Chapter III
Postgraduate Courses in Pediatrics
M. D. Pediatrics

Goals

The goals of postgraduate training in Pediatrics would be to train a basic medical graduate (MBBS) :

- To practice as a Child Health specialist equipped with appropriate knowledge and skills necessary to care for the normal and sick child.
- To practice Child Health in the community (urban or rural) and to perform professionally at all levels of the existing health care system.
- To practice with empathy and the highest ethical standards of the profession.
- To continue to strive for excellence by continuing medical education throughout his or her professional career.
- To teach by sharing knowledge and skills with colleagues
- To research and find solutions to challenges in health care.

Objectives

The objectives to be fulfilled at the completion of the course are as follows:
At the end of the program, the student should be able to:

- Knowledge:

- Describe, identify and monitor normal patterns of growth and development of children.
- Describe etio-pathogenesis, principles of clinical diagnosis, investigations and treatment of diseases of childhood.
- Demonstrate an understanding of Basic (Pre and Para-clinical) Sciences and its application to the normal and abnormal processes.
- Analyze clinical and investigation data approach and manage a health-related problem.
- Identify and understand socio-economic-environmental-cultural factors in health care.
- Recognize problems outside his or her abilities and appropriately refer.
- Update one's knowledge and skills by self directed learning and by participating in continued medical education programs utilizing media – spoken, written, Print and electronic.
- Teach and share knowledge and skills with colleagues.
- Audit and analyze work, assist in research and publish scientific articles in peer reviewed journals.

- Skills:

- Elicit an appropriate clinical history.

- Demonstrate appropriate clinical physical examination skills on children.
- Plan, decide upon and interpret appropriate cost effective investigations.
- Perform essential procedures both diagnostic and therapeutic.
- Manage, resuscitate and stabilize children in Pediatric or Neonatal emergencies.

- Communication and attitudes:

- Communicate appropriately with guardians and children, assisting in their health care decision making.
- Practice child health care at the highest ethical level, protecting the child at all costs.
- Respect Patient's (and their guardian's) rights and professional relationships (Doctor-Doctor, Doctor-Nurse, Doctor-Patient, Doctor-Society).
- Apply the highest level of ethics in Research, Publication, References and Practice of Pediatrics.

Course Contents

Knowledge
Must Know

The Field of Pediatrics

1. Evaluating Medical Literature
   Critical Appreciation of Journal articles
2. Overview of Child Health
3. The Normal Child
4. Preventive and Social Pediatrics
5. Epidemiology, Statistics and Research Methodology including Dissertation
6. Ethical Issues in Pediatrics

Growth and Development

1. Biopsychological Models of Development
2. Fetal growth and development
3. The newborn G/D
4. Infant, Preschool, Early school, Adolescence G/D
5. Assessment of Growth
6. Development Assessment
7. Standards/Normograms (including Indian)
8. Approach to short stature
9. Approach to Obesity
10. Approach to Undernutrition

Knowledge
Desirable to know

1. History of Pediatrics
2. Traditions and Cultural Issues pertaining to Child Care

1. IQ assessment

Knowledge Must Know	Knowledge Desirable to Know
Psychological Disorders	
1. Assessment and Interviewing CNS injury	1. Psychiatric considerations of
2. Vegetative Disorders-Rumination, Pica, Enuresis, Encopresis, Sleep	
3. Habit Disorders	2. Mood Disorders
4. Anxiety Disorders	3. Disruptive Behavioral disorders
5. Suicide	4. Sexual behavior variations
6. ADHD	5. Psychosis
7. Autism	6. Psychological treatment
8. Poor Scholastic performance in school age child	7. Neurodevelopment dysfunction
9. Psychosomatic Illness	8. Learning Disorders
Social Issues	
1. Adoption	1. Effects of a mobile society
2. Street Child	2. Impact of Violence
3. ChildCare	3. Street Child
4. Separation, death	4. Single parent child
5. Abuse and Neglect	5. Foster care
6. Child Labor	
7. Media (TV, Movies) and its effect on the child	
Children with Special Needs	
1. Failure To Thrive – Problems, Approach and Evaluation	1. Children in Poverty
2. Developmental disabilities, Chronic Illness	2. Homeless children
3. Mental Retardation – Problems, Approach and Evaluation	3. Foster Children
4. Care of Child with fatal illness	4. Runaway Children
Nutrition	
1. Nutritional Requirements- Water, energy, proteins, CHO, Fats, Minerals, Vitamins,	
2. Diet/Nutrition Evaluation	1. Athletic Diet
3. Diet for later childhood and Adolescent	
4. Infant and Child Feeding	
5. Breast Milk Feeding, Human Lactation Management, BFHI	
6. Nutrition Values of Indian Foods, Recipes	

Knowledge Must Know	Knowledge Desirable to Know

7. Weaning foods
8. Feeding through 1 and 2nd years
9. Nutritional Disorders Including Obesity
10. Protein Energy Malnutrition
11. Vitamin Deficiencies and Excess
12. Micro-nutrient Malnutrition
13. Nutrition in Special situations – LBW, Premature, IEM, Chronic illness, Surgery, Critically ill child
14. TPN

Patho-physiology of Body Fluids and Fluid therapy (Approach and Management)

1. Physiology of Fluids, Electrolytes and Acid Bases
2. Dehydration and fluid management
3. Dyselectrolytemia
4. Acid Base Disorders
5. Special Situations - Pyloric stenosis, CNS disorders, Burns, Peri-operative, Endocrine disorders, Renal Failure.

