

MBBS Course content & Learning Objectives

for Undergraduate Students

Department of Pediatrics

All India Institute of Medical Sciences

Rishikesh

LEARNING OBJECTIVES

The broad goals of the teaching of undergraduate students in Pediatrics are to acquire knowledge and appropriate skills for optimally dealing with major health problems of children and to ensure their optimal growth and development.

Knowledge

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

- (a) Describe the normal growth and development during fetal life, neonatal period, childhood and adolescence and outline deviations thereof;
- (b) Describe the common pediatrics disorder and emergencies in terms of epidemiology, etiopathogenesis, clinical manifestations, diagnosis, rational therapy and rehabilitation;
- (c) State age related requirements of calories, nutrients, fluids, drugs etc. in health and disease;
- (d) Describe preventive strategies for common infectious disorders, malnutrition, genetic and metabolic disorders, poisonings, accidents and child abuse;
- (e) Outline national programs relating to child health including immunization programs
- f) Understand & recognize common neonatal problems, able to understand the physiology of neonatal transition

Skills

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

- (a) Take a detailed pediatrics history,
- (b) Conduct an appropriate physical examination of children including neonates,
- (c) Make clinical diagnosis,
- (d) Conduct common bedside investigative procedures, interpret common laboratory investigations
- (e) Plan and institute therapy;
- (f) Take anthropometric measurements,
- (g) Resuscitate newborn infants with bag and mask at birth
- (h) Prepare oral rehydration solution
- (i) Perform tuberculin test
- (j) Administer vaccines available under current national programs,
- (k) Start an intravenous line and provide naso-gastric feeding,
- (l) Observe venesection and intra-osseous infusion if possible.
- (m) Conduct diagnostic procedures such as lumbar puncture, bone marrow aspiration, pleural tap and ascitic tap;
- (n) Observe liver and kidney biopsy.
- (o) Distinguish between normal newborn babies and those requiring special care and institute early care to all new born babies including care of pre-term and low birth weight babies, provide correct guidance and counselling in breast-feeding.
- (p) Provide ambulatory care to all sick children, identify indications for specialized/inpatient care and ensure timely referral of those who require hospitalization.

COURSE CONTENT

Vital statistics

Must know

- Definition and overview of Pediatrics with special reference to age-related disorders. Population structure, pattern of morbidity and mortality in children.
- Maternal, perinatal, neonatal, infant and preschool mortality rates. Definition, causes, present status and measures for attainment of goals.

Should Know

- Current National programs such as ICDS, RCH, Vitamin A prophylaxis, UIP, Pulse polio, ARI, Diarrhea Control Program, *etc.*

May know

- Other National programs

Growth and Development

Must know

- Normal growth from conception to maturity.
- Anthropometry — measurement and interpretation of weight, length/height, head circumference, mid-arm circumference. Use of weighing machines, infantometer.
- Interpretation of Growth Charts: Road to Health card and percentile growth curves
- Abnormal growth patterns-failure to thrive, short stature.
- Growth patterns of different organ systems such as lymphoid, brain and sex organs.
- Normal pattern of teeth eruption.
- Principles of normal development.

Should know

- Important milestones in infancy and early childhood in the areas of gross motor, fine motor, language and personal-social development. 3-4 milestones in each of the developmental fields, age of normal appearance and the upper age of normal.
- Preventable causes and assessment of developmental retardation.
- Psychological and behavioral problems.

May know

- Measurement and interpretation of sitting height, US: LS ratio and arm span.
- Age-independent anthropometric measurement-principles and application.
- Sexual maturity rating.

Nutrition

Must know

- Normal requirements of protein, carbohydrates, fat, minerals and vitamins for newborn, children and pregnant and lactating mother. Common food sources.
- Breastfeeding—physiology of lactation, composition of breast milk, colostrum, initiation and technique of feeding. Exclusive breastfeeding - Definition and benefits. Characteristics and advantages of breast milk. Hazards and demerits of prelacteal feed, top milk and bottle feeding. Feeding of LBW babies.

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- Infant feeding/weaning foods, method of weaning.
- Assessment of nutritional status of a child based on history and physical examination.

Should know

- Protein energy malnutrition - Definition, classification according to IAP/Welcome Trust, acute versus chronic malnutrition. Clinical features of marasmus and kwashiorkor. Causes and management of PEM including that of complications. Planning a diet for PEM.
- Vitamins-Recognition of vitamin deficiencies (A, D, K, C, B-Complex). Etiopathogenesis, clinical features, biochemical and radiological findings, differential diagnosis and management of nutritional rickets and scurvy. Hypervitaminosis A and D.

