
UG

**DELHI UNIVERSITY
FACULTY OF MEDICAL SCIENCES**

**DEPARTMENT OF PAEDIATRICS
UNDER-GRADUATE CURRICULUM**

PEDIATRICS

4

Objectives

At the end of the course, the learner shall be able to:

1. Diagnose and appropriately treat common pediatric and neonatal illnesses.
2. Describe the common pediatric disorders and emergencies in terms of epidemiology, etiopathogenesis, clinical manifestations, diagnosis, rational therapy and rehabilitation;
3. Identify pediatric and neonatal illnesses and problems that require secondary and tertiary care and refer them appropriately.
4. Advise and interpret relevant investigations and perform therapeutic procedures, as applicable to children including neonates.
5. Counsel and guide patient's parents and relatives regarding the illness, the appropriate care, the possible complications and the prognosis.
6. Provide emergency cardiopulmonary resuscitation to newborns and children.
7. Describe preventive strategies for common infectious disorders, malnutrition, genetic and metabolic disorders, poisonings, accidents and child abuse;
8. Participate in the National Health Programmes effectively.
9. Diagnose and effectively treat acute pediatric and neonatal emergencies.

Course Content

Topic	Must know	Desirable to know
<p>Vital Statistics Definition and overview of Pediatrics with special reference to age-related disorders. Population structure, pattern of morbidity and mortality in children.</p> <p>Maternal, perinatal, neonatal, infant and preschool mortality rates. Definition, causes, present status and measures for attainment of goals.</p>	<p>√</p> <p>√</p>	

Topic	Must know	Desirable to know
Current National programs such as ICDS, RCH, Vitamin A prophylaxis, UIP, Pulse polio, ARI, Diarrhea Control Program, IDD, etc.	√	
Growth and Development		
Normal growth from conception to maturity including different organ system	√	
Anthropometry: measurement and interpretation of weight, length/height, head circumference, mid-arm circumference. Use of weighing machines, infantometer, Normative values for clinical parameters in children	√	
Interpretation of Growth Charts: Road to Health card and percentile growth curves	√	
Identify short stature, obesity		√
Principles of normal development	√	
Important milestones in infancy and early childhood in the areas of gross motor, fine motor, language and personal-social development. 3-4 milestones in each of the developmental fields, age of normal appearance and the upper age of normal.	√	
Identify developmental delay/disability	√	
Sexual maturity rating		√
Nutrition		
Normal requirements of protein, carbohydrates, fat, minerals and vitamins for newborn, children, adolescents, and pregnant and lactating mother. Common food sources.	√	
Breastfeeding-physiology of lactation, composition of breast	√	

Topic	Must know	Desirable to know
milk, colostrums, initiation and technique of feeding. Exclusive breastfeeding-Definition and benefits. Characteristics and advantages of breast milk. Hazards and demerits of prelacteal feed, top milk and bottle feeding. Feeding of LBW babies. Problems in breastfeeding, BFHI, IMS Act.		
Complementary feeding, National Guidelines on Infant and Child Feeding (IYCF).	√	
Assessment of nutritional status of a child based on history and physical examination	√	
Protein energy malnutrition-Identification, classification. Causes and management of PEM including that of complications. Planning a diet for PEM.	√	
Vitamins-Recognition of vitamin deficiencies (A, D, K, C, B-Complex). Etiopatho-genesis, clinical features, biochemical and radiological findings, differential diagnosis and management of nutritional rickets and scurvy. Hypervitaminosis A and D	√	
Immunization		
National Immunization Programme	√	
Principles of Immunization. Vaccine preservation and cold-chain	√	
Types, contents, efficacy storage, dose, site, route, contra-indications and adverse reactions of vaccines- BCG, DPT, OPV, Measles, MMR, Hepatitis B and Typhoid: Rationale and methodology of Pulse Polio Immunization	√	
Investigation and reporting of vaccine preventable diseases. AFP (Acute Flaccid Paralysis) surveillance.	√	
Special vaccines like H.influenzaeb, Pneumococcal, Hepatitis A, Chicken pox, Meningococcal, Rabies		√

Topic	Must know	Desirable to know
Infectious Diseases		
Epidemiology, basic pathology, natural history, symptoms, signs, complications, investigations, differential diagnosis, management and prevention of common bacterial, viral and parasitic infections in the region, with special reference to vaccine-preventable diseases: Tuberculosis, poliomyelitis, diphtheria, whooping cough, tetanus including neonatal tetanus, measles, mumps, rubella, typhoid, viral hepatitis, cholera, chickenpox. Other infection: Giardiasis, amebiasis, intestinal helminthiasis, malaria, dengue fever, AIDS	√	
Tuberculosis : Pulmonary and Extra pulmonary Etiopathogenesis, diagnostic criteria in children versus adults. Diagnostic aids - technique and interpretation of Mantoux test. Radiological patterns, chemoprophylaxis and treatment including the DOTS schedule	√	√
Multidrug resistant tuberculosis	√	
Rational management of fever, PUO		√
Kala-azar, leprosy		
Hematology		
Causes of anemia in childhood. Classification based on etiology and morphology	√	
Epidemiology, recognition, diagnosis, management and prevention of nutritional anemia-iron deficiency, megaloblastic anemia.	√	
Clinical approach to a child with anemia with/without lymphadenopathy and/or hepato-splenomegaly	√	
Chronic hemolytic anemia with special reference to thalassemia, sickle cell disease	√	

Topic	Must know	Desirable to know
Approach to a bleeding child	√	
Diagnosis of acute lymphoblastic leukemia and principles of treatment		√
Clinical features and management of hemophilia, ITP		√
Diagnosis and principles of management of lymphomas		√
Respiratory System		
Clinical approach to a child with cyanosis, respiratory distress, stridor, wheezing.	√	
Etiopathogenesis, clinical features, complications, investigations, differential diagnosis and management of acute upper respiratory infections, pneumonia with emphasis on bronchopneumonia, bronchio-litis, bronchitis.	√	
Etiopathogenesis, clinical features, diagnosis, classification and management of bronchial asthma. Treatment of acute severe asthma	√	
Diagnosis and management of foreign body aspiration	√	
Pathogenesis, clinical features and management of pneumothorax, pleural effusion and empyema.	√	
Bronchiectasis, cystic fibrosis.		√
Gastrointestinal tract		
Clinical approach to a child with jaundice, vomiting, abdominal pain, bleeding, hepatosplenomegaly	√	
Acute diarrhea disease-Etiopathogenesis, clinical differentiation of watery and invasive diarrhea, complications of diarrheal illness. Assessment of dehydration, treatment at home	√	

Topic	Must know	Desirable to know
and in hospital. Fluid and electrolyte management. Oral rehydration, composition of ORS		
Clinical features and management of acute viral hepatitis, causes and diagnosis of chronic liver disease; neonatal cholestasis	√	
Common causes of constipation		√
Gastroesophageal reflux, GI bleeding, portal hypertension		√
Persistent diarrhea, Reye's syndrome, Celiac disease, malabsorption syndrome		√
Drug induced hepatitis		√
Wilson's disease		√
Central Nervous System		
Clinical approach to a child with coma, convulsions	√	
Clinical diagnosis, investigations and treatment of acute pyogenic meningitis, encephalitis and tubercular meningitis. Neurocysticercosis	√	
Seizure disorders - Causes and types of convulsions at different ages. Diagnosis, categorization and management of epilepsy (broad outline). Febrile convulsions-definition, types, management	√	
Identification of cerebral palsy and mental retardation	√	
Acute flaccid paralysis - Differentiation between Polio and Gullain-Barre syndrome	√	
Identification of Microcephaly, hydrocephalus	√	

Topic	Must know	Desirable to know
Intracranial space occupying lesions, infantile hemiplegia		√
Cardiovascular system		
Clinical features, diagnosis, investigation, treatment and prevention of acute rheumatic fever. Common forms of rheumatic heart disease in childhood. Differentiation between rheumatic and rheumatoid arthritis	√	
Recognition of congenital acyanotic and cyanotic heart disease. Hemodynamics, clinical features and management of VSD, PDA, ASD and Fallot's tetralogy	√	
Recognition and management of congestive cardiac failure and cyanotic splls in infants and children	√	
Diagnosis and management of bacterial endocarditis, pericardial effusion, myocarditis		√
Recognition of hypertension in children		√
Genitourinary system		
Approach to a child with proteinuria/hematuria	√	
Etiopathogenesis, clinical features, diagnosis, complications and management of acute post-streptococcal glomerulonephritis and nephritic syndrome	√	
Etiology, clinical features, diagnosis and management of urinary tract infection - related problems	√	
Etiology, diagnosis and principles of management of acute renal failure	√	
Hemolytic-uremic syndrome		√

