



**GUIDELINES FOR COMPETENCY  
BASED  
POSTGRADUATE TRAINING  
PROGRAMME FOR MD IN  
PAEDIATRICS**

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## **PREAMBLE**

The purpose of any postgraduate (PG) education is to train an individual, in this case a qualified MBBS doctor, to achieve competencies across all domains that enables the student to perform the professional role as an expert and specialist practicing a specialty in the community (Newborn to adolescent care; ambulatory and in-patient care; Well child/Healthy and Ill child; health promotion, disease prevention and curative care; individual and family centered care; emergency care, Intensive and routine Care). The shift towards competency-based medical education by Medical Council of India and continued by the National Medical Commission (NMC) focuses education to be outcome based, emphasizing abilities, balancing domains of learning and promoting a learner centered ownership of the curriculum.

The practice of medicine has and will continue to change. Existing changes in the environment and practice have included an explosion of information, stress on knowledge at the expense of skills/attitudes/critical thinking, increased access of information and health delivery systems by lay public, development and access to sub-specialties, technological and IT advances, costs of management (diagnostic and therapeutic), changes in disease trends (non-communicable diseases, behavioral/developmental disorders, malignancies, immunology, etc.), medico-legal litigations, emphasis on quality standards, improved patient safety, violence/anger against health personnel and the emergence of professional-ethical dilemmas to name a few.

The NMC's competency based education is organized using a framework of competencies (predefined abilities) that forms the backbone of the curriculum as defined outcomes. These competencies are defined as observable abilities of a health professional, integrating multiple components across all domains, cognitive, psychomotor skills, and affective. Identified competencies are to be measured and assessed to ensure their acquisition which in turn determines competence. Defined competencies in each domain facilitates education progressing from being a novice towards mastery with formative assessments (feedback) vital for success. Every domain will have weightage and the phenomenon of allowing the ability in one should not be allowed to compensate the lack of ability in another.

These changes are reflected in the review of Core Competencies keeping them mostly aligned with CBME Undergraduate efforts. Each competency will require Sub-competencies/milestones enabling both student and teacher monitor progress that is transparent making both accountable. Specific Learning Objectives that will be necessary to achieve (and assess) outcomes are certainly also required to complete the process. This document has been prepared by subject-content specialists of NMC. The Expert Group of the NMC had attempted to render uniformity without compromise to the purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies

## ***SUBJECT SPECIFIC OBJECTIVES***

### **Goal**

The goal of the MD Paediatrics post-graduate course on successful completion, is to mould the individual into a qualified Pediatrician who is a specialist doctor with the ability (competence) to assess the state of health; promote health; and diagnose as well as manage disease (acute or chronic, emergency or routine) in children of all ages from newborn to the adolescent.

Their expertise includes dealing with medical and surgical conditions of varied degrees of complexities providing a spectrum of care from prevention, promotion, resuscitation, emergency care, acute care, chronic care and procedures (diagnostic and therapeutic) including providing palliative care. Unlike in most adults, children go through changes in growth and development leading to anatomical, behavioral, and developmental changes that emphasizes that the Specialist incorporates this dynamic requirement into screening, assessments, diagnostic and therapeutic decisions. They will continue to play an important part in the health of the family and community especially through education and support of prevention of disease and health promotion since Paediatrics is child-centered and family-focused given the relationships and social structures of families. Pediatricians will also continue to provide consultative services to many other physicians across the specialties including Emergency, Burns, Plastic Surgery, Anesthesiologist, Surgeons, Infectious Disease, Community and Family Medicine.

## ***SUBJECT SPECIFIC OBJECTIVES***

The objectives of the postgraduate course (MD) in Paediatrics are to produce a competent pediatrician who:

- Acquires competencies relevant to all aspects of Paediatrics (newborn to adolescent) that are essential to function as a clinical expert in providing newborn and pediatric health services for the community at all levels.
- Recognizes the holistic health needs of healthy neonates, infants, children, and adolescents
- Performs responsibilities of the provision of clinical care in keeping with principles of the National Health Policy.
- Performs responsibilities in a professional and ethical manner.
- Acquires skills in effectively communicating not only with the health team but with the child, family, and the community
- Is actively involved in keeping oneself up to date with scientific advances in Paediatrics and Medicolegal aspects of practice.
- Is oriented to principles of research methodology enabling critical appreciation of published scientific evidence and contributing through scholarship
- Acquires skills to enable education of all stakeholders including health team members
- Acquires skills and understanding of dealing with health team members enabling optimizing system-based practice.

## ***SUBJECT SPECIFIC COMPETENCIES***

Towards achieving suitable outcomes certain Competencies are essential to be achieved, assessed that will enable the qualified professional to perform the role of a Paediatric Specialist.

Aligned with the NMC's existing Undergraduate CBME, the following are refined and identified as themes or roles mandatory to perform the responsibility as a Pediatric Specialist in the community after acquiring an MD Paediatric post-graduation:

1. Clinical Expert
2. Communicator

3. Professional
4. Scholar
5. Team Member

### **Core Competencies**

(The term ‘children’ is hereby used to include all age groups from birth to 18 years - newborn, neonates, infants, toddlers, children and adolescents)

*To perform each of these above roles as a Paediatrician, every role determines competencies which in turn requires Specific Learning Objectives covering all the domains of learning.*

*By the end of the MD Paediatric course, the postgraduate student should be able to:*

#### **1. Clinical Expert**

- 1.1. Appreciate and recognize maternal and child health needs in the context of the health priority of the country at all levels ie. Individual, Community, Local, Regional, and National.
- 1.2. Apply an understanding of the determinants of child health at individual, community, and population levels in practice of disease prevention, health promotion and clinical care of all children.
- 1.3. Understand the existing inequities in accessibility to child friendly health, economics of child health and existing status of child health across gender, communities, region, and nation (eg. NHFS survey).
- 1.4. Participate in population/community efforts towards prevention, promotion, and disease control relevant and with implications for child health (ie. National Health Programs).
- 1.5. Appreciate and recognize the importance of nurturing care for the early growth and development as the very foundation of Paediatrics and help each child realize her/his optimal growth and development potential.
- 1.6. Actively support the optimization of quality of growth, development, and holistic health of children in care through education enhancing the promotive, preventive, and curative measures.
- 1.7. Provide continuum of care and rehabilitation for children afflicted by chronic disease.
- 1.8. Scientific Knowledge and Evidence

1.8.1. Apply an understanding of scientific basis, concepts, principles, and advances as the basis of health and disease in the screening, diagnosis, and management of all children including growth and development.

1.9. Clinical History/Examination

1.9.1. Demonstrate appropriate proficiency in basic clinical skills appropriate for children, ie. History, Physical Examination and Assessments of Growth/ Development/ Behavior, in arriving at the most likely clinical differential; in identifying precipitating or predisposing factors; prioritizing high risk versus low-risk conditions; and, those in need of emergency versus routine care.

1.9.2. Organize and analyze an authentic history and relevant examination towards a valid clinical assessment of health of all children including growth, development, and behavioral assessments.

1.10. Investigations

1.10.1. Order rational Investigations and interpret results keeping in mind cost effectiveness and purpose in child health (ie., confirming diagnosis that impacts management decisions).

1.11. Procedures/Interventions

1.11.1. Order, perform with safety and interpret results of procedures/ interventions that are cost-effective for diagnostic and therapeutic purposes in child health.

1.12. Critical Thinking

1.12.1. Demonstrate a logical clinical approach to diagnose children in health and disease in all settings.

1.12.2. Manage using appropriate resources all children in health and disease in settings not less than secondary level facilities

1.12.3. Demonstrate clinical reasoning at every step from gathering, organization, prioritization, analysis and creating logical diagnostic hypothesis from clinical data relevant to childhood (history to examination to investigations)

1.12.4. Formulate rational, judicious, and cost-effective plans (Investigation, Therapeutic and Counseling/Education plans) for all children in health and disease (acute and chronic) taking into consideration individual/ family circumstances, interpersonal dynamics, socioeconomic status, vulnerabilities, epidemiology, and population health factors.

- 1.12.5. Choose investigations and prescribes medications/interventions that are rational and cost-effective balancing benefits and costs in child health in the context of family status.
- 1.12.6. Critically appreciate scientific literature especially relevant to children under their care.
- 1.13. Responsiveness
  - 1.13.1. Rapidly assess/screen, recognize and manage critically ill sick children prioritized for immediate attention.
  - 1.13.2. Demonstrate sensitivity and appreciate the emotional and behavioral characteristics and needs of children while dealing with them
- 1.14. Quality of Care
  - 1.14.1. Demonstrate practices that maximize child safety
  - 1.14.2. Optimize safe working practices in child health delivery settings
  - 1.14.3. Participate in incident reporting of adverse events and errors enabling quality improvement of child health
  - 1.14.4. Participate in continuous Child Health Care related Quality Improvement measures especially patient related audits, recognition of gaps and implementation of interventions to improve quality
- 1.15. Advocacy
  - 1.15.1. Responding to a Child's health needs by advocating for them
- 1.16. Documentation
  - 1.16.1. Maintain Child health records of relevant demographic details clinical details, progress, interpretations, educational, monitoring and management decisions accurately and neatly organized
  - 1.16.2. Provide relevant concise summaries and certification in completeness to authorized legal guardians of children
  - 1.16.3. Maintain childhood morbidity and mortality data for audit purposes.

## **2. Communicator**

### **2.1. Effective Communication**

- 2.1.1. Demonstrate all aspects of effective and empathetic communication during most encounters with children and parents/guardians (listening skills, culturally appropriate verbal and non-verbal cues, simple understandable

language, allow questions, clarify answers and concise written communications for prescriptions and patient education)

2.1.2. Demonstrate mutually respectful communications with children/parents/guardians (verbal, telephonic, electronic and written) that is collaborative and effective between health system colleagues of all levels.

## 2.2. Effective Counselling

2.2.1. Provide professional assistance and guidance in assisting children/parents/ authorized legal guardians determine their autonomous decisions regarding their own health (especially related Diagnostic Interventions and Therapeutic options).

## 3. Professional

### 3.1. Responsibility

3.1.1. Demonstrate responsibility for all aspects of the conduct of child care, academic tasks and research in children undertaken.

3.1.2. Demonstrate social accountability consistent with community and professional expectations through active participation in child health relevant Community Outreach programs

3.1.3. Demonstrate an understanding of one's own limits and seeks assistance appropriately in dealing with children in health and disease.

### 3.2. Integrity

3.2.1. Demonstrate commitment with honesty for consistent and uncompromising adherence to moral and ethical principles and values in protecting child rights and wellbeing during care, academics, and research.

### 3.3. Compassion and empathy

3.3.1. Demonstrate the ability to understand and share the feelings of children and families while dealing with them as care providers.

3.3.2. Demonstrate the ability to understand and share the feelings of health team members while working with them for the good of children.

### 3.4. Stigma and Discrimination

3.4.1. Demonstrate ability to comprehend the differences in values and beliefs while respectfully continuing child health care without discrimination

### 3.5. Ethical principles



- 3.5.1. Recognize ethical conflicts specific for child health between principles of ethics and justifies options/decisions while discussing within health care team discussions.
- 3.5.2. Demonstrate respect for confidentiality in issues related to child health.
- 3.5.3. Demonstrate ability to honor the doctor-child/parent/legal guardian relationship in all dealings with respect ensuring due care especially avoiding all inappropriate behavior and activities that lead to conflicts of interest.
- 3.5.4.** Demonstrate mutual respect for all members on the child health team and behaves equitably and collaboratively while dealing with them.
- 3.5.5. Demonstrate prioritization of child's welfare and community benefits over self when appropriate.

#### 3.6. Medicolegal Law and Code of Ethics

- 3.6.1. Practice within the NMC's standards as prescribed by the Code of Ethics especially in dealings with children.
- 3.6.2. Practice within the Law of the land fulfilling legal requirements during the provision of care especially relevant to children.

### **4. Scholar**

#### 4.1. Research

- 4.1.1. Refer to evidence-based guidelines in the decision-making process for child care justifying limitations.
- 4.1.2. Understand research methodology and the creation of a research studies for child health.
- 4.1.3. Demonstrate the ability to critically appreciate the quality and implications of scientific literature justifying its application in the delivery of child health care.
- 4.1.4. Demonstrate an ability to identify pertinent research questions relevant to child health through active participation and involvement in research.

#### 4.2. Academics

- 4.2.1. Demonstrate features of active adult learning through enthusiasm and displaying a positive attitude in the educational process while participating in educational activities to build child health care capacities (Intra- and inter-institutional).
- 4.2.2. Use appropriate educational techniques to promote health education amongst children/parents/legal guardians/community

4.2.3. Use appropriate educational techniques to facilitate learning of other child health care team members including undergraduates, nurses, paraclinical staff and peers

4.2.4. Maintain competency by keeping up to date with child health guidelines through continued medical education with scientific knowledge and skills to enable quality practice

#### 4.3. Application

4.3.1. Apply child health expertise in an area of study that is published in academic journals

4.3.2. Apply child health expertise while participating in health education and community efforts

### **5. Team Member**

#### 5.1. Teams

5.1.1. Demonstrate an understanding of the roles and competencies of other health care providers dealing with child health.

5.1.2. Demonstrate the ability to engage and collaborate with all child health care team members keeping the patient at the center of all such collaboration.

5.1.3. Recognize and discuss in a non-judgmental way the roles of informal stakeholders as extended teams especially in child care planning (especially mature adolescent, extended family, alternative medicine practitioners, support networks, etc.)

5.1.4. Demonstrate knowledge of health care financing, implications for management and its application in assisting patient to access the best possible care through extended team networking while dealing with child health.

5.1.5. Maintain personal health and wellbeing not only of self but of team members.

#### 5.2. Leaders

5.2.1. Demonstrate leadership and management skills enabling effective working as a child health team

5.2.2. Lead, manage, and participate as a member of an effective and efficient child health care team while collaborating respectfully either as leader or member.