May know

- Characteristics of transitional and mature milk (foremilk and hind milk). Prevention and management of lactation failure and feeding problems.
- Definition, causes and management of obesity.

Immunization

Must know

- National Immunization Program.
- Principles of Immunization. Vaccine preservation and cold-chain.
- Types, contents, efficacy storage, dose, site, route, contra-indications and adverse reactions of vaccines — BCG, DPT, OPV, Measles, MMR, and Typhoid: Rationale and methodology of Pulse Polio Immunization.

Should know

- Investigation and reporting of vaccine preventable diseases. AFP (Acute Flaccid Paralysis) surveillance.

May know

- Special vaccines like Hepatitis B, *H. influenzae* b, Pneumococcal, Hepatitis A, Chicken pox, Meningococcal, Rabies.

Infectious Diseases

Must know

- Epidemiology, basic pathology, natural history, symptoms, signs, complications, investigations, differential diagnosis, management and prevention of common bacterial, viral and parasitic infections in the region, with special reference to vaccine-preventable diseases: Tuberculosis, poliomyelitis, diphtheria, whooping cough, tetanus including neonatal tetanus, measles, mumps, rubella,

Should know:

- typhoid, viral hepatitis, cholera, chickenpox,
- giardiasis, amebiasis, intestinal helminthiasis, malaria, dengue fever, AIDS.

May know

- Kala-azar, leprosy, chlamydia infection

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Hematology

Must know

- Causes of anemia in childhood. Classification based on etiology and morphology.
- Epidemiology, recognition, diagnosis, management and prevention of nutritional anemia-iron deficiency, megaloblastic.
- Clinical approach to a child with anemia with lymphadenopathy and/or hepato-splenomegaly.
- Epidemiology, clinical features, investigations and management of thalassemia.
- Approach to a bleeding child.

Should Know

- Diagnosis of acute lymphoblastic leukemia and principles of treatment.
- Clinical features and management of hemophilia, purpura.
- Diagnosis and principles of management of lymphomas.

May know

- Types, clinical features and management of acute hemolytic anemia.

Respiratory system

Must know

- Clinical approach to a child with cyanosis, respiratory distress, wheezing. Significance of recession, retraction.
- Etiopathogenesis, clinical features, complications, investigations, differential diagnosis and management of acute upper respiratory infections, pneumonia with emphasis on bronchopneumonia, bronchiolitis, bronchitis. Acute and chronic otitis media.
- Etiopathogenesis, clinical features, diagnosis, classification and management of bronchial asthma. Treatment of acute severe asthma.

Should know

- Pulmonary tuberculosis- infection versus disease, difference between primary and post-primary tuberculosis. Etiopatho-genesis, diagnostic criteria in children versus adults. Diagnostic aids - technique and interpretation of Mantoux test and BCG test. Radiological patterns, chemo-prophylaxis and treatment.
- Diagnosis and management of foreign body aspiration. Differential diagnosis of stridor.
- Pathogenesis, clinical features and management of pneumothorax, pleural effusion and empyema.

May know

- Multidrug resistant tuberculosis, bronchi-ectasis, pulmonary cysts
- Congenital malformations of lungs

Gastrointestinal tract

Must know

- Clinical approach to a child with jaundice, vomiting, abdominal pain, bleeding, hepatosplenomegaly.
- Acute diarrhea disease- Etiopathogenesis, clinical differentiation of watery and invasive diarrhea, complications of diarr-heal illness. Assessment of dehydration, treatment at home and in hospital. Fluid and electrolyte management. Oral rehydration, composition of ORS.

Should Know

- Clinical features and management of acute viral hepatitis, causes and diagnosis of chronic liver disease.
- Common causes of constipation.
- Abdominal tuberculosis

May know

- Causes, clinical features and management of portal hypertension, Reye's syndrome, Celiac disease.
- Drug induced hepatitis

Central Nervous System

Must know

- Clinical approach to a child with coma, convulsions, mental retardation.
- Clinical diagnosis, investigations and treatment of acute pyogenic meningitis, encephalitis and tubercular meningitis.
- Seizure disorders - Causes and types of convulsions at different ages. Diagnosis, categorization and management of epi-lepsy (broad outline). Febrile convulsions - definition, types, management.

