CURRICULUM FOR POSTGRADUATE TRAINING IN PAEDIATRICS (MD)

1. OBJECTIVES

The objectives of MD Course in Paediatrics are to produce a competent Paediatrician who:

- Recognizes the health needs of infants, children and adolescents and carries out professional obligations in keeping with principles of the National Health Policy and professional ethics.
- Has acquired the competencies pertaining to Paediatrics that are required to be practiced in the community and at all levels of health system.
- Has acquired skills in effectively communicating with the child, family and the community.
- Is aware of contemporary advances and developments in medical sciences as related to child health.
- Is oriented to principles of research methodology.
- Has acquired skills in educating medical and paramedical professionals.
- Is able to recognize mental conditions and collaborate with Psychiatrists/Child Psychologists for the treatment of such patients.

2. *COMPETENCIES*

2. A. Cognitive domain

At the end of the MD course in Paediatrics, the students should be able to:

- Recognize the key importance of child health in the context of the health priority of country
- Practice the specialty of Paediatrics in keeping with the principles of professional ethics
- Identify social, economic, environmental, biological and emotional determinants of child and adolescent health, and institute diagnostic, therapeutic, rehabilitative,preventive and promotive measures to provide holistic care to children
- Recognize the importance of growth and development as the foundation of Paediatrics and help each child realize her/his optimal potential in this regard
- Take detailed history; perform full physical examination including neurodevelopment and behavioral assessment and anthropometric measurements in the child and make clinical diagnosis
- Perform relevant investigative and therapeutic procedures for the paediatric patient
- Interpret important imaging and laboratory results
- Diagnose illness based on the analysis of history, physical examination and investigations
- Plan and deliver comprehensive treatment for illness using principles of rational drug therapy
- Plan and advice measures for the prevention of childhood disease and disability
- Plan rehabilitation of children with chronic illness and handicap and those with special needs
- Manage childhood emergencies efficiently
- Provide comprehensive care to normal, ‘at risk’ and sick neonates
- Demonstrate skills in documentation of case details, and of morbidity and mortality data relevant to the assigned situation

- Recognize the emotional and behavioral characteristics of children, and keep these fundamental attributes in focus while dealing with them.
- Demonstrate empathy and humane approach towards patients and their families and keep their sensibilities in high esteem.
- Demonstrate communication skills of a high order in explaining management and prognosis, providing counseling and giving health education messages to patients, families and communities.
- Develop skills as a self-directed learner. Recognize continuing educational needs; use appropriate learning resources and critically analyze published literature in order to practice evidence-based Paediatrics.
- Demonstrate competence in basic concepts of research methodology and epidemiology.
- Facilitate learning of medical/nursing students, practicing physicians, paramedical health workers and other providers as a teacher-trainer.
- Implement National Health Programs, effectively and responsibly.
- Organize and supervise the desired managerial and leadership skills.
- Function as a productive member of a team engaged in healthcare, research and education.
- Recognize mental conditions, characterized by self absorption, reduced ability to respond, abnormal functioning in social interaction with or without repetitive behavior, poor communication (autism) and collaborate with Psychiatrists/ChildPsychologists for the treatment of such patients.

2. B. Affective Domain:

- Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
- Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
- Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

2. C. Psychomotor domain

At the end of the course, the student should have acquired following skills:

2. C.I. History and Examination

The student must gain proficiency in eliciting, processing and systematically presenting Paediatrics history and examination with due emphasis on the important aspects and minimization of less important facts. The following skills must be achieved:

- Recognition and demonstration of physical findings.
- Recording of height, weight, head circumference and mid arm circumference and interpretation of these parameters using growth reference standard assessment of nutritional status and growth.
- Assessment of pubertal growth.

- Complete developmental assessment by history and physical examination, and recognizing developmental disabilities, including autism.
- Systematic examination.
- Neonatal examination including gestation assessment by physical neurological criteria.
- Examination of the fundus and the ear-drum.
- Skills related to IMNCI, F-IMNCI, IYCF, and FBNC.

