, heavy particles in radiation therapy,Robotic surgery, Nanotechnology
35. Principles of Reconstructive Surgery
36. Principles of pain management and palliative care-Hospice

Suggested Reference books:

Sl.No.	*Name of Book*	*Authors*	*Edition*	*Publication*
1	Surgery of Liver, biliary tract and pancreas Vol.1 and 2	L.H.Blumgart Jacques Belghiti,William Jarnagii,Roneld DeMatteo,William Chepmen,Markus Buchler,Lucy Hann	4th	Saunders
2	Ashcraft's pediatric surgery	George W HolcombIII J Patrick Murphy	5th	Saunders
3	Surgery of the Anus,rectum and colon	Michel R B Keighley Norman Williams	3rd	Saunders
4	Campbell –Walsh urology	Wein,Kavossi,Novick	9th	Saunders
5	Pearsons' thoracic and esophageal surgery	G. Alexander Patterson MDF. Griffith Pearson MDJoel D. Cooper MDJean Deslauriers MD FRCPS(C)Thomas W. Rice MDJames D. Luketich MDAntoon E. M. R. Lerut MD PhD	3rd	Saunders
6	Aesthetic plastic surgery	Serell J Asher,Duoglass Steinbech,Jenifer l Walden		Saunders
7	Holland frei Cancer Medicine	Hong,Bast,Hait,Kufe	8th	
8	Cancer,principles and practice of oncology	Devita,hellman,Rosenberg	8th	LWW
9	Head and neck ,surgery and oncology	Jatin Shah	3rd	Elsevier
10	Grabb and Smith's Plastic surgery	Charles H. Thorne, Scott P. Bartlett, Robert W. Beasley, Sherrell J. Aston, Geoffrey C. Gurtner, Scott L. Spear	6th	
11	General thoracic surgery	Sheilds,Locicero,Reed	7th	LWW
12	Comprehensive vascular and endovascular surgery	Hallet,Mills,Earnshaw	2nd	Mosby
13	Rothman-Simeone- The Spine	Herkowitz,Garfin,Esmont,Bell	6th	Elsevier
14	Comprehensive clinical	Floege Johnson Feehally	4th	Elsevier

	nephrology			
15	Operative Neurosurgical techniques Indication,methods and results	SchmiDEK and Sweet	4th	Elsevier
16	Sabiston and Spencer Surgery of chest	Frank W Sellke Pedro J del Nido Scott Swanson	8th	Saunders
17	Enzinger and Weiss Soft tissue tumors	Weis and Goldblun	8th	Mosby
18	Principles and practice of Gynecologic oncology	Barelett,Markman,Randall	5th	LWW
19	Diagnostic Histopathology of tumors	Christopher D M Fletcher	3rd	Elsevier
20	Rosai And Ackermen's Surgical Pathology	Juan Rosai	10th	Elsevier

Suggested Journals:

Journal of Clinical Oncology
European Journal of Surgical oncology
Cancer
Journal of Surgical oncology
Seminars in Surgical oncology
North American Clinics of Surgical oncology
Seminars in Oncology
Seminars in Radiation oncology
Pathology
Seminars in Nuclear medicine
American Journal of Surgical Pathology
Nature Cancer reviews
Annals of Oncology
Radiology

LOG BOOK:

Hand written log book should be maintained by the postgraduate during the entire course. It should include

1. Major surgeries
2. Minor surgeries
3. Endoscopies
4. Lectures attended

5. Papers presented
6. Conferences attended
7. Seminars
8. Presentations in academic sessions
9. Research activities
10. Audits

Log book should be duly signed by head of the department and should be presented to the examiners at the time of final examination.

PATTERN OF EXAMINATION:

Part A:

Paper - I Basic Sciences as applied to Surgical Oncology - 100

Part B

Theory – 3 Papers - 100 Marks each
Duration: - Three hours each
Paper-II Systemic Surgical Oncology - 100
Paper-III Surgical Oncology and related topics - 100
Paper-IV Recent advances in Surgical Oncology - 100

Paper I- Basic Sciences as applied to Surgical Oncology

Topics covered:

1. Essentials of Molecular Biology - Basic Principles, Genomics, Proteomics and Cancer, Cancer genome, Telomeres and Telomerase, Programmed cell death, Signal transduction, Immunology, Cytogenetics, Cell Cycle, Cancer stem cells, invasion and metastases, antigenesis

2.Principles of Oncology: Etiology of cancer, Tobacco Carcinogenesis, Cancer Susceptibility syndromes, Etiology of cancer- Viruses, Inflammation, Chemical factors, Physical factors, Dietary factors, Obesity and physical factors

3. Cancer Immunology

4. Basic Epidemiology - epidemiologic methods, descriptive and analytical epidemiology. Epidemiology of Cancer: Global cancer incidence, Changes in cancer mortality

5. Principles of Cancer management: Surgical oncology, Medical Oncology, Radiation Oncology and Biologic Therapy.

6. Principles of Health Services Research

7. Principles of Cancer Chemotherapy

8. Pharmacology of Cancer Biotherapeutics - Interforne interlukins, Hormonal therapy, differentiating agents, monoclonal antibodies, antiangiogenic factors, antisense agents, preventive vaccines etc.

9. Clinical Trials

10. Cancer Prevention - tobacco related cancers, diet, chemoprevention etc

11. Tobacco – Global menace, dependence, treatment, legislation and preventive strategies

12. Cancer Screening

13. Cancer Diagnosis - Molecular pathology and Cytology, Imaging, Endoscopy, Laparoscopy, Nuclear medicine,

14. Specialised techniques in Cancer management- minimal access surgery, Vascular access, Isolated perfusion, intensity modulated radiation therapy, Interventional radiology, Radiofrequency thermal ablation, Functional imaging, Molecular imaging, Photodynamic therapy, recent advances in ablative techniques and biomarers.