Acutely Ill child

1. Evaluation in Emergency
2. Injury Control
3. Emergency Medical Services
4. Pediatric Critical Care
   Respiratory Failure, Ventilation
   Circulatory Failure and Shock
   Acute Neurological Dysfunction
   Resuscitation – Basic and Advanced, NALS/PALS
   Post Resuscitation stabilization
   Cold/Heat Injury
5. Transportation of Sick Child/neonate
6. Post-operative supportive care

1. Pediatric Anesthesia

2. Organization of a PICU/NICU
3. Equipment for Intensive care

Emergencies/ Critical Care Pediatrics

1. Fluid abnormalities
2. Electrolyte abnormalities
3. Thermoregulation problems
4. Acute Renal failure

Knowledge Must Know	Knowledge Desirable to Know
5. Hypertensive crisis	
6. Congestive Cardiac failure	
7. Cardiogenic shock	
8. Pericardial tamponade	
9. Cyanotic spells	
10. Unstable and stable Arrythmias	
11. Vomiting and Diarrhea	
12. GI Bleeds - Hematemesis, Melena, Hematochezia	
13. Adrenal Crisis	
14. Metabolic problems – hyperammonemia, lactic acidosis, acid base abnormalities, Hypoglycemia	
15. Septicemic shock, Viral infections and shock	
16. Pneumothorax, empyema, pleural effusion, ascites	
17. Severe Anemia, Bleeding child, Neutropenia	
18. Pain management, Drug therapy	
19. ARDS	
20. Respiratory Failure	
21. Burns/ electrocution	
22. Animal Bites	
23. Preanesthetic check up PAC	
24. Sickle cell crisis, severe complicated malaria	
25. Acute severe asthma, Bronchiolitis	
26. Status epilepticus	
27. Febrile seizure	
28. Coma, Increased intra-cranial pressure	
29. Cardiopulmonary resuscitation	
30. Shock	
31. Upper airway obstruction	
32. Near drowning	
33. Poisoning	
34. Snake bite	
35. Scorpion sting	
36. Physical abuse	
37. Sexual abuse	
Human Genetics	
1. Molecular Basis of Disorders	
2. Molecular Diagnosis	1. Human Genome Project
3. Inheritance Patterns	
4. Chromosomal/genetic clinical Abnormalities	
5. Genetic Counseling	

Knowledge Must Know	Knowledge Desirable to Know

6. Dysmorphism
7. Gene therapy

Metabolic Disorders

1. Approach to IEM defects
2. Common aminoacid Metabolic defects
3. Porphyria
4. Common Lipid Metabolism
5. Common CHO Metabolism
6. Mucopolysaccharidosis
8. Hypoglycemia

1. Purine and pyrimidine metabolism
2. Rare Amino acid Metabolic Defects –
3. Rare Lipid Metabolism -
4. Rare CHO Metabolism –
5. Mucolipidosis

Fetus and Newborn

1. Mortality and morbidity
2. Newborn – history, examination, routine delivery care, nursery care, bonding
3. High risk pregnancies
4. Dysmorphology
5. Fetus
   - Growth/Development
   - Fetal distress
   - Maternal diseases
   - Maternal medications
   - Detection, treatment, prevention of fetal disease
   - Antenatal diagnosis
   - Fetal therapy
   - Antenatal therapy
   - Counseling
   - Teratogens, radiation
6. High risk infant
   - Multiple pregnancies
   - Prematurity
   - Postdated
   - IUGR/LBW
   - LFD

Knowledge Must Know	Knowledge Desirable to Know

7. Congenital anomalies/ malformations
8. Birth injuries
9. Hypoxia - ischemia, asphyxia
10. Organization and levels of newborn care
11. Normal Newborn
12. Common problems in a normal newborn
13. Delivery room emergencies
14. Respiratory disorders
15. Oxygen therapy, toxicity
16. Ventilation
16. GI disturbances including NEC
17. Hyperbilirubinemia
18. Cardiac problems
19. PPHN
20. Blood disorders
    - Polycythemia
    - Anemia
    - Hemorrhagic disease of newborn
    - Hemolytic disease of newborn
    - Thrombocytopenia
21. Genitourinary disturbances
22. Metabolic disorders
22. Endocrine disorders- IDM, CAH
23. Ambiguous genitalia
24. Fluid and electrolytes in Newborn care
25. Nutrition and feeding the newborn – term/preterm, LBW, IUGR
26. Neonatal transport
27. Surgical problems
    - TEF
    - Anorectal malformations
    - Diaphragmatic Hernia/Eventeration
    - Hirschsprung
    - Urogenital anomalies
    - NEC

Knowledge Must Know	Knowledge Desirable to Know
Congenital Lobar Emphysema Volvulus 28. Thermoregulation 29. Neonatal follow-up	
Neonatal Infections 1. Epidemiology 2. Intrauterine infections 3. Viral Infections 4. Neonatal sepsis/meningitis 5. Pneumonia 6. UTI 7. Hepatitis 8. Nosocomial 9. Universal precautions 10. Prevention of infections 11. Therapy- antimicrobials, adjuvants	
Adolescent Health 1. Epidemiology 2. Sexual development and SMR stages 3. Deliveries of health care 4. Pregnancy 5. Contraception 6. STD 7. Menstrual problems 8. Anorexia nervosa, bulimia	1. Depression 2. Suicide 3. Substance abuse 4. Sleep disorders 5. Skin/Orthopedics
Immunological system 1. Basics of Immunology 2. Approach to immunodeficiency 3. HIV 4. Bone marrow transplantation 5. Primary B cell diseases 6. Primary T cell diseases 7. Complement and phagocytic diseases 8. Chronic granulomatous disease 9. Chediak Higashi Disease 10. Neutrophil abnormalities 11. Adhesion disorders	

