REPORT OF THE SUB-COMMITTEE FOR CURRICULUM IN PEDIATRICS FOR UNDERGRADUATE MEDICAL EDUCATION

In accordance with the request of the Medical Council of India, a Committee (Annexure 1) was constituted to review the undergraduate medical curriculum in relation to pediatrics.

The specific suggestions of the committee with respect to the tasks assigned for recommending the curriculum in Pediatrics for Undergraduate Medical Education are detailed below.

I. Syllabus

The following is a broad outline of the expected knowledge and skills including the course content. It must be reiterated that there is scope for flexibility in consideration of local health needs, available resources and student characteristics.

A. STUDENT MUST DEMONSTRATE SKILLS IN RELATION TO

(i) Neonatology

* Care of a newborn at birth including Apgar scoring and resuscitation.
* Identification of low birth weight and its differentiation into growth retarded and preterm infants.
* Identification of common physiological conditions like transitional stools, physiological jaundice, care of the cord, toxic erythema, etc.
* Differentiate a sick newborn from a normal one.
* Lactation management.
* Thermal care of newborns especially low birth weights.
* Knowledge of and exposure to common practical procedures like tube (naso/orogastric) feeding, venous sampling, intravenous line establishment and drug therapy, oxygenation, lumbar puncture, *etc.*

(ii) General Pediatrics

* History taking and examination of a pediatric patient which includes a crying and irritable child.
* Caring and compassionate attitude for the patients and their relatives.
* Consideration of social aspects of diseases.
* Operational aspects of immunization.
* Anthropometric assessment and nutritional classification.
* Developmental assessment.
* Assessment and management of diarrheal dehydration including oral rehydration therapy.
* Knowledge of and exposure to common pediatric practical procedures like intravenous line establishment and drug therapy, oxygen therapy, tube feeding, nasogastric tube insertion, blood transfusion, nebulizer therapy, *etc.*
* Knowledge of and exposure to common pediatric emergencies like cardiopulmonary resuscitation, shock, respiratory failure, congestive cardiac failure, status asthmaticus, status epilepticus, *etc.*
* Develop and approach for differentiating the common pediatric conditions (respiratory, gastrointestinal, cardiac,

hepatic, renal, nutritional, neurological, *etc.*) and outline their management.

* Knowledge of and exposure to common diagnostic procedures like venous sampling, lumbar puncture, liver biopsy, bone marrow aspiration, pleural tap, ascitic tap, *etc.*
* Provide ambulatory care to all sick children and ensure timely recognition of need and referral for specialized care.

B. STUDENT MUST DEMONSTRATE KNOWLEDGE OF

(i) Neonatology

(*a*) *Knowledge of*

* Nomenclature
* Care of normal newborn
* Common neonatal problems like transitional stools, physiological jaundice, umbilical cord care, etc.
* Feeding of neonates including low birth weight babies.

(*b*) *Describe/Explain Causes of, Diagnostic Procedures, Differential Diagnosis, Management Considerations and Complications of*

* Low birth weight (preterm and growth retarded)
* Asphyxia including assessmentt (APGAR score) and resuscitation
* Respiratory distress
* Jaundice
* Septicemia
* Life threatening congenital anomalies

(ii) General Pediatrics

(*a*) *Explain Essential Elements/Causes of, Diagnostic Procedures, Differential Diagnosis, Management Considerations and Complications of*

* Protein energy malnutrition including nutritional anthropometry and classification
* Vitamin and other micronutrient deficiencies
* Lactation management and weaning
* Growth and development
* Immunization and vaccines
* Common exanthematous illnesses (measles, varicella, rubella) and mumps
* Diphtheria
* Pertussis
* Tetanus including tetanus neonatorum
* Poliomyelitis
* Tuberculosis
* Malaria
* Enteric fever
* Important "local" infectious diseases (Kala Azar, leprosy, filariasis, guinea worm, Japanese encephalitis, dengue)
* Helmenthiasis
* AIDS in children
* Seizures in childhood including febrile convulsions
* Meningitis
* Viral encephalitis, cerebral malaria
* Acute respiratory infections
* Asthma in childhood
* Diahhrea and dysentery and their management (including ORS and persistent diarrhea)
* Chronic liver disease including ICC and portal hypertension