Paper II- Systemic Surgical Oncology:

Topics covered

i. Head and Neck Cancers
ii. Lung Cancer
iii. Medistinal neoplasms
iv. Gastrointestinal tract cancers
v. Cancers of Genitourinary system
vi. Gynaecologic cancers
vii. Breast cancer
viii. Endocrine Malignancies
ix. Musculoskeletal tumours
x. Mesotheloma
xi. Cancers of the skin
xii. Malignant Melanoma
xiii. Central nervous system malignancies
xiv Paediatric malignancies
xv. Lymphomas and leukemias
xvi. Plasma cell neoplasms
xvii. Pareneoplastic syndromes
xviii. Cancer of the unknown primary site
xix. Peritoneal carcinomatosis

xx. Cancer in immunosuppressed host

Paper III: Surgical oncology and related topics

Topics covered

1. Oncologic emergencies - SVC syndrome, spinal cord compression, metabolic emergencies, urologic emergencies, increased intracranial tension etc

2. Treatment of metastatic cancer - brain, lung, bone, liver, malignant Effusions and ascites.

3. Haemopoetic therapy - transfusion, grown factors, autologous and Allogenic stem cell transplantation, cord blood stem cell transplantation

4. Infection in the cancer patient

5. Supportive care and quality of life - pain management, nutritional support, sexual problems, genetic counselling, psychological issues, community resources, care of the terminally ill patient.

6. Adverse effects of treatment – haematological toxicity, vascular events, nausea and vomiting. Oral complications, Pulmonary toxicity, cardiac toxicity, hair loss, gonadal dysfunction, second cancers, miscellaneous toxicity, Cancer Related Fatigue, Neurocognitive effects etc.

7. Communication to cancer patient

8. Rehabilitation of the cancer patient

9. Oncology Nursing including various access

10. Principles of pain management and palliative care-Hospice

11. Ethical issues in Oncology

12. Societal issues in Oncology

13. Complementary, Alternative and Integrative therapies

Paper IV: Recent advances in surgical oncology

Topics covered

1. Information systems in Oncology and recent advances

2. Alternative methods of cancer treatment- Critical analysis

3. Newer approaches in cancer treatment - Gene therapy, molecular therapy, cancer vaccines, image guided surgery, heavy particles in radiation therapy, Robotic surgery, Nanotechnology

4. Principles of reconstructive Surgery and recent advances

5. Recent advances in Nutritional aspects in cancer

6. Recent land mark clinical trials and their impact in cancer management

7. Evolution of Targeted therapy and recent advances

8. Other recent advances

ii. MCh Cardio vascular and thorasic surgery

Curriculum & Syllabus:

Topics covered include:

CARDIAC SURGERY

Fundamentals

Surgical Anatomy of the Heart
Cardiac Surgical Anatomy and Physiology
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
Extracorporeal Circulation
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

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

Pathophysiology of Aortic Valve 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
Pathophysiology of Mitral Valve Disease
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

Immunobiology of Heart and Heart-Lung Transplantation
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

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

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
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

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

Postoperative Management of The General Thoracic Surgical Patient

General Principles of Postoperative Care
Mechanical Ventilation of the Surgical Patient

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

Embryology and Anatomy of 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

Anatomy of the Pleura
Reabsorption of Gases from the Pleural Space
Pneumothorax
Physiology of Pleural Fluid Production and Benign Pleural Effusion
Parapneumonic Empyema
Postsurgical Empyema
Tuberculous and Fungal Infections of the Pleura
Fibrothorax and Decortication of the Lung
Thoracoplasty: Indications and Surgical Considerations
Anatomy of the Thoracic Duct and Chylothorax
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
Surgical Anatomy of the Trachea and Techniques of Resection and Reconstruction
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

Statistical Analysis and Trial Design

Statistical Analysis

Clinical Trial Design

Carcinoma of the Lung

Lung Cancer: Epidemiology and Carcinogenesis
Screening for Long Cancer: Challenges for Thoracic Surgery
Investigation and Management of Nodules Less than One Centimeter in Size
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
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

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

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
Vascular Masses of the Mediastinum
Superior Vena Cava Syndrome: Clinical Features, Diagnosis, and Treatment
Vein Grafts for the Superior Vena Cava
The Use of Prosthetic Grafts for the Replacement of the Superior Vena Cava

Primary Mediastinal Tumors

Myasthenia Gravis
Standard Thymectomy
Transcervical Thymectomy
Video-Assisted Thymectomy
Extended Transsternal Thymectomy
Transcervical-Transsternal Maximal Thymectomy for Myasthenia Gravis
Evaluation of Results of Thymectomy for Nonthymomatous Myasthenia Gravis
Benign Lymph Node Disease Involving the Mediastinum
Biological Markers and Pathology of Mediastinal Lymphomas
Diagnosis and Treatment of Mediastinal Lymphomas
Benign Germ Cell Tumors of the Mediastinum
Primary Seminomas of the Mediastinum
Nonseminomatous Malignant Germ Cell Tumors of the Mediastinum
Poorly Differentiated Carcinoma of the Mediastinum
Benign and Malignant Neurogenic Tumors of the Mediastinum in Children and Adults
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
Critical Care

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:

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:

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

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

iii. MCh. Plastic and reconstructive surgery

Basic Science

1. Embryology and development of human tissues
2. Genetics and congenital abnormalities
3. Mechanism of healing of tissues, factors affecting the healing
4. Infection and its management
5. General principles of Surgery
6. The suture materials and suture techniques
7. Clinical examination of various systems and clinical photography
8. General anesthesia pre and post operative care for general anesthesia
9. Local, regional and other nerve blocks
10. Hypotensive and hypothermic anesthesia
11. Management of benign and malignant lesions
12. Wound healing, wound care, dressings and splints
13. Fluid and electrolyte balance, acid base balance
14. Shock and pulmonary failure, blood transfusions, ventilatory support and critical care
15. Assessment of trauma, vascular emergencies embolism

General Topics

1. History of Plastic Surgery
2. Scope of Plastic Surgery
3. Tissue distortion, tissue loss and its management
4. Tissue culture, Transplantation biology and its applications
5. Plastic Surgery instruments and equipments
6. Maintenance of medical records, informed consent
7. Applications of computer and related programs
8. Social psychological, ethical and medico legal aspects communication skills
9. Implants, orthotics and prosthesis and applied to Plastic Surgery
10. Tissue expansion and tissue distraction
11. Management of Leprosy, leprosy deformities and leprosy reconstructive surgery
12. Endoscopic Plastic Surgery
13. Advances, recent advances and current trends in Plastic Surgery
14. Principles of surgical audit, understanding journal and review articles, text books and reference books, critical assessment of articles
15. Research methodology and biostatistics
16. Arteriovenous malformations, varicose veins, chronic venous insufficiency
17. Meningomyelocoele, encephalocoele, spinal fusion defects, ventral defects, anorectal anomalies