5.2.3. Facilitate child health team capacity building of competencies by leading through conduct of effective education sessions for members of the health team learning.

- 5.2.4. Manage time and human resources efficiently and effectively to deliver optimal child health care.

## ***SYLLABUS***

*Syllabus gives an outline and summary of topics to be covered in the MD Paediatric Course.*

*In Competency Based Education, outcomes are required to be defined, taught, learnt, and assessed that determines competence at the end of the course. Defined Outcomes should focus on what is expected practically in the “real world” by the professional performing roles of the expert physician. This syllabus is focused on all age group of children from neonates to toddlers to children to adolescents as per existing practice. The syllabus thus stresses on “real world presentation of symptoms and signs” and is categorized under the following:*

- A. Cognitive Domain
  - a. Basic Sciences
  - b. Approaches/Management of common symptoms/signs inclusive of analysis, interpretation, and application of investigations
  - c. Specific Topics classified as per traditional systems
- B. Psychomotor Domain
- C. Affective Domain
- D. Pedagogic and Research Skills

### **A) Predominant in Cognitive (Knowledge) Domain**

#### **a. Basic Sciences**

- *Should be able to justify and apply in the practice of Paediatrics, an understanding of the fundamentals of basic sciences as listed below:*

#### **1. Applied Anatomy**

- 1.1. Embryogenesis of all organ systems
- 1.2. Central Nervous System

##### 1.2.1. Structures, Functions, Clinical considerations

- 1.2.1.1. Cerebral Cortex
- 1.2.1.2. Corticospinal tracts
- 1.2.1.3. Extraparamidal tracts
- 1.2.1.4. Cerebellar connections
- 1.2.1.5. Sensory tracts
- 1.2.1.6. Ventricles

##### 1.3. Spinal Cord, Peripheral Nerves

##### 1.3.1. Structures, Functions, Clinical considerations

- 1.3.1.1. Lower Motor Neuron

- 1.4. Bladder and Bowel control
- 1.5. Vascular supply – Principal arteries and veins
- 1.6. Extremities, Abdomen, Thorax, Head and Neck
- 1.7. Fetal circulation

## **2. Physiological basis and Pathophysiology in Health and Disease**

- 2.1. Physical Growth
- 2.2. Temperature regulation
- 2.3. Acid Base Balance
- 2.4. Fluid Balance
- 2.5. Hematopoiesis
- 2.6. Hemostasis
- 2.7. Electrolyte balance
- 2.8. Bone mineralization: Calcium-Phosphate balance
- 2.9. Puberty
- 2.10. Renal function
- 2.11. Hepatic function
  - 2.11.1. Bilirubin
  - 2.11.2. Drug metabolism
- 2.12. Respiratory function
- 2.13. Cardiac function
- 2.14. Gastrointestinal
- 2.15. Endocrine functions
- 2.16. Developmental Milestones
- 2.17. Adolescence
- 2.18. Placenta functions
- 2.19. Fetal to Infant Transitions (Cardio-respiratory)
- 2.20. Nutrition
- 2.21. Allergy

## **3. Biochemical basis of health and disease**

- 3.1. Cell biology
  - 3.1.1. Cell cycle
  - 3.1.2. Cell signaling
- 3.2. CHO metabolism
- 3.3. Lipid metabolism
- 3.4. Protein metabolism
- 3.5. TCA Cycle
- 3.6. Hemoglobin
- 3.7. Clinical Chemistry
  - 3.7.1. Vitamins
  - 3.7.2. Minerals
- 3.8. Plasma Proteins
- 3.9. Coagulation Pathway

## **4. Genetics and Molecular Medicine**

- 4.1. Human Genome
- 4.2. Nucleic acids

- 4.2.1. Protein synthesis
- 4.3. Recombinant DNA Technology
  - 4.3.1. Basic techniques
  - 4.3.2. Applications
- 4.4. Chromosomal abnormalities
  - 4.4.1. Pedigree charting
- 4.5. Prenatal/Postnatal diagnosis
- 4.6. Immunogenetics
  - 4.6.1. HLA

## **5. Clinical Microbiology**

- 5.1. Virology
  - 5.1.1. Classifications
  - 5.1.2. Diagnostics
  - 5.1.3. Therapeutics
  - 5.1.4. Resistance
- 5.2. Bacteriology
  - 5.2.1. Classification
  - 5.2.2. Endo/Exotoxins
  - 5.2.3. Diagnostics
  - 5.2.4. Therapeutics
  - 5.2.5. Resistance
  - 5.2.6. Antibiotic Stewardship
- 5.3. Mycology
  - 5.3.1. Classification
  - 5.3.2. Diagnostics
  - 5.3.3. Therapeutics
  - 5.3.4. Resistance
- 5.4. Parasitology (Protozoology and Helminthology)
  - 5.4.1. Classification
  - 5.4.2. Diagnostics
  - 5.4.3. Therapeutics
  - 5.4.4. Resistance
- 5.5. Waste disposal, sterilization, disinfection
  - 5.5.1. Infection Control

## **6. Immunology**

- 6.1. Immune response system
  - 6.1.1. Innate, Adaptive
  - 6.1.2. Cellular
  - 6.1.3. Antibodies
  - 6.1.4. Cytokines
  - 6.1.5. Clinical considerations
- 6.2. Immunoglobulins

- 6.2.1. Types
- 6.2.2. Clinical considerations
- 6.3. Complement
  - 6.3.1. Components
  - 6.3.2. Pathways
  - 6.3.3. Deficiencies
  - 6.3.4. Clinical considerations
- 6.4. Hypersensitivity reactions
- 6.5. Blood group Immunology
  - 6.5.1. ABO
  - 6.5.2. Rh
  - 6.5.3. Minor groups
- 6.6. Immunological assays
- 6.7. Science of Vaccinology
  - 6.7.1. Vaccines
  - 6.7.2. Classification
  - 6.7.3. Schedule
  - 6.7.4. Indications, contraindications
  - 6.7.5. Adverse effects
  - 6.7.6. Catch up doses
- 6.8. Immunodeficiency
  - 6.8.1. Primary
  - 6.8.2. Secondary
- 6.9. Autoimmune disease
  - 6.9.1. Basis
  - 6.9.2. Autoantibodies
  - 6.9.3. Clinical considerations
- 6.10. Transplant Immunology
  - 6.10.1. Stem cell
  - 6.10.2. GVH disease
  - 6.10.3. Solid organ transplant
- 6.11. Cancer Immunology

## **7. Pharmacology**

- 7.1. Pharmacokinetics – common medications
- 7.2. Antimicrobials
- 7.3. Analgesia, sedation
- 7.4. Drug interactions
- 7.5. Adverse effects
- 7.6. Antidotes for poisons
- 7.7. Drug induced disease

## **8. Epidemiology**

- 8.1. Rates
- 8.2. Principles of study design
- 8.3. Measures of effects
- 8.4. Association and causation
- 8.5. Diagnostic tests

## **9. Statistics**

- 9.1. Distribution of data
- 9.2. Measures of Central tendency
- 9.3. Measures of dispersion
- 9.4. Probability distributions
- 9.5. Sampling
- 9.6. Statistical significance

## **10. Professionalism and Ethics**

- 10.1. Professionalism
  - 10.1.1. Clinical competencies
  - 10.1.2. Effective communication
  - 10.1.3. Understanding of Ethics
  - 10.1.4. Accountability
  - 10.1.5. Altruism
  - 10.1.6. Excellence
  - 10.1.7. Humanism
- 10.2. Ethics
  - 10.2.1. Code of ethics
  - 10.2.2. Principles of Ethics
  - 10.2.3. Ethical workup
  - 10.2.4. Doctor-Patient relationship
  - 10.2.5. Confidentiality and privacy
  - 10.2.6. Doctor-Doctor relationship
- 10.3. Medico-legal essentials
  - 10.3.1. POSCO
  - 10.3.2. Certifications
  - 10.3.3. Documentation
  - 10.3.4. Informed consent
  - 10.3.5. MLC formalities

## **11. Pedagogy**

- 11.1. How adults learn
- 11.2. Competencies and Specific Learning Objectives
- 11.3. Teaching Learning Methodologies
- 11.4. T-L Media including Power Point Presentations
- 11.5. Assessments- Formative and Summative

## **12. Management**

- 12.1. Time Management
- 12.2. Conflict Management
- 12.3. Communication especially Listening

- 12.4. How to study – Lectures? Wards? Journal club?
- 12.5. Fundamentals of Counselling
- 12.6. Stress Management
- 12.7. Teamwork
- 12.8. Leadership

**b. Approaches/Management of common symptoms/signs inclusive of analysis, interpretation, and application of investigations (In every age group from newborn to adolescent)**

- **Approaches** (Clinical and Investigation) of the following clinical symptoms/ signs  
**Management plans** (Investigation, Treatment, Care, Counselling, Education, Follow Up, Rehabilitation Plans) of healthy children (section 1.1) and children with the following clinical symptoms/signs.

**1.1. Healthy Children**

- 1.1.1. Healthy neonate
- 1.1.2. Healthy infant
- 1.1.3. Healthy child
- 1.1.4. Healthy adolescent

**1.2. Cardiovascular Symptoms/Signs**

- 1.2.1. Murmurs
- 1.2.2. Cyanosis
- 1.2.3. Syncope
- 1.2.4. Dizziness
- 1.2.5. Breathlessness
- 1.2.6. Palpitations
- 1.2.7. Chest Pain

**1.3. Development (and Behavioral) Symptoms/ Signs**

- 1.3.1. Normal development
- 1.3.2. Delayed milestones
- 1.3.3. Regression of milestones
- 1.3.4. Unusual behaviors
- 1.3.5. Poor scholastic performance
- 1.3.6. Deviations in sexuality
- 1.3.7. Dysmorphic features
- 1.3.8. Suicide attempt
- 1.3.9. Behavioral issues -disinterest, isolation, poor social interaction
- 1.3.10. Substance abuse
- 1.3.11. Abnormal eating behavior
- 1.3.12. Sleep disturbance
- 1.3.13. Breath holding spells
- 1.3.14. Multiple unexplained unrelated complaints
- 1.3.15. Technology dependence
- 1.3.16. Speech abnormalities

**1.4. Dermatology**



- 1.4.1. Neonatal skin lesions
- 1.4.2. Infantile skin lesions
- 1.4.3. Acquired skin rashes in childhood
- 1.4.4. Urticaria
- 1.4.5. Neurocutaneous presentations

### **1.5. Emergencies**

- 1.5.1. Dehydration
- 1.5.2. Respiratory distress
- 1.5.3. Hypoxia
- 1.5.4. Shock
- 1.5.5. Incessant crying
- 1.5.6. Sick looking
- 1.5.7. Status epilepticus
- 1.5.8. Acute Severe Asthma
- 1.5.9. Trauma
- 1.5.10. Animal/human bite
- 1.5.11. Abuse
- 1.5.12. Cardio-pulmonary failure
- 1.5.13. Oliguria/Anuria
- 1.5.14. Raised intracranial pressure
- 1.5.15. Coma
- 1.5.16. Traumatic Brain Injury
- 1.5.17. Acute poisoning
- 1.5.18. Envenomation
- 1.5.19. Medico-legal conditions

### **1.6. Endocrine Symptoms**

- 1.6.1. Abnormal stature
- 1.6.2. Hypoglycemia
- 1.6.3. Delayed puberty
- 1.6.4. Precocious puberty
- 1.6.5. Goiter

### **1.7. Gastrointestinal (and Hepatic) Symptoms**

- 1.7.1. Tongue tie
- 1.7.2. Vomiting and regurgitation
- 1.7.3. Diarrhea – Acute
- 1.7.4. Diarrhea – Chronic, persistent, recurrent
- 1.7.5. Abdominal pain – Acute
- 1.7.6. Abdominal Pain - Recurrent
- 1.7.7. Constipation
- 1.7.8. Jaundice
- 1.7.9. Gastrointestinal bleed
- 1.7.10. Hepatomegaly
- 1.7.11. Splenomegaly
- 1.7.12. Hepatosplenomegaly
- 1.7.13. Encopresis
- 1.7.14. Abdominal distention

1.7.15. Abnormal Liver Function tests

### **1.8. Genital Symptoms**

- 1.8.1. Atypical or ambiguous genitalia
- 1.8.2. Menstrual abnormalities
- 1.8.3. Injuries to genitalia
- 1.8.4. Foreskin, penile problems
- 1.8.5. Labial adhesions

### **1.9. Growth (and Nutrition related) Symptoms**

- 1.9.1. Normal growth
- 1.9.2. Normal diet
- 1.9.3. Poor feeding in Infancy
- 1.9.4. Undernutrition
- 1.9.5. Failure to thrive
- 1.9.6. Overweight and obesity

### **1.10. Hematological Symptoms**

- 1.10.1. Pallor
- 1.10.2. Bleeding manifestations
- 1.10.3. Lymphadenopathy
- 1.10.4. Thrombotic manifestations
- 1.10.5. Abnormal Hematological parameters including Pancytopenia

### **1.11. Infectious (and Immunological) Symptoms**

- 1.11.1. Fever with focus
- 1.11.2. Fever without focus
- 1.11.3. Fever - persistent or recurrent
- 1.11.4. Exanthematous Fever
- 1.11.5. Recurrent infections
- 1.11.6. Hospital acquired infection
- 1.11.7. Vaccination Issues– complete, incomplete

### **1.12. Metabolic Symptoms**

- 1.12.1. Acidosis – metabolic, respiratory
- 1.12.2. Alkalosis – metabolic, respiratory
- 1.12.3. Mixed Acid-Base disturbance
- 1.12.4. Dyselectrolytemia – Hypo/Hyponatremia, Hypo/Hyperkalemia, Hypo/hypercalcemia
- 1.12.5. Hyperammoniaemia
- 1.12.6. Hypoglycemia