attending the Outpatient/Well Baby Clinics

* Immunization Sessions (performing immunization and principles of vaccine storage including cold chain)
* OPD handling of patients including management and diagnosis of common manifestations (fever, diarrhea, cough, abdominal pain, vomiting, failure to thrive, poor appetite, *etc.*)
* Performing common diagnostic procedures like venous sampling, lumbar puncture, liver biopsy, bone marrow aspiration, pleural tap, ascitic tap, etc.
* Performing common pediatric practical procedures like intravenous line establishment and drug therapy, oxygen therapy, tube feeding, nasogastric tube insertion, blood transfusion, nebulizer therapy, etc.
* Recognition of and use of commonly employed instruments for diagnostic and practical procedures (scalp vein, intravenous canula, intragastric tube, bag and mask, bone marrow aspiration needle, liver biopsy needle, lumbar puncture needle, *etc.*)
* Interpretation of common *X*-rays (rickets, scurvy, pneumonia, bronchopneumonia, primary complex, miliary tuberculosis, pleural effusion/empyema, pneumothorax, hydropneumothorax, renal calculus, cardiomegaly, left to right shunts, right to left shunts, increased intracranial pressure, esophageal varices, *etc.*)
* Managing common pediatric emergencies (diarrheal dehydration, respiratory distress – acute respiratory infections, status asthmaticus, cardiopulmonary resuscitation, shock, congestive heart failure, status epilepticus; *etc.*)

(*b*) *Diagnostic Procedures, Differential Diagnosis and Management of Children with*

* Protein energy malnutrition (includes associated micronutrient deficiency states–Vitamins A, B complex, C; iron)
* Rickets
* Generalized edema (nephrotic syndrome, cardiac cause, hepatic cause, kwashiorkor)
* Hepatosplenomegaly (hemolytic anemia, portal hypertension, chronic liver disease, Kala Azar/chronic malaria)
* Congenital heart disease (left to right shunt and right to left shunt)
* Rheumatic heart disease
* Respiratory infections (bronchopneumonia, bronchiolitis, pneumonia, pleural effusion, consolidation, collapse, tuberculosis)
* Poliomyelitis
* Cerebral palsy/retarded child
* Meningitis (tubercular, pyogenic)
* Hemiplegia, paraplegia
* Common malignancies (leukemia, lymphomas, neuroblastoma)
* Bleeding diathesis (hemophilia, ITP)
* Other anemias (aplastic, nutritional)
* Other common infectious illnesses (septicemia, post measles complications, enteric fever, *etc.*)
* Miscellaneous (Down syndrome, hypothyroid, AGN, hydrocephalus, meningomyelocele, *etc.*)

Note

Acquisition of skills will be supported by performance of tasks in relation to new-

borns and children which will be documented in a log book. The student will be expected to record atleast 20 cases out of which 5 each should be of neonatology and infectious diseases. The suggested prototypes for recording Neonatal and Pediatric histories, which can be modified according to local needs, are shown in *Annexures II and III.*

D. AREAS FOR POSSIBLE INTEGRATION

The committee felt that integrated teaching could be adapted to a wide range of topics. Salient examples of such areas of integration with various pre- and paraclinical disciplines are provided below:

Anatomy

* Growth and Development
* Congenital heart disease
* Anatomy of the fetus and transition of a fetus to newborn

Biochemistry

* Vitamin deficiency states
* Nutritional requirements
* Inborn errors of metabolism
* Fluid and electrolytic balance
* Acid base disorders
* Molecular biology (genetic engineering, gene therapy, application to pediatrics)
* Endocrinology

Physiology

* Congestive heart failure
* Fetal circulation
* Neonatal bilirubin metabolism
* Growth and development
* Organ function tests, (pulmonary, renal, hepatic, endocrine, cardiovascular, etc.)