Principal aspects of Plastic Surgery

Skin

1. Anatomy and functions of skin
2. Diseases and other conditions affecting skin
3. Skin grafts, its take and behavior
4. Scars, unstable scars and scar contracture
5. Hypertrophic scars and Keloids
6. Flaps, anatomy and physiology, classification and applications
7. Pedicled skin flaps and tube pedicle

Head and Neck

1. Embryology, anatomy, growth and development of face and facial skeleton
2. Structure and development of teeth
3. Temporomandibular joint and its dysfunction
4. Fractures of facial skeleton, management, sequel and subsequent surgery
5. Reconstruction of ear, eyelid, lip, nose, cheek and soft tissues of face
6. Congenital deformities of face and syndromes
7. Cleft lip and palate, embryogenesis, management, orthodontics, velopharyngeal incompetence and speech therapy
8. Craniofacial abnormalities, clefts, syndromes, microsomia, synostosis and hypertelorism Ptosis of eyelids
9. Facial Paralysis

10.Orthognathic surgery
11.Surgery of neck associated with congenital and acquired deformities
12.Rhinoplasty – corrective, aesthetic and reconstructive
13.Benign and malignant lesions and tumors of head and neck, tumor biology, management including chemotherapy, adjuvant therapy and radiotherapy
14.Reconstruction of mandible, maxilla and other bony defects
15.Prosthetic rehabilitation
16.Reconstruction of upper aerodigestive system

Trunk

1. Congenital and acquired defects of thorax and abdomen and its reconstruction
2. Decubitus ulcers and its management
3. Breast, anatomy, physiology, growth, development hormone influence, abnormalities, diseases, surgery and reconstruction, Gynecomastia
4. Reconstruction of full thickness defects of thorax and abdomen

Lower extremity

1. Anatomy and biomechanics of locomotor system
2. Functional anatomy of foot
3. Congenital and acquired deformities of lower extremity
4. Management of tissue defects following trauma
5. Lymphoedema

Genitourinary

1. Embryology and anatomy of the male and female genitourinary system and genitalia, undescended testis
2. Hypospadias, epispadias and ectopia vesicae, urinary diversion
3. Reconstruction of external genitalia
4. Vaginoplasty
5. Intersex
6. Infertility, vasectomy, tuboplasty, reconstruction

Hand

1. Embryology and anatomy of hand and upper extremity
2. Clinical examination of hand and general principles of hand surgery
3. Acute hand injuries
4. Tendon injuries
5. Nerve injuries
6. Brachial plexus injuries
7. Fractures and dislocations of hand
8. Injuries and disorders of nail
9. Electro diagnostic tests

10.Ischemic conditions and vasospastic disorders
11.Nerve compression syndromes
12.Surgery of spastic and tetraplegic hand
13.Infections and diseases of hand and its management
14.Congenital abnormalities of hand and its management
15.Tendon transfers
16.Lymphoedema
17.Benign and malignant tumors of hand
18.Rehabilitation of hand, physiotherapy, occupation therapy, splintage and prosthesis
19.Rheumatoid arthritis
20.Vascular malformations, tumors
21.Reconstruction of thumb
22.Reconstruction of mutilated hand
23.Innervated flaps

Micro-surgery

1. Principles of micro-surgery, micro vascular surgery and its applications
2. Replantations and revascularization surgery
3. Microvascular tissue transfer

Burns

1. Thermal, Electrical, Chemical, Radiation, Burns
2. Burns shock, Pathophysiology, treatment, wound care, nutrition, sequel
3. Post burn contractures, deformities and its management
4. Tangential excision, skin cover, allograft, homograft, xenograft and its application in burns
5. Planning for burns care in disaster
6. Organization of Burns care unit
7. Rehabilitation following burns, psychological and social impact

Aesthetic Surgery

1. Chemical peeling, dermabrasion, laser treatment
2. Blepharoplasty
3. Surgery of ageing face
4. Body contouring, liposuction, abdominoplasty, hernioplasty
5. Reduction and augmentation mammoplasty
6. Hair transplant
7. Orthognathic aesthetic surgery

M.CH. TRAINING IN PLASTIC SURGERY

Recommendations of the Association of Plastic Surgeons of India

Pre Requisites of a Training Centre In Plastic Surgery

1. Minimum beds 25 - 30

A) Burn beds extra
B) Separate facility for women and infants

2. Staff

A) Professor 1
B) Associate Professor/Reader 1
C) Assistant Professor/Lecturer 1
D) Service Doctors will be extra whether trainees or others Qualifications & experience as per MCI rules

3. Independent Operation theatre with requisite staff

4. Should take emergencies directly for primary care of cases pertaining to:

A) Hand trauma
B) Faciomaxillary trauma
C) Soft tissue trauma
D) Acute burns

5. Supporting facilities:

A) Physiotherapy & Occupational therapy
B) Orthostatic section for splint fabrication
C) Photography
D) Library-with all relevant books & periodicals
E) Experimental surgery laboratory for research and for practicing microvascular surgical techniques is desirables and recommended.
F) Facilities for cadaveric dissection

PATTERN OF EXAMINATION:

Part A:

Paper - I Basic Sciences relevant to Plastic Surgery - 100

Part B

Theory – 3 Papers - 100 Marks each
Duration: - Three hours each
Paper-II Principles and practice of plastic surgery - 100
Paper-III Operative Surgery and emergency management - 100
Paper-IV Recent advances in plastic surgery - 100

iv. MCh Genito urinary surgery

PREAMBLE

The objective of M Ch (Urology) degree course is to produce highly competent medical manpower in Urology. The training ingredients should provide in-depth knowledge of the entire urology and relevant basic allied subjects. The course is expected to bring about a change in attitude towards better scientific approach with logic and analysis. More stress should be given to development of psychomotor skills. This should culminate in shaping of a shrewd clinician, confident surgeon and a knowledgeable teacher insured to basic research methodology. Basis of an ideal training programme will be a powerful urology service complete in every sense. Today, a urology-teaching department should include complete adult and pediatric urology services with fully developed subspecialities such as gynaecologic urology, urooncology, neuro-urology, andrology & sexual dysfunction, newer modalities of stone management like endourological techniques and extracorporeal shock wave lithortripsy and renal transplantation.