Topic	Must know	Desirable to know
Identification of chronic renal failure		√
Endocrinology		
Etiology, clinical features and diagnosis of diabetes and hypothyroidism, and goiter in children	√	
Delayed and precocious puberty		√
Neonatology		
Definition - live birth, neonatal period, classification according to weight and gestation	√	
Delivery room management including neonatal resuscitation and temperature control	√	
Etiology, clinical features, principles of management and prevention of birth asphyxia	√	
Birth injuries - causes and their recognition	√	
Care of the normal newborn in the first week of life. Normal variations and clinical signs in the neonate	√	
Identification of congenital anomalies at birth with special reference to anorectal anomalies, tracheo-esophageal fistula, diaphragmatic hernia, neural tube defects	√	
Neonatal jaundice: causes, diagnosis and principles of management	√	
Neonatal infection - etiology, diagnosis, principles of management. Superficial infections, sepsis	√	
Low birth weight babies - causes of prematurity and small-for-date baby, clinical features and differentiation. Principles of feeding and temperature regulation. Problems of low birth weight babies.	√	

Topic	Must know	Desirable to know
Identification of high risk/sick newborn (i.e., detection of abnormal signs - cyanosis, jaundice, respiratory distress, bleeding, seizures, refusal to feed, abdominal distension, failure to pass meconium and urine)	√	
Transportation of a sick neonate	√	
Recognition and management of specific neonatal problems-hypoglycemia, hypo-calcemia, anemia, seizures, necrotizing enterocolitis, hemorrhage		√
Common intra-uterine infections		√
Genetics		
Principles of inheritance and diagnosis of common genetic disorders (for e.g. Down's syndrome, etc.)	√	
Behavioral Problems		
Breath holding spells, nocturnal enuresis, temper tantrums, pica	√	
Autism and ADHD		√
Pediatric Emergencies		
Status epilepticus	√	
Status asthmaticus / Acute severe asthma	√	
Shock and anaphylaxis	√	
Burns	√	
Gastrointestinal bleeding	√	
Comatose child	√	

Topic	Must know	Desirable to know
Congestive cardiac failure	√	
Common poisonings and snakebite	√	
Acute renal failure	√	
Fluid-Electrolyte		
Principles of fluid and electrolyte therapy in children	√	
Pathophysiology of acid-base imbalance and principle of management	√	
Therapeutics		
Principles of Pediatric Therapeutics	√	
Pediatric doses, drug combinations, drug interactions, age specific choice of antibiotics, etc		√
Adolescent Medicine		
Changes during adolescence, factors affecting adolescent health	√	
Psycho-social problems in adolescents		√
Integrated care of a sick child		
Triage	√	
Ambulatory care (IMNCI strategy)		
i) Management of a infant below 2 months	√	
ii) Management of child between 2 mo-5 yr. of age	√	
First Referral care	√	

Skills

Skills	Perform independ ently	Perform under supervisio n	Assist the expert	Observe
Clinical Examination including history taking, general physical examination and systemic examination	√			
Counseling skills	√			
Gestational age assessment by physical criteria	√			
Emergency Triaging	√			
Prepare ORS	√			
IMNCI Case Management Skills	√			
Nasogastric tube insertion	√			
Infant & young child feeding assessment & counseling	√			
Anthropometry	√			
Injections (IM, IV, S/C, I/D)	√			
Vaccine administration				
Pleural tap			√	
Ascitic tap			√	
Blood transfusion and monitoring		√		
Lumbar puncture		√		
IV cannula insertion and Blood sampling	√			
Bone marrow aspiration				√
Liver biopsy				√
Kidney biopsy				√
Peritoneal dialysis				√
Basic Life Support (Pediatrics and Newborn including Neonatal Resuscitation)	√			
Intraosseous infusion				√
Exchange transfusion				√
Use of Spacer and Nebulizer				√

- ★ It is recommended that an undergraduate should attend the emergency posting for 8 hours in VIIIth / IXth semester outside the routine working hours in order to enable him/her to practice and learn emergency triaging.
- ★ It is recommended that a log book should be maintained in order to record the skills learnt.

Suggested/proposed change in the Under Graduate curriculum Summative and formative evaluation.

1. The total integrated marks for both theory and practical should be increased to 200. The internal assessment should constitute 20% of the total marks.
2. The proposed papers should be Paper I and Paper II of 40 marks each. Part A of each paper should be the MCQ/Objective questions constituting of 25 % for each paper and amounting to total of 10 marks.
3. 75% of MCQ's should be from the "must know" component and 25% from "desirable to know" component.
4. Section B of the paper should consist of 1 Long Answer Question of 10 marks and 1 Short Answer Question of 5 marks.
5. Section C should contain 5 Questions of 3 marks each question from desirable to know area options within the questions; of these 50% i.e. 3 Questions should be left to the choice of the student, thereby there would be total of 15 marks. Each Question carrying 3 marks for the total of 5 Questions with 3 extra optional questions framed in the question itself.
6. No. of examiners should be atleast 4 per 100 students.
7. The total no. of students appearing in 1 day between 25-30
8. Internship should be of one month duration in pediatrics with a log book being compulsory

Section	Proposed Pattern	Marks
A	MCQ $\left\{ \begin{array}{l} 75\% \text{ must know} \\ 25\% \text{ desirable} \end{array} \right.$	10
B	Long Question/Short Question	15 (10+5)
C	Short Question Total questions 5 with choice of 3 (option within the question itself)	15 (5 x 3)

Each Paper should consist the Section A, B&C

Paper I

Section	Subject covered	Total Marks	Question type with division
A	MCQ	10	5 Neonatal component 5 remaining topics of paper I
B	Neonatal	15	LAQ 10 SAQ 5
C	1. Growth & Development Preventive & Social Pediatrics 2. Endocrine/Behavior/Genetics	3 3 3 x 3	SAQ total 5 With 3 having option in the question itself

Paper II

Section	Subject covered	Total Marks	Question type with division
A	MCQ	10	10
B	1. Nutrition 2. Infection	15	LAQ 10 SAQ 5
C	1. GIT 2. CNS 3. CVS 4. Hematology 5. Nephrology 6. Respiratory System	15	SAQ 5 With 3 having option in the question itself

Suggested Model for Examination

Proposed Guidelines for Examination

★ Total Marks Allotted	:		:	200
★ Theory	:		:	100
<i>Two papers</i>	:		:	<i>80</i>
<i>Internal Assessment</i>	:		:	<i>20</i>
 ★ Clinical	 :		 :	 100
<i>Cases</i>	:		:	<i>60 [30(1 LC)+15(1 SC)+15(NB)]</i>
<i>Spots/skill stations</i>	:		:	<i>20 [4+1(NB)]4 marks each</i>
<i>Int. Assessment</i>	:		:	<i>20</i>

Short case would be an ambulatory case to adjudge IMNCI skills

Module for internal assessment

Semester	Theory	Weightage for Internal assessment	Clinical (End of posting assessment)	Weightage for Internal assessment
3 rd / 4 th	-		History / Anthropometry	4
6 th / 7 th	-		IMNCI	4
8 th / 9 th (Ward Living)	Short Answer + MCQ	10	Short case + OSCE/Spots	6
Pre-Final (Sent Up)	Short Essay + MCQ/Short answer	10	2 cases + OSCE/Spots	6
Total		20		20

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DELHI UNIVERSITY
FACULTY OF MEDICAL SCIENCES

DEPARTMENT OF PAEDIATRICS
POSTGRADUATE CURRICULUM

Guidelines for Post Graduate Training Programme for MD (Pediatrics)

MD

Programme Objectives

The goal of MD course in Pediatrics is to produce a competent pediatrician who :

- recognizes the health needs of infants, children and adolescents and carries out professional obligations in keeping with principles of National Health Policy and professional ethics.
- has acquired the competencies pertaining to pediatrics that are required to be effpracticed 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 the 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.

Objectives

The objectives to be fulfilled at the completion of the course are as follows :

Knowledge

1. Understand importance of child health in context of health priority of the country.
2. Describe and monitor growth and development of children and identify deviations from normal.
3. Describe etio-pathogenesis, principles of clinical diagnosis, investigations and treatment of diseases of childhood.
4. Outline various childhood emergencies & their management
5. Develop an understanding of Basic (Pre and Para clinical) Sciences and its application to clinical practice
6. Identify and understand socio-economic environmental –cultural factors in health care.
7. Analyze clinical and investigation data to comprehensively manage a health related problem.
8. Plan comprehensive treatment for illness using principles of rational drug therapy.
9. Plan measures for prevention of childhood disease and disability.

10. Identify normal, 'at risk' and sick neonates
11. Provide care to normal, 'at risk' and sick neonates
12. Recognize problems requiring referral & identify pre-referral treatment.
13. Audit and analyze work, be conversant with basic principles of research methodology, assist in research and publishing of scientific articles.