Pharmacology

* Drug dosages
* Pharmacokinetics
* Rational drug therapy for all common diseases of Pediatrics

Pathology

* Nephrotic syndrome
* Rheumatic heart disease
* Malabsorption syndromes
* Anemias and blood transfusion
* Leukemias and malignancies
* Chronic liver disease

Microbiology

* Streptococcal infection
* Meningitis
* Tuberculosis
* Vaccine preventable diseases
* Gram negative septicemia
* Enteric infections
* Viral encephalitis
* Urinary tract infection
* Parasitic infections

Forensic Medicine

* Common childhood poisonings

Community Medicine

* National policy and programmes related to Child Health
* Primary Health Care

Obstetrics and Gynecology

* Integrating MCH and Family Welfare
* Minimum Perinatal Care.

Pediatric Surgery

* Common pediatric surgical problems

E. TIME FRAME

The suggested teaching-learning time for pediatrics and its distribution is outlined below:

1. *Four weeks:* Pediatrics/Infectious Diseases (Part-1; Phase-III). After completion of initial clinical posting in Medicine, Surgery, Obstetrics and Gynecology.
2. *Eight Weeks* (Part-II, Phase-III (8th and 9th Semester).

(i) Clinical teaching 3 h per day during morning hours.

(ii) Didactic lectures– 40 hours.

(iii) Tutorials/Demonstration/Seminar/ Group Discussions/Time for self learning.

(iv) Continuation of integrated teaching with Anatomy, Physiology, Biochemistry, Pathology, Pharmacology, Community-Medicine and Obstetrics and Gynecology.

F. INTERNSHIP

The details of the skills that an intern should acquire during his/her tenure in the Department of Pediatrics are as follows:

The interns should develop a reasonable competence for the following:

1. Diagnose and manage common childhood disorders including neonatal disorders and acute emergencies (enquiry from parents of sick children) examining a sick child and making appropriate documentation.
2. Carry out activities related to patient care such as laboratory work, investigative procedures and use of special equipments.

2(*a*). Diagnostic techniques (obtain and process samples): blood (including from femoral vein and umbilical cord), abscess, cerebrospinal fluid, urine, pleura, and peritoneum and common tissues biopsy techniques.

2(*b*). Techniques related to patients care: Immunization, perfusion techniques, feeding procedures, tuberculin testing, breast feeding, counselling.

2(*c*). Use of equipments: Vital monitoring, temperature monitoring, resuscitation at birth, care of children receiving intensive care.

3. Screening of newborn babies and those with risk factors for anomalies and steps for prevention in future.
4. Plan in collaboration with parents and individual, collective surveillance and growth and development of newborn babies, so that he is able to: (*a*) recognize growth abnormalities, (*b*) recognize anomalies of psychomotor development, and (*c*) detect congenital anomalies.
5. Assess nutritional and dietary status of infants and children and organize prevention, detection and follow-up of deficiency disorders both at individual and community level such as: (*a*) Malnutrition, (*b*) Deficiencies of vitamins specially A, B, C and D, and (*c*) Iron deficiency.
6. Institute early management of common childhood disorders with special reference to pediatric dosage and oral rehydration therapy.
7. Participate actively in National Health Programmes oriented towards children in the community.

II. BOOKS/READING MATERIAL

A. *Books Recommended*

1. Essential Pediatrics – O.P. Ghai

2. Essentials in Pediatrics – S.T. Achar
3. Care of the Newborn – Meharban Singh
4. Manual of Practical Neonatal Care – D.K. Guha

B. *Reference Books*

1. Text Book of Pediatrics published by IAP
2. Nelson's Text Book of Pediatrics.
3. Illingworth's (Normal and Abnormal Child)
4. Pediatric and Neonatal Emergencies – R.N. Srivastava, Man Mohan, H.P.S. Sachdev, R.K. Puri
5. Tuberculosis in Children – V. Seth, R.K. Puri, H.P.S. Sachdev.
6. Pediatric Diagnosis – Richmond and Green
7. Diseases of Children in Tropics and Sub-Tropics. Standfield, Jelliffe.

A Textbook of Pediatrics for undergraduates is being shortly developed by the Indian Academy of Pediatrics.

III. TEACHING METHODOLOGY/ EVALUATION

(i) Teaching Methodology

The committee felt that emphasis should be on active learning. A judicious mix of various methods like didactic lecturers, employing audio-visual aids, demonstrations, tutorials and small group learnings should be employed. Enough flexibility should be provided to employ newer techniques and innovation in teaching.