SYLLABUS

It will cover wide spectrum of the diseases of urogenital system & retroperitorium. Apart from the clinical aspect of these subjects, candidate has to acquire indepth knowledge of the related basic subjects like applied; anatomy; embryology, physiology; biochemistry, pharmacology; pathology, microbiology ,epidemiology, immunology etc.

1. Anatomy and Embryology of GU tracts, adrenal & retroperitoneum.
2. Applied physiology and biochemistry pertaining to Urology, Nephrology, renal transplantation and renovascular hypertension.
3. Investigative urology & Genito-urinary radiology and imaging including nuclear medicine.
4. Male Infertility, Andrology and Urological endocrinology.
5. Sexual dysfunction- investigations and management.
6. Perioperative care, management of urological complications and care of the critically ill patients.
7. Urodynamics and Neurology.
8. Genito-urinary trauma.
9. Urolithiasis-Medical, Biochemical & Surgical aspects.
10. Uro-oncology-Adult & Paediatric
11. Reconstructive Urology.
12. Paediatric Urology-congenital malformations and acquired diseases.
13. Urinary tract infections and sexually transmitted diseases.
14. Obstructive Uropathy.
15. Renal transplantation (including transplant immunology medical & surgical aspects).
16. Renovascular Hypertension.

17. Gynaecological urology.
18. Newer developments in urology.
19. Operative Urology-open & endoscopic
20. Endourology
21. Behavioural and social aspects of urology.
22. Neonatal problems in Urology.
23. Electrocoagulation, lasers, fibre optics, instruments,catheters, endoscopes etc.
24. Retroperitoneal Diseases & Management.
25. Medical aspects of the kidney diseases.
26. Laparoscopic Urologic Surgery.

Apart from above mentioned subjects, each candidate should have basic knowledge of the following:

1. Biostatistics & Epidemiology.
2. Computer Sciences.
3. Experimental & Research methodlogy and Evidence Based Medicine.
4. Scientific presentation.
5. Cardio-pulmonary resuscitation.
6. Ethics in medicine.

TRAINING & TEACHING METHODOLOGY

Besides didactic lectures (delivered by the faculty members, national & international visiting teachers, seminar symposium and journal clubs is to be be organized. Problem oriented training to be given in the form of case discussions, ward rounds, inter-disciplinary meetings and department statistical meetings.

Every candidate is supposed to discuss a minimum of 2 clinico-pathological conferences. Practical is to be imparted by full time residency training programme, where a trainee will be given full responsibility of the patients. He will be encouraged to improve and develop his decision-making ability under supervision of teachers.

Research

Each candidate has to carry out two dissertation or studies for thesis, which should be acceptable for publication in a Indian Journal or any International Journal.

1. Experimental Research Project – One May be a) Animal lab work or b) Associated with a Basic science Dept.
2. Clinical Research Project – At least one

TRAINING IN OPERATIVE UROLOGY

Special attention to be paid to improve the operative skill of the candidate. He shall be trained to take independent operative decisions. In a time bound schedule an opportunity

will be accorded to perform all the major open as well as endoscopic procedures so as to let him develop mastery in the essential procedures. Candidates will be required to maintain a logbook of operative procedures with details of, if any, and their management. This will be reviewed every three months. Completed logbook is to be submitted before the practical examination and will be reviewed by the external examiners.

First Two Years

Each Candidate should spent time for basic research specially related to animal laboratory or in collaboration with basic department i.e. biochemistry, biotechnology and ratholog.

0-6 Months

A candidate is supposed to master following procedures.

1. **Cystourethroscopy,** filiform, dilatation, retrograde pyelography. Interpretation of normal and abnormal findings in relation to gross inflammations, obstructive and neoplastic changes in the lower urinary tract.

2. **Minor Urological Procedures:**

Needle biopsy of the prostate, dilatation, trocar cystostomy, open cystostomy, orchiectomy, circumcision, meatotomy/Meatoplasty Arterio-verous shunts, Excision of urethral caruncle.

3. **Uro-Radiological & Imaging Techniques:**

During this period a candidate should perform various uroradiological & Imaging procedures like Retrograde Urethrograms & Micturating, Cystourethrogram, cystogram, triplecystogram, nephrostogram, Whitaker test, sinogram, vasoseminography, antegrade pyelograpy, interpretation of Ultrasound & computerized tomography scans and renography, renal angiography including Digital Substration Angiography & venography.

06-09 Months

A candidate should learn, perform and interpret urodynamic studies like Cystometrogram, electro
myography & Urethral pressure profile & Video urodynamics. He will also perform and interpret various
tests of sexual dysfunction such as dynamic cavernosography, papavarin test, Penil-Brachial Index,
Noctornal penile tumescene, regiscan, sacral latency period and other evoked potential studies.

9-23 Months

He will assist and perform following procedures.

(a) Endoscopic Surgery:

Internal urothrotomy, Bladder neck Incesion, Litholopaxy, cystolithotripsy, insertion & retrieval of bladder & ureteral stent, ureteral meatotomy, endoscopic suspension of bladder neck, Transurethral resection of bladder tumour.

(b) Surgical Procedures:

Simple nephrectomy, radical nephrectomy, cystolithotomy ureterolithotomy, pyelolithotomy, nephrostomy, pyeloplasty, various urethroplasties. Retropubic & a transvesical prostatectomy, surgery
for underscended testis, partial and total amputation of penis, extended pyelolithotomy, VVF repair.

24-36 Months

Open Surgery

Candidate should learn more complex surgical procedures like-transpubic urethroplasty, Hypospadias repair, Augmentation cystoplasty, Anatrophic Nephrolithotomy under hypothermia, Boari's flap procedure, exstrophy closure, urinary diversion, ureteroneocystostomy, partial and total cystectomy, nephroureterectomy, penile prosthesis, Artificial urinary sphincter, Microsurgical Vasoepididmostomy, and vasovasostomy,. Undiversion, Renal transplant surgery and AV fistulae, retroperitoneal lymphadenectomy.

Endoscopic Procedure

Trusurethral resection of prostate, percutaneous nephrolithotomy, Uretero-renoscopy, Laser Surgery, other endourolocial procedures etc.