### **1.13. Musculoskeletal Symptoms**

- 1.13.1. Joint pains with or without swelling
- 1.13.2. Low back pain
- 1.13.3. Deformities of bone growth
- 1.13.4. Scoliosis

1.13.5. Growing Pains involving lower limbs

#### **1.14. Neonatology**

- 1.14.1. Term gestation
- 1.14.2. Prematurity
- 1.14.3. Low birth weight
- 1.14.4. Neonatal Jaundice
- 1.14.5. Ill/Sick
- 1.14.6. Neonatal seizures
- 1.14.7. Neonatal respiratory distress
- 1.14.8. Neonatal Apnea
- 1.14.9. Neonatal Shock
- 1.14.10. Metabolic/electrolyte disturbances – Glucose, Sodium, Potassium, Calcium, Bicarbonate, Lactate, Ammonia
- 1.14.11. Feed Intolerance
- 1.14.12. Spinal/Cranial abnormalities
- 1.14.13. Post NICU follow up
- 1.14.14. HIV-HepB-Syphilis exposure/infection
- 1.14.15. Inadequate breast milk
- 1.14.16. Antenatal detected renal abnormalities

#### **1.15. Neurological Symptoms**

- 1.15.1. Seizures
- 1.15.2. Altered sensorium/Coma
- 1.15.3. Motor weakness
- 1.15.4. Incessant Irritability
- 1.15.5. Headache
- 1.15.6. Abnormal Head circumference
- 1.15.7. Sensory abnormalities
- 1.15.8. Abnormal gait
- 1.15.9. Ataxia
- 1.15.10. Facial weakness
- 1.15.11. Involuntary movements

#### **1.16. Ophthalmological Symptoms**

- 1.16.1. Red eye
- 1.16.2. Watering of eye
- 1.16.3. Discharge from eye
- 1.16.4. Poor vision
- 1.16.5. White reflex
- 1.16.6. Deviation of eyes

#### **1.17. Otorhino-laryngology Symptoms**

- 1.17.1. Nasal discharge, Nasal congestion, Sneezing
- 1.17.2. Sore Throat
- 1.17.3. Ear Pain/discharge
- 1.17.4. Tonsillar hypertrophy
- 1.17.5. Epistaxis
- 1.17.6. Impaired hearing

## **1.18. Renal and Urological Symptoms**

- 1.18.1. Enuresis
- 1.18.2. Dysuria
- 1.18.3. Proteinuria
- 1.18.4. Hematuria
- 1.18.5. Edema
- 1.18.6. Hypertension
- 1.18.7. Dyselectrolytemia
- 1.18.8. Polyuria
- 1.18.9. Scrotal and Inguinal swelling
- 1.18.10. Oliguria/Anuria

## **1.19. Respiratory Symptoms**

- 1.19.1. Cough
- 1.19.2. Breathlessness
- 1.19.3. Noisy breathing - snoring, stridor, wheeze
- 1.19.4. Hemoptysis

## **1.20. Community Situations**

- 1.20.1. Vaccination camps
- 1.20.2. School Health Checkups
- 1.20.3. Outbreaks of childhood diseases

## **1.21 Analysis, interpretation, and application of Investigations**

- 1.21.1. Radiology X-rays (Chest AP/PA/Lateral, abdomen, spine, extremities)
- 1.21.2. Contrast X-rays (Micturating cystourethrogram)
- 1.21.3. Ultrasound (Lung: Consolidation, Left Heart failure, effusion; Circulation: Intravascular Volume; Neonatal Brain: Hydrocephalus, Intracranial Collections; Central veins: Patency for US guided central lines; Lymphadenopathy: For US guided FNAC aspirations)
- 1.21.4. CT scan with/without contrast (Brain: Cerebral edema, Midline shift, Meningitis, Encephalitis, ADEM, Hemorrhage, Infarction, SOLS, Hydrocephalus)
- 1.21.5. MRI scan (Brain: Gross White vs Grey matter degeneration)
- 1.21.6. HIDA Scan

## **1.22. Microbiology**

- 1.22.1. Grams stain of CSF, Pus, Peritoneal fluid
- 1.22.2. Ziehl Neilson Stain of Sputum, Pus
- 1.22.3. Hanging drop for motile cholera
- 1.22.4. PCR reports for infectious disease diagnosis
- 1.22.5. Culture and sensitivity reports of body fluids

## **1.23. Pathology**

- 1.23.1. Pathology reports of human tissue

## **1.24. Routine labs**

- 1.24.1. Hematology reports of Blood counts, peripheral smear, Bleeding and Coagulation parameters, basic immunology
- 1.24.2. Urine routine analysis

**1.25. Biochemical**

- 1.25.1. Biochemical routine (Electrolytes, Calcium-Phosphate, Renal, Liver profiles, Arterial/venous Blood Gases)
- 1.25.2. Inborn error of metabolism newborn screening reports
- 1.25.3. Endocrine (Glucose related, Thyroid related, Hormonal assays, Lipid profiles)

**1.26. Electrophysiological Studies**

- 1.26.1. Electrocardiogram

**1.27. Lung Function Tests**

- 1.27.1. Spirometry

**C. *Specific Topics***

**Understanding the definition, epidemiology, etiopathogenesis, clinical presentation, investigations, complications, differential diagnosis, treatment, prognosis, prevention, follow up and rehabilitation, if required, of the following, but not limited to:**

**1. Overview**

- 1.1. History of Paediatrics
- 1.2. State of Health of Children – Global, Regional and India
- 1.3. Evidence-based Care in Pediatrics
- 1.4. WHO's Sustainable Development Goals
- 1.5. National Programs relevant to Child Health
- 1.6. Ethics in the Care of Children
- 1.7. Medico-legal aspects relevant to Paediatrics including:  
Documentation (Initial History/Examination/Differential Sheet, Progress (SOAP, Problem Oriented), Death and other Certification, Informed Consent, Wound Certificates, POSCO, Financial Receipts, Outpatient/In Patient Registers)

**2. Genetics**

- 2.1. Inheritance Patterns
- 2.2. Genetic Counseling
- 2.3. Prevention of Genetic Disorders  
Management of Genetic Disorders

**3. Metabolic Disorders**

- 3.1. Approach to Inborn Errors of Metabolism
- 3.2. Approach to Hypoglycemia
- 3.3. Defects of Amino Acid Metabolism
  - 3.3.1. Phenylalanine
  - 3.3.2. Urea Cycle Disorders
- 3.4. Defects of Lipid Metabolism

- 3.4.1. Organic Acidemias
- 3.4.2. Fatty Acid Oxidation
- 3.4.3. Mitochondrial Disorders
- 3.4.4. Peroxisomal Disorders
- 3.4.5. Lysosomal Storage Disorders
- 3.4.6. Gaucher Disease
- 3.4.7. Niemann-Pick Disease
- 3.5. Defects of Carbohydrate Metabolism
  - 3.5.1. Glycogen Storage Disease
- 3.6. GM1 and GM2 Gangliosidosis
- 3.7. Mucopolysaccharidoses
- 3.8. Porphyrias
- 3.9. Newborn Screening
- 4. Immunology
  - 4.1. Laboratory Diagnosis of Immune-mediated Diseases
  - 4.2. Primary Immunodeficiency Disorders
    - 4.2.1. Antibodies
    - 4.2.2. Cellular
    - 4.2.3. Multiple types
      - 4.2.3.1. SCID (Severe combined immunodeficiency)
  - 4.3. Phagocytic system
    - 4.3.1. Neutrophils
    - 4.3.2. Leukopenia
    - 4.3.3. Leucocytosis
  - 4.4. Complement pathway
    - 4.4.1. Complement deficiencies
  - 4.5. Intravenous Immunoglobulin
  - 4.6. Multisystem Inflammatory Syndrome of Childhood
- 5. Allergy
  - 5.1. Basis of Allergy
  - 5.2. Allergic rhinitis
  - 5.3. Atopic dermatitis
  - 5.4. Urticaria, Angioedema
  - 5.5. Anaphylaxis
  - 5.6. Asthma
  - 5.7. Serum sickness
  - 5.8. Drug allergies
  - 5.9. Food allergies
- 6. Fluid and Electrolytes
  - 6.1. Body Fluids – Composition, Osmolality

- 6.2. Fluid Therapy - Maintenance, Replacement
- 6.3. Sodium
- 6.4. Potassium
- 6.5. Calcium
- 6.6. Magnesium
- 6.7. Phosphorus
- 6.8. Acid-base Abnormalities
7. Therapeutics
  - 7.1. Principles of Drug Therapy
  - 7.2. Administration of Medications
  - 7.3. Pre-anesthesia Checkup
  - 7.4. Procedural sedation
  - 7.5. Analgesia
8. Acutely Ill
  - 8.1. Assessment and Triage
  - 8.2. Cardiopulmonary Resuscitation
    - 8.2.1. Basic Life Support
    - 8.2.2. Pediatric Advanced Life Support
  - 8.3. Minor Injuries – Abrasions, Lacerations
9. Pediatric Intensive Care
  - 9.1. Shock
  - 9.2. Respiratory Failure
  - 9.3. Pediatric Acute Respiratory Distress Syndrome
  - 9.4. Ventilation – Non-Invasive and Invasive
  - 9.5. Sedation, Analgesia and Paralysis
  - 9.6. Nutrition in Intensive Care
  - 9.7. ECMO
  - 9.8. Concepts of Futility, Do not Resuscitate, Withdrawal of Care
  - 9.9. Palliative Care
  - 9.10. Death
10. Toxins
  - 10.1. Clinical Approach to a Poisoned Child
  - 10.2. Poisonings by Common Drugs
  - 10.3. Hydrocarbon Poisoning
  - 10.4. Poisoning in the Household
  - 10.5. Corrosive Poisoning
  - 10.6. Snakebite
  - 10.7. Insect Stings including Bee, Wasp, Scorpion Sting
11. Injuries
  - 11.1. Poly Trauma: Stabilization, Triage, and Transport
  - 11.2. Drowning/Submersion Injuries
  - 11.3. Animal-related Injuries

- 11.4. Burn Injuries
- 11.5. Cold Injuries
  
- 12. Neonatology
  - 12.1. Neonatal Mortality and Morbidities
  - 12.2. Fetal Physiology and Growth
  - 12.3. Maternal Influences on Fetus
  - 12.4. Transition of the Fetus to Newborn
  - 12.5. Intrauterine diagnosis and management of Fetal disease
  - 12.6. Organization of Neonatal Care
  
- 13. Normal Newborn
  - 13.1. Delivery Room Care of the Newborn
  - 13.2. Newborn Resuscitation
  - 13.3. Assessment of the Newborn
  - 13.4. Care of the Normal Newborn
  - 13.5. Maintenance of Temperature
  - 13.6. Breastfeeding and Lactation Management
  
- 14. Disorders of Weight and Gestation in Neonates
  - 14.1. Low Birthweight
    - 14.1.1. Feeding of Low-birth weight
    - 14.1.2. Intrauterine Growth Restriction
  - 14.2. Prematurity
  - 14.3. Post term
  - 14.4. Large for Gestational Age
  
- 15. High-risk Newborn
  - 15.1. Recognition of High-risk neonate
  - 15.2. Multiple-gestational pregnancies
  - 15.3. Birth Injuries
  - 15.4. Perinatal Asphyxia
  - 15.5. Jaundice in the newborn
  - 15.6. Infant of Diabetic Mother
  - 15.7. Neonatal Hypoglycemia
  - 15.8. Anemia and Polycythemia
  - 15.9. The Bleeding Neonate
  - 15.10. Hemorrhagic Disease of the
  - 15.11. Thrombocytopenia in the Newborn
  - 15.12. Cyanosis in the Newborn
  - 15.13. Necrotizing Enterocolitis
  - 15.14. Retinopathy of Prematurity
  - 15.15. Dyselectrolytemia, Hypocalcemia, Hypermagnesemia
  - 15.16. Neonatal Transport
  - 15.17. Follow-up of the High-risk Neonate
  
- 16. Neonatal Infections



- 16.1. Neonatal Sepsis – Early and Late
- 16.2. Superficial Infections in Neonates
- 16.3. Neonatal Meningitis
- 16.4. Deep-seated Infections in Neonates
- 16.5. Neonatal Tetanus
- 16.6. Intrauterine Infections
  
17. Neonatal Neurological Problems
  - 17.1. Seizures in the Neonates
  - 17.2. Hypoxic Ischemic Encephalopathy
  - 17.3. Intra-cranial/ventricular Hemorrhage
  - 17.4. Peripheral nerve injuries
  
18. Neonatal Respiratory Problems
  - 18.1. Approach to a Neonate with Respiratory Distress
  - 18.2. Neonatal Apnea Neonatal Ventilation
  - 18.3. Hyaline Membrane Disease
  - 18.4. Transient Tachypnea of the Newborn
  - 18.5. Meconium Aspiration Syndrome
  - 18.6. Pulmonary Air Leaks in the Newborn
  - 18.7. Persistent Pulmonary Hypertension (PPHN)
  - 18.8. Pulmonary Hemorrhage
  - 18.9. Bronchopulmonary Dysplasia
  - 18.10. Extra pulmonary air leaks
  
19. Neonatal Cardiac Problems
  - 19.1. Neonate with a murmur
  - 19.2. Patent ductus arteriosus
  - 19.3. Ductus dependent shunts
  
20. Hematological disorders in Neonates
  - 20.1. Anemia in Neonate
  - 20.2. Hemolytic Disease
  - 20.3. Polycythemia
  - 20.4. Hemorrhagic Disease
  
21. Congenital Malformations
  - 21.1. Esophageal Atresia and Tracheoesophageal Fistula
  - 21.2. Diaphragmatic Hernia and Eventration
  - 21.3. Gastrointestinal and Abdominal Malformation
  - 21.4. Genitourinary Malformations
  - 21.5. CNS Malformations
  - 21.6. Single Umbilical Artery, Polydactyly, Skin Tags
  
