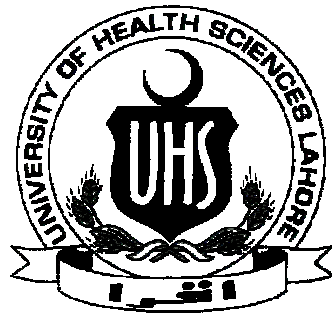


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**CURRICULUM/STATUTES & REGULATIONS  
FOR  
5 YEARS DEGREE PROGRAMME  
IN  
DEVELOPMENTAL PAEDIATRICS  
(MD DEVELOPMENTAL PAEDIATRICS)**

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**UNIVERSITY OF HEALTH SCIENCES,  
LAHORE**

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## **STATUTES**

### **1. Nomenclature Of The Proposed Course**

The name of degree programme shall be MD Developmental Paediatrics. This name is well recognized and established for the last many decades worldwide.

### **2. Course Title:**

MD Developmental Paediatrics

### **3. Training Centers**

Departments of Paediatric Medicine (accredited by UHS) in affiliated institutes of University of Health Sciences Lahore.

### **4. Duration of Course**

The duration of MD Developmental Paediatrics course shall be five (5) years (first year in Part I, first two years in Part II and next three years in Part III) with structured training in a recognized department under the guidance of an approved supervisor.

The course is structured in three parts:

**Part I** is structured for the 1<sup>st</sup> calendar year. The candidate shall undertake didactic training in Basic Medical Sciences, Behavioural Sciences and Biostatistics & Research Methodology. At the end of first year the examination shall be held in Basic Medical Sciences. The clinical training in fundamental concepts of Paediatric Medicine shall start from the 1<sup>st</sup> day of enrollment.

**Part II** is structured for the 1<sup>st</sup> and 2<sup>nd</sup> calendar years. The candidate shall undertake clinical training in fundamental concepts of Paediatric Medicine. At the end of 2<sup>nd</sup> year, the examination shall be held in fundamental concepts of Paediatric Medicine. The clinical training in Developmental Paediatrics shall start from 3<sup>rd</sup> year onwards in the recognized institutions.

**Part III** is structured for 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> calendar years in MD Developmental Paediatrics. The candidate shall undergo training to achieve educational objectives of MD Developmental Paediatrics (knowledge & skills) along with rotation in relevant fields. Over the five years duration of the course, candidate will spend total time equivalent to one calendar year for

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research during the training. Research can be done as one block in 5<sup>th</sup> year of training or it can be done in the form of regular periodic rotations over five years as long as total research time is equivalent to one calendar year.

### ***5. Admission Criteria***

- I. For admission in MD Developmental Paediatrics course, the candidate shall be required to have:
  - MBBS degree
  - Completed one year House Job
  - One year experience in Paediatrics/Internal Medicine/Allied medical discipline in the given order of preference
  - Registration with PMDC
  - Passed Entry Test conducted by the University & aptitude interview by the Institute concerned
  - Having up to the mark credentials as per UHS rules (no. of attempts in each professional, any gold medals or distinctions, relevant work experience, Rural/ Army services, research experience in a recognized institution, any research article published in a National or International Journal) may also be considered on case to case basis.
  
- II. Exemptions: A candidate holding FCPS/MRCP/Diplomate American Board /equivalent qualification in Paediatrics shall be exempted from Part-I & Part-II Examinations and shall be directly admitted to Part-III Examinations, subject to fulfillment of requirements for the examination.

### ***6. Registration and Enrollment***

- Total number of students enrolled for the course must not exceed 2 per supervisor/year.
- The maximum number of trainees that can be attached with a supervisor at a given point of time (inclusive of trainees in all years/phases of MD training), must not exceed 6.

- Beds to trainee ratio at the approved teaching site shall be at least 5 beds per trainee.
- The University will approve supervisors for MD courses.
- Candidates selected for the courses after their enrollment at the relevant institutions shall be registered with UHS as per prescribed Registration Regulations.

## ***7. Accreditation Related Issues of the Institution***

### **A. Faculty**

Properly qualified teaching staff in accordance with the requirements of Pakistan Medical and Dental Council (PMDC).

### **B. Adequate Space**

Including class-rooms (with audiovisual aids), demonstration rooms, computer lab and clinical pathology lab etc.

### **C. Library**

Departmental library should have latest editions of recommended books, reference books and latest journals (National and International).

- Accreditation of Developmental Paediatrics training program can be suspended on temporary or permanent basis by the University, if the program does not comply with requirements for residents training as laid out in this curriculum.
- Program should be presented to the University along with a plan for implementation of curriculum for training of residents.
  - Programs should have documentation of residents training activities and evaluation on monthly basis.
- To ensure a uniform and standardized quality of training and availability of the training facilities, the University reserves the right to make surprise visits of the training program for monitoring purposes and may take appropriate action if deemed necessary.

## **AIMS AND OBJECTIVES OF THE COURSE**

### **AIM**

The aim of five years MD programme in Developmental Paediatrics is to train residents to acquire the competency of a specialist in this field so that they can become good teachers, researchers and clinicians in their specialty after completion of their training.

### **GENERAL OBJECTIVES**

MD Developmental Paediatrics training should enable a resident in:

#### **1. History and Physical Examination**

The effective acquisition of a medical history and the performance of a comprehensive physical examination in paediatric patients with acute and chronic diseases necessitating hospital admission.

#### **2. Case Presentations**

Students are expected to effectively record an initial history and physical examination and follow-up notes as well as deliver comprehensive oral presentations to their team members based on these written documents.

#### **3. Test Interpretation**

Basic understanding of routine laboratory and ancillary tests, including complete blood count, chemistry panels, ECG, chest x-rays, pulmonary function tests, and body fluid cell counts. In addition, students will properly understand the necessity of incorporating sensitivity, specificity, and pre-test probability in the ordering of individual tests in the context of evaluating paediatric patients' signs and symptoms.

#### **4. Diagnostic Decision Making**

The formulation of a differential diagnosis with up-to-date scientific evidence and clinical judgment using history and physical examination data and the development of a prioritized problem list to select tests and make effective therapeutic decisions.

## **5. Therapeutic Decision Making**

This objective includes assessing the risks, benefits, and costs of varying, effective treatment options; involving the patient in decision-making via open discussion; selecting drugs from within classes; and the design of basic treatment programs and using critical pathways when appropriate.

## **6. Core General Paediatric Concepts**

The development of a basic understanding of core General Paediatric concepts.

## **7. Communication and Relationships with Patients and Colleagues**

The establishment of rapport with paediatric patients by identifying important psychosocial issues and providing patient-centered care through specific medical treatment as well as education. In addition, the development of effective communication skills demonstrating respect, compassion and integrity in working relationships with fellow students, house staff, faculty, nurses, and ancillary personnel. In each of these components, sensitivity to racial and cultural diversity should be demonstrated.

## **8. Bioethics of Patient Care**

The development of a functional understanding of informed consent, advanced directives, and the physician-patient relationship.

## **9. Self-directed Learning**

The identification of key information resources and the utilization of the medical literature to expand one's knowledge base and to search for answers to medical problems. They will keep abreast of the current literature and be able to integrate it to clinical practice.

## **10. Preventive Medicine**

The promotion of health via adult immunizations, periodic health screening, and risk factor assessment and modification.

## **11. Research and Scientific Knowledge**

Practice evidence-based learning with reference to research and scientific knowledge pertaining to their discipline.

## **SPECIFIC LEARNING OUTCOMES**

The developmental approach relies heavily on the pediatrician's knowledge of normal child development and on skills of observation and communication. It requires specific skill in integrating information drawn from three main sources: (1) observations of the child's developmental competencies and behavior with others; (2) formal examination/assessment of the child's functioning; and (3) interviews with children and families.

### **A. Knowledge of Child Development**

The content base of the developmental approach is, first and foremost, child development. It must include (1) normative, and observable landmarks of development; (2) theoretical frameworks of human development; and (3) familiarity with common disorders and indicators of risk to healthy development.

#### **1. Specific, Observable Behavioral Phenomena and Developmental Landmarks**

These make up the visible topography of child development for the resident who most often comes to his/her task without the personal experience of witnessing a child grow up. Developmental screening instruments are essential teaching tools with which to inculcate the landmarks that chart particular developmental streams.

#### **2. Theoretical/Research-Based Frameworks of Child Development**

Although in-depth study of the foundation and research based theories of child development—e.g., those of Erikson, Piaget, Gesell, Chess and Thomas, Bowlby, and others—are difficult to achieve given the time pressures of residency, a basic grasp of these frameworks is necessary to allow the trainee to sew together the observable pieces, noted above, into a larger understandable quilt.

#### **3. Clinically Important Clusters of Behaviors or Developmental Trends**

In child development, as with other subspecialty areas, pediatric residents must become familiar with a full range of symptom clusters and disorders that parents commonly describe and children of all ages display. Within each symptom cluster, pediatric residents must learn the range of risk and severity that may exist—e.g., encopresis as a simple, medically treatable problem or as a chronic and

entrenched pattern with significant psychosocial implications. Along with this, training curricula must distinguish those symptom clusters and disorders that are within the pediatrician's purview from those, which require referral and subspecialty evaluation. Faculty modeling and guidance is essential in teaching the resident to (1) describe and define the problem; (2) consider its origins, severity, and impact; (3) set reasonable goals for management; (4) determine the role of the pediatrician; and (5) consider indications for consultation with and/or referral to other professional colleagues.

## **B. Developmental Assessment**

### **1. Assessment of the Child**

Developmental pediatrics assessment inevitably requires the consideration of multiple domains of interacting influences: genetic, physiological, neurodevelopmental, temperamental, cognitive, speech/language-based, affective, social, family, community, and cultural. Thus the developmental pediatrics approach challenges the pediatrician to think broadly and flexibly and to resist the temptation to decide prematurely on a diagnostic impression— e.g., diagnosing “attention-deficit hyperactivity disorder” (ADHD) without knowledge of a child's school and learning performance.

### **2. Assessment of the Child in the Family**

No child assessment is adequate without knowledge of the child's family and the child in the family. In ongoing health supervision, a holistic understanding of the child's family and the role the child plays in the family permits individualized counseling of anticipatory guidance issues (e.g., feeding, sleep, discipline). Many general aspects of a child/family assessment can be ascertained through an interview.

## **C. Treatment and Management in Developmental Pediatrics**

Counseling is the central treatment methodology in developmental pediatrics. In a real sense, pediatricians offer themselves in attempting to understand and to guide children and families. Pediatric counseling may be thought of as primarily educational or as primarily facilitative.



Curriculum/Statutes & Regulations -MD Developmental Paediatrics  
**REGULATIONS**

**1. Scheme of the Course**

A summary of five years course in MD Development Paediatrics is presented as under:

Course Structure	Components	Examination
<b>Part I</b>	<ul style="list-style-type: none"> <li>• <b>Basic Medical Sciences</b> Anatomy, Physiology, Biochemistry, Pathology, Pharmacology, Behavioural Sciences and Biostatistics &amp; Research Methodology.</li> </ul>	Part-I examination at the end of 1 <sup>st</sup> year of MD Developmental Paediatrics programme. <ul style="list-style-type: none"> <li>• <b>Written:</b> Paper I: MCQs Paper II: SEQs</li> </ul>
	<ul style="list-style-type: none"> <li>• <b>General Paediatrics Training:</b> General Paediatrics training for first two year starting from first day of enrollment in MD programme.</li> </ul>	Part-II examination at the end of 2 <sup>nd</sup> year of MD Developmental Paediatrics programme. <ul style="list-style-type: none"> <li>• <b>Written:</b> Papers 1 &amp; 2: Problem-based questions in General Paediatrics</li> <li>• <b>Oral &amp; Practical/ Clinical Examination</b> <ul style="list-style-type: none"> <li>• OSCE</li> <li>• Clinical Examination (Long case, Short cases)</li> </ul> </li> <li>• <b>Log Book</b></li> </ul>
<b>Part III</b>	<p style="text-align: center;"><b><u>Clinical component of Part III</u></b></p> <ul style="list-style-type: none"> <li>• <b>Professional Education in Developmental Paediatrics:</b> Training in Developmental Paediatrics during 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> year of MD programme</li> <li>• Three years of training with optional rotations in related fields (up to 6 months)</li> </ul> <p style="text-align: center;"><b><u>Research component of Part III</u></b></p> <ul style="list-style-type: none"> <li>• <b>Research &amp; Thesis Writing:</b> Research work / Thesis writing project must be completed and thesis be submitted before the end of training.</li> </ul>	Part-III clinical examination in specialized components of Developmental Paediatrics at the end of 5 <sup>th</sup> year of MD Developmental Paediatrics programme <ul style="list-style-type: none"> <li>• <b>Written:</b> Papers 1 &amp; 2: Problem-based questions in the subject</li> <li>• <b>Oral &amp; Practical / Clinical Examination</b> <ul style="list-style-type: none"> <li>• OSCE</li> <li>• Clinical Examination (Long case, Short cases )</li> </ul> </li> <li>• <b>Log Book</b></li> </ul> Part-III Thesis examination at the end of fifth (5th) year of MD Developmental Paediatrics programme.

**Part-I Examination**

1. All candidates admitted in MD Developmental Paediatrics course shall appear in Part-I examination at the end of 1<sup>st</sup> calendar year.
2. The examination shall be held on biannual basis.
3. The candidate who fails to pass the examination in 3 consecutive attempts availed or un-availed, shall be dropped from the course.
4. The examination shall have two components:

Paper-I MCQs (single best)	100 Marks
Paper-II SEQs	100 Marks
5. Subjects to be examined shall be Basic Sciences relevant to Developmental Paediatrics (Anatomy, Physiology, Biochemistry, Pathology, Pharmacology), Behavioural Sciences and Biostatistics & Research Methodology.
6. To be eligible to appear in Part-I examination the candidate must submit;
  - i. duly filled, prescribed Admission Form to the Controller of Examinations duly recommended by the Principal/Head of the Institution in which he/she is enrolled;
  - ii. a certificate by the Principal/Head of the Institution, that the candidate has attended at least 75% of the lectures, seminars, practical/clinical demonstrations;
  - iii. Examination fee as prescribed by the University
7. To be declared successful in Part-I examination the candidate must secure 60% marks in each paper.