Efforts will be made that candidate is able to perform the following minimum stipulated number of procedures within three years of his training.

1. Endoscopies	-	100
2. Urethroplasties	-	5
3. Internal urethrotomy	-	20
4. Internal tract reconstractions		10
5. Repair of vesicovaginal fistulae	-	5
6. Pyeloplasties	-	5
7. Hypospadias repair	-	5
8. Transurethral Resection of Prostate	-	25
9. Uretero-Renoscopy	-	25
10. Percutaneous Nephrolithotomy & endopyelotomy	-	15

11. Donor Nephrectomies	-	5
12. Recepient Surgery	-	2

In addition to above mentioned procedures candidates will perform/assist minimum of two or five of each of following procedures depending upon the availability of the case material

- Nephrectomy for pyonephrosis-Surgical treatment of stress urinary incontinence
- Radical Cystoprostatectomy
- Radical Nephrectomy
- Ureteroneocystostomy
- Retroperitoneal lymphnode dissection-Ileal replacement
- Different type of Urinary diversion of orthotopic Neobaldder- Surgical mamagement of Renal and
  Urethral trauma
- Transpubic urethroplasty
- Augmentation cystoplasty
- Nephroureteractomy – Undiversion
- Anatrophic Nephrolithotomy
- Laparoscopic Urologic Surgery
- Paediatric surgical procedures.

In course Training

Since it will be a full time residency cum M Ch course, a candidate will be responsible for the total care of the patients. He will be encouraged to take independent decisions. Every day there will be atleast one hour academic activity to a maximum of 10 hours/week in which all the faculty members & residents will participate. Case discusser will take place weekly with 3rd year resident as a moterator.

Other academic activities like journal clubs, seminars, group discussions statistical meetings will be a fortnightly feature where deaths, complications, operations and consultations rendered will be discussed.

Consultation to the other department and in emergency will only be attended by the IInd & IIIrd year Senior Residents. Consultations given to other departments should also be discussed every morning with the respective consultants. In OPD a candidate will see the cases independently and will make all the pertinent notes. In problematic cases and a special referral, it is mandatory to show the case to the respective consultant. A candidate will not be allowed to provide independent consultations for first six months.

A candidate will have to attend all postmortem examination done for the department. Interdepartmental meetings like uroradiology, uronephrology, uroradiotherapy & medical oncology,

uro pathology, uroimaging will provide an opportunity for open discussion on a common subject and it will also provide an opportunity to learn views of the specialists on these subjects.

Posting

A candidate will be sent to Nephrology department for one month to learn medical aspect of Kidney diseases (except the renal transplantation). This posting should be after one to 1.1/2 year after joining the course.

It is highly desirable to formulate a reasonable teaching curriculum for this posting and a candidate is to be evaluated by the Nephrologist at the end of the posting. An unsuccessful candidate has to repeat his posting.

Exchange Programme

In view of expanding field of urology, it is difficult to see, observe and have training in all newer subspecialities. Therefore, it is imperative to inclucate exchange programme and resident should be rotated to two or three centers as per advise by the department committee. It is also suggested that department weak in some subspeciality should invite visiting professor from other centers to strengthen the course.

BOOKS AND JOURNALS

The following books, journals and periodicals should be made available through Central/Departmental Library for perusal of residents so as to enable them to keep abreast with latest developments in the field of Urology. It is also important that department should have an Internet facility which would enable residents to browse and use med line search.

General Urology

Sl No	***Book***	***Editor***
1	Campbell urology-3 Volumes	Edited by Walgh, et al
2	Scientific Basis of Urology	Mundy
3	Current Urological Therapy	Kaufman
4	Obstructive Uropathy	O'Reilly
5	Urogenital trauma Macaminch	
6	Text book of Urology	Whitefield & Hendry
7	Adult & Paediatric Urology	Gillenwater et al

Paediatric Urology

Sl	***Book***	***Editor***

No		
1	Pediatric Urology	Kelalis & King – 2 vol.
2	Paediatric Urology	Whitakar

<u>Uro-oncology</u>

Sl No	***Book***	***Editor***
1	Genito-urinary cancer management	Backeman & Paulson
2	Genitourinary cancer	Dekerrion et al
3	Testicular cancer	Javadopor

Urodynamics

Sl No	***Book***	***Editor***
1	Urodynamics principle & practise	Mundy
2	Controversy in Neurourology	Barret & wein
3	Neurourology & urodynamics	Bradly & Hald

<u>Stone Diseases</u>

Sl No	***Book***	***Editor***
1	Stone disease Diagnosis & management	Rous
2	Endourology	Clayman et.al
3	Endourology	Carson
4	Extracorporeal shock wave Lithotripsy	Gravernstein
5	Endourology	Arthur Smith

<u>Infertility</u>

Sl No	***Book***	***Editor***
1	Male Infertility	Amelar
2	Reproductive infertility	Silber
3	Microsurgery in male and female	

<u>Reconstructive and Female Urology</u>

Sl No	***Book***	***Editor***

1	Operative Gynaecology	Te Linde
2	Female urology	Blandy
3	Urinary Incontinence	Dat. D.O.'Donnel
4	Urogynaecology & urodynamics	Obstargard & Bent
5	Reconstructive urologic surgery	Libertino

Renal Transplantation

Sl No	***Book***	***Editor***
1	Kidney transplantation	Peter morris
2	Renal transplantation	Garovoy & Guttman
3	Introduction to Dialysis	Logan
4	Vascular access in Haemodialysis	Bell et Al

Operative Urology

Sl No	***Book***	***Editor***
1	Glen's operative urology	Glen
2	Urologic Endoscopy	Bagley et al
3	Transurethral surgery	Maurmayer

Laparoscopy

Sl No	***Book***	***Editor***
1	Laparoscopic urology	Ralph V. Clayman, E.M. McDougall
2	Urologic Laparoscopy	Sakti Das
3	Laparoscopic Urologic Surgery	A.K. Hemal

Uroradiology

Sl No	***Book***	***Editor***
1	Emmett's –Witten-Clinical Uroradiology 3 volumes	Emmett

Journals

- Indian Journal of Urology
- Journal of Urology
- British Journal of Urology
- Neurourology & Urodynamics
- Urology (Gold Journal)
- European Urology