Skills

1. Take detailed history, perform full physical examination including neurodevelopment & behavioral assessment and correlate to make a clinical diagnosis.
2. Perform relevant investigative and therapeutic procedures for the pediatric patient.
3. Interpret imaging and laboratory results.
4. Diagnose illness in children based on the analysis of history, physical examination and investigate work up.
5. Plan and deliver comprehensive treatment for illness in children using principles of rational drug therapy.
6. Provide emergency management to a sick child

Communication and Attitudes

1. Practice the speciality of Pediatrics in keeping with the principles of professional ethics.
2. Demonstrate empathy and humane approach towards patients and their families and keep their sensibilities in high esteem.
3. Demonstrate communication skills of a high order in explaining management and prognosis, providing counseling and giving health education messages to patients, families and communities.
4. Develop an attitude of being a self-directed learner, recognize continuing educational needs, use appropriate learning resources, and critically analyze relevant published literature in order to practice evidence-based pediatrics.
5. Function as a productive member of a team engaged in health care, research and education.

3. Syllabus

General Guidelines: During the training period effort must always be made that adequate time is spent in discussing child health problems of public health importance in the country or particular region.

- 3.1. **Disorders** (*Definition, Epidemiology, etiopathogenesis, presentation, complications, differential diagnosis, and treatment*).
- 3.2.1. **Growth and development.** Principles of growth and development, normal growth and development in childhood and adolescence, *growth & development monitoring*, deviations in growth and development, sexual maturation and its disturbances.
- 3.2.2. **Disorders of fluids & electrolytes:** Physiology of fluids, electrolytes and acid-basis, dehydration & fluid management, dyselectrolytemia, acid-base disorders
- 3.2.3. **Neonatology.** Perinatal care, normal newborn, care in the labor room and resuscitation, low birth weight, prematurity, newborn feeding, common transient phenomena, respiratory distress, apnea, infections, jaundice, anemia and bleeding disorders, neurologic disorders, gastrointestinal disorders, renal disorders, malformations, thermoregulation and its disorders, understanding of perinatal medicine.
- 3.2.4. **Nutrition.** Maternal nutritional disorders: impact on fetal outcome, nutrition for the low birth weight, breast feeding, infant feeding including complementary feeding, protein energy malnutrition, vitamin and mineral deficiencies, trace elements of nutritional importance, obesity. Adolescent nutrition, nutritional management in diarrhea, nutritional management of systemic illnesses (celiac disease, hepatobiliary disorders, nephrotic syndrome), parenteral and enteral nutrition in neonates and children.
- 3.2.5. **Cardiovascular.** Congenital heart diseases (cyanotic and acyanotic), rheumatic fever and rheumatic heart disease, infective endocarditis, arrhythmia, diseases of myocardium (cardiomyopathy, myocarditis), diseases of pericardium, systemic hypertension,.
- 3.2.6. **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 inflammatory upper airway obstruction, FB in larynx, trachea and bronchi, subglottic stenosis (Acute & Chronic), trauma to larynx, neoplasm of larynx and trachea. Bronchitis, bronchiolitis, aspiration pneumonia, GER, Acute pneumonia, interstitial pneumonia, suppurative lung disease, atelectasis, lung cysts, emphysema & hyperinflation bronchial asthma, pulmonary edema, bronchiectasis, pleural effusion, pulmonary leaks, mediastinal mass.

- 3.2.7. ***Gastrointestinal and liver diseases.*** Diseases of mouth, oral cavity and tongue, Disorders of deglutition and esophagus, peptic ulcer disease, *H. pylori* infection, foreign body, congenital pyloric stenosis, intestinal obstruction, malabsorption syndrome, acute and chronic diarrhea, Irritable bowel syndrome, ulcerative colitis, Hirschsprung disease, anorectal malformations. Liver disorders: hepatitis, hepatic failure, chronic liver disease, Wilson's disease, Budd-Chiari syndrome, metabolic diseases of liver, cirrhosis, and portal hypertension.
- 3.2.8. ***Genitourinary disorders.*** Acute and chronic glomerulonephritis, nephrotic syndrome, hemolytic-uremic syndrome, urinary tract infection, VUR and renal scarring, renal involvement in systemic diseases, renal tubular disorders, congenital and hereditary renal disorders, renal and bladder stones, posterior urethral valves, hydronephrosis, voiding dysfunction, undescended testis, Wilm's tumor, fluid-electrolyte disturbances.
- 3.2.9. ***Neurologic disorders.*** Seizure and non seizure paroxysmal events, epilepsy and epileptic syndromes of childhood, meningitis, brain abscess, coma, acute encephalitis and febrile encephalopathies, Guillain-Barre syndrome, neurocysticercosis and other neuro-infestations, HIV encephalopathy, SSPE, cerebral palsy, neurometabolic and *neuro-degenerative* disorders, mental retardation, learning disabilities, muscular dystrophies, acute flaccid paralysis and AFP surveillance, ataxia, movement disorders of childhood, CNS tumor, malformations, *neuro-cutaneous disorders, diseases of spinal cord & neuro-muscular junction*
- 3.2.10. ***Hematology & Oncology.*** Deficiency anemia, hemolytic anemia, aplastic anemia/pancytopenia, disorders of hemostasis, thrombocytopenia, blood component therapy, transfusion related infections, bone marrow transplant / stem cell transplant, acute and chronic leukemia, myelodysplastic syndrome, Hodgkin disease, non-Hodgkin's lymphoma, neuroblastoma, Wilms tumor, hypercoagulable states.
- 3.2.11. ***Endocrinology.*** Hypopituitarism/hyperpituitarism, Diabetes insipidus, pubertal disorders, hypo- and hyperthyroidism, hypo- and hyperparathyroidism, adrenal insufficiency, *congenital adrenal insufficiency*, Cushing's syndrome, adrenogenital syndromes, diabetes mellitus, short stature, failure to thrive, *ambiguous genitalia*, pubertal changes and gynecological disorders, dyslipidemia.
- 3.2.12. ***Infections.*** Bacterial, viral, fungal, parasitic, rickettsial, mycoplasma. *Pneumocystis carini* infections, chlamydia, protozoal and parasitic, tuberculosis, HIV, nosocomial infections. Control of epidemics and infection prevention.
- 3.2.13. ***Emergency and critical care.*** Emergency care of shock, cardiorespiratory arrest, respiratory failure, congestive cardiac failure, acute renal failure, status epilepticus, fluid and electrolyte disturbances and its therapy, acid-base disturbances, poisoning, accidents, scorpion & snake bites.

3.2.14. **Immunology and Rheumatology.** Arthritis (acute and chronic), connective tissue disorders, disorders of immunoglobulins, T and B cell disorders, immunodeficiency syndromes.

3.2.15. **ENT.** Acute and chronic otitis media, conductive/sensorineural hearing loss, acute/chronic tonsillitis/adenoids, allergic rhinitis/sinusitis.

3.2.16. **Skin diseases.** Exanthematous illnesses vascular lesions, pigment disorders, vesicobullous disorders, infections: pyogenic and fungal and parasitic, Steven-Johnson syndrome, eczema, seborrhea dermatitis, drug rash, urticaria, alopecia, ichthyosis.

3.2.17. **Eye problems.** Refraction & accommodation, partial/total loss of vision, cataract, night blindness, chorioretinitis, strabismus, conjunctival & corneal disorders, ROP, retinoblastoma, optic atrophy, papilloedema.

3.2.18. **Behavioral and psychological disorders.** Rumination, pica, enuresis, encopresis, sleep disorders, habit disorders, breath holding spells, anxiety disorders, mood disorders, temper tantrums, attention deficit hyperactivity disorder, infantile autism.

3.2.19 Community and social pediatrics. *National Health Nutrition Programs, nutrition screening of community, prevention of blindness, School Health Programs, health legislation, adoption, child labor, juvenile delinquency, general principles of prevention and control of infections including food borne, waterborne, soil borne and vector borne diseases, investigations of an outbreak in a community, child labor, rights of the child, national policy of child health and population.*

3.2.19. **Genetics.** Chromosomal disorders, single gene disorders, multifactorial disorders/polygenic, genetic diagnosis, and prenatal diagnosis.

3.2.20. **Orthopedics.** Major congenital orthopedic deformities, bone and joint infections, Potts' spine, and common bone tumors.

3.4. Basic sciences

Embryogenesis of different organ system especially heart, genitourinary system, gastrointestinal tract, applied anatomy of different organs, functions of kidney, liver, lungs, heart and endocrinal glands. Physiology of micturition and defecation, placental physiology, fetal and neonatal circulation, regulation of temperature (esp. newborn), blood pressure, acid base balance, fluid electrolyte balance, calcium metabolism, vitamins and their functions, hematopoiesis, hemostasis, bilirubin metabolism, growth and

development at different ages, puberty and its regulation, nutrition, normal requirements of various nutrients, basic immunology, bio-statistics, clinical epidemiology, ethical and medico-legal issues, teaching methodology and managerial skills. Pharmacokinetics of commonly used drugs, microbial agents and their epidemiology.