## Part-II Examination

1. All candidates admitted in MD Developmental Paediatrics course courses shall appear in Part-II examination at the end of 2<sup>nd</sup> calendar year, and having passed the Part-I examination.
2. The examination shall be held on biannual basis.
3. The candidate who fails to pass the examination within 3 years of passing the Part-I examination shall be dropped from the course.
4. The examination shall have the following components:
  - a. Written 200 Marks
  - b. OSCE 50 Marks
  - c. Clinical examination 100 Marks
  - d. Log Book Evaluation 80 Marks (40 marks per year)
5. There shall be two written papers of 100 marks each  
Papers 1 & 2: Principles of General Paediatrics
6. The types of questions shall be of Short/Modified essay type and MCQs (single best).
7. Oral & practical/clinical examination shall be held in clinical techniques in General Paediatrics.
8. To be declared successful in Part-II examination the candidate must secure 60% marks in each component and 50% in each sub-component.
9. Only those candidates, who pass in theory papers, will be eligible to appear in the Oral & Practical/clinical Examination.
10. The candidates, who have passed written examination but failed in oral & practical/ clinical examination, will re-appear only in oral & practical/clinical examination.
11. The maximum number of attempts to re-appear in oral & practical /clinical Examination alone shall be three, after which the candidate shall have to appear in both written and oral & practical/clinical examinations as a whole.
12. To be eligible to appear in Part-II examination the candidate must submit;

- i. duly filled, prescribed Admission Form to the Controller of Examinations duly recommended by the Principal/Head of the Institution in which he/she is enrolled;
- ii. a certificate by the Principal/Head of the Institution, that the candidate has attended at least 75% of the lectures, seminars, practical/clinical demonstrations;
- iii. a certificate of having passed the Part-I examination;
- iv. Examination fee as prescribed by the University.

### Part-III Examination

1. All candidates admitted in MD Developmental Paediatrics course shall appear in Part-III (clinical) examination at the end of structured training programme (end of 5th calendar year), and having passed part I & II examinations. However, a candidate holding FCPS / MRCP / Diplomate American Board/equivalent qualification in Paediatrics shall be exempted from Part-I & Part-II Examinations and shall be directly admitted to Part-III Examinations, subject to fulfillment of requirements for the examination.
2. The examination shall be held on biannual basis.
3. To be eligible to appear in Part-III examination the candidate must submit;
  - i. duly filled, prescribed Admission Form to the Controller of Examinations duly recommended by the Principal/Head of the Institution in which he/she is enrolled;
  - ii. a certificate by the Principal/Head of the Institution, that the candidate has attended at least 75% of the lectures, seminars, practical/clinical demonstrations;
  - iii. Original Log Book complete in all respect and duly signed by the Supervisor (for Oral & practical/clinical Examination);
  - iv. certificates of having passed the Part-I & part-II examinations;
  - v. Examination fee as prescribed by the University.
4. The Part-III clinical examination shall have the following components:
 

▪ Written	300 marks
▪ Oral & practical/clinical examination	300 marks
▪ Log Book Evaluation	120 marks (40 marks per year)
5. There shall be two written papers of 150 marks each.
6. Both papers shall have problem- based Short/Modified essay questions and MCQs.
7. Oral & practical/clinical examination shall have 300 marks for:
 

i. 1 Long Case	100
ii. 4 Short Cases	100 (25 marks each)
iii. OSCE	100

8. To be declared successful in Part-III examination the candidate must secure 60% marks in each component and 50% in each sub-component.
9. Only those candidates, who pass in theory papers, will be eligible to appear in the Oral & Practical/ Clinical Examination.
10. The candidates, who have passed written examination but failed in Oral & Practical/ Clinical Examination, will re-appear only in Oral & Practical/Clinical examination.
11. The maximum number of attempts to re-appear in oral & practical /clinical Examination alone shall be three, after which the candidate shall have to appear in both written and oral & practical/clinical examinations as a whole.
12. The candidate with 80% or above marks shall be deemed to have passed with distinction.
13. *Log Book/Assignments:* Through out the length of the course, the performance of the candidate shall be recorded on the Log Book.
14. The Supervisor shall certify every year that the Log Book is being maintained and signed regularly.
15. The Log Book will be developed & approved by the Advanced Studies & Research Board.
16. The evaluation will be maintained by the Supervisor (in consultation with the Co- Supervisor, if appointed).
17. The performance of the candidate shall be evaluated on annual basis, e.g., 40 marks for each year in five years MD Developmental Paediatrics course. The total marks for Log Book shall be 200. The log book shall reflect the performance of the candidate on following parameters:
  - Year wise record of the competence of skills.
  - Year wise record of the assignments.
  - Year wise record of the evaluation regarding attitude & behaviour.
  - Year wise record of journal club / lectures / presentations / clinico-pathologic conferences attended & / or made by the candidate.

### **3. Submission / Evaluation of Synopsis**

1. The candidates shall prepare their synopsis as per guidelines provided by the Advanced Studies & Research Board, available on UHS website.
2. The research topic in clinical subject should have 30% component related to basic sciences and 70% component related to applied clinical sciences. The research topic must consist of a reasonable sample size and sufficient numbers of variables to give training to the candidate to conduct research, to collect & analyze the data.
3. Synopsis of research project shall be submitted by the end of the 3<sup>rd</sup> year of MD program. The synopsis after review by an Institutional Review Committee shall be submitted to the University for consideration by the Advanced Studies & Research Board, through the Principal / Dean /Head of the institution.

### **4. Submission of Thesis**

1. Thesis shall be submitted by the candidate duly recommended by the Supervisor.
2. The minimum duration between approval of synopsis and submission of thesis shall be one year, but the thesis can not be submitted later than 8 years of enrolment.
3. The research thesis must be compiled and bound in accordance with the Thesis Format Guidelines approved by the University and available on website.
4. The research thesis will be submitted along with the fee prescribed by the University.

### **5. Thesis Examination**

1. All candidates admitted in MD courses shall appear in Part-III thesis examination at the end of 5<sup>th</sup> year of their training course.
2. Only those candidates shall be eligible for thesis evaluation who have passed Part I, II & III (clinical) Examinations.

3. The examination shall include thesis evaluation with defense.
4. The Vice Chancellor shall appoint three external examiners for thesis evaluation, preferably from other universities and from abroad, out of the panel of examiners approved by the Advanced Studies & Research Board. The examiners shall be appointed from respective specialty. Specialists from Internal Medicine and related fields may also be appointed/co-opted, where deemed necessary.
5. The thesis shall be sent to the external examiners for evaluation, well in time before the date of defense examination and should be approved by all the examiners.
6. After the approval of thesis by the evaluators, the thesis defense examination shall be held within the University on such date as may be notified by the Controller of Examinations. The Controller of Examinations shall make appropriate arrangements for the conduct of thesis defense examination in consultation with the supervisor, who will co-ordinate the defense examination.
7. The thesis defense examination shall be conducted by two External Examiners who shall submit a report on the suitability of the candidate for the award of degree. The supervisor shall act as coordinator.

#### ***6. Award of MD Developmental Paediatrics Degree***

After successful completion of the structured courses of MD Developmental Paediatrics and qualifying Part-I, Part-II and Part-III examinations, the degree with title MD Developmental Paediatrics shall be awarded.



## **COURSE OUTLINE**

### **Part I MD Developmental Paediatrics**

#### **1. Anatomy**

##### **General Organization of the Body**

1. Anatomical nomenclature
2. Terms of position
3. Divisions of the body according to the regions and organ systems
4. Detailed Anatomy of the Nervous system, Head, Neck and Thorax., their blood supply, nerve supply, lymphatic drainage and important gross relations to other organs.
5. Developmental Anatomy and associated common congenital abnormalities

##### **General Features of Human Development**

1. Features of mitotic and meiotic modes of cell division. Genetic consequences of meiotic division.
2. Abnormal mitotic and meiotic divisions of clinical importance.
3. Gametogenesis: origin of germ cells.
4. Oogenesis: prenatal and postnatal development of ova.
5. Spermatogenesis: proliferation and maturation of male germ cells. Abnormal gametes, their clinical significance.
6. Ovulation, fertilization and the consequences of fertilization.

##### **Period of the Growing Fetus:**

Various stages and salient features of the fetus development

##### **Extraembryonic Membranes:**

Development, functions and anomalies of yolk sac, amnion, chorion, allantois, umbilical cord and placenta.

##### **Development of the External Body Form:**

Shaping of the head, neck, trunk and limbs. Common developmental anomalies associated with this.

##### **The Branchial Apparatus:**

Development and fate of the bronchial grooves, arches and pouches. Their derivatives and anomalies.

##### **Teratogenesis:**

Factors known to be involved in the development of congenital anomalies. Concept of critical periods.

## **The Muscular Tissue**

1. Structural and functional differences between the smooth, skeletal and cardiac types of muscle.
2. Fine structure of skeletal and cardiac muscle fibers, and its relationship to the mechanism of contraction.
3. Specialized conducting tissue of the heart.

## **The Neural Tissue**

1. The neuron, morphology of the perikaryon and its processes.
2. Coverings of the axons in the peripheral nerves and the central nervous system.
3. Types of neuroglia and their functions.
4. Process of myelination in the peripheral nerves and the central nervous system.
5. Axon terminals and synapses. Nerve fiber degeneration and regeneration.

## **The Nervous System**

Development of the nervous system and common developmental anomalies.

## **The Brain**

1. Subdivisions of the brain.
2. External morphology of cerebellum, lobes, surface, sulci and gyri. External morphology of cerebellum and its subdivisions.
3. External morphology of midbrain, pons and medulla.
4. Different grey matter masses in the brain.
5. Ventricular system of the brain.
6. Circulation of cerebrospinal fluid and its composition.
7. Blood supply of the brain. Parts of the cranial dura, formation and drainage of dural sinuses.
8. Appearance of CT and MRI scans and identification of structures.
9. Cerebrum as seen in horizontal sections.

## **Cerebral Cortex**

1. Gross and microscopic organization of the cortex, location of motor and sensory cortical areas.
2. Functions and blood supply of various regions. White matter of the cerebrum, definition of association, commissural and projection fibers and their role in cortical functioning. Internal capsule, location, fibre content and blood supply.

## **Limbic System**

1. Core structures of the limbic system.
2. Other nuclei and pathways associated with the limbic system.
3. Functions of thalamus, hypothalamus and the limbic system.

## **Basal Ganglia**

Subdivisions, connections, functions and effects of lesions.

## **Thalamus**

Nuclear groups, afferent and efferent connections and their functional correlations.

## **Hypothalamus**

1. The nuclei, afferent and efferent connections and their functional correlations.
2. Effects of lesions.

## **Internal Structure of Cerebellum**

1. Cerebellar cortex: organization and functions.
2. Cerebellar nuclei: main connections.
3. Cerebellar peduncles, cerebellar afferent and efferent connections, functional correlations.
4. Effects of lesions.

## **Spinal Cord**

1. External morphology, meninges and blood supply of the spinal cord. Relationship of the "segments" to vertebrae at different ages.
2. Internal structure of the spinal cord, organization of the grey and white matter.
3. Variations in the structure of the grey matter at different levels and location of the important nuclei.
4. Location of ascending and descending tracts, and their functions.
5. Effects of injury or disease.

## **Peripheral Nervous System**

1. Anatomy and functions of cranial nerves with their intracranial and extracranial course and distribution.
2. Location of various cranial nerve nuclei.
3. Anatomy and functions of spinal nerves.
4. Foundation, course and distribution of a typical nerve.
5. Effects of lesions.

## **Organs of Special Senses**

1. Development of special sense organs and common developmental anomalies of the eye, ear and nose.
2. Basic mechanisms of olfaction, taste, vision and hearing.
3. The paranasal sinuses, their location and general morphology.

**Olfaction:**

1. Olfactory pathway and its termination.
2. Characters of smell and its significance.

**The Eye / Orbit**

1. Structure and function of eyelids.
2. Conjunctival sac, lacrimal gland and lacrimal apparatus, structure and functions.
3. Orbicularis oculi muscle, attachments, nerve supply and functions.

**Eyeball**

1. Formation, circulation and functions of aqueous humour, sinus venous sclerae (canal of Schlemm), filtration angle.
2. Blood supply of retina.
3. The visual pathway and effect of lesions at different levels.
4. Pupillary light reflex and its pathway.
5. Accommodation, its mechanism and pathway.
6. Colour vision and colour blindness.
7. Photopic, scotopic and binocular vision.
8. Field of vision and stereoscopic vision.

**The Ear**

**External ear:**

1. Skeleton, general morphology of the auricle and the external acoustic meatus.
2. Nerve supply of the external ear.
3. Tympanic membrane, size, shape, structure and nerve supply.

**Middle ear (tympanic cavity):**

Shape, size boundaries and contents.

**Internal ear:**

1. Location of special sensory areas and nerve supply.
2. Mechanism of hearing, auditory receptors and auditory pathway.
3. Functions of the Vestibular apparatus.

**Organ of Taste**

1. Structure of taste buds and location.
2. Gustatory receptors, gustatory pathway and its termination.

**Gastrointestinal System**

1. Development of the gastrointestinal tract and common developmental anomalies e.g. oesophageal fistulae, Meckel's diverticulum, atresias.
2. Rectal and associated urinary bladder anomalies related to partitioning of the cloaca.
3. Rotation of gut, physiological herniation and its withdrawal and related anomalies.

4. Development and partitioning of the coelomic cavity and formation of the diaphragm.

### **Cardiovascular System**

1. Development of the heart and vascular system and common developmental anomalies such as septal defects, patent ductus arteriosus, Fallot's tetralogy and coarctation of aorta.
2. Blood supply of heart.
3. Structure and functions of the arteries, arterioles, capillaries and veins.