22. Growth: Normal and Abnormal
  - 22.1. Normal Growth
  - 22.2. Factors Affecting Growth

- 22.3. Assessment of Physical Growth
- 22.4. Disorders of Growth (Failure to Thrive, Overweight and Obesity)
- 22.5. Abnormalities of Stature
  
- 23. Development and Developmental Delay
  - 23.1. Theories of Development and Behaviour
  - 23.2. Laws of Development
  - 23.3. Factors Affecting Development
  - 23.4. Normal Development
  - 23.5. Screening of Development and Behaviour
  - 23.6. Approach to Diagnosis of Developmental Delay: Developmental Screening and Surveillance
  - 23.7. Global Developmental Delay
  - 23.8. Specific Developmental Delays
  - 23.9. Cerebral Palsy
  - 23.10. Intellectual Disability
  - 23.11. Learning disabilities
  - 23.12. Hearing Impairment
  - 23.13. Mental Retardation
  
- 24. Behavior and Learning
  - 24.1. Evaluation of Mental Well-Being
  - 24.2. Psychosocial assessments
  - 24.3. Technology Dependence
  - 24.4. Bullying
  - 24.5. Common Behavioral Problems
  - 24.6. Tantrums and Breath-Holding
  - 24.7. Enuresis and Encopresis
  - 24.8. Sleep Medicine
  - 24.9. Common Speech, Language, and Communication Disorders
  - 24.10. Learning Disorders
  - 24.11. Dyslexia
  - 24.12. Attention-Deficit Hyperactivity Disorder
  - 24.13. Oppositional Defiant and Conduct Disorders
  - 24.14. Autism Spectrum Disorder
  - 24.15. Rett Syndrome
  - 24.16. Anorexia Nervosa and Bulimia
  - 24.17. Anxiety Disorders
  - 24.18. Suicide
  - 24.19. Management of Psychological Illness
  
- 25. Nutrition and Nutritional Disorders
  - 25.1. Nutritional Requirements
  - 25.2. Nutritive Values of Indian Foods
  - 25.3. Infant and Young Child Feeding
  - 25.4. Adolescent Feeding
  - 25.5. Feeding during Childhood and Food Allergy
  - 25.6. Undernutrition: Prevalence and Etiology

- 25.7. Pathophysiology of Undernutrition
- 25.8. Malnutrition – Moderate and Severe Acute
- 25.9. Vitamin A
- 25.10. Vitamin B Complex
- 25.11. Vitamin C and Scurvy
- 25.12. Vitamin D, Nutritional Rickets, and Hypervitaminosis D
- 25.13. Iodine Deficiency Disorders
- 25.14. Zinc in Child Health
- 25.15. Trace Elements in Nutrition and Health
- 25.16. Fluorosis
- 25.17. Nutritional Rehabilitation including Diet Prescription
- 25.18. Enteral and Parenteral Nutrition
- 25.19. National Nutrition Programs

26. Immunization

- 26.1. Basic Concepts of Vaccination
- 26.2. Vaccine Administration Practices
- 26.3. Scheduling of Vaccines
- 26.4. Vaccine Storage and Cold Chain
- 26.5. Adverse Events following Immunization
- 26.6. BCG Vaccine
- 26.7. Poliovirus Vaccines
- 26.8. Diphtheria, Tetanus, and Pertussis Vaccines
- 26.9. Hepatitis B Vaccine
- 26.10. Haemophilus Influenzae Type B (HIB) Vaccines
- 26.11. Measles Vaccine
- 26.12. Rubella Vaccines
- 26.13. Mumps Vaccine
- 26.14. Typhoid Fever Vaccines
- 26.15. Japanese Encephalitis Vaccine
- 26.16. Rabies Vaccines
- 26.17. Pneumococcal Vaccines
- 26.18. Rotavirus Vaccines
- 26.19. Cholera Vaccines
- 26.20. Varicella Vaccine
- 26.21. Hepatitis A Vaccine
- 26.22. Meningococcal Vaccine
- 26.23. Seasonal and Pandemic Influenza Vaccines
- 26.24. Human Papillomavirus Vaccines
- 26.25. Dengue Vaccines
- 26.26. Yellow Fever Vaccine
- 26.27. Combination Vaccines
- 26.28. Covid-19 Vaccines
- 26.29. Immunization in Special Situations

27. Adolescence

- 27.1. Gender, Sexual Identity and Sexuality
- 27.2. Psychosocial Development

- 28. Health Issues in Adolescence
  - 28.1. Factors Influencing Adolescent Health
  - 28.2. Adolescent Nutrition
  - 28.3. Mental Health
  - 28.4. Injuries, Violence, and Suicide
  - 28.5. Menstrual Disorders
  - 28.6. Polycystic Ovary Syndrome
  - 28.7. Teenage Pregnancy
  - 28.8. Sexually Transmitted Infections
  - 28.9. Substance Abuse
    - 28.9.1. Alcohol
    - 28.9.2. Tobacco
    - 28.9.3. Other substances
  
- 29. Care of the Adolescents
  - 29.1. Adolescent Counseling
  - 29.2. Promoting Health of Adolescents
  - 29.3. Adolescent Friendly Health Services
  
- 30. Infectious Diseases
  - 30.1. Epidemiology of Infectious Diseases
  - 30.2. Laboratory Diagnosis of Infection
  - 30.3. Microbiome and Child Health
  - 30.4. Antimicrobial Resistance
  - 30.5. Infection Control and Prevention
  
- 31. Fever
  - 31.1. Fever: General Principles of Management
  - 31.2. Fever with/without focus
  - 31.3. Fever of Unknown Origin
  - 31.4. Infections in Immunocompromised conditions
  
- 32. Bacterial Infections
  - 32.1. Natural History of Bacterial Infection
  - 32.2. Principles of Antibiotic Therapy
  - 32.3. Gram Positive Infections
    - 32.3.1. Streptococcal Infections
      - 32.3.1.1. Pneumococcal Infections
      - 32.3.1.2. Streptococcal Group A
      - 32.3.1.3. Streptococcal Group B
      - 32.3.1.4. Streptococcal Non A, Non B
    - 32.3.2. Staphylococcal Infections
    - 32.3.3. Enterococcus
    - 32.3.4. Diphtheria
    - 32.3.5. Nocardiosis
    - 32.3.6. *Listeria monocytogenes*
    - 32.3.7. Actinomycosis

- 32.4. Gram Negative Infections
  - 32.4.1. Haemophilus influenzae
  - 32.4.2. Neisseria
  - 32.4.3. Pseudomonas
  - 32.4.4. Pertussis
  - 32.4.5. Salmonella
    - 32.4.5.1. Nontyphoidal Salmonellosis
    - 32.4.5.2. Enteric Fever
  - 32.4.6. Shigella
  - 32.4.7. Escherichia coli
  - 32.4.8. Cholera
  - 32.4.9. Campylobacter
  - 32.4.10. Yersinia
  - 32.4.11. Aeromonas
  - 32.4.12. Brucella
  - 32.4.13. Moraxella catarrhalis
  - 32.4.14. Helicobacter pylori
- 32.5. Anaerobic Bacterial
  - 32.5.1. Clostridium tetani
  - 32.5.2. Clostridium botulinum
  - 32.5.3. Clostridium difficile
- 32.6. Spirochetal Infections
  - 32.6.1. Treponema pallidum
  - 32.6.2. Leptospirosis
  - 32.6.3. Borrelia
    - 32.6.3.1. Lyme
    - 32.6.3.2. Relapsing Fever
- 32.7. Mycoplasma
  - 32.7.1. Mycoplasma pneumoniae
- 32.8. Chlamydia
  - 32.8.1. Chlamydia pneumoniae
  - 32.8.2. Chlamydia trachomatis
  - 32.8.3. Psittacosis
- 32.9. Rickettsia
  - 32.9.1. Spotted Fever
  - 32.9.2. Scrub Typhus
  - 32.9.3. Typhus
  - 32.9.4. Ehrlichiosis
  - 32.9.5. Q fever
- 33. Mycobacterial Infections
  - 33.1. Childhood Tuberculosis: Epidemiology, Pathogenesis, Clinical Features, and Prevention

- 33.2. Diagnostic Tools for Tuberculosis in Children
- 33.3. Antitubercular Drugs and RNTCP
- 33.4. Guidelines for Childhood Tuberculosis
- 33.5. Drug Resistant Tuberculosis
- 33.6. Atypical Mycobacterial Infections
- 33.7. Leprosy

#### 34. Viral Diseases

- 34.1. Epidemiology of Viral Infections
- 34.2. Principles of Antiviral Drugs
- 34.3. Measles
- 34.4. Mumps
- 34.5. Rubella
- 34.6. Roseola
- 34.7. Epstein-Barr
- 34.8. Cytomegalovirus
- 34.9. Influenza
- 34.10. Parainfluenza
- 34.11. Respiratory syncytial virus
- 34.12. Human metapneumovirus
- 34.13. Rhinovirus
- 34.14. Adenovirus
- 34.15. Coronavirus
- 34.16. Rotavirus
- 34.17. Human Papillomavirus
- 34.18. Arbovirus
  - 34.18.1. Japanese Encephalitis
  - 34.18.2. Other Encephalitis
  - 34.18.3. Tick-borne Encephalitis
  - 34.18.4. Chikungunya
  - 34.18.5. Zika
- 34.19. Varicella-zoster
- 34.20. Herpes Simplex
- 34.21. Rabies
- 34.22. Parvovirus Infections
- 34.23. NonpolioEnteroviral Infections
- 34.24. Poliomyelitis
- 34.25. Viral Hepatitis
- 34.26. HIV
- 34.27. Human Lymphotropic 1 and 2
- 34.28. Dengue
- 34.29. Yellow Fever
- 34.30. Ebola, Hanta
- 34.31. Rabies
- 34.32. Viral Hemorrhagic Fevers
- 34.33. Covid-19

#### 35. Protozoal Disease

- 35.1. Epidemiology of Parasitic Infections
- 35.2. Principles of Antiparasitic therapy
- 35.3. Malaria
- 35.4. Leishmaniasis
- 35.5. Giardiasis
- 35.6. Amebiasis
- 35.7. Filariasis
- 35.8. Cryptosporidiosis
- 35.9. Toxoplasmosis
- 35.10. Helminthiasis
  - 35.10.1. Hookworm Infestation
  - 35.10.2. Ascariasis
  - 35.10.3. Trichuriasis
  - 35.10.4. Enterobiasis
  - 35.10.5. Strongyloidiasis
  - 35.10.6. Tapeworm Diseases
  - 35.10.7. Cysticercosis
  - 35.10.8. Trichinosis
  - 35.10.9. Toxocara
  - 35.10.10. Intestinal, Liver, and Lung Flukes
  - 35.10.11. Hydatid Disease: Echinococcosis
  - 35.10.12. Schistosomiasis

36. Fungal Infections

- 36.1. Fungi
- 36.2. Principles of Antifungal Therapy
- 36.3. Candidiasis
- 36.4. Aspergillosis
- 36.5. Malassezia
- 36.6. Cryptococcosis
- 36.7. Coccidioidomycosis
- 36.8. Blastomycosis
- 36.9. Histoplasmosis
- 36.10. Mucormycosis
- 36.11. Pneumocystis Jirovecii

37. Diarrheal Illnesses

- 37.1. Acute Watery Diarrhea
- 37.2. Dysentery
- 37.3. Cholera
- 37.4. Persistent Diarrhea
- 37.5. Chronic *Diarrhea*
- 37.6. Antibiotic Associated Diarrhea

38. Gastrointestinal Disorders

- 38.1. Anatomy and Physiology
- 38.2. Common Symptoms of Gastrointestinal Diseases
- 38.3. Oral Cavity disorders

- 38.3.1. Malocclusion
- 38.3.2. Dental Caries
- 38.3.3. Periodontal disease
- 38.3.4. Common lesions of soft palate
- 38.3.5. Cleft Lip and Cleft Palate
- 38.3.6. Diseases of Salivary Glands
- 38.4. Esophageal atresia, Tracheoesophageal Fistula
- 38.5. Disorders of Esophageal Motility
- 38.6. Gastroesophageal Reflux
- 38.7. Esophagitis
- 38.8. Hiatal Hernia
- 38.9. Ingestions
  - 38.9.1. Foreign Body
  - 38.9.2. Caustic
- 38.10. Infantile Hypertrophic Pyloric Stenosis, Volvulus, Duplication
- 38.11. Duodenal Obstruction
- 38.12. Malrotation
- 38.13. Intestinal duplication
- 38.14. Meckel Diverticulum
- 38.15. Chronic obstructive pseudoobstruction
- 38.16. Chronic Abdominal Pain—Functional Abdominal Pain
- 38.17. Acid Peptic Disease
- 38.18. Pancreas – Function, Tests
  - 38.18.1. Pancreatitis
  - 38.18.2. Treatment of Pancreatic insufficiency
- 38.19. Constipation
- 38.20. Hirschsprung Disease
- 38.21. Malabsorption Disorders
  - 38.21.1. Assessment
  - 38.21.2. Celiac
  - 38.21.3. Enzyme Deficiencies
- 38.22. Inflammatory Bowel Disease
- 38.23. Intestinal Obstruction
- 38.24. Intussusception
- 38.25. Appendicitis
- 38.26. Abdominal Tuberculosis
- 38.27. Ascites
- 38.28. Umbilical Hernia
- 38.29. Inguinal Hernia
- 38.30. Testicular Torsion
- 38.31. Anorectal Disorders
  - 38.31.1. Anal Fissure
  - 38.31.2. Hemorrhoids
  - 38.31.3. Prolapse