Knowledge Must Know	Knowledge Desirable to Know
Allergic disorders	
1. Allergy and Immunological basis	1. Insect allergy
2. Diagnosis	2. Ocular allergy
3. Therapy – principles	3. Adverse food reaction
4. Allergic Rhinitis	
5. Asthma	
6. Atopic dermatitis	
7. Urticaria, Angioedema	
8. Anaphylaxis	
9. Serum sickness	
10. Adverse drug reactions	
Rheumatology	
1. Autoimmunity	1. Ankylosis spondylosis
2. Laboratory evaluation	2. Neonatal Lupus
3. JRA	3. Scleroderma
4. SLE	4. Mixed connective Tissue Disease
5. Vasculitis	5. Behcet
6. Dermatomyositis	6. Sjogren
7. Erythema Nodosum	7. Non rheumatic conditions
	8. Pain syndromes, panniculitis, polychondritis, amyloidosis
Infectious diseases	
1. Fever	
2. Clinical use of Micro Lab	
3. Fever without a focus	
4. Sepsis and Shock	
5. CNS Infections	
6. Pneumonia	
7. Gastroenteritis	
8. Osteomyelitis, Septic arthritis	
9. Compromised host infections	
10. Bacterial Infections	
11. Anaerobic infections	

Knowledge Must Know	Knowledge Desirable to Know

12. Viral Infections
13. Mycotic infections
    - Candidiasis
    - Aspergillosis
14. Parasitic infections
    - Helminthiasis
15. Protozoal
    - Malaria
    - Kalazar
    - Leishmania
    - Giardia
    - Amoeba
16. Antiparasitic drugs
17. Antimicrobials
18. Antivirals drugs, interferon
19. Preventive measures
    - Health advice for travelling
    - Infection control
20. Immunization
    - Principles
    - Schedules
    - Controversies
    - Standard and Optional Vaccines
    - Recent advances in Vaccines

Digestive system

1. Normal tract – Physiology, Anatomy, Development
2. Clinical features of Disorders
3. Disorders of Esophagus
4. Disorders of Stomach
5. Disorders of Intestines except Food allergy
6. Disorders of Pancreas
7. Disorders of Liver and biliary system
   Acute Hepatitis, Chronic Hepatitis, Cirrhosis, Metabolic Liver Diseases, Cholestatic liver disease, Neonatal Obstructive Cholangiopathy, Complications of Liver Disease – Portal Hypertension, Encephalopathy, Coagulopathy,
8. Disorders of Peritoneum

1. Food allergy

Knowledge Must Know	Knowledge Desirable to Know
9. GI function tests 10. Approach to Malabsorption	
Respiratory system 1. Development and function 2. Disorders of Upper Respiratory tract 3. Disorders of Lower respiratory tract 4. Pleural disorders 5. Chronic Respiratory Disease Interstitial fibrosis, ILD, empyema, lung abscess, bronchiectasis 6. Recurrent Respiratory Disease 7. Ventilation 8. Pulmonary Function tests 9. Cystic Fibrosis 10. Obstructive sleep apnea 11. Pulmonary Hemosiderosis 12. Neuromuscular skeletal disorders 13. Bronchial Asthma	1. Congenital disorders of nose 2. Hypoventilation 3. Hypostatic pneumonia 4. Kyphoscolosis 5. Central hyperventilation 6. Obesity 7. Cough Syncope
Cardiovascular System 1. Investigations –Lab, ECG, CXR, ECHO, Cath 2. Physiology and Pathophysiology of Transitional Circulation Embryology 3. Congenital Heart Disease Epidemiology Approach Cyanotic Acyanotic 4. Cardiac Arrhythmia 5. Acquired heart disease Infective Endocarditis Rheumatic Heart Disease 6. Diseases of the Myocardium – Myocarditis, Cardiomyopathy 7. Cardiac Therapeutics	1. Sick Sinus 2. Tumors of Heart 3. Heart Lung, Heart Transplants 4. Aneurysms and fistulae

Knowledge Must Know	Knowledge Desirable to Know
Blood	
1. Development of Hematopoietic system	1. Elliptocytosis
2. Anemias	2. Stomatocytosis
Inadequate production	3. Other membrane defects
Nutrition – Iron, Folate, B12	
Bone Marrow failure	
Hemolytic	
Congenital and Acquired	
3. Constitutional pancytopenia	
4. Polycythemia	
5. Granulocyte transfusions	
6. Pancytopenia	
7. Blood and component transfusions	
8. Thrombotic disorders	
9. Hemorrhagic disorders – acquired and congenital	
Physiology	
Bleeding disorders	
Coagulation disorders	
10. Hyposplenism, trauma, splenectomy	
11. Physiology and Disorders of the Spleen	4. Lymphatic vessel disorders
12. Lymphatics	
Neoplasms	
1. Principles of diagnosis	1. Epidemiology
2. Principles of treatment	2. Molecular pathogenesis
3. Leukemia	3. Soft tissue sarcomas
4. Lymphomas	4. Gonadal, germ cell tumours
5. Neuroblastomas	
6. Liver neoplasm	
7. Kidney tumors	5. GI neoplasm
8. Bone Neoplasms	6. Carcinomas
9. Retinoblastoma	7. Skin Cancer
	8. Benign tumours
Nephrology	
1. Structure and function of kidney	
2. Hematuria and conditions	1. Membranous GN
3. HUS	2. Lupus nephritis
4. Evaluation	3. Membr Prolif GN
5. Proteinuria	4. Chronic infn GN
6. Nephrotic syndrome	5. Goodpasture