- Urologia internationalis
- Scandinavian Journal of Urology & Nephrology
- Transplantation
- Transplant Proceedings
- Urological Research
- Urologic Radiology
- World Journal of Urology

Periodicals

- Urological clinics of North America
- Seminars in Urology
- Controversy in Urology
- Recent Advances in Urology
- Year Book of Urology
- Modern Trend in Urology

PATTERN OF EXAMINATION:

Part A:

Paper - I Basic Sciences	- 100

Part B

Theory – 3 Papers	- 100 Marks each
Duration:	- Three hours each
Paper-II General Urology	- 100
Paper-III General Urology	- 100
Paper-IV Recent advances in Urology	- 100

v. MCh Surgical Gastroenterology

i. Knowledge

a. Understand etiology, pathophysiology and diagnose gastrointestinal surgical problems on the basis of history and clinical examination.
b. Interpret laboratory investigations, endoscopic and radiological finding in a logical manner and arrive at a reasonable diagnosis.
c. Advice the patient appropriate treatment on the basis of (a) and (b) above
d. Be proficient in the proper selection of patients for surgery, the timing of surgery, the pre-operative work up and post-operative care.
e. Manage emergency situations related to the gastrointestinal system such as gastro intestinal bleeding, scute abdomen, abdominal trauma etc.

f. Be proficient in the monitoring and management of the critically ill patient
g. Continuously update knowledge and skills and keep abreast of the latest advances after critically analyzing its risks and benefits
h. Teach undergraduate and Postgraduate students
i. Carry out medical research i.e. plan clinical trials and laboratory research

ii. Skills

a. Perform elective complex gastrointestinal surgeries in a graded manner, suchas pancreato-duodoenecomies, Colorectal surgery, esophageal resections, basic laparoscopic surgeries and have exposure to advanced laparoscopic and minimally invasive procedures.
b. Be proficient in the pre-operative work up and post-operative care of the urgical patient including invasive monitoring and life support systems
c. Have exposure to interventional radiological procedures and be involved in the decision making process.

iii. Ethical Principals

a. Follow high standards of ethical practice
b. Respect patients rights and privileges, his / her right to information and privacy as well as right to seek second opinion
c. He should able to work as member of a team and also provide leadership where necessary.

SYLLABUS THEORY

The syllabus will cover all undamental and Applied aspects of Surgical Gastroenterology. It will cover Embrology, Basic Science concerned with GI Tract and the whole fields of surgery of the Alimentary Tract and its current advances. It would be an exercise in futility to lay down a syllabus, in the strictest sense, for MCh in a Superspeciality . However, a rough guideline is given below for the candidates, Teachers and Examiners. Nevertheless, the point is stressed that all aspects of the GI tract , both normal and pathological, will have to be learnt by the candidate.

<u>Basic Sciences (Pertaining to Gastro-enterology)</u>

Anatomy:

It includes surgical anatomy and applied aspects of endoscopic and imageological anatomy too.

Physiology:

Clinical physiology pertaining to GI tract and applied aspects of clinical care physiology.

Pathology:

Both gross and microscopic pathology are included. An insight into the Genetic aspects and experimental field of pathology is mandatory.
Clinical pharmacology as applied to GI tract.
Microbiology and virology as applied to GI tract.
Clinical aspect of biochemistry as applied to GI tract.

Surgical Gastro-enterology:

Congenital and Acquired diseases of the entre GI tract:

1. Oesophagus
2. Stomach and Duodenum
3. Small gut
4. Appendix
5. Colon, Rectum and Anal canal
6. Liver and Biliary tract
7. Pancreas
8. Spleen

Trauma and its related special problems are covered. The entry gamut of investigative modalities pertaining to each system or Organ are included , with stress on interventional procedures.

Recent advances and current concepts in surgical Gastroenterology:

The trainees are instructed to keep track of the recent advances and current trends, those taking place in the field of Gastroenterology. An up to date knowledge in the field through journals, CD-ROM's Internet etc is expected. Awareness on the current concepts and the controversies are essential.

SYLLABUS- PRACTICALS

The MCh Trainees are residents and will be in direct contact with the patients. They will be responsible for the complex work up and follow up of all patients. Practical training through full participation in the regular work in the department is emphasized. The training will be oriented to equip them with adequate skill and know-how to perform procedures. There shall be opportunities to familiarize themselves with other investigational modalities such as contrast radiography, CT scan etc.. They will also get training in Gastrointestinal Pathology and the trainees will be exposed to other disciplines like Biochemistry, Pathology, Microbiology, Oncology and Imageology. Operations will be relegated to them in a phased manner depending upon the progress. Based on the periodic assessment more and

more responsibilities will be assigned to them. Facilities for dissection on cadavers and to carry out experimental surgical work on animals will be provided to them. Journal clubs, seminars and symposia will be held regularly in addition to combined clinical meeting with GE Medicine, Oncology as well as clinico-Pathological conferences with Pathology Department. The MCh trainee will present at least one paper per year in a National conference, will attend all relevant CMEs conducted on Gastroenterology by registered academic bodies and will be expected to publish one original article in an indexed journal.

EXAMINATION PATTERN

There will be one examination at the end of three years of training and the assessment of the trainee for the award of MCh in Gastroenterology Surgery will be done in four parts.

Written Examination:

There will be four papers, each of THREE HOURS duration.

Part A

Paper I : Basic Medical Science as applied to Surgical Gastroenterology.

Part B

Paper II : Basic Principles of Surgical Gastroenterology.
Paper III :Principles of surgical gastro enterology
Paper IV : Recent advances

PRACTICAL/ OPERATIVE, CLINICAL AND VIVA VOCE

Clinical Examination:

1. Long case – 1 hour
2. Short case – A selection of short cases covering a wide range of problems (1 hour)
3. Ward and ICU rounds

Viva voce:

This is to assess the competence of the candidate in interpreting various diagnostic aids such as imageology films; Surgical instruments of relevance to the subject are to be identified and discussed.