- 38.31.4. Pilonidal sinus
- 38.31.5. Anorectal malformations

38.32. Cyclic vomiting

39. Hepatobiliary Diseases

- 39.1. Liver Function Tests
- 39.2. Neonatal Cholestasis
- 39.3. Portal Hypertension
- 39.4. Gastrointestinal Bleeding
- 39.5. Metabolic Liver disease

39.5.1. Wilson

39.5.2. Others

- 39.6. Liver Abscess
- 39.7. Viral Hepatitis
- 39.8. Chronic Liver Disease
- 39.9. Acute Liver Failure
- 39.10. Autoimmune Hepatitis
- 39.11. Drug induced Hepatitis
- 39.12. Cystic disease of Liver
- 39.13. Liver transplantation
- 39.14. Liver Tumors
- 39.15. Peritoneum

39.15.1. Ascites

39.15.2. Peritonitis

39.16. Epigastric hernia

40. Disorders of Hematopoietic System

- 40.1. The Hematopoietic System
- 40.2. Anemia: Etiology and Classification
- 40.3. Inadequate Production

40.3.1. Physiological anemia of infancy

40.3.2. Congenital Bone Marrow Failure

40.3.3. Aplastic Anemia

40.3.4. Iron Deficiency Anemia

40.3.5. Megaloblastic Anemia

40.3.6. Anemia of Chronic disease

40.3.7. Congenital dyserythropoietic anemia

40.4. Hemolytic Anemia

40.4.1. Hemoglobinopathies

40.4.1.1. Sickle Cell Disease

40.4.1.2. Thalassemia

40.4.2. RBC Membrane Defects

40.4.3. Red Blood Cell Enzyme Defects

40.4.4. Immune Hemolytic Anemia

- 40.5. Polycythemia
- 40.6. Hemorrhagic and Thrombotic disorders
  - 40.6.1. Coagulation Disorders
  - 40.6.2. Hemophilia
  - 40.6.3. Other Clotting Factor Deficiencies
  - 40.6.4. Von Willebrand Disease
  - 40.6.5. Thrombotic disorders
  - 40.6.6. Disseminated Intravascular Coagulation
- 40.7. Platelet
  - 40.7.1. Immune Thrombocytopenia
  - 40.7.2. Hemolytic Uremic Syndrome
  - 40.7.3. Thrombotic Thrombocytopenic Purpura
  - 40.7.4. Kasabach- Merritt Syndrome
  - 40.7.5. Platelet Function Defects
- 40.8. Blood Component Therapy
- 40.9. Spleen
  - 40.9.1. Splenomegaly
  - 40.9.2. Splenectomy
- 40.10. Lymphatics
  - 40.10.1. Lymphadenopathy
- 41. Respiratory Diseases
  - 41.1. Congenital Malformations of the Upper Respiratory Tract
  - 41.2. Epistaxis
  - 41.3. Nasal Polyps
  - 41.4. Allergic Rhinitis
  - 41.5. Otitis Media
  - 41.6. Common Cold
  - 41.7. Acute Pharyngitis
  - 41.8. Retropharyngeal abscess
  - 41.9. Sinusitis
  - 41.10. Tonsils and Adenoids
  - 41.11. Community Acquired Pneumonia
  - 41.12. Pleural effusion, Empyema
  - 41.13. Bronchiectasis
  - 41.14. Pneumothorax, Pneumomediastinum, Pyopneumothorax
  - 41.15. Skeletal deformities of Chest
  - 41.16. Obstructive Sleep Apnea
  - 41.17. Congenital Malformations of the Respiratory Tract
  - 41.18. Congenital disorders of Lung
  - 41.19. Croup, Epiglottitis, Laryngitis, Tracheitis
  - 41.20. Bronchiolitis
  - 41.21. Alpha-1 Antitrypsin Deficiency

- 41.22. Aspiration Syndromes
- 41.23. Preschool Wheeze and Bronchial Asthma
- 41.24. Aerosol Therapy
- 41.25. Pneumonia
- 41.26. Parapneumonic Effusion and Empyema
- 41.27. Pneumothorax and Air Leaks
- 41.28. Persistent and Recurrent Pneumonia
- 41.29. Interstitial Lung Disease
- 41.30. Hemoptysis and Alveolar Bleeds
- 41.31. Primary Ciliary Dyskinesia
- 41.32. Cystic Fibrosis
- 41.33. Bronchiectasis
- 41.34. Lung Abscess
- 41.35. Foreign Body Aspiration
- 41.36. Central Hypoventilation
- 41.37. Acute Respiratory Distress Syndrome
- 41.38. SIDS

## 42. Cardiovascular Disorders

- 42.1. Genetic Basis of Heart Diseases
- 42.2. Chest Skiagram in Heart Disease
- 42.3. Electrocardiogram
- 42.4. Echocardiography
- 42.5. Congestive Heart Failure
- 42.6. Cardiac Malposition
- 42.7. Acyanotic Congenital Heart Disease, Left to Right shunt
  - 42.7.1. Ventricular Septal Defects
  - 42.7.2. Patent Ductus Arteriosus
  - 42.7.3. Atrial Septal Defects
  - 42.7.4. PAPVC
  - 42.7.5. Atrioventricular Septal Defects
- 42.8. Acyanotic Congenital Heart Disease, Obstructive
  - 42.8.1. Pulmonary Valve Stenosis
  - 42.8.2. Coarctation of Aorta
  - 42.8.3. Pulmonary Venous Hypertension
- 42.9. Acyanotic Congenital Heart Disease, Regurgitation
  - 42.9.1. Mitral Valve Prolapse
- 42.10. Cyanotic Congenital Heart Disease, reduced Pulmonary flow
  - 42.10.1. Tetralogy of Fallot and Variants
  - 42.10.2. Tricuspid Atresia
  - 42.10.3. Double outlet Right Ventricle
  - 42.10.4. Ebstein Anomaly
- 42.11. Cyanotic Congenital Heart Disease, Increased Pulmonary flow

- 42.11.1. Transposition of Great Arteries and variants
- 42.11.2. Truncus Arteriosus
- 42.11.3. TAPVC
- 42.11.4. Hypoplastic Left Heart Syndrome
- 42.12. Others
  - 42.12.1. Anomalies of the Aortic Arch
  - 42.12.2. Pulmonary Arterial Hypertension
- 42.13. Acquired Heart Disease
  - 42.13.1. Acute Rheumatic Fever
  - 42.13.2. Rheumatic Heart Disease
  - 42.13.3. Infective Endocarditis
  - 42.13.4. Myocardial Diseases: Myocarditis and Cardiomyopathies
  - 42.13.5. Diseases of the Pericardium
  - 42.13.6. Kawasaki disease
- 42.14. Cardiac Arrhythmias
- 42.15. Cardiac Emergencies
- 42.16. Heart Failure
- 42.17. Systemic Hypertension
- 43. Disorders of the Kidney and Urinary Tract
  - 43.1. Investigations for Kidneys and Urinary Tract
  - 43.2. Congenital Anomalies of Kidneys and Urinary Tract
    - 43.2.1. Cystic Kidney Diseases
  - 43.3. Glomerular Disease
    - 43.3.1. Glomerulonephritis
      - 43.3.1.1. Acute Poststreptococcal Glomerulonephritis
      - 43.3.1.2. Membranous Nephropathy
      - 43.3.1.3. Membranoproliferative Glomerulonephritis
      - 43.3.1.4. Rapidly Progressive Glomerulonephritis
    - 43.3.2. IgA nephropathy
    - 43.3.3. Alport syndrome
  - 43.4. Systemic Vasculitis and Lupus Nephritis
  - 43.5. Goodpasture Disease
  - 43.6. Henoch-Schonlein Purpura Nephritis
  - 43.7. Hemolytic Uremic Syndrome
  - 43.8. Toxic Nephropathy
  - 43.9. Tubulointerstitial Disease
    - 43.9.1. Pyelonephritis
    - 43.9.2. Tubulointerstitial nephritis
    - 43.9.3. Papillary necrosis
    - 43.9.4. Acute Tubular Necrosis
  - 43.10. Vascular Disease

- 43.10.1. Renal vein Thrombosis
- 43.10.2. Hypercalciuria
- 43.10.3. Nephrocalcinosis

43.11. Infections

- 43.11.1. Urinary Tract Infection
- 43.11.2. Cystitis
- 43.11.3. Urethritis
- 43.11.4. Hemorrhagic cystitis
- 43.11.5. Pyelonephritis

43.12. Proteinuria

- 43.12.1. Transient, Orthostatic
- 43.12.2. Nephrotic Syndrome

43.13. Tubular Disorders

- 43.13.1. Renal Tubular Disorders
- 43.13.2. Nephrogenic Diabetes Insipidus
- 43.13.3. Bartter Syndrome
- 43.13.4. Gitelman Syndrome

43.14. Renal Failure

- 43.14.1. Acute Kidney Injury
- 43.14.2. Chronic Kidney disease
- 43.14.3. End-stage renal disease
- 43.14.4. Renal Replacement Therapy
- 43.14.5. Renal Transplantation

43.15. Renal Calculi

43.16. Refractory Rickets

43.17. Hypertension

43.18. Vesicoureteral Reflux

43.19. Voiding Disorders

43.20. Penile anomalies

44. Gynecological Issues

- 44.1. Vaginal bleeding in prepubertal children
- 44.2. Breast concerns
- 44.3. Female genital mutilation

45. Neurological Disorders

- 45.1. Approach to Neurological Disorders including localization
- 45.2. Cerebrospinal Fluid and Neurophysiology
- 45.3. Neuroimaging
- 45.4. Congenital Anomalies

- 45.4.1. Neural Tube Defects and Spinal Cord Malformations

- 45.4.2. Microcephaly
  - 45.4.3. Brain Malformations
  - 45.4.4. Hydrocephalus
  - 45.4.5. Craniosynostosis
  - 45.5. Seizures
    - 45.5.1. Febrile Seizures
    - 45.5.2. Unprovoked Seizures and Epilepsy
      - 45.5.2.1. Generalized
      - 45.5.2.2. Focal
      - 45.5.2.3. Reflex Seizures
    - 45.5.3. Treatment of Seizures
    - 45.5.4. Status Epilepticus
    - 45.5.5. Nonepileptic Paroxysmal Disorders
  - 45.6. Headaches
    - 45.6.1. Migraine
    - 45.6.2. Tension Headache
    - 45.6.3. Secondary Headaches
  - 45.7. Neurocutaneous Syndromes
  - 45.8. Movement Disorders
  - 45.9. Encephalopathies
    - 45.9.1. Cerebral Palsy
    - 45.9.2. Autoimmune
    - 45.9.3. Mitochondrial
  - 45.10. Neurodegenerative Disorders
    - 45.10.1. Grey versus White Matter
    - 45.10.2. Sphingolipidosis
    - 45.10.3. Neuronal CeroidLipofuscinoses
    - 45.10.4. Adrenoleucodystrophy
  - 45.11. Demyelinating Disorders
    - 45.11.1. Acute Disseminated Encephalomyelitis
    - 45.11.2. Optic Neuritis
    - 45.11.3. Transverse Myelitis
    - 45.11.4. Multiple Sclerosis
    - 45.11.5. Autoimmune and Paraneoplastic
  - 45.12. Stroke
    - 45.12.1. Arterial versus Venous
  - 45.13. CNS Vasculitis
  - 45.14. CNS Infections
    - 45.14.1. Acute Pyogenic Meningitis
    - 45.14.2. Tuberculosis of the Central Nervous
- System



- 46.8.5. Acute Flaccid Paralysis
- 46.9. Toxic Neuropathies
- 46.10. Autonomic Neuropathy
- 46.11. Guillain-Barré Syndrome
- 46.12. Bell Palsy
- 47. Disorders of the Endocrine System
  - 47.1. Physiology of Neuroendocrinology
  - 47.2. Hypopituitarism
    - 47.2.1. Growth Hormone Deficiency and Resistance
    - 47.2.2. Polyuria, Diabetes Insipidus and Syndrome of Inappropriate Secretion of ADH
  - 47.3. Thyroid Disorders
    - 47.3.1. Thyroid Hormone Physiology
    - 47.3.2. Hypothyroidism
    - 47.3.3. Thyroiditis
    - 47.3.4. Hyperthyroidism
    - 47.3.5. Goiter and Thyroid Nodules
    - 47.3.6. Newborn Screening for Congenital Hypothyroidism
  - 47.4. Parathyroid Disorders
    - 47.4.1. Bone Mineral and Hormone Physiology
    - 47.4.2. Calcium Disorders
    - 47.4.3. Metabolic Rickets
    - 47.4.4. Disorders with Bone Fragility
    - 47.4.5. Hypoparathyroidism
    - 47.4.6. Pseudo hypothyroidism
    - 47.4.7. Hyperparathyroidism
  - 47.5. Pubertal Development
    - 47.5.1. Normal Puberty
    - 47.5.2. Delayed Puberty
    - 47.5.3. Precocious Puberty
  - 47.6. Adrenal Gland Disorders
    - 47.6.1. Normal Development and Physiology of the Adrenal Gland
    - 47.6.2. Congenital Adrenal Hyperplasia
    - 47.6.3. Adrenal Insufficiency
    - 47.6.4. Cushing Syndrome
    - 47.6.5. Primary Aldosteronism
    - 47.6.6. Pheochromocytoma
  - 47.7. Gonad Disorders
    - 47.7.1. Testicular Hypofunction
    - 47.7.2. Ovarian Hypofunction
    - 47.7.3. Gynecomastia
    - 47.7.4. Disorders of Sex Development