Approach to important clinical symptoms/problems

- Fever with/without rash
- Chronic/recurrent fever
- PUO
- Protein energy malnutrition
- Chronic/recurrent cough
- Chronic diarrhea
- Vomiting
- Jaundice
- Chronic liver disease
- Organomegaly
- Ascites
- Anasarca
- Failure to thrive
- Short stature
- Delayed development
- Developmental regression
- Respiratory distress
- Wheezing
- Recurrent /persistent pneumonia
- Anemia
- Lymphadenopathy
- Bleeding disorder
- Murmur
- Cyanosis
- CHF
- Hypertension
- Hemiplegia
- Hematuria
- Paraplegia
- Monoplegia
- Quadriplegia
- Seizures
- Limp
- Floppy infant
- Large head

- Low birth weight neonate
- Preterm neonate
- Microcephaly
- Acute flaccid paralysis
- Obesity
- Thyroid enlargement
- Precocious puberty
- Delayed puberty
- Ambiguous genitalia

SKILLS

I. History and Examination

The student must gain proficiency in eliciting, processing and systematically presenting pediatric history and examination with due emphasis on the important and minimization of less important facts.

The following skills must be achieved :

1. Recognition and demonstration of physical findings
2. Recording of height, weight, head circumference and mid arm circumference and interpretation of these parameters using growth reference standards for assessment of nutritional status and growth.
3. Assessment of pubertal growth.
4. Complete development assessment by history and physical examination.
5. Systematic examination.
6. Neonatal examination including gestation assessment by physical and neurological criteria.
7. Examination of the fundus and the ear-drum.
8. IMNCI & IYCF

II. Monitoring Skills

Non invasive monitoring of vital functions including BP, , PR, RR, SPO₂. and heart-rate patterns (ECG)

III. Investigative Procedures

1. Venous, capillary and arterial blood sampling for investigations and sample collection using appropriate asepsis and universal precautions.
2. Pleural, peritoneal sub-dural tap, lumbar puncture, ventricular tap.

3. Tuberculin test.
4. Biopsy of liver and kidney.
5. Urethral catheterization and supra-pubic tap.
6. Gastric content aspiration
7. Bone marrow biopsy, pericardial tap

IV. Therapeutic Skills

1. Breast feeding assessment and counseling on appropriate technique of breast feeding and management of common problems associated with it.
2. Establishment of vascular access
3. Administration of injections using safe injection practices.
4. Determination of volume and composition of intravenous fluids and their administration.
5. Neonatal and Pediatric basic and advanced life support.
6. Oxygen administration, CPAP and nebulisation therapy.
7. Blood and blood component therapy.
8. Intra-osseous fluid administration,.
9. Phototherapy, umbilical artery & venous catheterization and exchange transfusion.
10. Nasogastric feeding.
11. Common dressings and abscess drainage.
12. Basic principles of rehabilitation.

Desirable: Peritoneal dialysis, venesection, tracheostomy, central venous cannulation and CVP monitoring, intercostal tube drainage, mechanical ventilation.

IV. Bed side investigations

1. Hb, TLC, micro ESR, peripheral smear.
2. Urine routine and microscopic examination, urine reducing sugar by Benedicts test.
3. Stool microscopy and hanging drop.
4. Examination of CSF and other body fluids.
5. Blood sugar
6. Shake test on gastric aspirate
7. Gram stain, ZN stain.

V. Patient Management Skills

1. Proficiency in management of all pediatric emergencies.
2. Drawing and executing patient management plan and long term care.
3. Documenting patient records on day to day basis and problem oriented medical record.
4. Care of a normal and sick newborn, management of neonatal disorders like hypothermia, sepsis, convulsions, jaundice, metabolic problems, etc.
5. Identifying need for timely referral to appropriate departments / health care facility & pre-transport stabilization of the sick child

VI. Interpretation of Investigations

1. Plain x-ray chest, abdomen, skeletal system
2. Contrast radiological studies: Barium swallow, barium meal, barium enema, IVP, MCU.
3. Ultrasound skull, abdomen.
4. Histopathological, biochemical and microbiological investigations
5. CT Scan / MRI skull.
6. ECG
7. ABG

Desirable: Interpretation of radio-isotope studies, audiogram, common EEG patterns, neuro-physiological studies, BERA, VER, EMG, NCV, CT/MRI abdomen and chest, respiratory function tests

VII. Communication Skills & Attitudes

1. Communicating with parents / child about nature of illness and management plan, prognostication., breaking bad news
2. Counseling parents on breast feeding, nutrition, immunization, disease prevention and promoting healthy life style.
3. Genetic counseling
4. Communication with colleagues, nurses and paramedical workers.
5. Appropriate relation with pharmaceutical industry.

VIII. Academic Skills

Familiarity with basic research methodology.

Planning the protocol of the thesis, its execution and final report.

Review of literature

Conducting clinical sessions for undergraduates medical students.

Desirable: Writing and presenting a paper, Teaching sessions for nurses and para medical workers.

Thesis

Objectives

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

- Identify a relevant research questions;
- 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.

Guidelines

While selecting thesis topics, following should be kept in mind:

- The scope of study should be limited so that it is possible to conduct it within the resources and time available to the student.
- The emphasis should be on the process of research rather than the results.
- The research study must be ethically appropriate.
- The protocol, interim progress as well as final presentation must be made formally to the entire department.
- Only one student per teacher/thesis guide
- There should be periodic departmental review of the thesis work as per following schedule :
 - End of 1st year - Submission of protocol
 - During 2nd year - Mid-term presentation
 - 6 months prior to exam - Final Presentation and Submission

After submission of protocol, supervisor should send the information of work done by the candidates to the University every 6 months.

Evaluation of thesis

The thesis will be evaluated by two independent reviewers who shall grant marks out of 50 each. A minimum combined aggregate of 50% is a mandatory precondition for the postgraduate student to appear in the final examination.

General observations

- There should be a training program on Research Methodology for existing faculty to build capacity to guide research.
- Within 3 months of thesis submission the candidate should be communicated the acceptance/rejection of the thesis.

Log Book

During his/her training, the candidate should maintain a Log Book indicating the duration of the postings / work done in Paediatric Wards, OPDs and Casualty. It should indicate the procedures assisted and performed by the candidate, and the teaching sessions, symposia, journal club meetings, etc., attended.

The purpose of the Log Book is to :

1. Help to maintain a record of the work done during training.
2. Enable the consultant to have first hand information about the work done and to intervene whenever necessary.
3. Use it to assess the experience gained periodically.

The log book shall be used to aid the internal evaluation of the student.

TEACHING PROGRAMME

GENERAL PRINCIPLES

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

Acquisition of theoretical skills

- Self study
- Journal Club
- Seminars
- Lectures
- Inter-ward & inter-departmental case discussion
- CME Programmes for post-graduate students

Acquisition of Practical skills

- Bed-side teaching rounds
- NALS & PALS course
- Workshops on various subjects for examples : Assessment for growth & development, diarrhoea management, Ventilatory support, Communication skills etc.
- Clinico-radiological conference

It is desirable that at joining pediatric residency programme a post graduate student should attend the NALS & PALS courses and training in hospital waste management. A supervised training in practical procedure like blood sampling, I/V line insertion & other clinical procedures should be undertaken at the earliest opportunity. These should be supported by the videos where available. In addition, a series of orientation classes should be organized for them on subjects including common pediatric emergencies, fluid & electrolyte management etc. A suggested list of these classes is enclosed (Annex 1).

Formal teaching sessions

In addition to bedside teaching rounds, at least 5 hours of formal teaching per week are a must. The departments may select the activities from those mentioned above.

ASSESSMENT

General Principles :

- The Assessment should valid, objectives, and reliable.
- It must cover cognitive, psychomotor and affective domains.
- Formative, and summative assessment should be conducted in theory as well as practicals/clinicals. In addition, thesis should be assessed separately.

Formative (Internal Assessment)

Objective

- Providing feedback to the students
and
- Contribute towards final evaluation (20% of total score)

Fields of Assessment

- | | |
|------------------------------------|--------------------------------------|
| 1. Personal attributes | Ongoing after each clinical posting. |
| 2. Clinical skills and performance | -do- |
| 3. Academic activities | -do- |
| 4. Theory Exams | |
| 5. Practical Exams | |

I. Theory Assessment

The theoretical knowledge shall be assessed by means of written exams at the end of 1st year, 2nd year & sent up examination (at 2 yrs. 9 months.)