### **Urinary System**

1. Development of the urinary system and common developmental anomalies.
2. Morphology, including microscopic structure of the nephron.

### **Respiratory System**

1. Development of the respiratory system and common developmental anomalies.
2. Physiological anatomy and structure of the respiratory system.

### **Endocrine and Reproductive System**

Development and common developmental anomalies of the pituitary, thyroid, parathyroid, adrenal glands, testis, uterine tubes, ovary, uterus etc.

### **Musculoskeletal System**

Functions of the skeletal system.

#### **Joints**

1. Classification of joints
2. Factors contributing to the stability of joints.
3. Movements of the joints of shoulder, elbow, hip, knee and ankle.
4. Movements of the shoulder girdle as a whole, supination and pronation of forearm, inversion and aversion of foot and movements of fingers and thumb.
5. Maintenance of normal posture

#### **Muscles and Fasciae**

1. Muscles of the human body
2. General disposition, nerve supply and effects of nerve lesions
3. Muscle attachments, group actions and nerve supply.

## 2. Physiology

Cellular organization, structure function correlations and physiological alterations in the endocrine organ systems of body

### **Structural and Functional Organization of the Cells of Body**

- Concept of cells as the structural, functional and genetic units of the body.
- Cell components with their role in cell function.
- Diversity of cell morphology as related to the varied functional demands. Physical activities of the living cells, intracellular movements, cellular locomotion, endocytosis and exocytosis.
- Basic concepts of the principles of transport through cell membrane, membrane potential and action potential.
- DNA and RNA structure and protein synthesis.

### **Blood:**

- Structure, production, functions and fate of red blood cells, white blood cells and platelets.
- Disorders of blood.
- Blood groups (ABO, Rh and other systems), blood transfusion and exchange transfusion.
- Precautions and hazards of blood transfusion.
- Plasma proteins, their production and functions.
- Diagnosis of various types of anaemias and leukaemias
- Values of various components of blood in different age groups e.g. haemoglobin, WBCs, hormones etc.
- Interpretation of complete blood picture, haematological changes in infectious and non infectious paediatric diseases

### **Cardiovascular System:**

- Mechanism of production of heart sounds, their location, characters and relationship with the cardiac cycle.
- The normal electrocardiogram and characters of its various components. Significance of its parts, voltage and calibration, principles and methods of recording, electrocardiographic leads and general information obtained from ECG.
- Physiology and abnormalities of apex beat.
- Echocardiography, exercise tolerance test and the basis of ETT.
- Patho-physiology of cardiac failure, valvular heart disease and hypertension. Interpretation of data of diagnostic tests.
- Arterial blood pressure, measurement and regulation.
- Vasomotor system and control of blood vessels.
- Characters of arterial pulse and venous pulse.
- Significance of central venous pressure.
- Mechanism of haemorrhage and shock.
- Circulation through special organs: coronary circulation, cerebral circulation and pulmonary circulation.

**Respiration:**

- Pulmonary ventilation
- Mechanics of respiration, pulmonary volumes, capacities and pressures.
- Transport and exchange of oxygen and carbon dioxide.
- Regulation of respiration. (chemical and neural)
- Physiology of respiratory insufficiencies, hypoxia, dyspnoea, asphyxia and hypercapnia
- Exercise hypoxia and cyanosis
- Physiological changes due to altitude and space travel
- Principles and methods of artificial respiration.
- Principles of pulmonary function tests.
- Interpretation of data of diagnostic tests.
- Cardiopulmonary resuscitation.
- Patho-physiology of respiratory failure.

**Fluid Balance:**

- Basic requirements of fluid and electrolytes at different ages
- Mechanisms of homeostasis
- Influence of disease states
  - renal
  - cardiac
  - gastrointestinal
  - trauma
- Mechanisms of homeostasis
- Abnormalities encountered in disease

**Acid-Base Balance:**

- Basic requirements of fluid and electrolytes at different ages
- Mechanisms of homeostasis
- Influence of disease states

**Renal function:**

- Renal circulation
- Glomerular filtration
- Tubular function
- Water excretion
- Acidification of urine
- Regulation of Na + and K + excretion
- Regulation of extracellular fluid composition and volume
- Homeostatic mechanisms to maintain
  - Tonicity
  - Volume
  - H<sup>+</sup> concentration of extracellular fluid.

**Endocrinology:**

- General concepts of chemical nature, mechanism, site of action and functions of hormones of the hypothalamus, pituitary, thyroid, adrenal, parathyroid, pancreas, and pineal glands, ovaries and testis.
- Comprehensive knowledge of all hormones including their chemistry,

biosynthesis, storage, release, transport, mechanism of inactivation mode and site of action, distribution, physiological and pathological activities and assessment of functions.

Calcium homeostasis

- Effects of hypo-and hyperactivity of the endocrine glands.
- Production and functions of hormones related to the sex characters in the male and female child.
- Endocrine function of the kidney, heart, lung and gastrointestinal tract

#### **Gastrointestinal function:**

- Digestion and absorption
- Regulation of gastrointestinal function
- Motility: mastication, swallowing, gastric motility, intestinal motility and gall bladder motility.
- Circulation of bile. Principles and assessment of liver function tests. Interpretation of data, diagnostic tests.
- Hyperbilirubinaemia and congenital hyperbilirubinaemias.

#### **Central Nervous System**

- Motor cortex corticospinal and corticobulbar system.
- Basal ganglia
- Cerebellum

Autonomic Nervous System

- Overall functions of sympathetic and parasympathetic nervous systems. Autonomic reflex activity.

Functional Aspects Of The Nervous System

- Sensory activity: Peripheral sensory receptors, sensory pathways, physiology of pain and disorders of sensations.
- Motor activity: corticospinal and extra-corticospinal pathways, cerebellum and Vestibular system.
- Motor neurons, motor units and neuromuscular junction.
- Disorders of motor activity.

Muscle and nerve physiology.

- Reflex activity: Monosynaptic stretch reflexes, polysynaptic withdrawal reflexes, general characters of reflexes.
- Electroencephalogram and its uses.
- Sleep, types, physiological changes during sleep.
- Speech mechanism and its disorders.
- Cerebrospinal fluid, cerebral circulation, metabolism and functions.
- Blood brain and blood CSF barriers.

### **3. Biochemistry**

#### **Vitamins**

- Daily requirements, effects of deficiency and hypervitaminosis.
- Salient morphologic features of diseases related to deficiency or excess of vitamins.



### **Minerals**

- Sources of calcium, phosphorous, iron, iodine, fluorine, magnesium and manganese.
- Trace elements and their clinical importance.
- Absorption and factors required for it.
- Functions and fate.

### **Metabolism**

- Metabolic rate and basal metabolic rate
- Factors influencing metabolic rate, principles of measurement.

### **Carbohydrates**

- Digestion, absorption and utilization of dietary carbohydrates. Glucose tolerance test.
- Glycogenesis, glycolysis, gluconeogenesis, glycogenolysis, processes with the steps involved and effects of hormones.

### **Lipids**

- Digestion, absorption, utilization and control.
- Fatty acid oxidation with steps involved.
- Ketogenesis and its significance.
- Lipotropic factors and their actions. Lipoproteins, types and importance.

### **Proteins and Amino Acids**

- Digestion, absorption, utilization and control.
- Fate of amino acids.
- Urea formation with steps involved.
- Functions and effects of deficiency.

### **Pigment Metabolism**

- Disorders of pigment metabolism, inherited disorders, acquired disorders from deficiency or excess of vitamins, minerals, fats, carbohydrates, proteins etc.

### **Balanced Diet**

- Nutritional requirements at different ages
- Requisites of an adequate diet.
- Role of carbohydrates, fats, proteins, minerals, vitamins and water in diet.
- Principles of nutrition as applied to medical problems

## **4. Pharmacology**

- Mechanisms of Drug Action
- Pharmacokinetics
- Pharmacokinetic Process
  - Absorption
  - Distribution
  - Metabolism
  - Desired Plasma Concentration

- Volume of Distribution
- Elimination
- Elimination rate constant and half life
- Creatinine Clearance
- Drug Effect
  - Beneficial Responses
  - Harmful Responses
  - Allergic Responses
- Drug Dependence, Addiction, Abuse and Tolerance
- Drug Interactions
- Basic concepts of pharmacokinetics and dynamics of drugs prescription in pregnancy and in children
- Autonomic Pharmacology

## 5. Pathology

Pathological alterations at cellular and structural level along with brief introduction of Basic Microbiology and Haematological pathology as related to medicine

### Inflammation

#### Acute inflammation

- Cellular components and chemical mediators of acute inflammation
- Exudates and transudate
- Sequelae of acute inflammation

#### Chronic inflammation

- Etiological factors and pathogenesis
- Distinction between acute and chronic (duration) inflammation
- Histologic hallmarks
- Types of chronic inflammation, non-granulomatous and granulomatous, and their causes

### Haemodynamic disorders

- Etiology, pathogenesis, classification and morphological and clinical manifestations of Edema, Haemorrhage, Thrombosis, Embolism, Infarction & Hyperaemia
- Shock; classification etiology, and pathogenesis, manifestations.
- Compensatory mechanisms involved in shock
- Pathogenesis and possible consequences of thrombosis
- Difference between arterial and venous emboli

### Immunity and Hypersensitivity

- Immunity
- Immune response

- Protective immunity to microbial diseases
- Immunological tolerance, autoimmunity and autoimmune diseases.
- Hypersensitivity
- Immunodeficiency disorders
- Immunoprophylaxis & Immunotherapy

## **Haematology**

- Normal paediatric blood picture & variations in diseases

## **Microbiology**

- A brief account of the classification of microorganisms.
- Role of Microbes In Various Paediatric Diseases
- Infection source

### **Bacterial Growth and Death**

- Names, habitat, modes of transmission/infection, pathogenic mechanism and pathological changes produced by bacteria, commonly causing paediatric diseases in Pakistan
- Gram staining and AFB staining, Culture of blood and fluid; details regarding methodology in collection, transportation and preservation.

### **Fungal Diseases**

- Names, general morphological features, and paediatric diseases produced by fungi commonly found in Pakistan, including dermatophytes, maduromycosis and opportunistic infections.

### **Important Parasites;**

- Names and modes of infection of parasitic paediatric diseases commonly found in Pakistan including amoebiasis, malaria, leishmaniasis, ascariasis, cestodiasis, ankylostomiasis, giardiasis, hydatid disease and guinea worm disease.
- Important viruses
- Sterilization and disinfection
- Immunization
- Nosocomial infections
- Use of investigation and procedures in laboratory
- Sputum, urine, stool, cerebrospinal fluid (CSF), pus, aspirates etc.

## **6. Biostatistics & Research Methodology**

1. Introduction to bio-statistics
2. Introduction to bio- medical research
3. Why research is important?
4. What research to do?
  - i. Selecting a field for research
  - ii. Drivers for health research
  - iii. Participation in national and international research

- iv. Participation in pharmaceutical company research
- v. Where do research ideas come from
- vi. Criteria for a good research topic
5. Ethics in health research
6. Writing a scientific paper
7. Making a scientific presentation
8. Searching the literature

## **7. Behavioural Sciences**

- Bio-psycho-social (BPS) model of health care
- Use of non-medicinal interventions in clinical practice
  - Communication skills
  - Counseling
  - Informational skills
- Crisis intervention/disaster management
- Conflict resolution
- Breaking bad news
- Medical ethics, professionalism and doctor-patient relationship
  - Hippocratic oath
  - Four pillars of medical ethics (autonomy, beneficence, non-maleficence and justice)
  - Informed consent and confidentiality
  - Ethical dilemmas in a doctor's life
- Delivery of culturally relevant care and cultural sensitivity
- Psychological aspects of health and disease
  - Psychological aspect of health
  - Psychological aspect of disease
  - Stress and its management
  - Psychological aspect of pain
  - Psychological aspect of aging

## **Part-II MD Developmental Paediatrics**

### **Organ and System Competencies in:**

Definition, epidemiology, etiopathogenesis, presentation, complications, differential diagnosis and treatment of the following organ system disorders.

### **1. General, Community, Preventive & Social Pediatrics And Nutrition**

- Orientation/state of child health
- Primary Health Care
- Community Diagnosis (Types & Questionnaire Development)
- Role of Environment & Social Factors in Child Health
- Safe Motherhood
- Immunization (EPI & Surveillance)
- Malnutrition (Assessment & Rehabilitation)
- Nutritional Surveillance
- Role of Vitamin A in Child Health
- Role of Zinc in MCH
- Baby Friendly Hospital
- Save the Newborn Initiative
- Breast Feeding & Lactation Management
- Infant Nutrition
- Communicable Diseases in Paediatrics
- Maternal & Neonatal Tetanus
- Polio Eradication
- Millennium Development Goals
- HIV/AIDS & Child Health
- Child Labor
- National health programs related to child health
- National health nutrition programs
- Prevention of blindness
- School health programs\
- National policy on children, adolescence, adoption, child labor, juvenile delinquency etc.
- Government and non-government support services for children
- Investigation of adverse events following immunization in the community
- General principles of prevention and control of infections including food borne, waterborne, soil borne and vector borne diseases
- Investigation of an outbreak in a community

## 2. Neonatology

- Scope of Neonatology (definitions, neonatal, perinatal periods, live birth, still birth, abortion, legal viability, infant mortality, neonatal and perinatal mortality, morbidity, long term handicaps).
- Organization of neonatal services, primary, secondary and tertiary level care, system of referral.
- Reviewing role of obstetricians, LHV's, TBA's, Nurses, concept of coordinated team work during perinatal period.
- Obstetric history and birth history including antenatal, natal and postnatal periods, maternal illnesses in relation to neonatal problems.
- Routine history, examination of newborn (wt. Length, head circumference, normal newborn examination, congenital anomalies, birth injuries, detailed examination along with checklist, neonatal reflexes).
- Detailed categorization of newborns (term, pre-term, post-term, gestational assessment, AGA, SGA, LGA, IUGR), scoring system, IU growth charts).
- Neonatal Hypothermia (pathophysiology, prevention and management techniques).
- Organization of neonatal unit including neonatal equipment, appropriate adaptation at village, tehsil and district level).
- Feeding of newborns (breast feeding, formula feeding, techniques, types of formulas, lactation failure, parenteral nutrition).
- Birth anomalies (skeletal, visceral, systemic), associations, syndromes).
- Neonatal infections [septicemia, early onset, late onset, congenital TORCH, nosocomial patterns, prevention, investigations, treatment, sequelae, neonatal meningitis, localized infections (umbilicus, eye, skin, diarrhea)
- Neonatal Jaundice-etiology, type, diagnosis, management, prognosis.
- Respiratory distress - common causes, manifestations, management, referral.
- Cyanosis in newborn, recognition, differential diagnosis management, referral.
- Seizures in the newborn, types, etiology, management, outcome, neonatal tetanus.
- Metabolic problems: hypoglycemia, hypocalcemia, other metabolic derangements, management.
- Anemia in the newborn, causes, management
- Hemorrhagic disease of newborn, other bleeding disorders
- Neonatal surgical diseases (necrotizing enterocolitis, gut obstruction, esophageal atresia & TE fistula, diaphragmatic hernia, imperforate anus).