Knowledge Must Know	Knowledge Desirable to Know
7. Acute Glomerulonephritis	
8. Tubular disorders Function RTA DI	
9. Renal Failure	
10. RPGN	
11. Renal Replacement therapy	
12. Bartter syndrome	
13. Investigations	7. Interstitial nephritis
14. Toxic nephropathy	8. Cortical necrosis
Urological disorders	
1. UTI	
2. Congenital anomalies, dysgenesis kidney	
3. Vesicoureteral reflux	
4. Bladder anomalies	
5. Obstructions	
6. Penis, urethra anomalies	
7. Voiding dysfunction	
8. Scrotal anomalies	
9. Genitourinary trauma	
10. Urinary lithiasis	
11. Investigations – imaging, renal function tests	
12. Neurogenic bladder	
Gynecological problems	
1. Menstrual Problems	1. Neoplasms
2. Vulvovaginitis	2. Breast Disorders
3. Developmental anomalies	3. Hirsuitism, polycystic ovaries
4. A child with special gynea needs	4. Gyne imaging
	5. Athletic problems
Endocrine	
1. Hypothalamus and pituitary Hyperpitutarism Hypopitutarism, Growth hormone DI ADH Physiology of Puberty Disorders of puberty	1. Carcinoma of thyroid

Knowledge Must Know	Knowledge Desirable to Know
Precious Puberty Delayed puberty	
2. Thyroid Thyroid studies Hypothyroidism Thyroiditis Goitre Hyperthyroidism	4. Tumours of testis/ovary 5. Multiple Endocrine Disorders
3. Parathyroid and disorders	
4 Diabetes mellitus	
5. Adrenal Disorders CAH Cushing Addisons Excess mineralocorticoids Feminizing adrenal tumours Pheochromocytoma	
CNS	
1. Examination, Localization of lesions 2. Congenital anomalies 3. Seizures 4. Headaches 5. Neurocutaneous disorders 6. Coma 7. Brain death 8. Head Injury 9. Neurodegenerative disorders- Approach, Grey/white 10. Acute Stroke 11. Brain abscess 12. Tumors 13. Spinal cord disorders 14. Investigations 15. Antiepileptic drugs 16. SSPE 17. Rabies Vaccine Encephalomyelitis, 18. Acute Demyelinating Encephalomyelitis 19. Approach, Investigations of UMN, LMN, Extrapyramidal, Cerebellar lesions 20. Cerebral Palsy	1. Movement disorders

Knowledge Must Know	Knowledge Desirable to Know
21. Neuroinfections 22. Encephalopathies	
Neuromuscular	
1. Evaluation, investigations	1.Development disorders of muscle
2. Muscular Dystrophies, Congenital Myopathy, Myositis	2. Endocrine
3. Neuromuscular transmission and motor neuron abnormalities	3. Metabolic
4. GB syndrome	4. Motor sensory neuropathy
5. Bell's Palsy	5. Autonomic
6. Floppy Infant	
7. Myasthenia Gravis	
Eye	
1. Examination of eye	1. Refraction, accommodation
2. Diseases of Eye movement and alignment disorders	2. Vision
3. Diseases of Conjunctiva - Conjunctivitis	3. Pupils and iris
6. Diseases of Lens - Cataracts	4. Lids
7. Diseases of Optic nerve – Papillitis, Neuritis, Papilledema	
8. Diseases of Cornea - Clouding	5. Uveal tract
8. Vitamin A deficiency	6. Retina and vitreous
9. Lacrimal problems - Dacrocystitis	7. Glaucoma
10. Retinopathy of Prematurity	8. Orbital abnormalities
11. VER	9. Injuries to eye
Ear	
1. Clinical manifestations	1. Congenital malformations
2. Hearing loss	2. Inner ear dis
3. External Otitis	3. Trauma
4. Otitis media	4. Tumors
5. BAER	
Skin	
1. Morphology	1. Cutaneous defects
2. Evaluation	2. Hypersensitivity
3. Principles of therapy	3. Epidermis dis
4. Diseases of the neonate	4. Keratinization dis
5. Ectodermal dysplasias	5. Dermis dis