Marks for theory exams (Total maximum marks = 200)

I year end	MM = 50
II Year end	MM = 50
Sent-up examination	MM = 100

II. Practical Assessment (Total maximum marks = 200)

I Year	OSCE	MM = 40
II Year	OSCE & One case	MM = 60
III Year	OSCE & three cases (like main exam)	MM = 100

Other Evaluation

1. Academic Presentations
2. Scientific Excellence
3. Skill Proficiency
4. Personal attributes
5. Teaching activities

The above fields shall be graded on a scale of 1-5 (see annexures). The academic presentations shall be graded at the time of presentation by the Consultant in-charge. Evaluation on points 2 to 5 shall be done by the Unit in-charge at the end of every semester. A sample of the evaluation proforma for all the above points is presented in Annexures 2-5.

Summative Assessment

The theory paper & the practicals shall be marked instead of current practice of granting grades. The evaluation of theory papers shall be done independently before the commencement of practical examination.

- Ratio of marks in theory and practicals will be equal
- The minimum percentage require to pass will be 50%
- Candidate will have to pass theory and practical exam separately.
- Internal evaluation shall contribute towards 20% of total score

I. Theory (Total Maximum Marks = 200)

Paper 1:	Basic sciences as applied to pediatrics & community pediatrics.	MM = 50
Paper 2 :	Neonatology	MM = 50
Paper 3 :	General pediatrics including advances in pediatrics relating to Cluster-I specialities	MM = 50
Paper 4 :	General Pediarics including advances in pediatrics relating to Cluster-II specialities	MM = 50

Cluster- I Nutrition, Growth and development, Immunization, Infectious disease, Genetics, Immunology, Rheumatology Psychiatry and Behavioral Sciences, Skin, Eye, ENT, Adolescent Health, Critical Care, Accidents and Poisoning.

Cluster- II Neurology and disabilities, Nephrology, Hematology-oncology, endocrinology, Gastroenterology and Hepatology, Respiratory and cardiovascular disorder.

In each paper there should be 10 short essay questions (SEQ)

II. Practicals (Total Maximum Marks = 200)

1. 3 cases of equal weightage carrying 40 marks each

Desirable distribution of cases :

Case I – Neonate

Case II – Child upto 4-5 Years

Case III – Child more than 5 years.

2. OSCE

The OSCE shall consist of 10 stations of 8 marks each. It shall consist of 6 observed stations (1 by each examiner) & 4 unobserved stations.

The observed stations shall assess the students on the following skills.

- NALS/PALS
- Assessment of growth & development
- Communication/Counseling skills
- History taking
- Examination
- Procedural skills

The unobserved stations shall check the analytic skills of the students for example : Interpretation of laboratory investigations, ABG/ECG, Radiological investigations.

111 Internal assessment (Total maximum marks=100):

Theory: 50 marks

Practical 50 marks

Annex 1

Orientation sessions for Residents joining post-graduation in Pediatrics

Common for all Residents of the Institute

- Orientation to the Hospital : Various Departments & facilities available
- Communication skills : Patients & Colleagues
- Literature search
- Basic research methodology
- Protocol writing & thesis

For Pediatrics Residents

- Introduction to residency in Pediatrics
- Universal Precautions and Appropriate Disposal of Hospital Waste
- Management of Shock
- Congestive Cardiac Failure
- Normal Fluid & Electrolyte Requirement
- Disorders of Fluid & Electrolyte Balance
- ABG Interpretation & Management of Disorders of Acid-Base Balance
- Neonatal Seizures
- Evaluation of a sick newborn
- Management of Hypothermia and Hypoglycemia in the Newborn
- Management of Seizures & Status Epilepticus
- Management of Comatose Patients
- Hospital Management of Severe PEM
- Acute Renal Failure
- Fulminant Hepatic Failure
- Approach to a child with respiratory distress & initial management
- Management of Acute Diarrhoea
- Approach to a Bleeding Child and its Management
- Rational Antibiotic Therapy

Annex 2

End of year evaluation of the post graduate students

Name of the Student _____

Year 1 / 2 / 3

Place of Posting: _____ From _____ / To _____

_____ From _____ / To _____

_____ From _____ / To _____

1. Skill Proficiency*

	Posting1	Posting2	Posting3
Attendance in academic activities			
Performance in ward procedures			
Performance in emergency procedures			
Performance in neonatology procedures			
Handling of equipments			
Performance in laboratory procedures			
Decision making/formulation of management plan			
Record writing			
Administration			
Leadership qualities			

2. **Personal Attributes***

	Posting1	Posting2	Posting3
Availability (punctual, available on duty, responds promptly to calls, takes proper permission for leave)			
Sincerity & Motivation (dependable, honest, admits mistake, does not cook up information, exhibits good moral values, loyal to institution, takes initiative & responsibility, keen desire to learn)			
Diligence & performance (dedicated, hard working, does not shirk duties, leaves no pending work, does not sit idle. Competent in clinical case, skilled in procedure & file work)			
Academic ability (intelligent, shows sound knowledge/skills, participates in academic activities, self-learning ability)			
Interpersonal skills (compassionate attitude to patients, gets along well with colleagues, paramedics and respectful to seniors)			

*Grading of proficiency & personal attributes: On a scale of 1 to 5

1: Poor

5:Excellent

3. **Scientific Excellence**

- Awards
- Publications
- Conference paper presentations
- Attendance at C.M.E., Workshop, Symposium

4. **Teaching Activities**

- Health talks for parents/patients
- Under graduate clinical sessions
- Classes for nurse & paramedical workers

Signature of the Unit In-charge

Annex 3

Evaluation Sheet – Journal Club

Name of the Student _____

Date of Presentation _____

Points to the considered	Excellent	Meets Expectation	Below Expectation
Choice of article			
Cogency of presentation			
Critical review			
Whether cross-reference and other relevant publications consulted.			
Audio-Visual aids			
Interaction			

Signature of the Consultant In-charge

Annex 4

Evaluation Sheet – Seminar/Review/Protocol/Thesis

Name of the Student _____

Date of Presentation _____

Points to be considered	Excellent	Meets Expectation	Below Expectation
Presentation			
Completeness of preparation			
Cogency of presentation			
Use of Audio-Visual aids			
Understanding the subject			
Ability to answer questions			
Time scheduling			
Consulted all relevant literature			

Signature of the Consultant In-charge

Annex 5

Evaluation Sheet – Clinical Case Presentation

Name of the Student _____

Date of Presentation _____

Points to be considered	Excellent	Meets Expectation	Below Expectation
Logic Order			
Completeness of history			
Cogency of presentation			
Whether all relevant points elicited			
Mentioned all positive/negative points of importance			
Accuracy of general physical examination			
Whether all physical signs elicited correctly			
Whether any major sign missed or misinterpreted			
Diagnosis : whether it follows logically from history & findings Management <ul style="list-style-type: none">• Completes list of investigations• Relevant order• Interpretation of investigations• Treatment principles & details			
Ability to reach to questioning-whether answers relevant and complete			
Ability to defend diagnosis			
Ability to justify differential diagnosis			
Confidence			
Others			

Signature of the Consultant In-charge

①

Proposed Guidelines for Post Graduate Training Programme for MD
(Pediatrics)

Existing Guidelines	Proposed Guidelines
1. Programme Objectives Already defined	<ul style="list-style-type: none"> • No Changes.
2. Specific Learning Objectives: Defined	<ul style="list-style-type: none"> • Components of knowledge, skills, communication and attitudes, monitoring skills, investigative procedures, therapeutic skills, bed side investigation, patient management skills, interpretation of investigations, communication skills and attitudes and academic skills sub grouped. <ol style="list-style-type: none"> 1. In the skills section it was felt that the history should be elicited using skills of good communication. 2. In the Investigative skills addition of Pain management (Analgesia and sedation etc) and performing of Bone Marrow aspiration was incorporated. 3. In the therapeutic skills Techniques and indications of blood and blood component therapy were added; CVP monitoring and mechanical ventilation were shifted to must know areas. Intra thecal drug administration was shifted to desirable area. 4. In bedside investigation ZN stain was shifted to desirable area. 5. In patient management skills the word neonatal was added in the line of Proficiency in management of all pediatric emergencies. 6. In interpretation of investigations metabolic screening tests, web resources, presentation and data analysis, ECHO, antenatal USG were shifted to must know area. Whereas MRI was incorporated in a desirable skill. 7. A subheading of Ethics was added which included research ethics, GCP sensitization, informed

	consent and about about appropriate relationship with pharmaceutical industry.
3. Syllabus: Defined paper wise	<ul style="list-style-type: none"> • Approach to list of topics related to approach to important clinical symptoms deleted. Growth and development monitoring added. • Component of approach to inborn errors of metabolism added along with genetics (eg. Chromosomal disorders, genetic diagnosis and prenatal diagnosis)
4. Thesis: Not defined	<ul style="list-style-type: none"> • Objectives guidelines and evaluation methodology incorporated.
5. Rotations: Defined	<ul style="list-style-type: none"> • No change
6. Log book: Not mentioned in the guidelines	<ul style="list-style-type: none"> • Log book to be maintained by the students to aid in internal evaluation.
7. Teaching Programme: Defined	<ul style="list-style-type: none"> • No change except for incorporation of NALS, PALS and hospital based management.
8. Assessment: Details not mentioned in guidelines	<ul style="list-style-type: none"> • Concept of internal assessment introduced. Fields of assessment defined, methodology defined, marks assigned and percentage of internal assessment marks to be added to final exams defined (20%). The theoretical knowledge shall be assessed by means of written exams at the end of first year and second year and sent up examinations at 2 year 9 months. • Practical assessment will be held in the first year (OSCE and NALS), second year (OSCE and one case), third year (OSCE and three cases like main exam). • The concept of ongoing evaluation throughout the year introduced. • Concept of grading as excellent, meets expectation, below expectation introduced.