### **3. Infectious Diseases**

- Malaria
- Enteric Fever
- EPI Diseases (Polio, AFP, pertussis, diphtheria, tetanus, hepatitis)
- Child with Rash
- Worm Infestations
- PUO
- Tuberculosis
- Shigellosis
- Cholera
- Chicken Pox
- Mumps
- Antibiotic therapy

### **4. Hematology & Oncology**

- Clinical Approach to Anemia
- Iron deficiency anemia
- Thalassemia
- G6PD deficiency / hemolytic anemias
- Aplastic anemia
- Thrombocytopenic purpura
- Clinical approach to bleeding child
- Hemophilia & Von-Wiilebrand Disease
- Acute lymphoblastic leukemia
- Lymphoma / Hodgkin's Lymphoma
- Wilm's Tumor / Neuroblastoma

### **5. Respiratory Diseases**

- Pneumonia
- Bronchiolitis
- Bronchial Asthma
- Pleural Effusion / Empyema
- Pulmonary Tuberculosis
- Pneumothorax
- Croup
- Foreign body inhalation
- Otitis media

### **6. Gastroenterology & Hepatology**

- Hepatitis A,B, C, D, E.
- Hepatic Encephalopathy
- Clinical approach to bleeding from upper/ lower GIT
- Acute Diarrhea & complications
- Chronic / persistent Diarrhea

- Malabsorption/Celiac Disease
- Recurrent abdominal pain
- Wilson's Disease
- Constipation
- Gastroesophageal reflux
- Acid peptic disease

## **7. Nephrology**

- Urinary Tract Infection
- Hematuria / Proteinuria: Clinical approach
- Acute Glomerulonephritis
- Posterior urethral valves
- Obstructive Uropathy
- Urolithiasis

## **8. Cardiovascular Diseases**

- Heart Failure
- Cyanotic Congenital Heart Disease (TOF)
- Acyanotic congenital heart diseases (VSD, PDA, ASD)
- Rheumatic Fever
- Hypertension
- Viral myocarditis

## **9. Endocrine Diseases**

- Short Stature
- Hypothyroidism
- Congenital Adrenal Hyperplasia
- Ambiguous Genitalia
- Diabetes Mellitus
- Hypoparathyroidism
- Addison's Disease
- Obesity & Cushing Syndrome

## **10. Rheumatic & Orthopedic Diseases**

- Limping Child
- Juvenile Rheumatoid Arthritis
- Systemic Lupus Erythromatosis
- Henoch Schonlein Purpura

## **11. Toxicology**

- General Principles of Management
- Kerosene oil poisoning
- Snake bite
- Insecticide poisoning



- Corrosive poisoning
- Opioid poisoning

## **12. Child Abuse**

- Child Rights
- Child Abuse
- Child Labor

## **13. Pediatric Surgery**

- Cleft Palate/Lip
- Acute Abdomen (appendicitis, intestinal obstruction, atresia, malrotation)
- Esophageal atresia & TE fistula
- Hirschprung Disease
- Inguinal hernia/hydrocele
- Undescended testis
- Club Foot
- Imperforate anus
- Congenital hypertrophic pyloric stenosis
- Diaphragmatic hernia
- Rectal polyp, prolapse, anal fissure
- Congenital dislocation of hips
- Circumcision

## **14. Dermatology**

- Common skin infections (scabies, impetigo)
- Eczema (including Atopic)
- Common fungal infections

## **15. Miscellaneous**

- Immunodeficiency
- Anaphylaxis & Allergies

## **16. Paediatric Emergency and Critical Care**

- Shock
- Cardio-respiratory arrest
- Respiratory failure
- Congestive cardiac failure
- Acute UTI
- Acute renal failure
- Febrile child
- Status epilepticus
- Head injury
- Spinal injury

- Burns
- Diabetic ketoacidosis
- Fluid and electrolyte disturbances and its therapy
- Acid-base disturbances
- Sepsis
- Poisoning
- Drowning
- Accidents and major trauma
- Scorpion and snake bites

## Skills & Procedures

***By the end of subspecialty training, trainees will:***

- Understand the appropriate relevant anatomical markers, indications, contraindications and complications of procedures commonly used in the Developmental Paediatrics.
- Understand local and national guidelines for obtaining informed consent
- Understand local guidelines for providing sedation and pain relief
- Understand and practice scrupulous aseptic techniques
- Be able to interpret results and undertake a management plan accordingly
- Be able to record results and document procedures legibly and accurately
- Understand age-appropriate normal ranges of tests commonly requested in the Department setting
- Understand the positive and negative predictive value of commonly performed tests
- Be able to explain investigation results to caregivers and/or the patient
- Be able to enlist the help of play therapists and nursing staff in order to attempt to reduce the anxiety of a child and caregivers

### ▪ **History and Examination.**

- History taking including psychosocial history
- Physical examination including fundus examination
- Newborn examination
- Gestation assessment
- Thermal protection of young infants
- Nutritional anthropometry and its assessment
- Assessment of growth, use of growth chart
- SMR rating
- Developmental evaluation
- Communication with children, parents, health functionaries and social support groups
- Genetic counseling.

### ▪ **Monitoring Skills:**

- Temperature recording
- Capillary blood sampling

- Peripheral Arterial blood sampling
- Pulse oximetry
- Measurement of peak flow

▪ **Therapeutic Skills:**

- Hydrotherapy
- Nasogastric feeding
- Endotracheal intubation
- Cardiopulmonary resuscitation (pediatric and neonatal)
- Administration of oxygen
- Venepuncture and establishment of vascular access
- Collection of blood from central lines
- Umbilical venous cannulation and sampling
- Administration of fluids, blood, blood components
- Parenteral nutrition
- Intraosseous fluid administration
- Intrathecal administration of drugs
- Common dressings
- Abscess drainage
- Basic principles of rehabilitation.

▪ **Acute Life Support/Resuscitation procedures**

- Manual airway clearance manoeuvres
- Airway insertion
- Orotracheal and nasotracheal intubation
- Use of continuous positive airways pressure
- Needle thoracentesis
- Tube thoracotomy
- Direct current electrical cardioversion defibrillation
- External cardiac pacing
- Pericardiocentesis

▪ **Investigative Skills:**

- Lumbar puncture
- Ventricular tap
- Pleural, peritoneal, pericardial and subdural tap
- Collection of urine for culture
- Urethral catheterization
- Supra-pubic aspiration.

▪ **Gastrointestinal Procedures**

- Oro/nasogastric tube replacement
- Gastrostomy tube replacement
- Gastric lavage

▪ **Neurological Procedures**

- Lumbar puncture
- Ventriculoperitoneal shunt tap (VP)

▪ **Pain Relief and Sedation**

- Pain scoring
- Non-pharmacologic measures
- Pharmacologic approaches
- Local anaesthetics
- Regional nerve blocks
- Procedural sedation techniques

▪ **Bedside Investigations:**

- Hemoglobin
- TLC
- ESR
- Peripheral smear staining and examination
- Urine: routine and microscopic examination
- Stool microscopy including hanging drop preparation
- Examination of CSF and other body fluids
- Gram stain, ZN stain
- Shake test on gastric aspirate.

▪ **Bedside Interpretation:**

- X-rays of chest, abdomen, bone and head
- ECG
- ABG findings
- CT scan.
- Common EEG patterns
- Audiograms
- Ultrasonographic abnormalities and isotope studies.

## **LOG BOOK PART II**

The residents must maintain a log book and get it signed regularly by the supervisor. A complete and duly certified log book should be part of the requirement to sit for MD examination. Log book should include adequate number of diagnostic and therapeutic procedures observed and performed, the indications for the procedure, any complications and the interpretation of the results, routine and emergency management of patients, case presentations in CPCs, journal club meetings and literature review.

**Format of Log Book is as follows:**

Candidate's Name: -----

Roll No. \_\_\_\_\_ Supervisor -----

The following procedures shall be entered in the log book as per format

**Procedures:**

- |    |  |    |
|----|--|----|
| 1. | Venous Cannulation                                     | 25 |
| 2. | Lumber Puncture  | 20 |
| 3. | Pleural Tap  | 2  |
| 4. | Peritoneal Tap   | 2  |
| 5. | Endotracheal Intubation                                | 5  |
| 6. | Cardiopulmonary Resuscitation                          | 10 |
| 7. | Exchange Transfusions                                  | 2  |
| 8. | Emergency Pneumothorax<br>Drainage (Needle Aspiration) | 1  |

**Procedures Performed**

Sr.#	Date	Name of Patient, Age, Sex & Admission No.	Diagnosis	Procedure Performed	Supervisor's Signature
1					
2					
3					
4					

**Emergencies Handled**

Sr.#	Date	Name of Patient, Age, Sex & Admission No.	Diagnosis	Procedure/Management	Supervisor's Signature
1					
2					
3					
4					

**Case Presented**

Sr.#	Date	Name of Patient, Age, Sex & Admission No.	Case Presented	Supervisor's Signature
1				
2				
3				
4				

**Seminar/Journal Club Presentation**

<b>Sr.#</b>	<b>Date</b>	<b>Topic</b>	<b>Supervisor's signature</b>
1			
2			
3			
3			

**Evaluation Record**

(Excellent, Good, Adequate, Inadequate, Poor)

At the end of the rotation, each faculty member will provide an evaluation of the clinical performance of the fellow.

<b>Sr.#</b>	<b>Date</b>	<b>Method of Evaluation (Oral, Practical, Theory)</b>	<b>Rating</b>	<b>Supervisor's Signature</b>
1				
2				
3				
4				

## **Part-III MD Developmental Paediatrics**

### **Specialized Training in Developmental Paediatrics**

This will contain seven modules:

#### **MODULE I**

##### **1. Research Process**

This module will be taught in 3<sup>rd</sup> year and will be examined via thesis in the final year exam.

This includes the learning of skills of critically assessing the published articles in medical journals based on the knowledge acquired earlier. Applying the knowledge of epidemiology and biostatistics, population dynamics, qualitative research methods, computer skills and clinical skills, the student will learn the development of a research question, giving essential background, making statements for objectives, data collection, analysis applying statistical methods using the computer skills and present their readings and research projects for the third session.

##### ***Objectives***

**The objectives of this section of Module I is to enable the students to:**

1. Create a critical mass of trained persons well-oriented in writing a research proposal for the dissertations and funding purposes.
2. Critically comprehend the concepts and at the same time apply the epidemiological and statistical methods to develop a research protocol making use of computer statistical soft wares and information technology.

##### ***Potential Learning Experiences***

1. The critical analysis of the published scientific paper will be used as baseline to start with the concept of writing a proposal to enable the students to identify the scientific requirements of medical writing and the various components of the paper.
2. This will be critical reading of a published paper in context with the background, objectives, aims, study designs, data collection tool and their validity, data presentation and interpretation, in terms of discussion and conclusions. Statistical methods will be assessed for their applications and validity. The citation and listing of references

Curriculum/Statutes & Regulations -MD Developmental Paediatrics  
will also be examined using the guidelines for critical assessment of scientific papers.

- The definitions of research and its uses and advantages will be highlighted in context with its importance in health and disease.
  - The selection and prioritizing topic for research demands some underlying reasoning which will be dealt with in this section requiring guidelines to select a topic.
3. Hands-on-training of the students will be made possible in searching for the relevant literature using hand and web search.
    - Providing a background to the study will be worked at through exercises using several examples.
  4. Formulation of objectives needs clarity of logical thinking which can focus on the scientific principals and, at the same time, covering the language issues.
  5. Formulation of hypothesis is critical in terms of stating them in measurable terms.
  6. Through definitions of objectives and hypothesis, the identification of variables and their types will be worked at.
  7. Once the objectives and variables are identified, the design of the study will be identified based on the prior knowledge of basics in epidemiology.
  8. Sampling techniques employed will be qualified appropriate to the objectives and the study designs. Probability and non-probability techniques will be applied on different scenario to appropriate their use in research.
  9. Sample size estimation based on objectives and study designs will be done using various statistical applications.
  10. Construction of Proforma and questionnaire appropriate to the study objectives and variables.
    - Validity of the measurements will be discussed for the documented variables.
    - Importance of self- and interviewer administered questionnaire.
    - Pre-testing the methodology of data collection



11. Outlining of the plan for data analysis will be carried out constructing dummy tables and identifying appropriate statistical analysis.
12. Preparing of the work plan using the pattern of a Gantt chart.
13. Preparing budget and its justification for a proposal when seeking funding.
14. Writing the title of the study topic to include the study design, variables and statistical analysis.
15. Abstract writing will be done according to different standards.
16. Presentation of the project will be the final step

**Contents:**

Following are the contents of the course:

1. Principles of critical reading of a scientific paper
2. Definition of research
3. Importance of research in public health
4. Selection of topic for research
5. Literature Search using internet and library
6. Preparing the background for the proposal writing.
7. Parts of proposal writing.
8. Basics of Epidemiology and Biostatistics will be covered.
9. Study design, sampling techniques, inclusion and exclusion criteria.
10. Methodology
11. Choosing the statistical techniques.
12. Reference writing
13. Abstract writing
14. Title writing for the proposals

**2. Basic Epidemiology**

Basic Epidemiology lays stress on the basic epidemiological principles and research methodology developing on the understanding of the fundamental principles and on the development of the practical skills and concepts rather than on mathematical calculations.