2. C.II. Monitoring Skills

Non-invasive monitoring of blood pressure, pulse and respiratory rates, saturation; ECG

2. C.III. Investigative Procedures

- Venous, capillary and arterial blood sampling using appropriate precautions
- Pleural, peritoneal, pericardial aspiration; subdural, ventricular and lumbar puncture
- Tuberculin test
- Biopsy of liver and kidney
- Urethral catheterization and suprapubic tap
- Gastric content aspiration

2. C. IV. Therapeutic Skills

- Breast feeding assessment and counselling; management of common problems.
- Establishment of central and peripheral vascular access; CVP monitoring.
- Administration of injections using safe injection practices.
- Determination of volume and composition of intravenous fluids and their administration.
- Neonatal and Pediatric basic and advanced life support.
- Oxygen administration, CPAP and nebulization therapy.
- Blood and blood component therapy.
- Intraosseous fluid administration.
- Phototherapy, umbilical artery and venous catheterization and exchange transfusion.
- Nasogastric feeding.
- Common dressings and abscess drainage; intercostal tube insertion.
- Basic principles of rehabilitation.
- Peritoneal dialysis.
- Mechanical ventilation.

2. C.V. Bed side investigations, including

- Complete blood counts, micro ESR, peripheral smear
- Urinalysis
- Stool microscopy and hanging drop
- Examination of CSF and other body fluids
- Blood sugar
- Shake test on gastric aspirate
- Gram stain, ZN stain

2. C.VI. Patient Management Skills

- Proficiency in management of pediatric emergencies, including emergency triaging.
- Drawing and executing patient management plan and long term care.
- Documenting patient records on day to day basis and problem oriented medical record (POMR).
- Care of a normal and sick newborn, management of neonatal disorders, hypothermia, sepsis, convulsions, jaundice, metabolic problems.
- Identifying need for timely referral to appropriate departments/health facility and pre-transport stabilization of the sick child.

2. C.VII. Communication Skills; Attitudes; Professionalism

- Communicating with parents/child about nature of illness and management plan prognostication, breaking bad news
- Counseling parents on breast feeding, nutrition, immunization, disease prevention, promoting healthy life style
- Genetic counselling
- Communication and relationship with colleagues, nurses and paramedical workers
- Appropriate relation with pharmaceutical industry
- Health economics
- Professional and research ethics

2. C.VIII. Interpretation of Investigations

- Plain x-ray chest, abdomen and skeletal survey
- Contrast radiological studies: Barium swallow, barium meal, barium enema, MCU
- Ultrasound skull and abdomen
- Histopathological, biochemical and microbiological investigations
- CT Scan and MRI (skull, abdomen, chest)
- Electrocardiogram, electroencephalogram
- Arterial and venous blood gases
- Bed side Echocardiography.
- **Desirable**: Interpretation of radio-isotope studies, audiogram, neurophysiological studies, (BERA, VER, Electromyography [EMG], Nerve Conduction Velocity[NCV]), lung function tests

2. C.IX. Academic Skills

- Familiarity with basic research methodology, basic IT skills. Planning the protocol of the thesis, its execution and final report
- Review of literature
- Conducing clinical sessions for undergraduates medical students
- Desirable: writing and presenting a paper. Teaching sessions for nurses and medical workers

3. Syllabus

3.1 Course contents:

Guidelines

During the training period, adequate time is to be spent in discussing child health problems of public health importance in the country or particular region.

3.1.1 Basic Sciences

- Principles of inheritance, chromosomal disorders, single gene disorders, multifactorial / polygenic disorders, genetic diagnosis and prenatal diagnosis, pedigree drawing.
- Embryogenesis of different organ systems especially heart, genitourinary system, gastro-intestinal tract.Applied anatomy and functions of different organ systems.
- Physiology of micturition and defecation; placental physiology; fetal and neonatal circulation; regulation of temperature, blood pressure, acid base balance, fluid electrolyte balance and calcium metabolism.
- Vitamins and their functions.
- Hematopoiesis, hemostasis, bilirubin metabolism.
- Growth and development at different ages, growth charts; puberty and its regulation.
- Nutrition: requirements and sources of various nutrients.
- Pharmacokinetics of common drugs, microbial agents and their epidemiology.
- Basic immunology, biostatistics, clinical epidemiology, ethical and medico-legal issues.
- Teaching methodology and managerial skills.