<p>9. Main examination: 4 theory papers and 4 cases and viva on defined areas by each examiner. No mention of internal assessment marks being added.</p> <p><i>Theory papers should be evaluated by a different set of appointed examiners.</i></p>	<ol style="list-style-type: none"> 1. A change in the assessment has been introduced i.e. from a system of grades to a system of marks. 2. In the summative assessment the total marks of theory paper has been increased from 200 to 400. and of practical from 200 to 400. <ol style="list-style-type: none"> a) The theory would then constitute of 4 papers of 100 marks each. In each paper there will be 10 short essay questions. b) The practicals would constitute of three cases: Case 1: neonate/young infant less than 3 months, Case 2: Child upto 4-5 years, Case 3: Child more than 5 years. 3. Also a system of OSCE's has been introduced and followed. It would consist of 10 stations of 8 marks each. 6 observed and 4 unobserved stations. In the observed stations a station of OPD/ambulatory case will be introduced. The OSCE would be done on day one for all students appearing. In OSCE stations assessing the skills of history taking and examination should not be incorporated in the proposed stations.
<p>10. Orientation Session for residents: Not mentioned in guidelines</p>	<p>a) To be individualized institution wise.</p>
<p>11. End semester evaluation of PG students: Not mentioned</p>	<p>a) Well structured assessment forms devised and incorporated.</p>

Guidelines for Post Graduate Training Programme for MD (Pediatrics)

MD

Programme Objectives

The goal of MD course in Pediatrics is to produce a competent pediatrician who :

- recognizes the health needs of infants, children and adolescents and carries out professional obligations in keeping with principles of National Health Policy and professional ethics.
- has acquired the competencies pertaining to pediatrics that are required to be effpracticed 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 the 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.

Objectives

The objectives to be fulfilled at the completion of the course are as follows:

Knowledge

1. Understand importance of child health in context of health priority of the country.
2. Describe and monitor growth and development of children and identify deviations from normal.
3. Describe etio-pathogenesis, principles of clinical diagnosis, investigations and treatment of diseases of childhood.
4. Outline various childhood emergencies & their management
5. Develop an understanding of Basic (Pre and Para clinical) Sciences and its application to clinical practice
6. Identify and understand socio-economic environmental –cultural factors in health care.
7. Analyze clinical and investigation data to comprehensively manage a health related problem.
8. Plan comprehensive treatment for illness using principles of rational drug therapy.
9. Plan measures for prevention of childhood disease and disability.

10. Identify normal, 'at risk' and sick neonates
11. Provide care to normal, 'at risk' and sick neonates
12. Recognize problems requiring referral & identify pre-referral treatment.
13. Audit and analyze work, be conversant with basic principles of research methodology, assist in research and publishing of scientific articles.

Skills

1. Take detailed history, perform full physical examination including neurodevelopment & behavioral assessment and correlate to make a clinical diagnosis.
2. Perform relevant investigative and therapeutic procedures for the pediatric patient.
3. Interpret imaging and laboratory results.
4. Diagnose illness in children based on the analysis of history, physical examination and investigate work up.
5. Plan and deliver comprehensive treatment for illness in children using principles of rational drug therapy.
6. Provide emergency management to a sick child

Communication and Attitudes

1. Practice the speciality of Pediatrics in keeping with the principles of professional ethics.
2. Demonstrate empathy and humane approach towards patients and their families and keep their sensibilities in high esteem.
3. Demonstrate communication skills of a high order in explaining management and prognosis, providing counseling and giving health education messages to patients, families and communities.
4. Develop an attitude of being a self-directed learner, recognize continuing educational needs, use appropriate learning resources, and critically analyze relevant published literature in order to practice evidence-based pediatrics.
5. Function as a productive member of a team engaged in health care, research and education.

3. Syllabus

General Guidelines: During the training period effort must always be made that adequate time is spent in discussing child health problems of public health importance in the country or particular region.

- 3.1. **Disorders** (*Definition, Epidemiology, etiopathogenesis, presentation, complications, differential diagnosis, and treatment*).
- 3.2.1. **Growth and development.** Principles of growth and development, normal growth and development in childhood and adolescence, *growth & development monitoring*, deviations in growth and development, sexual maturation and its disturbances.
- 3.2.2. **Disorders of fluids & electrolytes:** Physiology of fluids, electrolytes and acid-basis, dehydration & fluid management, dyselectrolytemia, acid-base disorders
- 3.2.3. **Neonatology.** Perinatal care, normal newborn, care in the labor room and resuscitation, low birth weight, prematurity, newborn feeding, common transient phenomena, respiratory distress, apnea, infections, jaundice, anemia and bleeding disorders, neurologic disorders, gastrointestinal disorders, renal disorders, malformations, thermoregulation and its disorders, understanding of perinatal medicine.
- 3.2.4. **Nutrition.** Maternal nutritional disorders: impact on fetal outcome, nutrition for the low birth weight, breast feeding, infant feeding including complementary feeding, protein energy malnutrition, vitamin and mineral deficiencies, trace elements of nutritional importance, obesity. Adolescent nutrition, nutritional management in diarrhea, nutritional management of systemic illnesses (celiac disease, hepatobiliary disorders, nephrotic syndrome), parenteral and enteral nutrition in neonates and children.
- 3.2.5. **Cardiovascular.** Congenital heart diseases (cyanotic and acyanotic), rheumatic fever and rheumatic heart disease, infective endocarditis, arrhythmia, diseases of myocardium (cardiomyopathy, myocarditis), diseases of pericardium, systemic hypertension,.
- 3.2.6. **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 inflammatory upper airway obstruction, FB in larynx, trachea and bronchi, subglottic stenosis (Acute & Chronic), trauma to larynx, neoplasm of larynx and trachea. Bronchitis, bronchiolitis, aspiration pneumonia, GER, Acute pneumonia, interstitial pneumonia, suppurative lung disease, atelectasis, lung cysts, emphysema & hyperinflation bronchial asthma, pulmonary edema, bronchiectasis, pleural effusion, pulmonary leaks, mediastinal mass.

- 3.2.7. **Gastrointestinal and liver diseases.** Diseases of mouth, oral cavity and tongue, Disorders of deglutition and esophagus, peptic ulcer disease, *H. pylori* infection, foreign body, congenital pyloric stenosis, intestinal obstruction, malabsorption syndrome, acute and chronic diarrhea, Irritable bowel syndrome, ulcerative colitis, Hirschsprung disease, anorectal malformations. Liver disorders: hepatitis, hepatic failure, chronic liver disease, Wilson's disease, Budd-Chiari syndrome, metabolic diseases of liver, cirrhosis, and portal hypertension.
- 3.2.8. **Genitourinary disorders.** Acute and chronic glomerulonephritis, nephrotic syndrome, hemolytic-uremic syndrome, urinary tract infection, VUR and renal scarring, renal involvement in systemic diseases, renal tubular disorders, congenital and hereditary renal disorders, renal and bladder stones, posterior urethral valves, hydronephrosis, voiding dysfunction, undescended testis, Wilm's tumor, fluid-electrolyte disturbances.
- 3.2.9. **Neurologic disorders.** Seizure and non seizure paroxysmal events, epilepsy and epileptic syndromes of childhood, meningitis, brain abscess, coma, acute encephalitis and febrile encephalopathies, Guillain-Barre syndrome, neurocysticercosis and other neuro-infestations, HIV encephalopathy, SSPE, cerebral palsy, neurometabolic and *neuro-degenerative* disorders, mental retardation, learning disabilities, muscular dystrophies, acute flaccid paralysis and AFP surveillance, ataxia, movement disorders of childhood, CNS tumor, malformations, *neuro-cutaneous disorders, diseases of spinal cord & neuro-muscular junction*
- 3.2.10. **Hematology & Oncology.** Deficiency anemia, hemolytic anemia, aplastic anemia/pancytopenia, disorders of hemostasis, thrombocytopenia, blood component therapy, transfusion related infections, bone marrow transplant / stem cell transplant, acute and chronic leukemia, myelodysplastic syndrome, Hodgkin disease, non-Hodgkin's lymphoma, neuroblastoma, Wilms tumor, hypercoagulable states.
- 3.2.11. **Endocrinology.** Hypopituitarism/hyperpituitarism, Diabetes insipidus, pubertal disorders, hypo- and hyperthyroidism, hypo- and hyperparathyroidism, adrenal insufficiency, *congenital adrenal insufficiency*. Cushing's syndrome, adrenogenital syndromes, diabetes mellitus, short stature, failure to thrive, *ambiguous genitalia*, pubertal changes and gynecological disorders, dyslipidemia.
- 3.2.12. **Infections.** Bacterial, viral, fungal, parasitic, rickettsial, mycoplasma, *Pneumocystis carini* infections, chlamydia, protozoal and parasitic, tuberculosis, HIV, nosocomial infections. Control of epidemics and infection prevention.
- 3.2.13. **Emergency and critical care.** Emergency care of shock, cardiorespiratory arrest, respiratory failure, congestive cardiac failure, acute renal failure, status epilepticus, fluid and electrolyte disturbances and its therapy, acid-base disturbances, poisoning, accidents, scorpion & snake bites.