***Objectives***

**The objectives of this section of Module I is to enable the students to:**

1. Enable health professionals to understand the concepts and apply the epidemiological and statistical methods to design, conduct, analyze and apply interventions for evaluation, making use of computer statistical software and information technology.

***Potential learning Experiences***

By the end of the course, the participants must be able to:

1. Define Epidemiology and its uses in Child Health and Research
  - Importance of epidemiological investigations
  - Developments in modern Epidemiology
  - Uses of Epidemiology in health and disease
2. Apply and design strategies commonly used for epidemiological studies
  - Describe Descriptive and Analytical studies,
  - Describe each study design with its uses, strengths and limitations
  - Define rates, ratios, proportions in relation to vital statistics. Calculate incidence, prevalence, morbidity and mortality rates in human populations.
3. Describe the validity and reliability of a study design: internal and external validity and its measure, Hawthorne effect etc. Reliability and its measures.
4. Investigate association in terms of strength of association and causality. Make 2x2 tables. Calculate Relative risk, Attributable risk, population attributable risk percent and population attributable risk fraction. Interpret these measures.
5. Identify Risk and risk factors: definition and characteristics. Define Causality and judge cause-effect relationship:
6. Drawing Inference from study results (alternative explanations):
  - Define confounding, its characteristics and effects on the results and how to control for it.
  - Define Bias, its characteristics and effects on results and how to control for it.

- Define Chance, its characteristics and effects on results and how to control for it.

**Contents:**

The following are the contents of the course:

1. Definition of Epidemiology
2. Importance of Epidemiology
3. Types of study designs: their importance, uses and limitations.
4. Outcome measures for each study design e.g. Relative risk, Odds ratio etc.
5. Causality and association
6. Inferential Epidemiology
7. Validity and Reliability
8. Measuring the Disease burden: Rates, Ratios, Incidence, Prevalence
9. Role of Chance, Confounding and Bias in interpretations.
10. Screening in disease control.

**3. Basic Biostatistics**

This discipline plays a fundamental role in the interpretation of findings obtained as a result of the studies conducted, data collected and analysed using statistical applications which appropriately draw inferences on the collected data.

***Objectives***

**The objectives of this section of Module I is to enable the students to:**

1. Define and give the rationale for statistics in medicine
2. Define variables and their types:
  - What are variables, different type of variables, classify variables into qualitative, quantitative, discrete and continuous variables
  - Define dependent and independent variables
  - Breakdown the range of a series of quantitative measurements into intervals and specify which measurement belongs to which intervals.
3. Define the data types and the scales of measurements
  - Continuous and discrete data sets

- Ordinal and nominal data sets
  - Interval scales
  - Composite scales
4. Interpret a given data: Apply descriptive statistics for continuous variables in terms of:
    - Measures of central tendency: Calculate the mean, median and mode and interpret them.
    - Measures of dispersion: variance, standard deviation, coefficient of variation
    - Measures of shapes: regarding the distribution of the data sets
  5. Apply frequency distribution to a given data and its interpretation. What are percentiles, their uses and limitations in a dataset
  6. Apply the concepts of probability. Recognize the algebraic notations used in statistics to differentiate between parameters and statistics.
  7. Define Probability, types of probability with examples.
  8. Describe the common probability distributions especially Normal and Binomial distributions.
    - List the descriptive properties of a normal distribution with mean  $\mu$  and standard deviation  $\sigma$
    - Use tables of normal distribution function to estimate the area under a normal curve with mean  $\mu$  and  $\sigma$  for one and between 2 values of the variable.
  9. Describe Population and its relation to sample:
  10. Define Sampling and its techniques:
    - Distinguish between probability and non-probability sampling
    - Define various types of probability and non-probability sampling
    - Why sampling errors arise in a sample estimate of a parameter.
    - Describe the sampling distributions of a mean and a proportion.
    - Interpret and explain quantitatively the effect of the standard deviation and sample size on the sampling distributions
  11. Calculate the sampling errors; Calculate the standard error of a mean and a proportion and its interpretation.

- 12.** Calculate and interpret confidence intervals for a parameter.  
Explain why it is necessary to calculate confidence interval in a data
- 13.** Apply concepts of comparing data (Inferential statistics):
  - Learn about the basics of hypothesis development
  - What is a Null hypothesis and Alternate Hypothesis
  - Describe the rationale of a significance test
  - Define Alpha and Beta errors
  - Calculate the Power of a study
- 14.** Apply various tests of significance: their rationale and use.
- 15.** Explain the meaning of 'p' in statistical terms and its interpretation.
- 16.** Apply the steps of Hypothesis testing
- 17.** Apply the steps of Hypothesis testing
  - Choosing an appropriate test of significance
  - Use the tests of significance for parametric data: for a single mean, for two means of unpaired observations, two means of paired observations, three or more independent means (ANOVA).
  - Use the tests of significance for categorical data: for one proportion, two independent proportions, two paired proportions, several proportions, analyzing frequency tables (2x2, 2xk tables), large tables with ordered categories.
- 18.** Investigate the association between two continuous variables: using a scatter diagram to:
  - Identify dependent and independent variables
  - Apply correlation—calculate correlation coefficients,
  - interpretation and presentation of correlation.
- 19.** Investigate the relationship of two continuous variables using regression, calculating linear regression of y on x and draw line of regression, interpreting and presenting regression.
  - When to choose –regression or correlation?

**Contents:**

The following are the contents of the course:

1. Introduction to Biostatistics
2. Types of statistical applications
3. Variables
4. Scales of measurements
5. Descriptive Statistics
6. Measures of central tendencies
7. Measures of variability
8. Measures of shapes
9. Probability
10. Probability Distributions: Normal, Poisson, Binomial
11. Sampling techniques, sampling errors/ Confidence Intervals
12. Concepts of analytical statistics: Hypothesis testing:
13. Alpha and Beta errors
14. Tests of Significance: Normal test, t test, Chi square test etc.
15. Correlation
16. Regression
17. Sampling and various sampling techniques
18. Data presentation: Figures, graphs, tables

**MODULE II**

**Knowledge of Child Development**

**1. Domains of Development**

***Objectives***

**The objectives of this section of module II are to enable the student to:**

1. Describe the major theories of cognitive, language, moral, social, and emotional development in children and the clinical applicability of these theories.
2. Describe the stages and the sequence of development in cognitive, motor, language, self-help, and social/emotional abilities from infancy through adolescence.
3. Recognize how different developmental domains (e.g., cognitive, social/emotional) interact and influence one another at different stages of development.

4. Identify the range of individual variation in normal development seen among typically developing children and adolescents at any given age in clinical settings.

### ***Potential Learning Experiences***

1. Residents should be expected to review development in each domain with families (and preceptors) and to discuss expected advances in each domain before the next scheduled visit.
2. Develop a library of selected videotapes. Over the course of training, have residents review tapes independently and keep an ongoing record of those viewed.
3. Longitudinal case study: At the beginning of residency, pair each resident up with a family of a newborn to follow over time. At selected intervals, residents will visit families in their homes to interact with, observe, and assess the child's developmental progress. Visits should be reviewed with a preceptor and approximately once or twice a year have small groups of residents get together with a preceptor for a tutorial in which each resident will discuss their child and the family's current adaptation.
4. Videotape children at all developmental levels during well child visits. As part of the primary care clinic teaching curriculum, view tapes of children of different ages and discuss each child's development and the approach to anticipatory guidance that was (or could be) used for each case viewed.
5. Observe parent-child interactions in the natural environment, e.g., zoo, museum, grocery store, mall, restaurant. Identify disciplinary practices, nurturing behaviors, and displays of developmental skills of the child. Estimate the age of the child on the basis of displayed skills.
6. At the beginning of each rotation, have residents explore their own developmental history (when possible by talking with parents or other family members) in terms of the timing of different developmental achievements (e.g., when they slept through the night, said their first words, took their first steps, learned to read, rode a two-wheeled bicycle, etc.). Make a time line chart to post on a wall for each resident to include his/her developmental milestones. Use the chart during each rotation as the basis for a discussion of individual variation in normal development.
7. Have a resident accompany a faculty member into a clinical encounter in which the age and developmental status of the child is not known to the resident. The resident's task could be to simply observe the child and glean as much information as possible for later discussion with the faculty member. Asking the resident to estimate the child's age from these observations, and marshalling evidence for the estimate, usually catches the resident's attention and provides a basis for planning additional observations.

## 2. Processes and Mechanisms of Development

### *Objectives*

**The objectives of this section of module II is to enable the students to:**

1. Develop a working knowledge of the role of early attachment relationships in promoting and/or discouraging optimal developmental adaptation and later interpersonal relationships.
2. Describe the role of temperament, individual differences, and “goodness of fit” in influencing development and interaction with others.
3. Recognize, assess, and include in management plans factors that predispose the child to developmental risk and those that best predict to resilience in development.
4. Vary and clinically manage the potentially vulnerable child.
5. Use information related to the processes and mechanisms of development in anticipatory guidance and problem management.

### *Potential Learning Experiences*

1. Have residents evaluate themselves using a standard temperament rating instrument. Discuss how their own temperaments were reacted to by others during childhood and how these interactions influenced their overall development.
2. Have residents evaluate the temperamental characteristics of a child and his/her parents who present with discipline and/or noncompliance issues.  
Identify clinical examples of how parent and child temperaments interact to create problems, such as an “anxious” mother with a “fussy” baby. Discuss goodness-of-fit and suggestions for management with the family.
3. Have a tutorial session on how different patterns of attachment present in clinical settings during infancy. Include discussion of the developmental sequelae of each pattern and how to use information from observations of attachment clinically in primary care. Follow up by having residents observe parent–infant interactions during patient visits in primary care clinic, and discuss the observations with families.
4. In a day-care center for infants and toddlers, have residents observe interactions between parents and children when the children are picked up at the end of the day.
  - o Discuss how the same families might look in the pediatric office and how the pediatrician might use such observations in anticipatory guidance with the family.
5. Encourage residents, when possible, to follow in one or two families with infants who had some medical complication shortly after birth (e.g., febrile neonate, brief NICU stay), which resolved, to watch for and ameliorate the development of vulnerability.



## **MODULE III**

### **Communication Skills**

#### ***Objectives***

**The objectives of module III is to enable the students to:**

1. Demonstrate the ability to obtain information from children, adolescents, and families in a manner that is:
  - o Culturally sensitive.
  - o Developmentally appropriate.
  - o Family focused.
2. Demonstrate skill in using appropriate interview techniques to gather information, such as:
  - o Use of open-ended and direct questions.
  - o Monitor nonverbal communication, both of the patient and family members and of themselves.
  - o Observing child behaviors.
  - o Providing and receiving feedback from patient and family.
3. Demonstrate skill in communicating with children, adolescents, and families in problem situations, such as dealing with difficult parents, giving bad news, and discussing sensitive issues.
4. Demonstrate the ability to share information clearly and concisely with professional colleagues in many venues, including during clinical situations, on rounds in formal presentations, on the telephone, and in writing. In all these forms, demonstrate sensitivity to patients and families, including respect for confidentiality.

#### ***Potential Learning Experiences***

1. In a small group setting, have residents recall and discuss their own experiences with giving bad news to families with a preceptor who helps focus the group on aspects that went well and opportunities for improvement. This could include setting the scene with appropriate supports for families and providers, expressing empathy, when and how to include children, deciding how much information to convey at one time, and providing follow-up.
2. Have residents conduct, with preceptor supervision, a group meeting with parents, children, and adolescents to discuss what they want to see, hear, and do during a visit to their doctor.
3. Review dictated or written reports, summaries, and letters to parents, teachers, and physicians. Use examples of their own work or that of their colleagues and faculty to demonstrate effective written communication.
4. Provide opportunities for residents to observe faculty modeling appropriate communication skills such as providing bad news or dealing with stressed parents, including difficult interview situations. The faculty's ability to acknowledge their own challenges, dilemmas, and mistakes in communication with patients encourages the resident trainee to focus fully on this important area.

5. Develop a collaborative office rounds program for residents. This consists of pediatricians and mental health professionals discussing challenging children with psychosocial issues.

## **MODULE IV**

### **Assessment Skills**

#### **1. Developmental Surveillance and Screening from Infancy Through Adolescence**

##### **Objectives:**

**The objectives of this section module IV are to enable the student to:**

1. Demonstrate an understanding of the process of developmental surveillance, which emphasizes monitoring development over time and in the context of the child's overall well-being using historical information, parental concerns, clinical observation, hands-on examination, and family/environmental information.
2. Enlist the purposes for developmental, and psychosocial screening of children in clinics.
3. Complete a thorough history using a proforma through parent interview and review of medical records to make a risk determination regarding developmental concerns.
4. Appraise developmental status of a child at any age by observation, physical examination, and neurodevelopmental assessment.
5. Apply screening protocol to older children and adolescents for high risk behaviors such as drug and alcohol use, unprotected sexual activity, running away, and driving safety as part of routine well-adolescent visits.
6. Demonstrate a working knowledge of the range of instruments and techniques including interviews, standard physician check-sheets, parent-completed forms, naturalistic observation, and direct testing appropriate for screening children and families in health care settings.
7. Apply preselected tools for using a biopsychosocial model to the evaluation of developmental and behavioral concerns.

A resident should:

- be able to correctly administer and interpret at least one formal developmental screening method. This includes using screening results to give feedback to parents and to guide referral decisions.
  - Be able to use global behavioral rating scales (including both parent and teacher scales) and interview data to identify behavioral problems in need of mental health intervention and/or referral.