3.2 Understanding the definition, epidemiology, aetiopathogenesis, presentation, complications, differential diagnosis and treatment of the following, but not limited to:

3.2.1 Growth and development

- principles of growth and development
- normal growth and development,
- normal growth and development
- sexual maturation and its disturbances
- failure to thrive and short stature
- Autism

3.2.2 Neonatology

- perinatal care
- low birth weight
- care in the labor room and resuscitation
- newborn feeding
- prematurity

- respiratory distress
- common transient phenomena
- apnea
- infections
- anemia and bleeding disorders
- jaundice
- gastrointestinal disorders
- neurologic disorders
- malformations
- renal disorders
- understanding of perinatal medicine
- thermoregulation and its disorders

3.2.3 Nutrition

- maternal nutritional disorders;
- nutrition for the low birth weight
- impact on fetal outcome
- breast feeding
- infant feeding including
- vitamin and mineral deficiencies
- complementary feeding
- protein energy malnutrition
- obesity
- adolescent nutrition
- parenteral and enteral nutrition
- nutritional management of systemic illness (GI, hepatic, renal illness)

3.2.4 Cardiovascular

- congenital heart diseases
- rheumatic fever and rheumatic heart(cyanotic and acyanotic) disease
- infective endocarditis
- arrhythmia
- disease of myocardium
- diseases of pericardium(cardiomyopathy, myocarditis)
- systemic hypertension
- hyperlipidemia in children

3.2.5 Respiratory

- congenital and acquired disorders of nose
- infections of upper respiratory tract ,tonsils and adenoids
- obstructive sleep apnea,congenital anomalies of lower respiratory tract
- acute upper airway obstruction
- foreign body in larynx trachea and bronchus

- trauma to larynx
- subglottic stenosis (acute, chronic)
- neoplasm of larynx and trachea
- bronchial asthma
- bronchiolitis
- acute pneumonia, bronchiolitis
- aspiration pneumonia, GER
- recurrent, interstitial pneumonia
- suppurative lung disease
- atelectasis
- lung cysts, mediastinal mass
- pleural effusion

3.2.6 Gastrointestinal and liver disease

- disease of oral cavity
- disorders of deglutition and esophagus
- peptic ulcer disease
- congenital pyloric stenosis
- intestinal obstruction
- acute and chronic pancreatic disorders
- malabsorption syndrome
- acute and chronic diarrhea
- irritable bowel syndrome
- inflammatory bowel disease
- Hirschsprung disease
- anorectal malformations
- hepatitis
- hepatic failure
- chronic liver disease
- Budd-Chiari syndrome
- metabolic diseases of liver
- cirrhosis and portal hypertension

3.2.7 Nephrologic and Urologic disorders

- acute and chronic glomerulonephritis
- xanthema syndrome
- hemolytic uremic syndrome
- urinary tract infection
- VUR and renal scarring
- involvement in systemic diseases
- renal tubular disorders
- neurogenic bladder, voiding dysfunction
- congenital and hereditary renal disorders

- renal and bladder stones
- posterior urethral valves
- hydronephrosis
- undescended testis, hernia, hydrocoele
- Wilms tumor

3.2.8 Neurologic disorders

- seizure and non-seizure paroxysmal events
- epilepsy, epileptic syndromes
- meningitis, encephalitis
- brain abscess
- febrile encephalopathies
- Guillain-Barre syndrome
- neurocysticercosis and other neuroinfestations
- HIV encephalopathy
- SSPE
- cerebral palsy
- neurometabolic disorders
- neurodegenerative disorders
- neuromuscular disorders
- mental retardation
- learning disabilities
- muscular dystrophies
- acute flaccid paralysis and AFP surveillance
- malformations
- movement disorders
- Tumors

3.2.9 Hematology and Oncology

- deficiency anemias
- hemolytic anemias
- aplastic anemia
- pancytopenia
- thrombocytopenia
- disorders of hemostasis
- blood component therapy
- transfusion related infections
- bone marrow transplant/stem cell transplant
- acute and chronic leukemia
- myelodysplastic syndrome
- Lymphoma
- neuroblastoma
- hypercoagulable states

3.2.10 Endocrinology

- hypopituitarism/hyperpituitarism
- diabetes insipidus
- pubertal disorders
- hypothyroidism and hyperthyroidism
- adrenal insufficiency
- Cushing's syndrome
- adrenogenital syndromes
- diabetes mellitus
- hypoglycemia
- short stature
- gonadal dysfunction and intersexuality
- obesity

3.2.11 Infections

- bacterial (including tuberculosis)
- viral (including HIV)
- fungal
- parasitic
- rickettssial
- mycoplasma
- protozoal and parasitic
- nosocomial infections
- control of epidemics and infection prevention
- safe disposal of infective material

3.2.12 Emergency and Critical Care

- emergency care of shock
- cardio-respiratory arrest
- respiratory failure
- acute renal failure
- status epilepticus
- acute severe asthma
- fluid and electrolyte disturbances
- acid-base disturbances
- poisoning
- accidents
- scorpion and snake bites

3.2.13 Immunology and Rheumatology

- arthritis (acute and chronic)
- vasculitides
- immunodeficiency syndromes
- systemic lupus erythematosus