- 3.2.14. **Immunology and Rheumatology.** Arthritis (acute and chronic), connective tissue disorders, disorders of immunoglobulins, T and B cell disorders, immunodeficiency syndromes.
- 3.2.15. **ENT.** Acute and chronic otitis media, conductive/sensorineural hearing loss, acute/chronic tonsillitis/adenoids, allergic rhinitis/sinusitis.
- 3.2.16. **Skin diseases.** Exanthematous illnesses vascular lesions, pigment disorders, vesicobullous disorders, infections: pyogenic and fungal and parasitic, Steven-Johnson syndrome, eczema, seborrhea dermatitis, drug rash, urticaria, alopecia, ichthyosis.
- 3.2.17. **Eye problems.** Refraction & accommodation, partial/total loss of vision, cataract, night blindness, chorioretinitis, strabismus, conjunctival & corneal disorders, ROP, retinoblastoma, optic atrophy, papilloedema.
- 3.2.18. **Behavioral and psychological disorders.** Rumination, pica, enuresis, encopresis, sleep disorders, habit disorders, breath holding spells, anxiety disorders, mood disorders, temper tantrums, attention deficit hyperactivity disorder, infantile autism.
- 3.2.19 **Community and social pediatrics.** *National Health Nutrition Programs, nutrition screening of community, prevention of blindness, School Health Programs. health legislation, adoption, child labor, juvenile delinquency, general principles of prevention and control of infections including food borne, waterborne, soil borne and vector borne diseases, investigations of an outbreak in a community, child labor, rights of the child. national policy of child health and population.* ~~MPIC~~
- 3.2.19. **Genetics.** Chromosomal disorders, single gene disorders, multifactorial disorders/polygenic, genetic diagnosis, and prenatal diagnosis.
- 3.2.20. **Orthopedics.** Major congenital orthopedic deformities, bone and joint infections, Potts' spine, and common bone tumors.

3.4. Basic sciences

Embryogenesis of different organ system especially heart, genitourinary system, gastrointestinal tract, applied anatomy of different organs, functions of kidney, liver, lungs, heart and endocrinal glands. Physiology of micturition and defecation, placental physiology, fetal and neonatal circulation, regulation of temperature (esp. newborn), blood pressure, acid base balance, fluid electrolyte balance, calcium metabolism, vitamins and their functions, hematopoiesis, hemostasis, bilirubin metabolism, growth and

development at different ages, puberty and its regulation, nutrition, normal requirements of various nutrients, basic immunology, bio-statistics, clinical epidemiology, ethical and medico-legal issues, teaching methodology and managerial skills. Pharmacokinetics of commonly used drugs, microbial agents and their epidemiology.

SKILLS

I. History and Examination

The student must gain proficiency in eliciting, processing and systematically presenting pediatric history and examination with due emphasis on the important and minimization of less important facts.

The following skills must be achieved :

1. Recognition and demonstration of physical findings like anemia, jaundice, grades of coma, severity of dehydration, capillary filling time, lethargy, recording of vital parameters, etc.
2. Recording of height, weight, head circumference and mid arm circumference and interpretation of these parameters using growth reference standards for assessment of nutritional status and growth.
3. Assessment of pubertal growth.
4. Complete development assessment by history and physical examination.
5. Systematic examination of all systems.
6. Neonatal examination including gestation assessment by physical and neurological criteria.
7. Examination of the fundus and the ear-drum.
8. Skills related to IMNCI and IYCF

II. Monitoring Skills

Non invasive monitoring of vital functions including BP, , PR, RR, SPO₂. and heart-rate patterns (ECG)

III. Investigative Procedures Including

1. Venous, capillary and arterial blood sampling for investigations and sample collection using appropriate asepsis and universal precautions.
2. Pleural, peritoneal sub-dural tap, lumbar puncture, ventricular tap.
3. Tuberculin test.
4. Biopsy of liver and kidney.

5. Urethral catheterization and supra-pubic tap.
6. Gastric content aspiration
7. Bone marrow biopsy, pericardial tap

IV. Therapeutic Skills Including

1. Breast feeding assessment and counseling on appropriate technique of breast feeding and management of common problems associated with it.
2. Establishment of vascular access.
3. Administration of injections using safe injection practices.
4. Determination of volume and composition of intravenous fluids and their administration.
5. Neonatal and Pediatric basic and advanced life support.
6. Oxygen administration, CPAP and nebulisation therapy.
7. Blood and blood component therapy.
8. Intra-osseous fluid administration
9. Phototherapy, umbilical artery & venous catheterization and exchange transfusion.
10. Nasogastric feeding.
11. Common dressings and abscess drainage.
12. Basic principles of rehabilitation.

Peritoneal dialysis, venesection, tracheostomy, central venous cannulation and CVP monitoring, intercostal tube drainage, mechanical ventilation.

IV. Bed side investigations Including

1. Hb, TLC, micro ESR, peripheral smear.
2. Urine routine and microscopic examination, urine reducing sugar by Benedicts test.
3. Stool microscopy and hanging drop.
4. Examination of CSF and other body fluids.
5. Blood sugar
6. Shake test on gastric aspirate
7. Gram stain, ZN stain.

V. Patient Management Skills

1. Proficiency in management of all pediatric emergencies.
2. Drawing and executing patient management plan and long term care.
3. Documenting patient records on day to day basis and problem oriented medical record.
4. Care of a normal and sick newborn, management of neonatal disorders like hypothermia, sepsis, convulsions, jaundice, metabolic problems, etc.
5. Identifying need for timely referral to appropriate departments / health care facility & pre-transport stabilization of the sick child

VI. Interpretation of Investigations

Hemogram

1. Plain x-ray chest, abdomen, skeletal system
2. Contrast radiological studies: Barium swallow, barium meal, barium enema, IVP, MCU.
3. Ultrasound skull, abdomen.
4. Histopathological, biochemical and microbiological investigations
5. CT Scan / MRI skull.
6. ECG
7. ABG

Desirable: Interpretation of radio-isotope studies, audiogram, common EEG patterns, neuro-physiological studies, BERA, VER, EMG, NCV, CT/MRI abdomen and chest, respiratory function tests

VII. Communication Skills & Attitudes

1. Communicating with parents / child about nature of illness and management plan, prognostication., breaking bad news
2. Counseling parents on breast feeding, nutrition, immunization, disease prevention and promoting healthy life style.
3. Genetic counseling
4. Communication with colleagues, nurses and paramedical workers.
5. Appropriate relation with pharmaceutical industry.

Evaluation of thesis

The thesis will be evaluated by two independent reviewers who shall grant marks out of 50 each. A minimum combined aggregate of 50% is a mandatory precondition for the postgraduate student to appear in the final examination.

General observations

- There should be a training program on Research Methodology for existing faculty to build capacity to guide research.
- Within 3 months of thesis submission the candidate should be communicated the acceptance/rejection of the thesis.

Log Book

During his/her training, the candidate should maintain a Log Book indicating the duration of the postings / work done in Paediatric Wards, OPDs and Casualty. It should indicate the procedures assisted and performed by the candidate, and the teaching sessions, symposia, journal club meetings, etc., attended.

The purpose of the Log Book is to :

1. Help to maintain a record of the work done during training.
2. Enable the consultant to have first hand information about the work done and to intervene whenever necessary.
3. Use it to assess the experience gained periodically.

The log book shall be used to aid the internal evaluation of the student.

VIII. Academic Skills

Familiarity with basic research methodology.