##### ***Potential Learning Experiences***

1. Have residents use assessment techniques with children of a variety of ages in different settings.
2. Incorporate developmental screening methods into routine guidelines for well-child care.
3. Seminar sessions during block rotation could include the observation of child behavior and parent-child interactions via videotapes, role-playing

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exercises, or simulated patients, with integration of observation skills expected in patient care activities.  
4. Comfortable in using PEEP, CRS, SGS II and CARS etc

## **2. Diagnostic Classification Schemas**

**The objectives of this section of module IV are to enable the students to:**

1. Apply International Classification of Diseases- 10 diagnoses to children with developmental disabilities.
2. Become familiar with DSM-IV and its multi-axial system as it applies to children with diagnosed mental disorders.

### ***Potential Learning Experiences***

1. Incorporate application of DSM-IV diagnoses into case conferences. Give three to four residents the manuals during case presentations as designated "coders" who can then present diagnoses at the end of case discussions. The group can come to a consensus (by vote) as to the best codes for the child and for situations.

## **3. Evaluations by Other Professionals:**

**The objectives of this section of module IV are to enable the students to:**

1. Determine the need for assessment by other professionals. Specific discipline competencies include:
  - o Child Psychiatry.
  - o Physical Medicine.
  - o Neurology.
  - o Educational specialties.
  - o Psychology.
  - o Social work.
  - o Speech pathology.
  - o Audiology.
2. Formulate effective referral questions to appropriate professionals.
3. Interpret the results of evaluations by other professionals.
4. Use information from other professionals to guide decisions for additional evaluations and interventions.
5. Recognize the use of evaluations by other disciplines in the eligibility determination for early intervention and special education services.

### ***Potential Learning Experiences***

1. Observe psychological evaluations, including observations of the administration and interpretation of psychometric procedures.
2. Provide opportunity for residents to have hands-on exposure to materials and methods used by other professionals (e.g., IQ tests).
3. Encourage residents to obtain evaluation reports on their clinic patients and review results with a preceptor or professional from the same discipline (e.g., psychologist).
4. Sit in on occupational/physical therapy evaluation, preferably with the resident's own patient.

5. Make a school visit to a patient, e.g., a child for whom the resident is considering prescribing stimulant medication, and discuss educational programming with the school psychologist and the child's teacher.

## **MODULE V**

### **Spectrum of Child Development**

#### ***Objectives***

**The objectives in this section of module V are to enable the students to:**

1. Comprehend normal developmental influences on the specific topic.
2. Describe common variations of the topic area.
3. Describe common family, environmental, and cultural factors associated with the topic.
4. Counsel parents regarding the prevention of problems and the management of variations using common intervention strategies.

#### **1. Introduction/Orientation to the Spectrum Concept:**

o Conditions and findings in development follow a spectrum that ranges from normal, to variants of normal, to clear deviations from normal. The presentation of symptoms and findings follows in a similar fashion. A child's presenting symptoms may be assessed as normal or a normal variant, as a variant that presents a problem for the child and/or family, or as a clear problem of sufficient magnitude or intensity to be considered a disorder. This concept of developmental symptoms and conditions occurring across a spectrum is important because it shapes a hierarchy of responses to these symptoms.

o The first level of response is to those concerns or findings that are assessed as normal development and behavior. Such concerns are often brought to the physician for assessment and appropriate management. In this case, appropriate management usually consists of education and reassurance of the parent. Often there may be a need for guidance regarding the handling of the situation to prevent the condition from worsening or to promote a decrease in symptoms. Incorporating professional advice into health care before the onset of symptoms is known as anticipatory guidance, and this guidance is a cornerstone of health promotion.

o The second level of response is toward those concerns that are assessed to be problems. At this level, the symptoms have some adverse impact on the child and/or family and require some degree of intervention. Such intervention may include consultation with other professionals, but it will most often rest with the primary care physician. Interventions might include specific management suggestions, counseling the family on possible approaches to the problem, or recommending other resources to help the family address their concerns. The third level of response is toward those concerns that are determined to be severe enough to be labeled disorders.

- o Symptoms at this level are severe enough to meet the specific criteria for a disorder, such as are outlined in the DSM IV.
- o The section on health promotion pertains to providing anticipatory guidance regarding a number of topics. Effective anticipatory guidance is based on the application of general principles and knowledge of child development as well as on the recognition of the infinite normal variations seen among children and families.

## **2. Developmental and Behavioral Symptoms and Disorders**

### **o Developmental Disabilities**

#### ***Objectives***

**The objectives of this section module V are to enable the students to:**

1. Generate a differential diagnosis for the child with persistent global developmental delays.
2. Generate a differential diagnosis for the child with persistent motor delays, such as cerebral palsy, developmental coordination disorder, and other neurodevelopmental and general medical conditions.
3. Generate a differential diagnosis for the child with abnormalities in speech and language development, such as language disorders, stuttering, and other medical conditions.
4. Generate a differential diagnosis for the child with 'persistent learning difficulties, such as specific learning disabilities, other general medical conditions, and other mental disorders.
5. Coordinate an evaluation of a child with persistent developmental symptoms, after having generated a differential diagnosis.
6. Know the role of early intervention programs in the evaluation and treatment of children with developmental delays or those who are at risk for such delays.
7. Recognise the effects that developmental disabilities can have on the child and family functioning and how to assist with them.
8. Comprehend/Diagnose the common medical complications associated with cerebral palsy, moderate to severe mental retardation, Down syndrome, and myelomeningocele.
9. treat acute medical conditions in the all disabilities.
10. Develop effective therapies available for patients with cerebral palsy, mental retardation, genetic disorders, and myelomeningocele
11. Coordinate comprehensive care for patients with cerebral palsy, various degrees of mental retardation, genetic disorders, and myelomeningocele.

#### ***Potential Learning Experiences***

1. Attend specialty clinics in which children with developmental problems are evaluated, following a child/family through a full evaluation and feedback session with the family when possible.
2. Additional clinical settings include specialties such as neurology, genetics, psychology, and neonatal follow up programs.
3. Observe or participate in the evaluation of children with delays.

4. For a patient presenting with questionable learning or attention problems, have residents contact teachers and work with the school to develop a plan for assessment and follow-up.

#### o **Impulsive/Hyperactive or Inattentive Behavior**

##### ***Objectives***

**The objectives of this section of module V are to enable the students to:**

1. Generate a comprehensive differential diagnosis to assess the concerns of parents regarding their child's disruptive, overactive, impulsive, and/or inattentive behaviors.
2. Describe the natural history of ADHD and how its presentation varies with developmental progression.
3. List and recognize the common mental health and learning comorbid conditions that can present with symptoms suggesting ADHD.
4. Use history, physical examination, child observations, parent and teacher questionnaires, and child and family interviews in evaluating symptoms of impulsivity, hyperactivity, and inattention.
5. Appropriately use additional disciplines in the evaluation and treatment of symptoms of impulsivity, hyperactivity, and inattention.
6. Assist families in initiating behavioral, cognitive, academic, and pharmacological interventions in children with ADHD behaviors

##### ***Potential Learning Experiences***

1. Direct an evaluation of a patient presenting with complaints of impulsivity, inattention, and/or hyperactivity. Monitor their progress over several visits by covering the diagnostic process and management of the problem symptoms.
2. In programs with multidisciplinary assessment teams, involve the resident in taking the initial history and physical/neurological examinations, and enlist the resident as a companion to the child through psychoeducational and other formal testing.
3. Role-play a diagnostic family interview in which the chief complaint is "ADHD."
4. Use a tutorial session to review a variety of child, parent, and teacher questionnaires and assess their uses, strengths, and weaknesses.

#### o **Negative/Antisocial Behavior**

##### ***Objectives***

**The objectives of this section of module V are to enable the students to:**

1. Generate a differential diagnosis for patients presenting with:
  - o Negative emotional behaviors.
  - o Aggressive oppositional behaviors.
  - o Secretive/antisocial behaviors.

2. Discuss the physiological (e.g., temperament) and environmental (e.g., maternal depression, family antisocial behavior) antecedents of negative/antisocial behavior patterns.
3. Devise an evaluation and intervention strategy for a child exhibiting negative/antisocial behavior.
4. Counsel families of children having milder forms (developmental variations and problems level conditions) of negative/ antisocial behavior, and monitor the effectiveness of interventions over time.
5. Determine when a child with negative/antisocial behaviors needs to be referred to appropriate professionals and community resources, and continue to participate in that child's ongoing primary care.

### ***Potential Learning Experiences***

1. Attend and participate in multidisciplinary clinics as available (e.g., behavior problems clinic, child psychiatry clinic). Some ways residents could be actively involved in such clinics include:
  - o Performing initial or follow-up parent interviews.
  - o Completing structured child observation/interaction session while parents are being interviewed.
  - o Developing assessment reports and management plans.
2. Participate in educational or support groups for parents of children with disruptive behavior problems. This could be done monthly as part of a primary care clinic.
3. Perform a role play of parents with children having negative/ antisocial behaviors. Be sure to include children of all ages (toddlers through adolescents).

### **o Feeding/Eating Problems**

#### ***Objectives***

**The objectives of this section of module V are to enable the students to:**

1. Recognize symptoms of feeding disorders in young children, such as failure to thrive, food refusal, and oral motor difficulties.
2. Recognize symptoms of problem eating habits such as fasting, binge eating, purging, excess snacking, excessive dieting, and excessive exercise.
3. Elicit problem symptoms such as inappropriate body image, nutritional beliefs, sense of loss of control of eating behavior, and misuse of diuretics and laxatives.
4. name the psychosocial factors possibly contributing to problem habits of under eating and overeating, including peer and media influence and family situations.
5. Collaborate with other providers to develop individualized management plans for patients with anorexia nervosa, bulimia nervosa, binge eating disorder, or eating disorder not otherwise specified.

### ***Potential Learning Experiences***

1. Participate in a feeding problem or eating disorders program in which identified patients are being treated.

2. In primary care settings, identify, counsel, and follow a child with obesity and his family.
3. Develop case vignettes about patients with eating disorders for residents to review and discuss with faculty supervision.

#### o **Elimination Problems**

##### ***Objectives***

**The objectives of this section of module V are to enable the students to:**

1. Define encopresis and enuresis.
2. generate a comprehensive differential diagnosis for encopresis and enuresis.
3. evaluate concerns regarding elimination behaviors using interview, physical examination, and indicated diagnostic studies.
4. initiate treatment for problem elimination behaviors using counseling, behavioral management, and appropriate medical intervention.
5. counsel families regarding the management of nocturnal enuresis, including the use of alarms and medications.
6. counsel families regarding the management of encopresis, including initial bowel evacuation and ongoing bowel regimens.
7. Recognize when elimination problems may warrant referral for subspecialty evaluation or management (e.g., urology, gastroenterology, psychiatry).

##### ***Potential Learning Experiences***

1. In primary care settings, the resident should identify, assess, counsel, and follow patients with elimination problems.
2. Develop a set of case vignettes of various elimination issues presenting in primary care for discussion.

#### o **Illness-Related Adaptations**

##### ***Objectives***

**The objectives of this section of module V are to enable the students to:**

1. Counsel families regarding the developmental progression of how children typically think about illness and health and how to improve their understanding to better cope with illness.
2. Counsel families regarding the impact of acute illnesses, physical disabilities, sensory impairments, and hospitalizations on child behavior and development.
3. Counsel families regarding the impact of chronic illness and terminal conditions on development and behavior from toddlerhood through adolescence.
4. Calculate the impact of a chronically ill child on family relationships and the available mechanisms of support.
5. Recognize the importance of, and use strategies for, minimizing pain and suffering during and after medical procedures and in chronic conditions, using behavioral and pharmacological techniques.



6. Utilize the understanding of the child's developmental level to provide anticipatory guidance, and discuss the management of acute and chronic illness with patients and families.

***Potential Learning Experiences***

1. Arrange for residents to spend time in child-life departments (play rooms) and with child-life staff followed by guided discussion of how specific patients are coping with hospitalization and illness.
2. Attend chronic illness support group meetings for children, siblings, or parents.
3. During the developmental rotation, have residents interview two or three children at different developmental levels (e.g., preschoolers, 6 to 8 year olds, 10 to 12 year olds, and adolescents) about their understanding of health and illness. Interviews can be conducted with friends or relatives, in the clinics or on the inpatient wards. Interviews are then discussed with emphasis on the developmental progression of health understanding in children.

o **Atypical Behaviors/Disordered Relationship Skills**

***Objectives***

**The objectives of this section of module V are to enable the students to:**

1. Demonstrate a working knowledge of, and be able to manage effectively, repetitive behavior problems and disorders, such as head-banging and other self-injurious behaviors, trichotillomania, transient tic disorders, and Tourette syndrome.
2. Describe the clinical manifestations of problems involving social interaction behaviors including pervasive developmental disorders (PDD) and Autistic Spectrum Disorders (ASD).
3. Distinguish pervasive developmental disorders from other childhood disorders.
4. Develop a complete differential diagnosis for PDD.
5. Determine whether a child with social interaction difficulties needs referral for further evaluation for PDD.
6. Familiarize with appropriate long-term management techniques and necessary components of an effective educational and/or habilitation program for children and youth with PDDs.
7. Recognize bizarre behaviors in children (e.g., delirium, psychotic behaviors, agitation, disorientation, memory impairments); determine whether they are caused by a medical condition, substance abuse, or mental disorder; and intervene accordingly.

***Potential Learning Experiences***

1. Evaluate preschool children previously identified with autistic-like behaviors to identify their medical needs; assist in determination of a definitive diagnosis, if possible; identify other assessments required; and provide input into their individualized program plans.

2. Attend child psychiatry settings, developmental diagnostic programs, and child psychology services in which children are being assessed and/or treated for PDD.

3. Visit a school-based program that includes children with PDD. When possible, have residents arrange to visit one of their own patients in school while doing the block rotation.

## **MODULE VI**

### **Environmental Influences on Development**

#### **1. Crisis and Change in the Family**

##### ***Objectives***

**The objectives of this section of module VI are to enable the students to:**

1. Recognize that family transitions are commonly accompanied by physical and behavioral symptoms in the child and in other family members.