3.2.14 ENT

- acute and chronic otitis media
- hearing loss
- post-diphtheritic palatal palsy
- acute/chronic tonsillitis/adenoids
- allergic rhinitis/sinusitis
- foreign body

3.2.15 Skin Diseases

- exanthematous illnesses
- vascular lesions
- pigment disorders
- vesicobullous disorders
- infections
- Steven-Johnson syndrome
- atopic, seborrheic dermatitis
- drug rash
- alopecia
- icthyosis

3.2.16 Eye problems

- refraction and accommodation
- partial/total loss of vision
- cataract
- night blindness
- strabismus
- conjunctival and corneal disorders
- disorders of retina, including tumors

3.2.17 Behavioral and Developmental disorders

- rumination, pica
- enuresis, encopresis
- sleep disorders
- habit disorders
- breath holding spells
- anxiety disorders

- mood disorders
- temper tantrums
- attention deficit hyperactivity disorders
- autism

3.2.18 Social/Community Paediatrics

- national health programs related to child health
- IMNCI
- F-IMNCI
- FBNC
- IYCF
- Vaccines: constituents, efficacy, storage, contraindications and adverse reactions
- rationale and methodology of pulse polio immunization
- child labor, abuse, neglect
- adoption
- disability and rehabilitation
- rights of the child
- National policy of child health and population
- juvenile delinquency
- Principles of prevention, control of infections (food, water, soil, vector borne)
- Investigation of an epidemic

3.2.19 Orthopaedics

- major congenital orthopedic deformities
- bone and joint infections
- common bone tumors

3.3 Approach to clinical problems

3.3.1 Growth and development

- precocious and delayed puberty
- developmental delay
- impaired learning

3.3.2 Neonatology

- low birth weight newborn
- sick newborn

3.3.3 Nutrition

- lactation management and complementary
- protein energy malnutrition feeding (underweight, wasting, stunting)
- failure to thrive and micronutrient deficiencies

3.3.4 Cardiovascular

- Murmur
- cyanosis
- congestive heart failure
- systemic hypertension
- arrhythmia
- shock

3.3.5 GIT and Liver

- Acute diarrhea
- persistent and chronic diarrhea
- abdominal pain and distension
- ascites
- vomiting
- constipation
- gastrointestinal bleeding
- jaundice
- hepatosplenomegaly
- hepatic failure and encephalopathy

3.3.6 Respiratory

- Cough/chronic cough
- hemoptysis
- wheezy child
- respiratory distress

3.3.7 Infections

- acute onset pyrexia
- prolonged pyrexia with and
- recurrent infections without localizing signs
- nosocomial infections
- fever with xanthema

3.3.8 Renal

- Hematuria/dysuria
- bladder/bowel incontinence
- voiding dysfunctions
- renal failure (acute and chronic)
- hypertension

3.3.9 Hematology and Oncology

- anemia
- bleeding

3.3.10 Neurology

- limping child
- convulsions
- paraplegia, quadriplegia
- cerebral palsy
- macrocephaly and microcephaly
- floppy infant
- acute flaccid paralysis
- headache

3.3.11 Endocrine

- thyroid swelling
- ambiguous genitalia
- obesity
- short stature

3.3.12 Miscellaneous

- skin rash
- lymphadenopathy
- epistaxis
- proptosis
- arthralgia, arthritis

4. TEACHING AND LEARNING METHODS

Postgraduate teaching programme

General principles

Acquisition of practical competencies being the keystone of PG medical education, PG training should be skill oriented. Learning in PG program should be essentially self-directed and primarily emanating from clinical and academic work. The formal sessions are merely meant to supplement this core effort.

Formal teaching sessions

In addition to bedside teaching rounds, at least 5-hr of formal teaching per week including

Activity	Frequency	Preceptor	Evaluator
Journal Club	Once a week	SR & Faculty	2 faculty members other than the Preceptor
Seminar	Once in 15 Days	SR & Faculty	2 faculty members other than the Preceptor
Case Discussion	Once a week	Faculty	Assigned faculty
Grand Round	Once in 15 Days		
Interdepartmental Presentations **A. Neurology** **B. Cardiology** **C. Endocrinology** **D. Nephrology** **E. Radiology** **F. Pediatric Surgery** **G. Dermatology** **H. Psychology /Psychiatry** **I. Biostatistics, etc.**	Once in a month		
General Statistics	Once a week	SR & Faculty	
Statistics PICU	Once in three months	PICU SR & Faculty	
Statistics NICU	Once in three months	NICU SR & Faculty	
Faculty Lectures (Paediatrics)	Once a week		