Planning the protocol of the thesis, its execution and final report.

Review of literature

Conducting clinical sessions for undergraduates medical students.

Desirable: Writing and presenting a paper, Teaching sessions for nurses and para medical workers.

Thesis

Objectives

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

- Identify a relevant research questions;
- 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.

Guidelines

While selecting thesis topics, following should be kept in mind:

- The scope of study should be limited so that it is possible to conduct it within the resources and time available to the student.
- The emphasis should be on the process of research rather than the results.
- The research study must be ethically appropriate.
- The protocol, interim progress as well as final presentation must be made formally to the entire department.
- Only one student per teacher/thesis guide
- There should be periodic departmental review of the thesis work as per following schedule :
 - End of 6 months - Submission of protocol
 - During 2nd year - 2 Mid-term presentation
 - 1 month prior to exam - Final Presentation and Submission

After submission of protocol, supervisor should send the information of work done by the candidates to the University every 6 months.

TEACHING PROGRAMME

GENERAL PRINCIPLES

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

Acquisition of theoretical skills

- Self study
- Journal Club
- Seminars
- Lectures
- Inter-ward & inter-departmental case discussion
- CME Programmes for post-graduate students

Acquisition of Practical skills

- Bed-side teaching rounds
- NALS & PALS course
- Workshops on various subjects for examples : Assessment for growth & development, diarrhoea management, Ventilatory support, Communication skills etc.
- Clinico-radiological conference

It is desirable that at joining pediatric residency programme a post graduate student should attend the NALS & PALS courses and training in hospital waste management. A supervised training in practical procedure like blood sampling, I/V line insertion & other clinical procedures should be undertaken at the earliest opportunity. These should be supported by the videos where available. In addition, a series of orientation classes should be organize for them on subjects including common pediatric emergencies, fluid & electrolyte management etc. A suggested list of these classes is enclosed (Annex 1).

Formal teaching sessions

In addition to bedside teaching rounds, at least 5 hours of formal teaching per week are a must. The departments may select the activities from those mentioned above.

Rotations:

The postgraduate student should rotate through all the clinical units in the department. In addition, following special rotations should be undertaken:

Must:

- Neonatology - 6 months [maximum 9 months]
(including perinatology)
- Intensive care/Emergency- 3 months

Desirable

Posting in Out Patient Services of the following specialties is recommended for the duration indicated below:

- Skin - 12 hours (e.g 3 hours/day for 4 days or 2 hours/day for 6 days)
- Pediatric Surgery - 24 hours (e.g 3 hours/day for 8 days)
- Physical Medicine and
- Rehabilitation - 12 hours (e.g 3 hours/day for 4 days)
- Community - 24 hours (e.g 3 hours/day for 8 days)

Note: In addition the candidates may be sent to allied specialties such as cardiology, neurology etc. depending on facilities available locally. It should be ensured that it must conform and focus on contents of curriculum for that area as provided in this document.

ASSESSMENT

General Principles :

- The Assessment should valid, objectives, and reliable.
- It must cover cognitive, psychomotor and affective domains.
- Internal term end assessment should be conducted in theory as well as practical/clinicals. In addition, thesis should be assessed separately.

Formative (Internal Assessment)

Objective

- Providing feedback to the students
- Contribute towards final evaluation and
- Clearing internal assessment mandatory for appearing in the final exam.

Fields of Assessment

- | | |
|------------------------------------|--------------------------------------|
| 1. Personal attributes | Ongoing after each clinical posting. |
| 2. Clinical skills and performance | -do- |
| 3. Academic activities | -do- |
| 4. Theory Exams | |
| 5. Practical Exams | |

I. Theory Assessment

The theoretical knowledge shall be assessed by means of written exams at the end of 1st year, 2nd year & sent up examination (at 2 yrs. 9 months.)

Syllabus for theory exams (Total maximum marks = 200)

I year	MM = 50
II Year	MM = 50
III Year	MM = 100

II. Practical Assessment (Total maximum marks = 200)

I Year	OSCE & NALS	MM = 40
II Year	OSCE & One case	MM = 60
III Year	OSCE & three cases (like main exam)	MM = 100

Other Evaluation

1. Academic Presentations
2. Scientific Excellence
3. Skill Proficiency
4. Personal attributes
5. Teaching activities

The above fields shall be graded on a scale of 1 to 5. The academic presentation shall be graded at the time of presentation by the Consultant in-charge. Evaluation on points 2 to 5 shall be done by the Unit in-charge at the end of every semester. A sample of the evaluation proforma for all the above points is presented in Annexures 2-5.

Summative Assessment

The theory paper & the practicals shall be marked instead of current practice of granting grades. The evaluation of theory papers shall be done independently before the commencement of practical examination.

- Ratio of marks in theory and practicals will be equal
- The minimum percentage require to pass will be 50%
- Candidate will have to pass theory and practical exam separately.

I. Theory (Total Maximum Marks = 400)

Paper 1:	Basic sciences as applied to pediatrics & community pediatrics.	MM = 100
Paper 2 :	Neonatology	MM = 100
Paper 3 :	General pediatrics including advances in pediatrics relating to Cluster-I specialities	MM = 100
Paper 4 :	General Pediarics including advances in pediatrics relating to Cluster-II specialities	MM = 100

Cluster- I Nutrition, Growth and development, Immunization, Infectious disease, Genetics, Immunology, Rheumatology Psychiatry and Behavioral Sciences, Skin, Eye, ENT, Adolescent Health, Critical Care, Accidents and Poisoning.

Cluster- II Neurology and disabilities, Nephrology, Hematology-oncology, endocrinology, Gastroenterology and Hepatology, Respiratory and cardiovascular disorder.

In each paper there should be 10 short essay questions (SEQ)

II. **Practicals (Total Maximum Marks = 400)**

1. 3 cases ~~of equal weightage carrying 40 marks each~~

Desirable distribution of cases :

Case I – Neonate/young infant < 2 months of age

Case II – Child upto 4-5 Years ✓

Case III – Child more than 5 years. ✓

60 marks
120 marks each.
120 marks each

2. OSCE (80 marks)

The OSCE shall consist of 10 stations of 8 marks each. It shall consist of 6 observed stations (1 by each examiner) & 4 unobserved stations.

The observed stations shall assess the students on the following skills.

- NALS/PALS
- Assessment of growth & development
- Communication/Counseling skills
- History taking
- Examination
- Procedural skills

The unobserved stations shall check the analytic skills of the students for example : Interpretation of laboratory investigations, ABG/ECG, Radiological investigations.

Annex 1

Orientation sessions for Residents joining post-graduation in Pediatrics

Common for all Residents of the Institute

- Orientation to the Hospital : Various Departments & facilities available
- Communication skills : Patients & Colleagues
- Literature search
- Basic research methodology
- Protocol writing & thesis
- Infection control and

Annex 2

End Year Evaluation of the post graduate students

Name of the Students _____

Place of Posting _____

Year 1 / 2 / 3

From _____ / To _____

1. Skill Proficiency

	T1	T2	T3
Attendance in academic activities			
Performance in ward procedures			
Performance in emergency procedures			
Performance in neonatology procedures			
Handling of equipments			
Performance in laboratory procedures			
Decision making/formulation of management plan			
Record writing			
Administration			
Leadership qualities			

Annex 3

Evaluation Sheet – Journal Club

Name of the Student _____

Date of Presentation _____

Points to be considered	I	II	III
Choice of article			
Cogency of presentation			
Critical review			
Whether cross-reference and other relevant publications consulted.			
Audio-Visual aids			
Interaction			

(Grade: 1-5)

Signature of the Consultant In-charge

Annex 4

Evaluation Sheet – Seminar/Review

Name of the Student _____

Date of Presentation _____

Points to be considered	T1	T2	T3
Presentation			
Completeness of preparation			
Cogency of presentation			
Use of Audio-Visual aids			
Understanding the subject			
Ability to answer questions			
Time scheduling			
Consulted all relevant literature			

Signature of the Consultant In-charge

Annex 5

Evaluation Sheet – Clinical Case Presentation

Name of the Student _____

Date of Presentation _____

Points to the considered	T1	T2	T3
Logic Order			
Completeness of history			
Cogency of presentation			
Whether all relevant points elicited			
Mentioned all positive/negative points of importance			
Accuracy of general physical examination			
Whether all physical signs elicited correctly			
Whether any major sign missed or misinterpreted			
Diagnosis : whether it follows logically from history & findings			
Management <ul style="list-style-type: none">• Completes list of investigations• Relevant order• Interpretation of investigations• Treatment principles & details			
Ability to reach to questioning-whether answers relevant and complete			
Ability to defend diagnosis			
Ability to justify differential diagnosis			
Confidence			
Others			

Scale Grade: 1-5

(2: Below Expectation)

Signature of the Consultant In-charge