- 47.7.5. Cryptorchidism and Micropenis
- 47.8. Glucocorticoid Use and Withdrawal
- 47.9. Diabetes Mellitus
  - 47.9.1. Classification of Diabetes Mellitus
  - 47.9.2. Type 1 Diabetes Mellitus
  - 47.9.3. Type 2 Diabetes Mellitus
  - 47.9.4. Acute and Chronic Complications of Diabetes Mellitus
- 47.10. Monogenic Obesity
- 47.11. Hyperlipidemia
- 47.12. Endocrine Consequences of Thalassemia Major
- 47.13. Endocrine Effects of Radiation and Cancer Chemotherapy
- 47.14. Adult Consequences of IUGR and Preterm Birth
- 48. Malignancies in Children
  - 48.1. Epidemiology and Biology of Cancers
  - 48.2. Principles of Diagnosis and Therapy of Cancer
  - 48.3. Leukemias
    - 48.3.1. Acute Lymphoblastic Leukemia
    - 48.3.2. Acute Myelogenous Leukemia
    - 48.3.3. Chronic Myelogenous Leukemia
    - 48.3.4. Infantile Leukemia
  - 48.4. Lymphoma
    - 48.4.1. Hodgkin Lymphoma
    - 48.4.2. Non-Hodgkin Lymphoma
  - 48.5. Brain Tumors
  - 48.6. Neuroblastoma
  - 48.7. Wilms Tumor
  - 48.8. Soft Tissue Tumors
  - 48.9. Bone Tumors
  - 48.10. Retinoblastoma
  - 48.11. Gonadal, Germ cell neoplasms
  - 48.12. Hemangioma
  - 48.13. Lymphangiomas, Cystic Hygromas
  - 48.14. Thyroid Tumours
  - 48.15. Nasopharyngeal Carcinoma
  - 48.16. Adrenal Tumours
  - 48.17. Histiocytosis
    - 48.17.1. LCH
    - 48.17.2. Hemophagocytic Lymphohistiocytosis
  - 48.18. Oncological Emergencies and Supportive Care
  - 48.19. Hematopoietic Stem Cell Transplant
- 49. Rheumatological Disorders

- 49.1. Approach to a Child with Rheumatological Disorder
- 49.2. Laboratory Investigations for Rheumatological Disorders
- 49.3. Drugs and Principles of Management for Rheumatic Disorders
- 49.4. Juvenile Idiopathic Arthritis
- 49.5. Reactive, Post-Infectious Arthritis
- 49.6. Systemic Lupus Erythematosus: Clinical Features and Diagnostic Criteria
- 49.7. Management of Systemic Lupus Erythematosus
- 49.8. Juvenile Dermatomyositis
- 49.9. Large Vessel Vasculitis: Takayasu Arteritis
- 49.10. Medium Vessel Vasculitis: Kawasaki Disease and Polyarteritis Nodosa
- 49.11. Small Vessel Vasculitis: Henoch-Schönlein Purpura and ANCA Associated Vasculitis
- 49.12. Juvenile Scleroderma
- 49.13. Antiphospholipid Syndrome
- 49.14. Growing Pains
- 50. Common Eye Abnormalities
  - 50.1. Common Visual Problems
  - 50.2. Congenital Anomalies
  - 50.3. Refractive Errors
  - 50.4. Cornea and Conjunctiva
  - 50.5. Uveitis
  - 50.6. Cataract and Lens
  - 50.7. Glaucoma
  - 50.8. Optic Nerve and Pupil
  - 50.9. Strabismus and Motility Disorders
  - 50.10. Eyelid, Orbit, and Lacrimal Sac
  - 50.11. Ocular Injuries
  - 50.12. Orbital Infections
  - 50.13. Ocular Manifestations of Systemic Disorders
- 51. Common ENT Problems
  - 51.1. Hearing Loss
  - 51.2. Congenital malformations of Ear
  - 51.3. External Otitis
  - 51.4. Otitis Media
  - 51.5. Mastoiditis
  - 51.6. Inner Ear
- 52. Common Skin Problems
  - 52.1. Skin of the Newborn: Physiological and Pathological Changes
  - 52.2. Care of Skin in the Newborn
  - 52.3. Infections and Infestations
  - 52.4. Congenital Cutaneous Malformations
  - 52.5. Vitiligo and Other Hypopigmentary Diseases
  - 52.6. Atopic Dermatitis
  - 52.7. Contact Dermatitis

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- 52.8. Urticaria and Mastocytosis
- 52.9. Psoriasis, Gianotti-Crosti Syndrome
- 52.10. Acanthosis Nigrans
- 52.11. Cutaneous Drug Reactions
- 52.12. Cutaneous Manifestations of Nutritional Deficiency
- 52.13. Cutaneous Manifestations of Collagen Vascular Diseases
- 52.14. Neurocutaneous Syndromes
- 52.15. Vesiculobullous Disorders
- 52.16. Papulosquamous Disorders
- 52.17. Ichthyosis
- 52.18. Genetic Cutaneous Disorders
- 52.19. Hair Disorders
- 52.20. Nail Disorders
- 52.21. Infections of Skin
  - 52.21.1. Impetigo
  - 52.21.2. Subcutaneous Infections
  - 52.21.3. Staphylococcal Scalded Skin Syndrome
  - 52.21.4. Ecthyma
  - 52.21.5. Fungal Infections
  - 52.21.6. Viral Infections
  - 52.21.7. Arthropod bites
  - 52.21.8. Scabies
  - 52.21.9. Pediculosis
  - 52.21.10. Acne

### 53. Disorders of Bones and Joints

- 53.1. Assessment of the Locomotor System
- 53.2. Deformities of Foot and Toes
  - 53.2.1. Congenital Talipes Equinovarus
- 53.3. Torsional deformities of Limb
- 53.4. Leg Length discrepancies
- 53.5. Transient Monoarticular synovitis
- 53.6. Legg-Calvé-Perthes Disease
- 53.7. Neck Problems
  - 53.7.1. Torticollis
  - 53.7.2. Cervical anomalies
- 53.8. Scoliosis and Kyphosis
- 53.9. Developmental Dysplasia of the Hip (DDH)
- 53.10. Osteomyelitis
- 53.11. Septic Arthritis
- 53.12. Osgood-Schlatter Disease
- 53.13. Arthrogyrosis
- 53.14. Injuries to Bones/Joints
- 53.15. Skeletal Dysplasia
- 53.16. Osteogenesis imperfecta
- 53.17. Marfan Syndrome
- 53.18. Metabolic Bone Disease

- 53.18.1. Hypo/Hyperphosphatemia
- 53.18.2. Osteoporosis

54. Vulnerable Children

- 54.1. Street Children
- 54.2. Child Labor
- 54.3. Child Abuse and Neglect
- 54.4. Adoption: Medical and Legal Issues
- 54.5. Rights of the Child

55. Environmental Health

- 55.1. Climate Change and its impact on Health
- 55.2. Air Pollution and its impact on Health
- 55.3. Biomedical Waste Management

56. Community Pediatrics

- 56.1. Indicators of Child Health
- 56.2. Environment and Child Health
- 56.3. Lead Poisoning
- 56.4. Adoption
- 56.5. Travel Medicine
- 56.6. Protection of Children from Sexual Offences ACT 2012
- 56.7. Rights of People With Disability Act 2016
- 56.8. National Programs for Child Health as relevant to National Health Mission including RBSK.
- 56.9. Integrated Management of Neonatal and Childhood Illness-Facility (IMNCI-F)
- 56.10. Investigation of an Outbreak

57. Quality Assessment and Improvement

- 57.1.1. Point of Care Quality Improvement

## **B. Psychomotor Domain**

- *Should be able to perform independently in the practice of Paediatrics, the following diagnostic and therapeutic interventions as listed below:*

### **1. Physical Examination**

- 1.1. Measurement of Vitals
- 1.2. Measurement of Anthropometry
- 1.3. General physical examination
- 1.4. Physical Examination of Systems
- 1.5. Development (Screening) Assessment
- 1.6. Behavioral (Screening) Assessment
- 1.7. Sexual Maturity Assessment
- 1.8. Newborn Assessment including gestational assessments
- 1.9. Breastfeeding Assessment of Position and Attachment
- 1.10. Motor Disability Assessment

- 1.11. Autism Spectrum Disorder Screening
- 1.12. Fundus examination
- 1.13. Middle ear examination
- 1.14. Throat examination
- 1.15. Triage - Rapid assessment of Airway, Breathing and Circulation
- 1.16. Hand hygiene
- 1.17. Biomedical Waste disposal guidelines

## **2. Non-Invasive Monitoring**

- 2.1. Pulse oximetry
- 2.2. Electrocardiogram
- 2.3. Vital Data Monitor

## **3. Procedures – Diagnostic**

- 3.1. Informed Consent
- 3.2. Aseptic measures for all invasive procedures
- 3.3. Sampling
  - 3.3.1. Venous blood
  - 3.3.2. Arterial blood
  - 3.3.3. Capillary blood
- 3.4. Vascular Access and cannulation
  - 3.4.1. Intravenous – Peripheral
  - 3.4.2. Intravenous - Central
  - 3.4.3. Intraosseous
  - 3.4.4. Intraarterial
  - 3.4.5. Umbilical Vein
- 3.5. Diagnostic Taps
  - 3.5.1. Pleural
  - 3.5.2. Peritoneal
  - 3.5.3. CSF
  - 3.5.4. Pericardial
  - 3.5.5. Joint fluid
  - 3.5.6. Subdural
  - 3.5.7. Ventricular
- 3.6. Urinary Catheterization
- 3.7. Urine collection
  - 3.7.1. Mid-stream sampling
  - 3.7.2. Catheter sampling
  - 3.7.3. Suprapubic puncture
- 3.8. Tuberculin Skin Test
- 3.9. Antibiotic Test Dose
- 3.10. Feeding/Ryles Tube
  - 3.10.1. Insertion

- 3.10.2. Gastric Aspiration
- 3.10.3. Feeds
- 3.10.4. Stomach wash
- 3.11. Respiratory
  - 3.11.1. Naso, Pharyngeal and Nasopharyngeal swab collection
- 3.12. Suppository insertion
- 3.13. Per rectal exam
- 3.14. Inspection of Vulva/Vagina
- 3.15. Aspiration/Biopsy
  - 3.15.1. Bone marrow
  - 3.15.2. Liver
  - 3.15.3. Kidney
  - 3.15.4. FNAC Lymph node
- 3.16. Ultrasound – Lung (B line, Effusion), Circulation (IVC Volume), Vascular access (Central venous), Soft Tissue (Pus)
- 3.17. Blood Group/Type
- 3.18. Smears
  - 3.18.1. Malaria Parasite Smear/Rapid Antigen Test
  - 3.18.2. Peripheral Blood Smear
  - 3.18.3. CSF/Pus Grams Stain
  - 3.18.4. Sputum Ziehl Neilson Smear
- 3.19. Urine dipstick
- 3.20. Stool Hanging drop
- 3.21. Glucometer Blood Sugar
- 3.22. Shake test (Newborn gastric aspirate)
- 3.23. Electrocardiogram
- 3.24. Specific Screening/Assessment Tools
  - 3.24.1. Gestation Assessments
  - 3.24.2. Anthropometric measurements and Growth charting
  - 3.24.3. Peak Flow Meter Measurement
  - 3.24.4. HEADSS screening (Adolescence)
  - 3.24.5. DDST screening (Development Assessment)
  - 3.24.6. Assessment of Sexual Maturity using Tanner's
  - 3.24.7. M-CHAT-R screening (Autism Assessment)
  - 3.24.8. GMSCF Assessment of Motor Disability (Cerebral Palsy)
  - 3.24.9. Pain assessment

#### **4. Procedures – Therapeutic**

- 4.1. Informed Consent
- 4.2. Prescriptions/Medication Orders
- 4.3. Neonatal Resuscitation Program including intubation
- 4.4. Basic Life Support
- 4.5. Advanced Paediatric Life Support including intubation

- 4.6. Heimlich, Foreign Body Removal
- 4.7. Exchange Transfusion
- 4.8. Stomach wash
- 4.9. Injections
  - 4.9.1. Intravenous
  - 4.9.2. Intramuscular
  - 4.9.3. Subcutaneous
  - 4.9.4. Intradermal
- 4.10. Infusions
  - 4.10.1. IV bolus
  - 4.10.2. Intravenous
  - 4.10.3. Intraosseous
  - 4.10.4. Blood Component Transfusion
- 4.11. Respiratory
  - 4.11.1. Meter dose inhalation with or without Spacer/Mask
  - 4.11.2. Nebulization
  - 4.11.3. Airway Insertion – Nasopharyngeal,  
Oropharyngeal
  - 4.11.4. Needle Cricothyroidotomy
  - 4.11.5. Oxygen delivery methods
  - 4.11.6. HFNC/CPAP/Non-Invasive Ventilation
  - 4.11.7. Ventilation – Conventional
  - 4.11.8. Intercostal drainage
  - 4.11.9. Surfactant Administration (INSURE)
- 4.12. Spinal infusion/injection
- 4.13. Therapeutic Ascitic Tap
- 4.14. Peritoneal dialysis
- 4.15. Phototherapy
- 4.16. Incision and Drainage
- 4.17. Dressings
- 4.18. Sling
- 4.19. Transport onto and off stretcher
- 4.20. Neonatal Temperature Warm Chain Measures
  - 4.20.1. Wrapping up Newborn
  - 4.20.2. Kangaroo Mother Care
- 4.21. Immunization Cold Chain Measures
  - 4.21.1. Refrigerator
  - 4.21.2. Vaccine carrier
- 4.22. Restraining a child
- 4.23. Transporting a child
- 4.24. Early Interventional Therapy
- 4.25. Chest Physiotherapy