Knowledge Must Know	Knowledge Desirable to Know
6. Vascular disorders 7. Cutaneous nevi 8. Pigment Disorders Hyperpigmentation Hypopigmentation 9. Vesiculobullous dis 10. Eczema 11. Cutaneous Infections – Bacterial, Viral, Fungal 12. Arthropod bites, infestations 13. Acne 14. Nutritional diseases 15. Drug Reactions	6. Subcutn dis 7. Sweat glands 8. Hair 9. Nails 10. Mucous membranes 11. Tumors
Bone/Joint 1. Evaluation 2. Diseases of Foot, toes 3. Torsional, angular deformities 4. Leg length discrepancy 5. Diseases of Knee 6. Diseases of Hip 7. Diseases of Spine 8. Diseases of Neck 9. Upper limb 10. Arthrogryposis 11. Common Fractures 12. Arthritis – approach, investigations, Management 12. Congenital Dislocation of Hip 13. Osteomyelitis 14. Septic Arthritis 15. Rickets – Nutritional and non nutritional	1. Sports medicine 2. Pseudoachondroplasia 3. Diagnosis, assessment of genetic skeletal disorders 4. Dysplasias - Thantophoric, diastrophic, camptomelic 5. Ellis van Creveld 6. Osteochondrodysplasia 7. Inherited osteoporosis 11. Hypophosphatasia 12. Primary Chondrodystrophy 13. Idiopathic hypercalcemia 14. Hyperphosphatasia
Genetic skeleton 1. Lethal and nonlethal bone dysplasias 2. Achondroplasia 3. Osteopetrosis 4. Marfans	

Knowledge Must Know	Knowledge Desirable to Know

Metabolic Bone disease

1. Bone and vitamin D
2. Familial Hypophosphatemia
3. Rickets – Nutritional and non nutritional

Unclassified disease

1. SIDS
2. Histiocytosis
3. Cystic fibrosis

1. Sarcoidosis
2. Progeria
3. Chronic fatigue syndrome

Environmental

1. Lead poisoning
2. Envenomation
3. Mammalian bites
3. Common Poisonings – OP, Kerosene, Phenobarbitone, Iron, etc

4. Radiation
5. Chemical pollutants
6. Mercury
7. Nonbacterial poisoning

PEDAGOGY

Principles of learning, objectives, teaching learning methods, evaluation

HEALTH STATISTICS, NATIONAL PROGRAMS

ORGANIZATION OF OFFICE PRACTICE

Equipment, Documentation, Records, Space and functioning

RECENT ADVANCES IN PEDIATRICS

DURATION 5 years

ALLIED SUBJECTS

Anatomy

Applied Embryology, Development of major organ systems

Physiology

Applied Physiology with regard to major organ systems

Biochemistry

Biochemical basis or diseases in children – Nutritional and metabolic

Pathology

Pathophysiology of diseases in children, Pathogenesis, Basic Histo-pathology

Microbiology

Clinical Microbiology applied to investigations for diseases in childhood, serology,
staining, cultures

Pharmacology

Clinical Pharmacology, Therapeutics of childhood diseases, drug interactions, Rational drug therapy, Adverse Drug Reactions,

Community Medicine

Health Care Delivery Systems – structure and function, Health Statistics, National Programs

Pediatric Surgery

Recognition and referral of surgical conditions in Pediatrics

Radiology

Clinical Indications and interpretations of Xray, Ultrasound, CT, MRI

Legal and Ethical Medicine

Rights and protection of children, Consumer Protection Act, Basic Principles of Ethics

I. Postgraduate skills

Please note code:

PI: Perform Independently
PA: Perform with assistance
O: Observe

Number at end of item indicates minimum number of supervised and documented skills.

Psychomotor skills

Procedural

Procedures: List of PI Skills

• Clinical History and Physical examination	-
• Human Lactation management (counseling and practical skills)	20
• Neonatal resuscitation	30
• Pediatric resuscitation	30
• Teaching encounters	5
• Intravenous injections	50
• Intravenous cannulation	50
• Lumbar puncture	50
• Test dose	10
• Infusions	10
• Blood transfusions	10
• Neonatal Exchange transfusions	10

• ABG	10
• Central line, CVP	10
• Intraosseous	10
• Bone marrow aspiration, trephine biopsy	10
• Pleural tap	10
• Paracentesis – diagnostic and therapeutic	10
• Mantoux test	10
• DPT, OPV, Measles vaccination	10
• Sampling for Fluid cultures	10
• Liver biopsy	10
• Neonatal, Pediatric Partial exchange	5
Respiratory management (All PI)	
• Nebulization	50
• Inhaler therapy	10
• Oxygen delivery	50
Critically Ill child (All PI)	
• Monitoring a sick child	50
• Pulse oximetry	10
• Infant feeding tube/ Ryles tube, stomach wash	10
• Urinary catheterization	10
• Restraining a child for a procedure	10
• ORS and ORT	10
• Prognostication	10
Laboratory- Diagnostic (All PI)	
• Urine Protein, sugar, microscopy	10
• Peripheral blood smear	10
• Malarial smear	10
• Ziehl Nielson smear – sputum, gastric aspirate	10
• Grams smear – CSF, pus	10
• Stool pH, reducing substances, microscopy	10
• KOH smear	2
Neonatal tests (All PI)	
• Apt test	5
• Shake test	5
Clinical Assessment skills (All PI)	
• Clinical History and Physical examination	-
• Anthropometry	50

- Dietary recall, calorie and protein estimation 50
- Nutritional advice 50
- Gestational assessment 10
- Neurological examination of newborn 10
- Primitive reflexes 10
- Fundoscopy 10
- Otoscopy 10
- Examination of external genitalia – male and female 10
- Tanner's SMR scales 5
- DDST or Baroda scales, TDS 5
- Amiel Telson's angles 5
- Per rectal examination 2