(ii) Evaluation

The general princi;es of evaluation including weightage for internal assessment should be on lines similar to other clinical disciplines. In brief, the scheme of evaluation shall be as follows:

(a) *Theory:* One paper of 80 marks, consisting of 2 parts.

Part A. Social Pediatrics, Growth and Development, Nutrition, Immunization, Neonatology.

Part B. Common diseases of infancy and childhood including critical care.

The paper will have MCQs carrying a weightage of at least 40% and the remaining as structured essay type questions.

(b) *Practical:* This will carry 80 marks, which will be distributed as follows:

(*i*) Two clinical cases including newborn – 60 marks

(*ii*) Interpretive and didactive exercises involving tests of clinical skill application and use of equipment and principles of critical care and emergencies handling.

Efforts should be made to evaluate by newer objective techniques like OSPE and OSCE.

Note

1. Internal evaluation must be conducted after each training session by the faculty involved in the teaching programme. It should include both written and clinical assessment.
2. Due weightage should also be given to day to day assessment, evaluation of student assignment, preparation for seminar and clinical case presentation. It should also incorporate the log book where at least 20 cases should be recorded of which 5 each should relate to neonatology and infectious diseases.

Evaluation of Internship: The skills expected to be acquired by an intern should be evaluated at the end of posting. A

format for evaluating the same, which can be modified according to local needs, is given in *Annexure IV.*

IV. OTHER RECOMMENDATIONS

(i) *Physical Facilities in the Department:*

The Department of Pediatrics in each Medical College must be properly set for comprehensive teaching of child health and disease. It must cover all the aspects – preventive, curative, promotive, and rehabilitative components and not just provide for curative services. Each Department, therefore, must have:

(1) 1.1 *Pediatric Beds*–In a ratio of 6 beds for each 10 undergraduate admissions of which 10-15% should be reserved for intensive care.

1.2 *Intermediate Care New Born Nursery* (Level-2): In a ratio of 5 beds for every 1000 deliveries.

1.3 *Pediatric Surgery Beds:* In a ratio of 3 beds for 10 undergraduate admissions.

(2) *Facilities for Preventive and Promotive Pediatrics having following Services*

1. Neonatal follow-up clinic
2. Under five clinic with facilities for growth monitoring and immunization
3. Nutrition Rehabilitation Clinic
4. Diarrheal Treatment and Management Unit
5. Child Guidance Clinic
6. Rehabilitation Clinic in collaboration with physiotherapy

(3) *Social Pediatrics*

1. Play room for children
2. Mother craft and functional literacy in the mothers
3. Creche for the institutional staff children and siblings of hospitalized children and children of hospitalized women

(4) *Outpatient Clinics*

(*i*) Routine

(*ii*) Subspeciality clinics

(5) *Field Practice Areas*

There should be an active liaison and involvement (undergraduates and interns) with the Community Pediatrics practice areas both in the urban and rural setting.

1. *Urban*–Urban Health Centres/Dispensaries, ICDS Beneficiary Areas (Anganwadi), *etc.*
2. *Rural*–District Health System, (District Hospital, Taluka Hospital, Community Health Centre, Primary Health Centre, Subcentre, Village–*e.g.,* ICDS Beneficiary area).

(ii) *Other Aspects*

1. Change of attitude of teachers through suitable teaching material and training in educational technology must be attempted. Establishment of Central Resource Centre at MCI on the highest priority followed by similar centres in different regions would be a welcome step in this direction.
2. The recommendations on Pediatrics deserve a specific attention to Minimum Perinatal Care, which is one of the most important need for child health and child survival. The curriculum for the same may be selected from the detailed report of the Task Force on Maternal Mortality of Government of India (1987).
3. In order to acquaint the medical student with various National Progra-

mmes on Child Health, it is desirable that a small book of about 100 pages is produced. This book should aim at imparting knowledge about these National Programmes beyond the stereotype narratives of the Government and show avenues to students for involvement in operation and monitoring of programmes. The contents would contain MCH, ORT, Immunization, Minimum Perinatal Care, Tuberculosis, Vitamin A, Leprosy and other Vector borne diseases (Kala Azar, Filariasis, Guinea Worm infestation).