**Milestones to be achieved on Psychomotor Skills through Year 1 to 3.**

**O-Observe**

**PS-Perform under supervision**

**PI-Perform independently**

<b>Milestones</b>	<b>1<sup>st</sup> Year</b>	<b>2<sup>nd</sup> Year</b>	<b>3<sup>rd</sup> Year</b>
<b>1. Physical Examination</b>			
1.1. Measurement of Vitals	PI		
1.2. Measurement of Anthropometry	PI		
1.3. General physical examination	PI		
1.4. Physical Examination of Systems	PI		
1.5. Development (Screening) Assessment	O, PS	PI	
1.6. Behavioral (Screening) Assessment	O	PS	PI
1.7. Sexual Maturity Assessment	O, PS	PI	
1.8. Newborn Assessment including gestational assessments	PI		
1.9. Breastfeeding Assessment	PI		
1.10. Motor Disability Assessment	O	PS	PI
1.11. Autism Spectrum Disorder Screening	O	PS	PI
1.12. Fundus examination	PI		
1.13. Middle ear examination	PI		
1.14. Throat examination	PI		
1.15. Triage - Rapid assessment of ABC	PI		
1.16. Hand hygiene	PI		
1.17. Biomedical Waste disposal guidelines	PI		
<b>2. Non-Invasive Monitoring</b>			
2.1. Pulse oximetry	PI		
2.2. Electrocardiogram	PI		
2.3. Vital Data Monitor	PI		
<b>3. Procedures – Diagnostic</b>			
3.1. Informed Consent	PI		
3.2. Aseptic measures for all procedures	PI		
3.3. Sampling			
3.3.1. Venous blood	PI		
3.3.2. Arterial blood	PI		



3.3.3. Capillary blood	PI		
3.4. Vascular Access and cannulation			
3.4.1. Intravenous – Peripheral	PI		
3.4.2. Intravenous - Central	O	PS	PI
3.4.3. Intraosseous	PI		
3.4.4. Intraarterial	O	PS	PI
3.4.5. Umbilical Vein	PI		
3.5. Diagnostic Taps			
3.5.1. Pleural	PS	PI	
3.5.2. Peritoneal	PI		
3.5.3. CSF	PI		
3.5.4. Pericardial	O	PS	PI
3.5.5. Joint fluid	O	PS	PI
3.5.6. Subdural	O, PS	PI	
3.5.7. Ventricular	O	PS	PI
3.6. Urinary Catheterization	PI		
3.7. Urine collection			
3.7.1. Mid-stream sampling	PI		
3.7.2. Catheter sampling	PI		
3.7.3. Suprapubic puncture	PI		
3.8. Tuberculin Skin Test	PI		
3.9. Antibiotic Test Dose	PI		
3.10. Feeding/Ryles Tube			
3.10.1. Insertion	PI		
3.10.2. Gastric Aspiration	PI		
3.10.3. Feeds	PI		
3.10.4. Stomach wash	PI		
3.11. Respiratory			
3.11.1. Naso, Pharyngeal, NP swab collection	PI		
3.12. Suppository insertion	PI		
3.13. Per rectal exam	O	PS	PI

3.14. Inspection of Vulva/Vagina	PI		
3.15. Aspiration/Biopsy			
3.15.1. Bone marrow	O, PS	PI	
3.15.2. Liver	O	PS	PI
3.15.3. Kidney	O	PS	PI
3.15.4. FNAC Lymph node	O	PS	PI
3.16. Ultrasound – Lung (B line, Effusion), Circulation (IVC Volume), Vascular access (Central venous), Soft Tissue (Pus)	O	O, PS	PS
3.17. Blood Group/Type	O, PS	PI	
3.18. Smears			
3.18.1. Malaria Parasite Smear/Rapid Antigen Test	O, PS	PI	
3.18.2. Peripheral Blood Smear	O, PS	PI	
3.18.3. CSF/Pus Grams Stain	O, PS	PI	
3.18.4. Sputum Ziehl Neilson Smear	O, PS	PI	
3.19. Urine dipstick	PI		
3.20. Stool Hanging drop	O, PS	PI	
3.21. Glucometer Blood Sugar	PI		
3.22. Shake test (Neon gastric aspirate)	PI		
3.23. Electrocardiogram	PI		
3.24. Specific Screening/Assessment Tools			
3.24.1. Gestation Assessments	PI		
3.24.2. Anthropometric measurements and Growth charting	PI		
3.24.3. Peak Flow Meter Measurement	PI		
3.24.4. HEADSS screening (Adolescence)	O, PS	PI	
3.24.5. DDST screening (Development Assessment)	O, PS	PI	
3.24.6. Assessment of Sexual Maturity using Tanner's	O, PS	PI	
3.24.7. M-CHAT-R screening (Autism Assessment)	O	PS	PI
3.24.8. GMSCF Assessment of Motor Disability (Cerebral Palsy)	O	PS	PI

3.24.9. Pain assessment	PI		
<b>4. Procedures – Therapeutic</b>			
4.1. Informed Consent	PI		
4.2. Prescriptions/Medication Orders	PI		
4.3. Neonatal Resuscitation Program including ET	PI (BVM)	PI (ET)	
4.4. Basic Life Support	PI		
4.5. Advanced Paediatric Life Support including ET	PI (BVM)	PI (ET)	
4.6. Heimlich, Foreign Body Removal	PI		
4.7. Exchange Transfusion	O	PS	PI
4.8. Stomach wash	PI		
4.9. Injections			
4.9.1. Intravenous	PI		
4.9.2. Intramuscular	PI		
4.9.3. Subcutaneous	PI		
4.9.4. Intradermal	PI		
4.10. Infusions			
4.10.1. IV bolus	PI		
4.10.2. Intravenous	PI		
4.10.3. Intraosseous	PI		
4.10.4. Blood Component Transfusion	PI		
4.11. Respiratory			
4.11.1. Meter dose inhalation with or without Spacer/Mask	PI		
4.11.2. Nebulization	PI		
4.11.3. Airway Insertion – Nasophy, Orophy	PI		
4.11.4. Needle Cricothyroidotomy	O	PS	PI
4.11.5. Oxygen delivery methods	PI		
4.11.6. HFNC/CPAP/Non-Invasive Ventilation	O, PS	PI	
4.11.7. Ventilation – Conventional, High Freq (HFV)	O	PS	PI (Not HFV)
4.11.8. Intercostal drainage	O, PS	PI	
4.11.9. Surfactant Administration	O, PS	PI	

	(INSURE)			
4.12.	Spinal infusion/injection	O	PS	PI
4.13.	Therapeutic Ascitic Tap	O, PS	PI	
4.14.	Peritoneal dialysis	O	PS	PI
4.15.	Phototherapy	PI		
4.16.	Incision and Drainage	O	PS	PI
4.17.	Dressings	PI		
4.18.	Sling	PI		
4.19.	Transport onto and off stretcher	PI		
4.20.	Neonatal Temperature Warm Chain	PI		
4.20.1.	Wrapping up Newborn	PI		
4.20.2.	Kangaroo Mother Care	PI		
4.21.	Immunization Cold Chain Measures			
4.21.1.	Refrigerator	PI		
4.21.2.	Vaccine carrier	PI		
4.22.	Restraining a child	O, PS	PI	
4.23.	Transporting a child	O, PS	PI	
4.24.	Early Interventional Therapy	O	PS	PI
4.25.	Chest Physiotherapy	O, PS	PI	

## C. Predominant in Affective Domain

*Should be able to effectively and empathetically.....*

### 1. Communication – Child/Attender/Guardian

- 1.1. Elicit a relevant and appropriate history from an attender/child including family and support systems
- 1.2. Engage and explain in appropriate language the plan (diagnostic and management including economics of plans) to an attender/child
- 1.3. Explain the prognosis of the child's condition
- 1.4. Educate a Parent, an attendant/guardian/child with regards disease/, cultural, and spiritual understanding associated with health care delivery complication prevention, health promotion, and management keeping illustrating ethical ?
- 1.5. Counsel towards an Informed Consent/Assent
- 1.6. Communicate disturbing/bad news including death

**1.7.** Demonstrates communication skills to appropriately word reports, professional opinions, patient education and counseling with regards

1.7.1. Health and Disease condition with management plan

1.7.2. Nutrition - Breastfeeding, complimentary feeding and nutrition using a Growth chart

1.7.3. Immunization – On schedule, catch up including costs and advantages/disadvantages

1.7.4. Lifestyle

1.7.4.1. Dietary

1.7.4.2. Habits

1.7.5. Genetic risks of relevant inherited conditions

1.7.6. Options for management and future approach in care with advantages and disadvantages

1.7.7. Rights and responsibilities

**1.8.** Demonstrates knowledge or applies an understanding of psychological, social, and economic factors which are pertinent to the delivery of health care.

**1.9.** Demonstrates and effectively engages the patient and / or family in all communication.

**1.10.** Demonstrates ability to provide patient, family and community education through written material especially simple patient information leaflets

*Should be able to effectively and respectfully.....*

## **2. Communication – Health Team members**

**2.1.** Communicate with all members of the health care team

**2.2.** Communicate with other members of the profession

**2.3.** Communicate with allied professionals associated with Health care

*Should be able to .....*

## **3. Professionalism and Ethical Behaviour**

**3.1.** Demonstrates Professional Conduct in patient care and research

3.1.1. Demonstrate respect for the Doctor-Patient relationship

3.1.2. Demonstrate respect for the Doctor-Health Care Team Member relationship

3.1.3. Demonstrate adherence to confidentiality and patient privacy in all communications in and outside the place of work.

- 3.1.4. Demonstrate respect of a patient's rights and decisions including the right to information and second opinion.
- 3.1.5. Demonstrate behaviour aligned with MCI/NMC code of ethics in all related dealings
- 3.1.6. Demonstrates personal and social responsibility/accountability in the provision of health care at an individual, community and population level
- 3.1.7. Demonstrate an awareness of economic costs of health care in all dealings with patients.
- 3.1.8. Demonstrate adherence to research ethics guidelines in the conduct of patient related research.
- 3.1.9. Demonstrates work ethics while working in a health care team.
- 3.1.10. Demonstrates truthfulness, honesty and integrity in all interactions.
- 3.1.11. Provides care that surpasses personal beliefs and prejudices
- 3.1.12. Demonstrates appropriate etiquette in dealings with patients, relatives and other health personnel
- 3.2. Demonstrates behavior that is Ethical and bound by the Law of the land
  - 3.2.1. Recognizes Ethical conflicts and dilemmas seeking solutions to reduce conflicts and do the right thing.
  - 3.2.2. Complies with legal requirements while dealing with child health and includes issues dealing with the Industry Conflict, MTP Act, PCPNDT act, Child Abuse, Child labour, Legal adoption, Consent and Assent.

## ***D. Pedagogic and Research Skills***

***Should be able to effectively .....***

### **1. Pedagogic Skills**

- 1.1. Conduct a small group learning session (Theory and Practical) using appropriate tools
- 1.2. Create and use an effective Powerpoint Presentation
- 1.3. Present to a large group

***Should be able to effectively .....***

### **2. Research Skills**

- 2.1. Search scientific literature and critically appraise the evidence using standard study design checklists enabling application to clinical care.

- 2.2. Justify the application of the findings of a research study in clinical practice  
(Diagnostic and Therapeutic Studies)
- 2.3. Develop a research hypothesis supported by scientific literature review, design an appropriate study, implement the methodology, generate results by analyzing data, and draw appropriate conclusions.
- 2.4. Should be able to present or/and publish a paper based on the conducted research.

## ***TEACHING AND LEARNING METHODS***

### **General principles**

Acquisition of competencies being the keystone of doctoral medical education, such training should be skills oriented. Learning in the program, essentially autonomous and self-directed, and emanating from academic and clinical work, shall also include assisted learning. The formal sessions are meant to supplement this core effort.

All students joining the postgraduate (PG) courses shall work as full-time (junior) residents during the period of training, attending not less than 80% of the training activity during the calendar year, and participating in all assignments and facets of the educational process. They shall maintain a logbook for recording the training they have undergone, and details of the procedures done during laboratory and clinical postings in real time.

### **Teaching-Learning methods**

This should include a judicious mix of demonstrations, symposia, journal clubs, clinical meetings, seminars, small group discussion, bed-side teaching, case-based learning, simulation-based teaching, self-directed learning, integrated learning, interdepartmental meetings and any other collaborative activity with the allied departments. Methods with exposure to the applied aspects of the subject relevant to basic/clinical sciences should also be used. **The suggested examples of teaching-learning methods are given below but are not limited to these.**

**A. Lectures:** Didactic lectures should be used sparingly. A maximum of 10 lectures per year in the concerned PG department is suggested. All postgraduate trainees are encouraged to attend such lectures. Lectures can cover topics such as:

1. Subject-related important topics as per Paediatric requirements

2. Recent advances
3. Research methodology and biostatistics
4. Undergraduate/Postgraduate medical curriculum
5. Teaching and assessment methodology.

Topic numbers 3, 4, 5 can be done during research methodology/biostatistics and medical education workshops in the institute.

**B. Journal club:** Minimum of once in 1- 2 weeks is suggested.

Topics will include presentation and critical appraisal of original research papers published in peer reviewed indexed journals. The presenter(s) shall be assessed by faculty and grades recorded in the logbook.

**C. Student Seminar:** Minimum of once in 1-2 weeks is suggested.

Important topics should be selected as per subject requirements and allotted for in-depth study by a postgraduate student. A teacher should be allocated for each seminar as faculty moderator to help the student prepare the topic well. It should aim at comprehensive complete evidence-based review of the topic. The student should be graded by the faculty and peers. Symposium, Colloquium and Seminars may overlap to enhance involvement and active participation of postgraduates.

**D. Student Symposium:** Minimum of once every 3 months.

A broad topic of significance should be selected, and each part shall be dealt by one postgraduate student. A teacher moderator should be allocated for each symposium and moderator should track the growth of students. The symposium should aim at an evidence-based exhaustive review of the topic. All participating postgraduates should be graded by the faculty and peers. Symposium, Colloquium and Seminars may overlap to enhance involvement and active participation of postgraduates.

**E. Bedside clinics:** Minimum - once a week.

Clinics/bedside teaching should be coordinated and guided by faculty from the department. Various methods like DOAP (Demonstrate, Observe, Assist, Perform), simulations in skill lab, and case-based discussions etc. are to be used. Faculty from the department should participate in moderating the teaching-learning sessions during clinical rounds.