Interpretation *(All PI)*

- Clinical History and Physical examination -
- Blood, Urine, CSF and Fluid investigations – hematology,
- biochemistry 50
- Chest Xray 50
- ECG 20
- ABG interpretation 20
- Abdominal Xray 20
- Bone and joint Xray 20
- CT scan Brain 20
- Barium studies 10
- IVP, VUR studies 10
- Ultrasound abdomen 10
- Neurosonogram 10

Communication skills

All PI:

- Clinical History and Physical examination
- Communicating health, disease
- Communicating about a seriously ill or mentally abnormal child
- Communicating death
- Informed consent
- Empathy with a family
- Referral letters, Replies
- Discharge summaries
- Death Certificates
- Pre-counseling for HIV

- Post counseling for HIV
- Basic Pedagogy sessions – teaching students, adults
- Lectures, bedside clinics, discussions
- Medline search, internet, Computer usage

List of Observations:

• Genetic counseling	2
• Classification of diseases	2

List of PA skills:

• Sedation	10
• Analgesia	10
• Brain death	10
• Intercostal tube placement with underwater seal	5

List of PA skills:

• Peritoneal dialysis	2
• Subdural,Ventricular tap	5

Teaching Learning Activities

Methods suggested for Pediatric Postgraduate Training Programs:

- **Didactic Lectures:** (Faculty lectures)

Objective: To introduce a broad-based concept in an important area of learning to orient the postgraduate student.

Examples: Potential introductory topics to Pediatrics like Fluid and Electrolytes, Early recognition of Shock and Respiratory Failure, DTTU management, Recent advances, Basic Science/ Concepts and ARI program.

Frequency: Three times a week during the introductory phase of the first one-two months of the new postgraduates joining the course. Following this period of orientation, it does not serve a purpose of self-directed learning and is best avoided as a regular activity except as an exceptional guest lecture.

- **Seminars:**

Objective: To enable a student to study in depth an important area of learning important to the training of the student.

Examples: Examples of potential seminar topics would be Protein Energy Malnutrition, Pediatric Tuberculosis, Pediatric HIV, Bronchial Asthma, Chronic Liver Disease and its complications.

Frequency: Three times a month. Topics to rotate once every 2-3 years (DCh, MD). Topic to be shared among 2-3 students and to be equally distributed depending upon the number of postgraduate students in the department.

- **Journal Club:**
  Objective: To appreciate and enable the critical analysis of scientific literature published in peer reviewed journals – studies, reviews.

  Examples: Articles like the study on prophylactic Zidovudine to HIV positive pregnant women in prevention of vertical transmission to the fetus, Digoxin versus Captopril in VSD in CCF, etc.

  Frequency: Ideally, once in 1-2 months. MDs get the first opportunity and juniors begin after their first year in the course.

- **Undergraduate Teaching Clinics**
  Objective: To teach effectively undergraduate and colleagues utilizing simple educational methods.
  Methodology: During the third year of MD course, postgraduate students should be given opportunities to teach undergraduates.

  Examples: Bedside Clinic, Didactic lecture, skill workshop (e.g. NALS, PALS)

  Frequency: During undergraduate postings in the department each postgraduate should have a minimum of 2 opportunities per year after the first year of the postgraduate course is completed.

- **Bedside Clinics**
  Objective: To learn bedside techniques - interview, physical examination, analysis, diagnostic decision making, investigation decisions, treatment and communication.

  Examples: Child with hemiplegia, hepatosplenomegaly, anemia, jaundice, etc.

  Frequency: Once in a week is the minimum as it forms the basis of good clinical training activities.

- **Mortality Review Meeting**
  Objective: To analyze, discuss and learn from mortalities.

Frequency: Once in a month preferably in the first week to allow the previous months mortality to be presented for discussion.

- **Grand Rounds**
  Objective: To improve on bedside techniques – interview, physical examination, analysis, diagnostic decision making, investigation decisions, treatment, communication.

  Examples: The child with pyrexia of unknown origin, undiagnosed hepato-splenomegaly, multi-systemic disease.

  Frequency: Once in a week presuming the Head of Unit or Department does not daily interfere with the day to day management of the ward except in special circumstances.

- **Inter-departmental Meetings**
  Objective: To experience inter-departmental cooperation and develop a healthy professional respect for each others opinions in addition to the subject learning experience.

  Methodology: Case discussions or students present investigations to members of both faculty. The discussion is a learning experience and improves communications between departments.

  Examples: Chest X-rays of a complicated bronchopneumonia progressing to an empyema, CT scans of intra-cranial pathology, Tracheo-esophageal fistulae and supportive care.

  Frequency: Once or twice in a month and rotated between departments – Radiology, Pediatric Surgery, Cardiology, Nephrology, Neurology, Clinical Hematology, etc.

- **Clinical Pathological Conference CPC**
  Objective: To analyze clinical material to reach a differential diagnosis and correlate with the pathological biopsy findings.

  Frequency: Once in two months. First choice is a senior MD student. All are encouraged to participate.

- **Records Round**
  Objective: To appreciate the importance of documentation of facts and record keeping.

Methodology: Faculty in the presence of the team scrutinizes random case records. History sheets, doctor order sheets, progress sheets and discharge summaries are discussed.

Frequency: Once a week with the entire team present at the session.

Dissertation

1. Every candidate pursuing degree course is required to carry out work on a selected research project under the guidance of a recognised post graduate teacher. The results of such a work shall be submitted in the form of a dissertation.