- Attend accredited scientific meetings (CME, symposia, and conferences).
- Additional sessions on resuscitation, basic sciences, biostatistics, research methodology, teaching methodology, hospital waste management, health economics, medical ethics and legal issues related to pediatric practice.
- The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

- A postgraduate student of a postgraduate degree course in broad specialities/superspecialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

5. Log book

During the training period, the post graduate student shall need to maintain a Log Book indicating the duration of the postings/work done in Pediatric Wards, OPDs and Casualty. This should indicate the procedures assisted and performed, and the teaching sessions attended. The purpose of the Log Book is to:

- Help maintain a record of the work done during training,
- Enable Consultants to have direct information about the work; intervene if necessary,
- Use it to assess the experience gained periodically.The log book shall be used to aid the internal evaluation of the student. The Logbooks shall be checked and assessed periodically by the faculty members imparting the training.

6. Rotations:

The postgraduate student will need to rotate through all the clinical units in the department.The rotations would be as follows as: -

- Neonatology (including perinatology): - 6-9 months
- Intensive Care: - 6-8 months
- Emergency: - 4-6 months
- Pediatric ward (including outpatient dept): - 9-12 months with rotation in both the units.
- Nephrology:- 15 Days
- Gastroenterology: - 15 Days
- Paediatrics Surgery: - 15 Days
- PMR: - 01 Week
- Dermatology: - 01 week

7. Thesis

7.1 Objectives

By carrying out a research project and presenting his work in the form of thesis, the student shall be able to:

- identify a relevant research question
- conduct a critical review of literature
- formulate a hypothesis
- determine the most suitable study design
- state the objectives of the study
- prepare a study protocol
- undertake a study according to the protocol
- analyze and interpret research data, and draw conclusions
- write a research paper

7.2 Guidelines

While selecting the topic, following should be kept in mind:

- the scope of study is limited to enable its conduct within the resources and time available
- the study must be ethically appropriate
- the emphasis should be on the process of research rather than the results
- the protocol, interim progress and final presentation is made formally to the department
- Only one student per teacher/thesis guide.

There should be periodic review of the thesis work, as per the following schedule: -

- ✓ End of 3 months:- Submission of protocol
- ✓ During 2nd yr : - Mid-term presentation
- ✓ 6 months prior to examination: - Final presentation; submission

During the training programme, patient safety is of paramount importance; therefore skill laboratory will also be used for PG training.

8. Recommended Reading:

8.1 Core Books & Reference Books

1. Nelson Text book of Pediatrics
2. Avery Text book of Neonatology
3. Care of Newborn Meharban Singh
4. Cloherty – Mannual of Neonatal Care
5. IAP Text book of Pediatrics
6. Rogers'Textbook of Pediatrics Intensive Care, etc.

8.2 Journals

1. Indian J Pediatrics
2. Indian Pediatrics
3. Journal of Pediatrics
4. Pediatric Clinics of North America
5. Archives of Diseases of Childhood

9. Orientation sessions for PG students joining MD in Paediatrics

- Orientation to the Hospital: Various Departments and facilities available
- Communication skills: Patients and colleagues
- Literature search
- Basic research methodology
- Protocol writing and thesis
- Universal precautions and appropriate disposal of hospital waste
- Management of shock
- Congestive cardiac failure
- Normal fluid and electrolyte requirement and their disorders
- Interpretation and management of disorders of acid-base balance
- Evaluation of a sick newborn
- Management of seizures, hypothermia and hypoglycemia in the newborn
- Management of seizures and status epilepticus
- Management of comatose patients
- Hospital management of severe PEM
- Acute kidney injury
- Fulminant hepatic failure
- Management of respiratory distress
- Management of acute diarrhea
- Approach to a bleeding child and its management
- Rational antibiotic therapy
- Basics of Mechanical Ventilation
- BLS
- Neonatal Resuscitation

Annexure I

Postgraduate Students Appraisal Form

Name of the Department/Unit:

Name of the PG Student :

Period of Training : FROM……TO……

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1/2/3	4/5/6	7/8/9	
01.	Journal based / recent advances learning				
02.	Patient based /Laboratory or Skill based learning				
03.	Self directed learning and teaching				
04.	Departmental and interdepartmental learning activity				
05.	External and Outreach Activities / CMEs				
06.	Thesis / Research work				
07.	Log Book Maintenance				

Publications Yes/ No

Remarks----------

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