**F. Interdepartmental colloquium**

Faculty and students must attend monthly meetings between the main Department and other department/s on topics of current/common interest or clinical cases. Symposium, Colloquium and Seminars may overlap to enhance involvement and active participation of postgraduates.



### **G. a. Rotational clinical / community / institutional postings**

Final decision that determines “external” postings outside the primary department will differ according to department needs, feasibility, sub-speciality availability and accessibility. Apart for mandatory postings, ‘external’ postings listed below are highly recommended (desirable) to expose postgraduates to allied Pediatric sub-specialities given existing trends in practice. Specific Learning Outcomes need to be defined for each of these postings even assessed keeping in mind the Competency based curriculum and their future professional roles as Pediatricians.

Rotations are listed below:

#### **Mandatory Postings**

- Paediatric emergency (minimum 1 month a year)
- Neonatology (NICU) (minimum 3 months a year)
- Intensive Care (PICU) (minimum 2 months a year)
- District Residency Programme with participation in Community Outreach Child Health Programs (at least 3 months over the entire course; 3<sup>rd</sup> or 4<sup>th</sup> or 5<sup>th</sup> semester; See Section G-b below).

**Desirable postings based on need, availability, accessibility, and feasibility and may be innovatively integrated into schedule of posting to optimize learning experiences.**

- Subspecialities Outpatient Clinics / observing- assisting in emergency
  - Clinical
    - Child Psychiatry
    - Pediatric Surgery
    - Developmental Pediatrics
    - Pediatric Nephrology
    - Pediatric Hemato-oncology
    - Pediatric Cardiology
    - Pediatric Gastroenterology
    - Pediatric Rheumatology/Immunology/Allergy
    - Genetic
    - Pediatric Pulmonology
    - Pediatric Dermatology
    - Pediatric Endocrinology
    - Adolescent Health

- DOTS, PPTCT, ART center with pediatric exposure
- Microbiology diagnostic Lab
- Radiology including CT/MRI
- Forensic Medicine especially Child related
- Neuro-rehabilitation (PMR, Physiotherapy, Occupational Therapy)

**G b. Posting under “District Residency Programme” (DRP):**

All postgraduate students pursuing MD/MS in broad specialities in all Medical Colleges/Institutions shall undergo a compulsory rotation of three months in District Hospitals/District Health System as a part of the course curriculum, as per the Postgraduate Medical Education (Amendment) Regulations (2020). Such rotation shall take place in the 3<sup>rd</sup> or 4<sup>th</sup> or 5<sup>th</sup> semester of the Postgraduate programme and the rotation shall be termed as “District Residency Programme” and the PG medical student undergoing training shall be termed as “District Resident”.

Every posting should have its defined learning objectives. It is recommended that the departments draw up objectives and guidelines for every posting offered in conjunction with the collaborating department/s or unit/s. This will ensure that students acquire expected competencies and are not considered as an additional helping hand for the department / unit in which they are posted. The PG student must be tagged along with those of other relevant departments for bedside case discussion/basic science exercises as needed, under the guidance of an assigned faculty.

**H. Teaching research skills**

Writing a thesis should be used for inculcating research knowledge and skills. All postgraduate students shall conduct a research project of sufficient depth to be presented to the University as a postgraduate thesis under the supervision of an eligible faculty member of the department as guide and one or more co-guides who may be from the same or other departments.

In addition to the thesis project, every postgraduate trainee shall participate in at least one additional research project that may be started or already ongoing in the department. It is preferable that this project will be in an area different from the thesis work. For instance, if a clinical research project is taken up as thesis work, the additional project may deal with community/field/laboratory work. Diversity of knowledge and skills can thereby be

reinforced. There should be periodic department review of the thesis work, as per following schedule:

- |                                 |                                |
|---------------------------------|--------------------------------|
| • End of 6 months               | Submission of protocol         |
| • During 2nd year               | Mid-term presentation          |
| • 6 months prior to examination | Final presentation; submission |

### **I. Training in teaching skills**

MEU/DOME should train PG students in education methodologies and assessment techniques. The PG students shall conduct UG classes in various courses and a faculty shall observe and provide feedback on the teaching skills of the student.

### **J. Log book**

During the training period, the postgraduate student should maintain a Log Book indicating the duration of the postings/work done in Wards, OPDs, Casualty and other areas of posting. This should indicate the procedures assisted and performed and the teaching sessions attended. The logbook entries must be done in real time. The logbook is thus a record of various activities by the student like: (1) Overall participation & performance, (2) attendance, (3) participation in sessions, (4) record of completion of pre-determined activities, and (5) acquisition of selected competencies.

- The purpose of the Log book is to:
  - a) help maintain a record of the work done during training,
  - b) enable Faculty/Consultants to have direct information about the work done and intervene, if necessary,
  - c) provide feedback and assess the progress of learning with experience gained periodically.

The Logbook should be used in the internal assessment of the student, should be checked and assessed periodically by the faculty members imparting the training. The PG students will be required to produce completed logbook in original at the time of final practical examination. It should be signed by the Head of the Department. A proficiency certificate from the Head of Department regarding the clinical competence and skillful performance of procedures by the student will be submitted by the PG student at the time of the examination.

The PG students shall be trained to reflect and record their reflections in logbook particularly of the critical incidents. Components of good teaching practices must be assessed in all academic activity conducted by the PG student and at least two sessions dedicated for assessment of teaching skills must be conducted every year of the PG program. The teaching faculty are referred to the MCI Logbook Guidelines uploaded on the Website.

**K. Course in Research Methodology:** All postgraduate students shall complete an NMC recognized course in Research Methodology within six months of the commencement of the batch and generate the online certificate on successful completion of the course.

#### **Other aspects**

- The Postgraduate trainees must participate in the teaching and training program of undergraduate students and interns attending the department.
- Trainees shall attend accredited scientific meetings (CME, symposia, and conferences) at least once a year.
- Department shall encourage e-learning activities.
- The Postgraduate trainees should undergo training in Basic Cardiac Life Support (BCLS), Neonatal Resuscitation, Advanced Pediatric Life Support and Adult Advanced Cardiac Life Support (ACLS).
- The Postgraduate trainees must undergo training in information technology and use of computers.

**During the training program, patient safety is of paramount importance; therefore, relevant clinical skills are to be learnt initially on the models, later to be performed under supervision followed by independent performance. For this purpose, provision of skills laboratories in medical colleges is mandatory.**

## ***5. ASSESSMENT***

**FORMATIVE ASSESSMENT** ie., assessment to improve learning

**Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.**

#### **General Principles**

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

The Internal Assessment should be conducted in theory and practical/clinical examination, should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

**Quarterly assessment during the MD training should be based on:**

- Case presentation, case work up,  
case handling/management : once a week
- Laboratory performance : twice a week
- Journal club : once a week
- Seminar : once a fortnight
- Case discussions : once a fortnight/month
- Interdepartmental case or seminar : once a month

**Note:** These sessions may be organized and recorded as an institutional activity for all postgraduates.

- Attendance at Scientific meetings, CME programmes (at least 02 each)

*For Knowledge Assessments, Patient case scenario presentations and discussions including interdepartmental sessions remain the cornerstone of Paediatric learning focused on critical thinking and clinical reasoning. This is also ideally achieved during teaching at the bedsides on rounds and in ambulatory settings such as outpatient clinics if not emergency. Clinical Pathologic Case discussions, Mortality-Morbidity discussions and Prescription-Medication Order Audits are of great value and are encouraged to improve quality of care as well teaching-learning preferably scheduled every month to routine educational program.*

*For Psychomotor and Affective/Communication Assessments, consider the use of OSCEs, DOPs and even mini-CEX that one may strengthen Formative Feedback/Assessments.*

**The student to be assessed periodically as per categories listed in appropriate (non-clinical/clinical) postgraduate student appraisal form (Annexure I).**

**SUMMATIVE ASSESSMENT ie., assessment at the end of training**

**Essential pre-requisites for appearing for examination include:**

1. **Log book** of work done during the training period including rotation postings, departmental presentations, and internal assessment reports should be submitted.
2. At least one if not two presentation(s) at national/state level conference. If not presented at national level, alternatively, one research paper should be published / accepted in an indexed journal. (It is suggested that the local or University Review committee assess the work sent for publication).

The summative examination would be carried out as per the Rules given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. The theory examination shall be held in advance before the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the commencement of the clinical/Practical and Oral examination.

**The postgraduate examination shall be in three parts:**

**1. Thesis**

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student in broad specialty shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

**2. Theory examination**

The examinations shall be organized based on 'Grading' or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training, as given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination. The examination for M.D./ M.S shall be held at the end of 3<sup>rd</sup> academic year.

There shall be 4 theory papers (as per PG Regulations).

**Paper I: Basic Sciences as related to the subject**

**Paper II: General Paediatrics**

**Paper III: Systemic Paediatrics**

**Paper IV: Recent Advances**

### **3. Practical/clinical and Oral/viva voce examination**

#### **Practical examination**

Practical examination should be as per concerned university regulation.

**Oral/Viva voce examination** shall be comprehensive enough to test the post graduate student's overall knowledge of the subject focusing on psychomotor and affective domain.

**The final clinical examination in broad specialty clinical subjects should include:**

- Cases pertaining to major systems (eg. one long case and three short cases)
- OSCE Stations to cover clinical, procedural and communication skills
- Logbook Records and reports of day-to-day observation during the training
- It is emphasized that Oral/viva voce examination shall be comprehensive enough to test the post graduate student's overall knowledge of the subject.

### **RECOMMENDED READING:**

#### **Books (latest edition)**

1. Nelson Textbook of Pediatrics, Ed: Kliegman RM, St. Geme J. Elsevier.
2. PG Textbook of Pediatrics, Ed: Gupta P, Menon PSN, Ramji S, Lodha R. Jaypee
3. Rudolph's Pediatrics, Ed: Kline MW, McGraw Hill.
4. Textbook of Clinical Neonatology (IAP/NNF), Ed: Pejavar RK, Thakre R. Paras.
5. Cloherty and Stark's Manual of Neonatal Care. Ed: Eichenwald EC, Hansen AR, Martin CR, Stark AR. Wolters Kluwer.
6. Principles of Pediatric & Neonatal Emergencies (IAP). Ed: Gupta P, Bagga A, Ramji S, Chugh K, Lodha R, Dewan P, Kaushik JS, Shah D. Shah. Jaypee.
7. Clinical Methods in Pediatrics. Gupta P. CBS Publisher.
8. The Harriet Lane Handbook. Hughes HK, Kahl LK, Elsevier.
9. Nutrition and Child Development. Elizabeth KE. Paras Medical Publisher.
10. Illingworth's Development of The Infant and The Young Child. Au: Illingworth RS; Elsevier Health.

11. Fenichel's Clinical Pediatric Neurology. Au: Piña-Garza JE, James KC. Elsevier.
12. Park's Pediatric Cardiology for Practitioners. Myung Park M, Salamat M. Elsevier.
13. Lanzkowsky's Manual of Pediatric Hematology and Oncology. Fish J, Lipton J, Lanzkowsky P. Elsevier.
14. Essential Paediatric Pulmonology. Lodha R, Kabra SK. Jaypee.
15. Textbook of Pediatric Rheumatology. Petty RE, Laxer R, Lindsley C, Wedderburn L, Fuhlbrigge RC, Mellins ED. Elsevier.

### **Journals**

03-05 international Journals and 02 national (all indexed) journals.

### **Online Resources**

- a. IAP <https://www.iapindia.org/><https://diapindia.org/>
- b. GOI MOHFW and IIPS. <http://rchiips.org/nfhs/>
- c. Pubmed. <https://pubmed.ncbi.nlm.nih.gov/>
- d. Google Scholar. <https://scholar.google.co.in/>
- e. Cochrane. <https://www.cochranelibrary.com/>
- f. Uptodate. <https://www.uptodate.com/login>
- g. Clinical Key. <https://www.clinicalkey.com#!/login>
- h. Medscape. <https://www.medscape.com/>
- i. JM Rey's IACAPAP e-Textbook of Child and Adolescent Mental Health.  
Rey JM, Martin A. International Association for Child and Adolescent  
Psychiatry and Allied Professions. ISBN 9780646574400 Free on  
<https://iacapap.org/english/>



Student appraisal form for MD in Pediatrics											
	Elements	Less than Satisfactory			Satisfactory			More than satisfactory			Comments
		1	2	3	4	5	6	7	8	9	
<b>1</b>	<b>Scholastic Aptitude and Learning</b>										
1.1	Has Knowledge appropriate for level of training										
1.2	Participation and contribution to learning activity (e.g., Journal Club, Seminars, CME etc)										
1.3	Conduct of research and other scholarly activity assigned (e.g. Posters, publications etc.)										
1.4	Documentation of acquisition of competence (eg Log book)										
1.5	Performance in work based assessments										
1.6	Self- directed Learning										
<b>2</b>	<b>Care of the patient</b>										
2.1	Ability to provide patient care appropriate to level of training										
2.2	Ability to work with other members of the health care team										
2.3	Ability to communicate appropriately and empathetically with patients families and care givers										
2.4	Ability to do procedures appropriate for the level of training and assigned role										
2.5	Ability to record and document work accurately and appropriate for level of										

	training										
2.6	Participation and contribution to health care quality improvement										
<b>3</b>	<b>Professional attributes</b>										
3.1	Responsibility and accountability										
3.2	Contribution to growth of learning of the team										
3.3	Conduct that is ethically appropriate and respectful at all times										
<b>4</b>	<b>Space for additional comments</b>										
<b>5</b>	<b>Disposition</b>										
	Has this assessment been discussed with the trainee?	Y es	N o								
	If not explain										
	Name and Signature of the assessee										
	Name and Signature of the assessor										
	Date										