2. Consider the following types of family crisis and change and of accompanying challenges to adaptation by the child:

- o Parental discord and divorce.
- o Remarriage.
- o Family illness, including acute, chronic, and terminal conditions.
- o Death and bereavement.
- o Family violence.
- o Family mobility.

3. Utilize inquiries regularly regarding past or impending family change and family stress during health maintenance visits and in all assessments of developmental and behavioral concerns.

4. Demonstrate the ability to identify children who are at developmental risk as a result of family crisis and change to facilitate assessment and referral.

##### ***Potential Learning Experiences***

1. Observe faculty assessing and managing such family issues.

2. Role-play interview scenarios in which child symptoms arise in the context of family change.

#### **2. Diversity in Family Constellations**

##### ***Objectives***

**The objectives of this section of module VI are to enable the students to:**

1. Demonstrate how diversity in family structure can influence child development, behavior, and health.

2. Define the major strengths and risks to children living in each of the following types of family constellations: heterosexual family, single

parent, blended family, adolescent parent(s), intergenerational family, adoptive family.

3. Provide anticipatory guidance appropriate to differing family constellations, as well as support around specific family life problems as needed, to both parents and children.

4. Be aware of community services and resources that provide support for children and parents in nontraditional families.

### ***Potential Learning Experiences***

1. Management of a panel of patients in a primary care setting that includes families reflecting some of the constellations listed above in Objective

2. Longitudinal attendance in one community support group for single, adolescent, adoptive, or foster parents.

3. Arrange for a panel of grandparents who are raising their grandchildren to talk to residents as a group (perhaps as a noon conference).

### **3. Diversity in Culture and Community**

#### ***Objectives***

**The objectives of this section of module VI are to enable the students to:**

1. Demonstrate understanding of and sensitivity toward the values, perspectives, and special needs connected with the differing racial, cultural, religious, or educational status of patients and families.

2. Demonstrate an attitude of respect for the value of diversity, i.e., an attitude that acknowledges the contributions, the interdependence, and the belonging of all cultural groups within our society.

3. Demonstrate knowledge regarding cultural beliefs and biases and an ability to extend to families concrete permission to discuss their own culturally based experiences and values—i.e., invite families to educate the physician.

4. Recognize cultural differences in how families understand illness, especially how sick children are expected to behave and how families are expected to respond. Demonstrate an ability to adjust clinical inquiries and interventions to these culture-specific expectations.

5. Demonstrate an ability to communicate successfully with culturally diverse patients and families.

6. Demonstrate a general understanding of differing patient needs on the basis of differences in defined geographic communities, i.e., rural, suburban, and urban.

### ***Potential Learning Experiences***

1. Require residents, as a routine, to identify the relevant racial, cultural, religious, and educational backgrounds of the patient during case presentations.

2. Hold group discussions intended to share culturally distinct information about child rearing, family life, social acceptance and discrimination, and viewpoints regarding illness and disability. Such groups may be

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specifically designed as part of a rotation in developmental pediatrics or  
as part of a resident retreat.

3. Frequently, university medical centers have specially trained facilitators  
who are available to lead such group discussions or seminars.

#### **4. Child Abuse and Neglect**

##### ***Objectives***

**The objectives of this section of module VI are to enable the students to:**

1. Describe major legal aspects regarding the reporting of child abuse and neglect.
2. Summarize the major etiological theories of child abuse and discuss how these affect the evaluation and management of an abused child.
3. Describe the common physical and developmental effects of violence on children and the factors that temper these effects.
4. Describe the incidence of sexual abuse and characteristics commonly manifested by the victims.
5. Demonstrate the physical and psychological effects of sexual abuse on children and adolescents, and discuss the seriousness of the impact on their overall health.
6. Enlist the physical and developmental-behavioral effects of neglect on children and adolescents.
7. Define child neglect and contrast its etiology, implications, and diagnosis with child abuse.
8. Evaluate and appropriately manage victims of child abuse and neglect.

##### ***Potential Learning Experiences***

1. Child abuse most commonly presents in primary care and urgent care settings. Faculty in these settings will have the most opportunities to supervise assessments of possible child abuse and neglect.
2. In programs with a team approach to assessment of suspected abuse, residents can serve on a rotation with the team or be on call for abuse assessments with other members of the team.
3. Arrange for supervised community visits to children's protective services and foster care settings.

## **MODULE VII**

### **Therapeutic Modalities/Services**

#### **1. Skills in Management**

##### **o Anticipatory Guidance**

##### ***Objectives***

**The objectives of this section of module VII are to enable the students to:**

1. Determine that anticipatory guidance is used to change or enhance behaviors to promote the health, growth, and development of children
2. List at least five areas of anticipatory guidance to be addressed that are specific for each of the recommended health supervision visits for infants, children, and adolescents (e.g., feeding, safety, parent/child interaction, health promotion and illness prevention, oral health, family relationships, community interaction, etc.).
3. Use counseling, pamphlets, and audiovisual resources to deliver effective anticipatory guidance for each of the recommended health supervision visits.

### ***Potential Learning Experiences***

1. The clinic is the principal setting for providing anticipatory guidance. Residents should be expected to incorporate anticipatory guidance activities appropriate to the age and developmental stage of the child at each well-care visit.

## **o Counseling and Referral Skills**

### ***Objectives***

**The objectives of this section of module VII are to enable the students to:**

1. Demonstrate ability to form therapeutic relationships with children and families and elicit concerns, attributions, and expectations for interventions.
2. Counsel parents with developmental, behavioral, and family concerns.
3. Counsel the older child and adolescent with developmental variation and problem level concerns.
4. Recognize the limitations of counseling skills, and recognize indications for referral to other mental health or developmental professionals.
5. Make effective referrals to other professionals when indicated.
6. Describe barriers to children receiving mental health services.

### ***Potential Learning Experiences***

1. Use a discussion session during a block rotation to focus on the referral process and the many factors influencing whether a family will follow through with referrals.
2. Have residents research community resources for families with children having developmental-behavioral problems. Research can include making appointments to visit at least one site as well as putting together a written description of services provided. A central data bank of resident site visits and descriptions can be compiled for use when making referrals.

## **o Behavioral Treatment Methods**

### ***Objectives***

**The objectives of this section of module VII are to enable the students to:**

1. Demonstrate the understanding of basic principles of behavioral treatments including positive reinforcement, punishment, rewards, shaping, and modeling.
2. Conduct a functional analysis of behavior before initiating a behavioral treatment recommendation.
3. Apply techniques appropriately to behavioral problems when indicated (e.g., urine alarm conditioning methods for nocturnal enuresis; time-out for mild aggressive behavior; contingency charts for improving compliance with household chores).
4. Recognize when the family needs to be referred to a behavioral specialist for further evaluation or counseling.

### ***Potential Learning Experiences***

1. Provide a four-part seminar series on behavioral interventions.
  - Session 1 provides a review of basic learning theory.
  - Session 2 is focused on conducting a behavioral assessment.
  - Session 3 involves discussing intervention techniques.
  - Session 4 consists of resident case presentations in which they apply the theory and techniques to clinical practice with an actual patient.
2. Provide flexibility in scheduling patients for occasional extended primary care clinic sessions. These may allow for 1-hour appointments and fewer overall patients, perhaps once per month, so that the resident can schedule a patient who needs additional time for counseling. These sessions could be overseen by the developmental pediatrics faculty.

### **o Basic Psychopharmacotherapy**

#### ***Objectives***

**The objectives of this section of module VII are to enable the students to:**

1. List indications for the use of medications in the management of common mental diagnoses in pediatrics, such as ADHD and mild depression.
2. List the stimulant class medications most commonly used in the treatment of ADHD, their benefits, side effects, and risks.
3. Describe the second-line medications most commonly used to treat ADHD either alone or in conjunction with stimulant medication, along with their benefits and side effects.
4. Identify antidepressant medications used in pediatric populations as adjunct treatment for ADHD and for mild depression in adolescents.
5. Describe management strategies for patients who have poor response to medication or for whom medication no longer seems as effective as in the past.
6. Recognize other medications that may be prescribed as treatment for children with psychiatric conditions.

### ***Potential Learning Experiences***

1. Learning experiences in specialty clinic settings, such as child psychiatry offices or behavior problem clinics, can give residents

opportunities to see first-hand the assessment and follow-up of children with common mental diagnoses such as ADHD and mild depression.

2. The resident should have the opportunity to manage patients with ADHD through his or her ongoing primary care clinic experience. This management should include the diagnostic process, development of a treatment plan, and prescribing and monitoring medications as appropriate.

3. Present and discuss case vignettes describing patients for whom medication is about to be prescribed for the first time; for a patient who experiences undesirable side effects; and for a patient whose medication is no longer as effective as it was in the past. These vignettes should include additional information pertinent to proper management, such as any changes in the home or school environment, other social stressors, or other health concerns.

### o Acute Care

#### ***Objectives***

**The objectives of this section of module VII are to enable the students to:**

1. Demonstrate competency to diagnose and treat acute infections of children with disabilities.
2. Describe the benefits of competence in neurodisability
3. Identify patients who would benefit from initiation of developmental rehabilitation while they are admitted.
4. Function as an effective member of a developmental team in delivering both acute and rehabilitation care to patients with special needs.

#### ***Potential Learning Experiences***

1. Residents should participate in on call rotation in the special needs ward setting to get experience in treating acute on chronic conditions like fever, chest infections, seizures in patients with cerebral palsy, global delays and down syndrome etc.
2. Resident should become competent in chest physiotherapy and nasogastric feeding principles.

### o Care Coordination

#### ***Objectives***

**The objectives of this section of module VII are to enable the students to:**

1. Define care coordination in the context of pediatric care.
2. Describe the benefits of care coordination.
3. Screen patients who would benefit from care coordination (in addition to traditional medical care), e.g., home ventilation patients, early intervention, behavioral/ mental health problems, chronic diseases.
4. Function as an effective member of a care coordination team in delivering care to patients with special needs.

### ***Potential Learning Experiences***

1. Residents can participate in clinical experiences in community- based programs that provide care coordination (e.g., early intervention programs, mental health centers, managed care organizations).

## **2. Knowledge of Other Professional's Treatments**

### ***Objectives***

**The objectives of this section of module VII are to enable the students to:**

1. Recognize the activities that encompass the major psychotherapeutic modalities with children, adolescents, and families, including:
  - o Behavioral/cognitive treatments.
  - o Individual psychotherapy.
  - o Family therapy.
  - o Play therapy.
  - o Group therapy.
  - o Sensory therapy
  - o Occupational therapy
2. Recognize when a child or family might benefit from a referral to receive the above services.
3. Acquire knowledge about early intervention (EI), including:
  - o Know criteria for eligibility including establishing risk conditions.
  - o Local resources and service providers.
  - o Procedures for identifying children for potential eligibility for services.
  - o Specific steps within the state for referring a child into the EI system.
  - o Physician's role in providing a medical home and assistance in ongoing service coordination for children receiving EI services.
4. Acquire knowledge about educational interventions, including:
  - o Legislation related to mandates for educational services for handicapping conditions.
  - o Handicapping conditions recognized by the public educational system.
  - o Multifactorial evaluation procedures used for determining eligibility for special educational services.
  - o Physician's role in ongoing service coordination for children receiving special education services.
5. Recognize when a child or family might benefit from a referral to receive therapeutic interventions such as:
  - o Speech and language therapies.
  - o Occupational and physical therapies.
  - o Clinical hypnosis.
  - o Biofeedback.
  - o Emerging gene therapies.

### ***Potential Learning Experiences***

1. Residents should be exposed to a variety of mental health professionals in settings using the above psychotherapeutic approaches. For example, have residents observe and report similarities and differences among children and techniques of therapists who use



behavioral approaches versus those who use play therapy. Participate in a family and group therapy session.

2. Attend a school meeting to determine a child's eligibility for special services.
3. Observe other professionals providing services to one of the resident's own primary care clinic patients.
4. Participate as a member of an interdisciplinary team (e.g., developmental disabilities team, EI collaborative group, rehabilitation team).
5. Review a sample individual family service plan (IFSP) on a patient the resident is following; review it with a preceptor so that the resident can become familiar with the format and type of information it contains.
6. Attend an IFSP meeting along with a parent of a child the resident follows in primary care clinic.
7. Attend a local early intervention coordinating council meeting.

### **Knowledge of Hospital and Community**

- o Resources and Support Services

#### ***Objectives***

**The objectives of this section of module VII are to enable the students to:**

1. Have a working knowledge of roles and functions of the non medical resources and support programs serving children and families within the hospital setting, such as social work, child life, allied health therapies, pastoral care, and NICU developmental specialists.
2. Have a working knowledge of the range of community based resources for children and families as well as what services are provided and the characteristics of client populations served at different types of sites.
3. Be able to investigate the types and quality of resources for families and children in any community in which they practice.

#### ***Potential Learning Activities***

- o Residents can spend one-half day each week during the block rotation with members of the different support service programs in the hospital.

## **LOG BOOK PART III**

The residents must maintain a log book and get it signed regularly by the supervisor. A complete and duly certified log book should be part of the requirement to sit for MD examination. Log book should include adequate number of diagnostic and therapeutic procedures observed and performed, the indications for the procedure, any complications and the interpretation of the results, routine and emergency management of patients, case presentations in CPCs, journal club meetings and literature review.

**Proposed Format of Log Book is annexed at 'Annex I'.**

## **METHODS OF INSTRUCTION/COURSE CONDUCTION**

As a policy, active participation of students at all levels will be encouraged. Following teaching modalities will be employed:

1. Lectures
2. Seminar Presentation and Journal Club Presentations
3. Group Discussions
4. Grand Rounds
5. Clinico-pathological Conferences
6. SEQ as assignments on the content areas
7. Skill teaching in ICU, emergency and ward settings
8. Self study, assignments and use of internet
9. Bedside teaching rounds in ward
10. OPD & Follow up clinics
11. Long and short case presentations

In addition to the conventional teaching methodologies interactive strategies like conferences will also be introduced to improve both communication and clinical skills in the upcoming consultants. Conferences must be conducted regularly as scheduled and attended by all available faculty and residents. Residents must actively request autopsies and participate in formal review of gross and microscopic pathological material from patients who have been under their care. It is essential that residents participate in planning and in conducting conferences.