2. The dissertation is aimed to train a post graduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, comparison of results and drawing conclusions.

3. Every candidate shall submit to the Registrar (Academic), RGUHS, in the prescribed proforma, a synopsis containing particulars of proposed dissertation work six months from the date of commencement of the course on or before the dates notified by the University. The synopsis shall be sent through the proper channel.

4. Such synopsis will be reviewed and the dissertation topic will be registered by the University. No change in the dissertation topic or guide shall be made without prior approval of the University.

5. The dissertation should be written under the following headings:
   i. Introduction
   ii. Aims or Objectives of study
   iii. Review of Literature
   iv. Material and Methods
   v. Results
   vi. Discussion
   vii. Conclusion
   viii. Summary
   ix. References (Vancouver style)
   x. Tables
   xi. Annexures

6. The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other

annexures. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the Institution.

7. Four copies of dissertation thus prepared shall be submitted to the Registrar (Evaluation), six months before final examination on or before the dates notified by the University.

8. The dissertation shall be valued by examiners appointed by the University. Approval of dissertation work is an essential precondition for a candidate to appear in the University examination.

9. For some more details regarding Guide etc., please see Chapter I and for books on research methodology, ethics, etc., see Chapter IV.

Rotation Postings

Core

Pediatrics	--	18 - 23 months
Neonatology	--	6 - 8 months
Intensive Care/Emergency	--	2 - 3 months

Optional Specialities (optional subject to availability) -- 6 months

- Oncology
- Neurology
- Pediatric Surgery
- Nephrology
- Cardiology
- Clinical Hematology
- Dermatology
- Pulmonology
- Gastroenterology
- Clinical Microbiology
- Community/Rural

Monitoring Learning Progress

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning out comes to be assessed should included: (i) Personal Attitudes, (ii) Acquisition of Knowledge, (iii) Clinical and operative skills, (iv) Teaching skills and (v) Dissertation.

i) ***Personal Attitudes.*** The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trust worthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii) ***Acquisition of Knowledge*** : The methods used comprise of `Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

Journal Review Meeting (Journal Club): The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)

Seminars / Symposia: The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)

Clinico-pathological conferences : This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

iii) ***Clinical skills***

Day to Day work : Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).

Clinical and Procedural skills : The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)

iv) Teaching skills : Candidates should be encouraged to teach undergraduate medical students and paramedical students, if any. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students (See Model checklist V, Chapter IV)

v) Dissertation in the Department : Periodic presentations are to be made in the department. Initially the topic selected is to be presented before submission to the University for registration, again before finalisation for critical evaluation and another before final submission of the completed work (See Model Checklist VI & VII, Chapter IV)

vi) *Periodic tests:* The departments may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be held three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.

vii) Work diary / Log Book- Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

viii) *Records:* Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

Log book

The log book is a record of the important activities of the candidates during his training, Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

Format for the log book for the different activities is given in Tables 1,2 and 3 of Chapter IV. Copies may be made and used by the institutions.

Procedure for defaulters: Every department should have a committee to review such situations. The defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

Scheme of Examination

a) Theory

There shall be four question papers, each of three hours duration. Each paper shall consist of two long essay questions each question carrying 20 marks and 6 short essay questions each carrying 10 marks. Total marks for each paper will be 100. Questions on recent advances may be asked in any or all the papers. Details of distribution of topics for each paper will be as follows.

Paper I : **Fetal and newborn**

Paper II : **General Pediatrics I***

* General Paediatrics I includes: -Respiratory, CNS, Hematology, Nutrition, Growth and Development, Oncology, Endocrine, Metabolic, Allergy/Immunology, Psychiatry.

Paper III : **General Paediatrics II****

Includes: Infection, Gastroeneterology, Hepatology, Immunization ,Renal, CVS, Surgical, Adolescent, Collagen Vascular, Miscellaneous.

Paper IV : Ambulatory (OPD) Pediatrics, Community and Social Pediatrics, Emergency and Critical Care Pediatrics

Basic Sciences and Recent Advances as applied to clinical paediatric disorders should be **incorporated** into relevant and appropriate question papers covering the respective areas.

Note: The distribution of chapters / topics shown against the papers are suggestive only.

b) Clinical Examination 200 Marks

	No. of Cases	Marks
Long case	1	80
Short Case	1	45
OPD case	1	25
Emergency case	1	25
Newborn	1	25
Total	**5**	**200**

c) Viva – voice: 100 marks

1) Viva-Voce Examination: (80 Marks)
All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents. In addition candidates may also be given case reports, charts, gross specimens, pathology slides, instruments, X- rays, ultrasound, CT scan images, for interpretation. It includes discussion on dissertation also.