Recommended Readings Journals;

1. Journal of GI Surgery
2. Surgical Clinics of North America
3. New England Journal of Medicine
4. Digestive Surgery
5. British Journal of Surgery
6. Annals of Surgery

7. Gut
8. Lancet
9. World Journal of Surgery
10. Transplantation

vi. MCh Paediatric surgery

A. Instructional goals

At the end of the training the candidate should have acquired knowledge, abilities and attitudes to be able to function as a pediatric surgeon in a teaching/non teaching hospital with confidence and competence to diagnose and manage surgical conditions of infancy and childhood. He/She would also have acquired skills to identify, plan and carry out surgical treatment and the ability to transfer knowledge and skills of his specialty and thus fulfill the function of a teacher.

B. Instructional objectives

At the end of the course the student should have acquired:

i) A broad understanding of the principles of basic sciences related to Paediatric Surgery.
ii) Ability and skills to perform and interpret investigative procedures relating to his specialty.
iii) Skills in the clinical diagnosis and management, with capabilities to take independent decisions in emergency situations, perform major paediatric surgical operation and guide postoperative treatment and manage complications, thereof.
iv) Competence in intensive care of newborn infants before and after surgery with practical knowledge of working with resuscitative and monitoring equipments.
v) Ability of self learning critically appraise published literature, interpret data and to broaden his knowledge by keeping abreast with modern developments in Paediatric Surgery.
vi) Ability to identify, outline and initiate research projects relating to his specialty and draw relevant/ pertinent scientific conclusions.
vii) Ability to search online, use information technology to his advantage, and critically evaluate medical literature and draw own conclusion.
viii) Ability to impart instructions and transfer knowledge and skills to postgraduates and undergraduate and nursing students in the basic management of surgical diseases of infancy and childhood.
ix) Necessary knowledge of basic pediatric health care and principles of management of common ailments of childhood.
x) Keep abreast of Government's latest policies and procedures as related to health care.

C. Syllabus

I. General knowledge of basic medical sciences as applied to Paediatric Surgery:

Developmental Anatomy and physiology.

Applied and regional anatomy.

Physiology as applied to children.

Neonatal physiology, metabolism and pathology.

General pathology-with special emphasis on paediatric conditions.

Pharmacokinetics in paediatric and neonates.

Biochemical and metabolic considerations related to paediatric surgery.

Foetal anatomy physiology and pathology.

II. Growth & Development.

III. Genetics as applied to surgery: parent counseling.

IV. Knowledge of common Paediatric medical conditions and their treatment.

V. Neonatal surgery.

VI. Etiology and treatment of congenital malformations.

VII. Organization of intensive care unit, referral & transfer services.

VIII. Specialized investigative procedure: technique and interpretation of results.

IX. Pathology of surgical conditions of childhood and broad knowledge of microscopic appearances.

X. Systemic and Regional paediatric surgery. Including Paediatric Urology, Plastic Surgery, Thoracic Surgery and principles of management of common neurosurgical problems relevant to Paediatric Surgery practice

XI. Paediatric operative surgery.

XII. Trauma in children-including burns.

XIII. Malignancy in childhood –Surgical management and basic knowledge of chemotherapy and radiation therapy.

There are some items common to the teaching of Pediatrics and can be jointly taken up. Similarly rotation through Paediatric, Newborn ICU and genetics should be planned. (optional)

D. Research work

The candidate should carry out research during the period of training for M Ch. However, the department should see that the work is of a satisfactory quality and completed well in time for the M Ch examination. The research work can be submitted either in dissertation form or a manuscript ready for publication, if not already accepted for publication.

CURRICULUM FOR M Ch COURSE IN PAEDIATRIC SURGERY

The list below is only a guideline and not comprehensive

All candidates admitted to M Ch course in paediatric surgery should be proficient in the following areas at the end of the training period.

A. Basic Sciences

Ethics	
Molecular biology	(relevant to Pediatric Surgery)
Genetics	(relevant to Pediatric Surgery)
Embryology Growth & Development	
Fetal medicine	(diagnosis and management of surgically correctable lesions)
Physiology as applicable to surgery	(including neonatal physiology, Monitoring, acid-base etc.)
Respiratory physiology	(including ventilatory support)
Metabolism and nutrition	(including principles and practice of parenteral nutrition) Hematology (including coagulation defects and transfusion medicine)

B. Training of surgery

<u>B (I). Neonatal Surgery</u>

Special Anatomy and Physiology as applicable to fetus and newborn

- Surgical technique
- Pre and post operative management
- Ventilatory/respiratory care
- Monitoring

- Investigative Procedures

B (II). General Paediatric Surgery

Wound healing Infections and sepsis Organ transplantation
Anesthesia (including pain relief)
Trauma (including burns)
Head and neck (excluding ophthalmic and otorhinolaryngologic disorders)

Abdomen

Umbilicus Abdominal wall Hernia
Testis

Vascular Malformations

Hemangioma
Lymphangiomas
Peripheral arterio-venous disorders

Soft Tissue Lesions Twining Oncology

B (III). Imaging Techniques

Knowledge of principles of various imaging techniques and their application in Paediatric Surgery like ultrasound, conventional and specialized Radiology, CT and MRI and Nuclear scans. Basic knowledge of radiation biology.

B (IV). Genitourinary Tract

Anatomy and physiology Congenital anomalies

Kidney
Ureter Bladder
Urethra Bladder
Genital tract

Obstructive uropathy
Vesicoureteral relfux, Megaureter
Urinary tract infections
Urolithiasis
Renal vein thrombosis, renovascular hypertension
Urinary diversion and undiversion
Functional disorders of bladder
Hypospadias and epispadias
Other disorders of urethra, penis and scrotum
Ambiguous genitalia and disorders of sexual differentiation
Endoscopy, laparoscopy Urodynamic studies

B (V). Gastrointestinal, Pancreatic, Hepatobiliary

Anatomy and physiology
Congenital anomalies
Esophagus
Stomach Small
bowel Large
bowel Anorectum
Liver and biliary tree
Pancreas
Spleen

Oesophagus

Oesophageal burns, strictures, replacement
Oesophageal manometry and pH studies
Gastro esophageal reflux

Meconium ileus
Disorders of rotation and fixation
Intestinal obstruction due to various causes GI Bleeding
Ascites
Necrotising enterocolitis
Short Bowel syndrome
Inflammatory bowel disease
Peritonitis and other infections

Tumors

Gastrointestinal Hepato-biliary Pancreatic
Portal Hypertension Anorectal manometry Endoscopy and Laparoscopy