### **1. Clinical Case Conference**

Each resident, except when on vacation, will be responsible for at least one clinical case conference each month. The cases discussed may be those seen on either the consultation or clinic service or during rotations in specialty areas. The resident, with the advice of the Attending Physician on the Consultation Service, will prepare and present the case(s) and review the relevant literature.

### **2. Monthly Student Meetings**

Each affiliated medical college approved to conduct training for MD Internal Medicine will provide a room for student meetings/discussions such as:

- a. Journal Club Meeting
- b. Core Curriculum Meetings
- c. Skill Development

#### ***a. Journal Club Meeting***

A resident will be assigned to present, in depth, a research article or topic of his/her choice of actual or potential broad interest and/or application. Two hours per month should be allocated to discussion of any current

articles or topics introduced by any participant. Faculty or outside researchers will be invited to present outlines or results of current research activities. The article should be critically evaluated and its applicable results should be highlighted, which can be incorporated in clinical practice. Record of all such articles should be maintained in the relevant department.

### ***b. Core Curriculum Meetings***

All the core topics of Medicine should be thoroughly discussed during these sessions. The duration of each session should be at least two hours once a month. Evaluation will be done at the student and faculty level. The students will be given an evaluation form for each session for commenting on the:

- a) Course Contents
- b) Facilitation
- c) Use of Audio visual aids

The teachers will their comments at the end of each module to:

- a) Review the contents
- b) Add changes to teaching methodologies and exams.

### ***c. Skill Development***

Two hours twice a month should be assigned for learning and practicing clinical skills.

**List of skills to be learnt during these sessions is as follows:**

1. Residents must develop a comprehensive understanding of the indications, contraindications, limitations, complications, techniques, and interpretation of results of those technical procedures integral to the discipline (mentioned in the Course outlines).
2. Residents must acquire knowledge of and skill in educating patients about the technique, rationale and ramifications of procedures and in obtaining procedure-specific informed consent. Faculty supervision of residents in their performance is required, and each resident's experience in such procedures must be documented by the program director.
3. Residents must have instruction in the evaluation of medical literature, clinical epidemiology, clinical study design, relative and absolute risks of disease, medical statistics and medical decision-making.
4. Training must include cultural, social, family, behavioral and economic issues, such as confidentiality of information, indications for life support systems, and allocation of limited resources.
5. Residents must be taught the social and economic impact of their decisions on patients, the primary care physician and society. This can be achieved by attending the bioethics lectures

6. Residents should have instruction and experience with patient counseling skills and community education.
7. This training should emphasize effective communication techniques for diverse populations, as well as organizational resources useful for patient and community education.
8. Residents may attend the series of lectures on Nuclear Medicine procedures (radionuclide scanning and localization tests and therapy) presented to the Radiology residents.
9. Residents should have experience in the performance of clinical laboratory and radionuclide studies and basic laboratory techniques, including quality control, quality assurance and proficiency standards.

### **3. Annual Grand Meeting**

Once a year all residents enrolled for MD Development Paediatrics should be invited to the annual meeting at UHS Lahore.

One full day will be allocated to this event. All the chief residents from affiliated institutes will present their annual reports. Issues and concerns related to their relevant courses will be discussed. Feedback should be collected and suggestions should be sought in order to involve residents in decision making.

The research work done by residents and their literary work may be displayed.

In the evening an informal gathering and dinner can be arranged. This will help in creating a sense of belonging and ownership among students and the faculty.

## **EVALUATION & ASSESSMENT STRATEGIES**

### **Assessment**

It will consist of action and professional growth oriented *student-centered integrated assessment* with an additional component of *informal internal assessment, formative assessment* and measurement-based *summative assessment*.

### **Student-Centered Integrated Assessment**

It views students as decision-makers in need of information about their own performance. Integrated Assessment is meant to give students responsibility for deciding what to evaluate, as well as how to evaluate it, encourages students to '**own**' the evaluation and to use it as a basis for self-improvement. Therefore, it tends to be growth-oriented, student-controlled, collaborative, dynamic, contextualized, informal, flexible and action-oriented.

In the proposed curriculum, it will be based on:

- Self Assessment by the student
- Peer Assessment
- Informal Internal Assessment by the Faculty

### ***Self Assessment by the Student***

Each student will be provided with a pre-designed self-assessment form to evaluate his/her level of comfort and competency in dealing with different relevant clinical situations. It will be the responsibility of the student to correctly identify his/her areas of weakness and to take appropriate measures to address those weaknesses.

### ***Peer Assessment***

The students will also be expected to evaluate their peers after the monthly small group meeting. These should be followed by a constructive feedback according to the prescribed guidelines and should be non-judgmental in nature. This will enable students to become good mentors in future.

### ***Informal Internal Assessment by the Faculty***

There will be no formal allocation of marks for the component of Internal Assessment so that students are willing to confront their weaknesses rather than hiding them from their instructors.

It will include:

- a. Punctuality

- b. Ward work
- c. Monthly assessment (written tests to indicate particular areas of weaknesses)
- d. Regular assignments
- e. Participation in interactive sessions

### **Formative Assessment**

Will help to improve the existing instructional methods and the curriculum in use

#### ***Feedback to the faculty by the students:***

After every three months, students will be providing a written feedback regarding their course components and teaching methods. This will help to identify strengths and weaknesses of the relevant course, faculty members and to ascertain areas for further improvement.

### **Summative Assessment**

It will be carried out at the end of the programme to empirically evaluate **cognitive, psychomotor** and **affective domains** in order to award diplomas for successful completion of courses.

## **MD DEVELOPMENTAL PAEDIATRICS EXAMINATIONS**

### **Part I MD Developmental Paediatrics**

**Total Marks: 200**

All candidates admitted in MD Developmental Paediatrics course shall appear in Part I examination at the end of first calendar year.

#### **Components of Part-I Examination:**

Paper-I, 100 MCQs (single best, having one mark each)	100 Marks
Paper-II, 10 SEQs (having 10 marks each)	100 Marks

#### **Topics included in paper:**

	<b>Paper-I</b>	<b>Paper-II</b>
1. Anatomy	(20 MCQs)	(2 SEQs)
2. Physiology	(20 MCQs)	(2 SEQs)
3. Pathology	(20 MCQs)	(2 SEQs)
4. Biochemistry	(15 MCQs)	(1 SEQs)
5. Pharmacology	(10 MCQs)	(1 SEQ)
6. Behavioural Sciences	(10 MCQs)	(1 SEQ)
7. Biostatistics & Research Methodology	(05 MCQs)	(1 SEQ)

### **Part II MD Developmental Paediatrics**

**Total Marks: 430**

All candidates admitted in MD Developmental Paediatrics course shall appear in Part II examination at the end of 2<sup>nd</sup> calendar year.

There shall be two written papers of 100 marks each, Oral & practical/ clinical examination of 150 marks and log book assessment of 80 marks.

#### **Topics included in paper 1**

General Paediatrics including;

1. General, Community, Preventive & Social Pediatrics	(10 MCQs)
2. Nutrition & Neonatology	(10 MCQs)
3. Infectious Diseases	(05 MCQs)
4. Hematology & Oncology	(05 MCQs)
5. Respiratory Diseases	(10 MCQs)
6. Gastroenterology & Hepatology	(10 MCQs)

**Topics included in paper 2**

General Paediatrics including;

- |   |           |
|---|-----------|
| 1. Nephrology                             | (05 MCQs) |
| 2. Cardiovascular Diseases                | (05 MCQs) |
| 3. Endocrine Diseases                     | (05 MCQs) |
| 4. Rheumatic Diseases                     | (05 MCQs) |
| 5. Child Abuse                            | (05 MCQs) |
| 6. Toxicology                             | (05 MCQs) |
| 7. Pediatric Surgery & Orthopedic         | (10 MCQs) |
| 8. Paediatric Emergency and Critical Care | (10 MCQs) |

**Components of Part II Examination****Theory:**

<b>Paper 1:</b>	<b><u>100 Marks</u></b>	<b>3 Hours</b>
10 SEQs (No Choice; 05 marks each)	50 Marks	
50 MCQs	50 Marks	
<b>Paper 2:</b>	<b><u>100 Marks</u></b>	<b>3 Hours</b>
10 SEQs (No Choice; 05 marks each)	50 Marks	
50 MCQs	50 Marks	

Only those candidates, who pass in theory papers, will be eligible to appear in the Oral & Practical/Clinical Examination.

Oral & Practical/ Clinical Examination shall be held in clinical techniques relevant to General Paediatrics.

**OSCE****50 Marks**

10 stations each carrying 05 marks of 10 minutes duration; each evaluating performance based assessment with five of them interactive.

**Clinical****100 Marks**

Four short cases (each 15 marks)	60 Marks
One long case:	40 Marks

**Log Book****80 Marks**



**Part III MD Developmental Paediatrics**  
**Total Marks: 920**

All candidates admitted in MD course shall appear in Part-III examination at the end of structured training programme (end of 5th calendar year and after clearing Part I & II examinations).

There shall be two written papers of 150 marks each, Oral & Practical/ Clinical examination of 300 marks, log book assessment of 120 marks and thesis examination of 200 marks.

Module I will be examined by thesis examination.

**Topic included in paper 1**

1. Module II Knowledge of Child Development
2. Module III Communication Skills
3. Module IV Assessment Skills

**Topic included in paper 2**

1. Module V Spectrum of Child Development
2. Module VI Environmental Influences on Development
3. Module VII Therapeutic Modalities/Services

**Components of Part III Examination**

**Theory**

<b>Paper I</b>	<b><u>150 Marks</u></b>	<b>3 Hours</b>
15 SEQs (No Choice)	75 Marks	
75 MCQs	75 Marks	
 <b>Paper II</b>	 <b><u>150 Marks</u></b>	 <b>3 Hours</b>
15 SEQs (No Choice)	75 Marks	
75 MCQs	75 Marks	

Only those candidates, who pass in theory papers, will be eligible to appear in the Oral & Practical/ Clinical Examination.

**OSCE**

**100 Marks**

10 stations each carrying 10 marks of 10 minutes duration; each evaluating performance based assessment with five of them interactive

**Clinical**

**200 Marks**

Four short cases (25 marks each)

100 Marks

One long case:

100 Marks

**Log Book**

**120 Marks**

**Thesis Examination**

**200 Marks**

Module I will be examined by thesis examination.

All candidates admitted in MD courses shall appear in Part-III thesis examination at the end of 5<sup>th</sup> calendar year of the MD programme and not later than 8th calendar year of enrolment. The examination shall include thesis evaluation with defense.

**RECOMMENDED BOOKS**

1. **Text book of Developmental Paediatrics** by Margaret Pollak, published by Churehill Livingstone; London, 1993.
2. **Developmental – Behavioural Paediatrics** by Levine Carey Crocker, published by Launder: 3rd edition: London, 1999.
3. **Early childhood development: Multicultural perspectives** by Jeffery Trauvick Smith published by Meril; New Jercey, 1997.
4. **Developmental Paediatrics** by K.S. Holt published by Butterworths: London, Boston, 1997.
5. **Prevention of Malnutrition and Rehabilitation of Malnourished children by Unicef, Nutrition Rehabilitation unit department of Paediatrics Unit II, Civil Hospital Karachi, Pakistan 1991.**
6. **The Developing Child** by Helen Bee. 9th edition published by Allyn and Bacon: Boston, London, 2000.
7. **The Development of the Infant & Young Child: Normal & abnormal** by D llingworth, 4th edition 1970.
8. **Developmental follow-up: Concepts, Domaine, and Method** by Sarah L. Freudman published by Academic Press; New York, 1994.
9. **The Development of Children** by Cole Michael. 5th edition, worth publishers: New York, 2005.
10. **Developmental & Behavioural Paediatrics, A Handbook of Primary care: Second edition** by Steven Parker, Barry Luckerman, Marihyn Augustyn.
11. Rana M. H., Ali S. Mustafa M. **A Handnook of Behavioural Sciences for Medical and Dental Students.** Lahore: University of Health Science; 2007.
12. Fathalla M. F. and Fathalla M. M. F. **A Practical Guide for Health Researcher.** Cairo: World Health Organization; 2004.
13. Abramson JH, Abramson ZH. Survey methods in community medicine, fifth edition. Edinburgh: Churchill Livingstone; 1999.
14. Altman DG. Practical statistics for medical research. London: Chapman and Hall; 1991.

15. Bowling A. Research methods in health: investigating health and health services, 2<sup>nd</sup> ed. Buckingham: Open University Press; 1997.
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18. Greenhalgh T. How to read a paper: the basics of evidence-based medicine, 2<sup>nd</sup> ed. London: BMJ Publishing Group; 1997.
19. Beaglehole R, Bonita R, Kjellstrom T. Basic epidemiology. Geneva: World Health Organization; 1993.
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21. Hennekens CH, Buring JE. Epidemiology in medicine. Boston, MA: Little Brown and Company; 1987.
22. Holford TR. Multivariate methods in epidemiology. New York, NY: Oxford University Press; 2002.
23. Lilienfeld AM, Lilienfeld DE. Foundations of epidemiology, 3<sup>rd</sup> edition. New York, NY: Oxford University Press; 1994.
24. Mausner JK, Bahn AK. Epidemiology: an introductory text, 2<sup>nd</sup> ed. Philadelphia, Pa: WB Saunders Company; 2002.
25. Fletcher RH, Fletcher SW, Wagner EH. Clinical epidemiology: the essentials, 3<sup>rd</sup> ed. Philadelphia, PA: Williams & Wilkins Publishers; 1996.
26. Colton T. Statistics in medicine, 1<sup>st</sup> ed. Boston, MA: Little Brown and Company ; 1994.
27. Kirkwood BR. Essentials of medical statistics, 2<sup>nd</sup> ed. Oxford, UK: Blackwell Scientific Publications; 1988.