2) Pedagogy Exercise: (20 Marks)

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

d)

Maximum marks for	Theory	Practical	Viva	Grand Total
M.D. degree course	400	200	100	700

Recommended Books and Journals

Texts:

Essential

1. Nelson's Textbook of Pediatrics, Harcourt Asia Saunders
2. Cloherty's Manual of Neonatal Care
3. Meharban Singh's Care of the Newborn
4. Harriat Lane
5. Manual of Pediatric Therapeutics, Little Brown's Children's Hospital, Boston.
6. O.P. Ghai's Textbook of Pediatrics

Reference

1. Rudolf's Pediatrics, Appelton and Lange
2. Forfar and Arneil's Textbook of Pediatrics, ELBS
3. Frank Oski's Principles and Practice of Pediatrics
4. Avery's Disease of the Newborn
5. Roberton's Textbook of Neonatology
6. Illingworth's The normal child
7. Guha's Textbook of Neonatology
8. IAP Textbook of Pediatrics
9. Nadas' Pediatric Cardiology
10. Perloff's Approach to Congenital Heart Disease
11. Moss and Adam's Heart Disease in Infants, children and Adolescent
12. Miller's Blood Diseases of Infancy and Childhood
13. DeGruchy's Clinical Hematology in Medical Practice
14. Barret and Holiday's Pediatric Nephrology
15. Caffey's Pediatric X-Ray diagnosis
16. Alleyne's Protein Energy Malnutrition
17. Miller, Tuberculosis
18. Vimlesh Seth, Tuberculosis
19. Swanson's Pediatric Surgery
20. Cherry and Feigen's Pediatric Infectious Diseases
21. Fenichel's Pediatric Neurology
22. Kendig's Respiratory Diseases in Pediatrics
23. Alex Mowat's Liver Disease in Children
24. Roger's Pediatric Critical Care
25. H.P.S. Sachdev's Principles of Pediatric and Neonatology Emergencies
26. Smith's Recognition patterns of Human Malformations

Indexed Journals

1. Indian Pediatrics
2. Indian Journal of Pediatrics
3. Pediatric Clinics of North America
4. New England Journal of Medicine
5. Lancet
6. British Medical Journal
7. Journal of Pediatrics
8. Archives Disease of Childhood and Adolescence
9. Pediatrics
10. Perinatal Clinics of North America

Reference Series

1. Suraj Gupta's Recent Advances in Pediatrics
2. David's Recent Advances in Pediatrics
3. Advances in Pediatrics
4. Year Book of Pediatrics

SRI SIDDHARTHA UNIVERSITY

M.D. Degree Examination – Model Question Paper

[Time: 3 Hours] [Max. Marks: 100]

PAEDIATRICS
BASIC SCIENCES - PAPER – I

Q.P. CODE :

Your answers should be specific to the questions asked.
Draw neat labeled diagrams wherever necessary. Answer all questions

LONG ESSAY **2 X 20 = 40 Marks**

1. Discuss the visual pathways and outline the pathophysiology of retinopathy of prematurity
2. Discuss the normal sexual differentiation and approach to ambiguous genitalia at birth

SHORT ESSAY **6 X 10 = 60 Marks**

3. Anion gap
4. Surfactant
5. Fetal circulation
6. Neonatal seizures
7. Anti nuclear antibody
8. Bone age

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SRI SIDDHARTHA UNIVERSITY

M.D. Degree Examination – Model Question Paper

[Time: 3 Hours] [Max. Marks: 100]

PAEDIATRICS

FETAL AND NEONATAL MEDICINE
PAPER – II

Q.P. CODE :

Your answers should be specific to the questions asked.
Draw neat labeled diagrams wherever necessary. Answer all questions

LONG ESSAY **2 X 20 = 40 Marks**

1. A 5 year boy is brought with history of bone pain, fever and bleeding from the gums. How will you investigate and manage the child?

2. Discuss briefly commonly used renal function tests

SHORT ESSAY **6 X 10 = 60 Marks**

3. Acute bronchiolitis

4. Nutritional rickets

5. Metabolic Alkalosis

6. Different types of Proteinuria

7. Congenital hypothyroidism

8. Anti retro viral drugs commonly used in children

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SRI SIDDHARTHA UNIVERSITY

M.D. Degree Examination – Model Question Paper

[Time: 3 Hours] [Max. Marks: 100]

PAEDIATRICS

GENERAL PAEDIATRICS

PAPER – III

Q.P. CODE :

Your answers should be specific to the questions asked.
Draw neat labeled diagrams wherever necessary. Answer all questions

LONG ESSAY **2 X 20 = 40 Marks**

1. Six year old child brought for short stature. Discuss differential diagnosis, investigations and management

2. Eight year old child admitted with Congestive Heart Failure. Discuss differential diagnosis, investigations and management

SHORT ESSAY **6 X 10 = 60 Marks**

3. Hepatic Coma

4. Management of a 9 year old girl with Systemic Lupus Erythematosus

5. Congenital Megacolon

6. Slowly resolving pneumonias

7. Microcytic Anemias – Differential diagnosis

8. Conditions which mimic seizures

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SRI SIDDHARTHA UNIVERSITY

M.D. Degree Examination – Model Question Paper

[Time: 3 Hours] [Max. Marks: 100]

PAEDIATRICS
SOCIAL PAEDIATRICS AND PAEDIATRIC EMERGENCIES
PAPER – IV

Q.P. CODE :

Your answers should be specific to the questions asked.
Draw neat labeled diagrams wherever necessary. Answer all questions

LONG ESSAY **2 X 20 = 40 Marks**

1. You are the Medical Officer in a PHC. Two year old child brought with 3 days history of fever, cough and breathlessness. How will you manage him as per the ARI control program?
2. Five year old child who has fallen into a pond is brought to the hospital. How do you manage him?

SHORT ESSAY **6 X 10 = 60 Marks**

3. Chickenpox vaccination
4. Energy dense food
5. ICDS program
6. Temper tantrums in a child
7. RNTCP management of TB in children
8. Management of Acute Febrile seizure in a 2 year old child

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