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Annexure II–*Prototype of Neonatal Case Record*

Father's Name	Age	Occupation		Education
Mother' Name	Age	Occupation		Education
Family Income	Address			

Mother's History

Booked/Unbooked				
ANC visits outside		ANC visits		
Tetanus toxoid	1st	2nd	3rd	Booster
LMP		EDD		
Gestation		Presentation		
Height		Weight		
Blood Group	ICT			
Pallor	Hb			Urine Examination

Previous Medical History

Family History

Past Obstetrical History

Illness, Drugs, *X*-ray in pregnancy

Antenatal complications

Labour : Spontaneous/Induced/Augmented

No. of internal examinations done outside

No. of internal examinations done in hospital

Duration of ruptured membranes

Fetal heart irregularity	Yes/No	Duration	Rate
Meconium stained liquor	Yes/No	Thin/Thick	Duration
Duration of Stage	**1st**	2nd	**3rd**

Drugs during labor:

- Pethidine
- Syntocinon
- I/V fluids
- Others

Type of Delivery If aided, indication

Liquor: Clear/Foul smelling/Meconium stained

Placenta : Weight

Description

Placental swab : Sent/Not sent

Report

Infant's Record

Date of birth Sex Unit No. Age at examination

1st gasp 1st cry Respiration established at

Apgar score at 1 min 5 min

Birth weight Head circumference Length

General Observation

Fontanelle Color Pallor Jaundice

Scalp Oral cavity Palate

Eyes Ears Nose

Limbs Digits Hips Spine

Skin Genitalia

Heart rate Respiratory rate Temperature

Heart Lungs

Abdomen:

Umbilical stump Umbilical vessels

Liver Spleen Any other mass

CNS:

Activity Neonatal reflexes:

Muscle tone Moro's

Movements Rooting

Deep tendon reflexes Sucking

Grasp

Gestational Assessment

Scalp hair Ear cartilage Genitalia

Skin Breast nodule Sole creases

Urine passed first at

Meconium passed first at

Diagnosis

Date	Age	Feeding	Stool	Color	Jaundice	Umbilical stump

Annexure III–*Patient's Case Record*

Informant:

Name

Unit No.

Date of birth Age

Sex

Date of admission

Date of discharge

Chief complaints

History of present illness.

Development history

Age at which milestones achieved

Other milestone

Recognition of mother

Social smile

Head holding

Sitting

Crawling

Standing

Walking

Immunization history

Age and place of vaccination:

Boosters

BCG (Scar)

DPI I II III

OPV I II III IV V

Measles MMR

TA I II

Dietary history

Family history

Silings

Illness

Socio-economic history

Father's occupation and education

Mother's occupation and education

Family income

Family size

Housing conditions

Sanitary environment

Physical Examination

The order of presentation depends on the individual case. A guideline for examination is given below:

General Observation

Sensorium	Facies
Nutrition	Signs of Vit. deficiencies
Pallor/Jaundice/Cyanosis	Edema

General Examination

Anterior fontanel		Eyes
Ear	Nose	
Teeth	(No.)	Mouth

Throat

Lymph nodes

Hair

Skin

Nails

Bones and joints

Anthropometry

Weight

Height/Length

Wt for age

Ht for age

Wt for height

Head circumference

Percentile

Mid arm circumference

US : LS ratio

Vital Signs

HR

RR

BP

Temperature

Systemic Examination

Chest

CVS

Abdomen

CNS

Provisional diagnosis

Investigations

Final diagnosis (Give complete List)

Treatment

Date	Clinical Notes	Treatment advised

Annexure IV–*Assessment Form of Interns*

Name..... **Period of Posting**.....

Weekly Performance
(Code from 5 to 1)

Punctuality				
Ward work				
OPD work				
Statistics				
Diligence				
Responsibility				
Interest				
Compassion				
Registrar's signature				

General Remarks by Senior Doctors

Case Management by the Intern

Case (Type)	Emerg Mgt (Note procedure done)	Hx & Exam write up (Comment)	Diagnostic procedure (which done)	Differential diagnosis (List)	Case Mgt (Essential done)	Social factor mgt.	Other	Overall Speakers

Score 5 = Superior; 4 = Good; 3 = Acceptable; 2 = Lacking; 1 = Poor.