B (VI). Thoracic

Anatomy and Physiology Chest wall deformities
Tumors
Aero-digestive tract- Foreign bodies
Infection of lung and pleura
Congenital Malformation
Breast
Chest wall
Diaphragm
Mediastinum
Lungs and pleura
Aero-Digestive tract

B (VII). Surgical staplers & Endoscopy

B (VIII). Plastic Surgery

Principles, anatomy (relevant)
Burns management and sequel
Cleft lip and Palate,
Choanal Atresia Syndactyly
Skin graft, flap rotation, z-plasty

B (IX). Neurosurgery

Basic knowledge of Anatomy and physiology of brain, CSF pathways and spine
Principles of management of
(a) Hydrocephalus
(b) Cranio-spinal dysraphism and sequel
(c) Craniofacial deformities

B (X). Oncologic Surgery

Physiologic effects mode of actions, synergism of chemotherapy

- Biopsies
- Curative/palliative resections

Use of energy devices (CUSA, Lasers, Vessel Sealing Devices etc)

C (I). Educational methods/ Lectures

C (II). Teaching experience	Demonstrations Case discussions Journal clubs Seminars
C (III). Research methods	Projects leading to the degree - Clinical - Experimental - small animal - laboratory based - Other projects

Clinical case studies Epidemiologic studies Statistical methods

	Literature search, Critical evaluation of published material
C (IV). Assessment/evaluation of performance	Day to day performance Academic exercises work Outpatient/special clinics Operation theatre End term assessments Final examination
C (V). Attitudes	- Punctuality - Behaviour - Keenness - Motivation and initiative - Reliability - Aptitude for research

PATTERN OF EXAMINATION:

Part A:

Paper - I Basic Medical Sciences relevant to Paediatric Surgery - 100

Part B

Theory – 3 Papers - 100 Marks each
Duration: - Three hours each
Paper-II Practice of General Paediatric surgery - 100
Paper-III Practice of subspecialities of Paediatric surgery - 100
Paper-IV Recent advances in Paediatric surgery - 100

vii. MCh Neurosurgery

OBJECTIVES

At the end of the training period for the degree of M.Ch. in Neurosurgery, a candidate should be able give advanced specialist training in the field of clinical investigations and Neurosurgical disease

SYLLABUS –THEORY

1. Neuroanatomy:

a) Dissection of whole brain& spinal cord, cranial nerves
b) Histology of grey matter - cerebrum
White matter
Basal ganglia
Cerebellum
Spinal cord
c) Peripheral nerves

2. Neurophysiology:

a) Peripheral nerves
Receptor
Nerve functions
Conductive studies

b) Spinal cord localisation
c) Individual studies of:
Cerebellum
Cerebral lobes
Limbic system
Brain stem
C. S. F.
d) Posture , Tone etc.

3. Electrophysiology:

Basic priniciples of EEG & EMG with specific reference to Nerve injuries.

4. Neruopathology

Pathology of Brain Tumours , Histology of all tumours.
Essentials of tumours & histochemistry

5. Neuroradiology:

Normal skull & spine, changes in skull and spine due to SOL, special views.
Contrast studies – Myelography , Pneumoencephalography , Ventriculography

Angiography, Isotopic scanning
Newer diagnostic procedures – C.T. Scan, M.R.I & P.E.T . Scan.

6. Neurology

Methods of clinical examination, General diagnostic principles, Localisation With specific reference to function, Principles of Neuroendocrinology & cord Compressions.

7. a) Neruopharmacology and b) Neurobiochemistry

8. Neurosurgery:

Congenital anomalies of C. N. S
Infections of CNS
Pyogenic |
Tuberculous | Meningitis Brain Abscess
Fungal
HIB - auds ad neurological system
Cerebrovascular Diseases:

Header Injuries:
Basic principles in diagnosis and management
Brainstem injury
Post traumatic sequelae
Modern trends, Preventive aspects.

Brain Tumours: Localisation, Pathology, Principles in management, Approaches to space occup lesions, surgical techniques, Approaches to frontal lobe, Occipital lobe and pituitary fossa.

3rd Ventricular tomours – anterior & Posterior
Pineal Tumours
Cerebellar Tumours
Spinal cord compression – Laminectomy & Disc Surgery
Spinal fusions – Anterior fusions
Chronic Atlanto Axial Dislocations
Psyhosurgery
Use of operating loups
Operating microscope
Stereotaxic Surgery
Rcent advances –CUSA, LASRER. Endoscopy

SYLLABUS PRACTICALS

The postgraduate students work as full time residents but will not be allowed private practice. An amount be given as stipend per month. They are required to be residents and be 'in service' all 24 hrs, to at emergency cases. More responsibility would be assigned as they gain more experience and they will responsible for the primary care of the admitted cases, in steps of increasing levels of responsibility.

1 month to be spent in Neuropathology: 3 month to be spent in studying Electrophysiology and neurology which will be guided by the Head of the Neurology. The candidates are to be sent to 2 reputed neuro surgical centres for a period of one month. The candidates will publish at least two articles on an original work in any of the recognised journals, and attend and present papers in at least two recognised conferences.

They keep a log book regarding the operative procedures they have done independently and have assisted. They take part in the teaching of M. S. General Surgery students, B. Sc Nursing Students, undergraduate students posted in the Department by rotation. They are encouraged to take part in Research Projects instrument. They must be responsible for proper record keeping of the department, to the satisfaction of the HOD.

Three internal assessments will be conducted.

1st - covering basic sciences neurology in relation to Neurosurgery – at the end of first year

2nd - covering investigations – at the end of second year

3rd - covering full subjects – at the end of 3 year and 6 months

Examination pattern

UNIVERSITY EXAMINATION includes a written, clinical examinations, operative surgery and oral examination

Written: Four papers each of three hours duration
Part A
1 - Basic Sciences
Part B
2 - General Principles and Applied Neurosurgery
3 - Cerebro spinal trauma and peripheral nerve injuries
4 - Recent Advances

Surgical/Operative, Clinical and Viva Voce

Candidate has to operate a case in presence of the examiners in the operating room. Pre-operative assessment and post –operative problem of that case is also discussed in detail.
Clinical examinations
Long case – 1 hour

Short cases to be picked at random during ward rounds
Oral examinations
Neuropathology slides, Neuroradiology specimens, Instruments etc.

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