Should Know

- Causes, diagnosis and management of cerebral palsy.
- Acute flaccid paralysis - Differentiation between Polio and Gullain-Barre syndrome.
- Microcephaly, hydrocephalus, chorea

May know

- Infantile tremor syndrome, infantile hemiplegia

Cardiovascular system

Must know

- Clinical features, diagnosis, investigation, treatment and prevention of acute rheumatic fever. Common forms of rheumatic heart disease in childhood. Differentiation between rheumatic and rheumatoid arthritis.
- Recognition of congenital acyanotic and cyanotic heart disease. Hemodynamics, clinical features and management of VSD, PDA, ASD and Fallot's tetralogy.

Should Know

- Recognition of congestive cardiac failure in infants and children.
- Hypertension in children-recognition, etiology, referral.

May know

- Diagnosis and management of bacterial endocarditis, pericardial effusion, myo-carditis.

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Genitourinary system

Must know

- Etiopathogenesis, clinical features, diagnosis, complications and management of acute post-streptococcal glomerulonephritis and nephrotic syndrome.
- Etiology, clinical features, diagnosis and management of urinary tract infection - related problems.

Should Know

- Etiology, diagnosis and principles of management of acute renal failure.
- Causes and diagnosis of obstructive uropathy in children.
- Diagnosis and principles of management of chronic renal failure.
- Causes and diagnosis of hematuria.

May know

- Renal and bladder stones
- Hemolytic-uremic syndrome

Endocrinology

Must know

- Etiology clinical features and diagnosis of diabetes and hypothyroidism, hyperthyroidism and goiter in children.

Should know:

- Addisons disease ,Congenital adrenal hyperplasia& other adrenal related diseases

May know

- Delayed and precocious puberty,pituitary disorders

Neonatology

Must know

- Definition - live birth, neonatal period, classification according to weight and gestation, mortality rates.
- Delivery room management including neonatal resuscitation and temperature control
- Etiology, clinical features, principles of management and prevention of birth asphyxia.
- Birth injuries - causes and their recognition.
- Care of the normal newborn in the first week of life. Normal variations and clinical signs in the neonate.
- Breastfeeding - physiology and its clinical management
- Identification of congenital anomalies at birth with special reference to anorectal anomalies, tracheo-esophageal fistula, diaphragmatic hernia, neural tube defects.
- Neonatal jaundice: causes, diagnosis and principles of management.
- Neonatal infection - etiology, diagnosis, principles of management. Superficial infections, sepsis.

Should Know:

- Low birth weight babies
- Causes of prematurity and small-for-date baby, clinical features and differentiation. Principles of feeding and temperature regulation.

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- Problems of low birth weight babies.
- Identification of sick newborn (*i.e.*, detection of abnormal signs - cyanosis, jaundice, respiratory distress, bleeding, seizures, refusal to feed, abdominal distension, failure to pass meconium and urine).

May know

- Recognition and management of specific neonatal problems-hypoglycemia, hypo-calcemia, anemia, seizures, necrotizing enterocolitis, hemorrhage.
- Common intra-uterine infections.
- Transportation of a sick neonate.

Pediatric Emergencies

Must know

- Status epilepticus.
- Status asthmaticus / Acute severe asthma.
- Shock and anaphylaxis.

Should know: Hypertensive emergencies.

- Gastrointestinal bleeding.
- Comatose child.
- Congestive cardiac failure.

May Know

- Acute renal failure.
- Burns

Fluid-Electrolyte

Must know

- Principles of fluid and electrolyte therapy in children

Should know

- Pathophysiology of acid-base imbalance and principle of management

May Know:

- Practical aspects of fluid& electrolyte therapy

Genetics

Must know

- Principles of inheritance and diagnosis of genetic disorders
- Down's syndrome.

Should know:

- Turners syndrome,
- Edwards syndrome
- Patau's syndrome

May know:

- Rare genetic syndromes
- Single gene disorders

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Behavioral Problems

Must know

- Breath holding spells, nocturnal enuresis,

Should know:

- temper tantrums, pica.

May know

- Syndromes with tics

Pediatric Surgical Problems

Must know

- Diagnosis and timing of surgery of cleft lip/palate, hypospadias, undescended testis,

Should know

- tracheo-esophageal fistula, hydro-cephalus, CTEV, umbilical and inguinal hernia,

May Know

- anorectal malformations, hypertrophic pyloric stenosis

Therapeutics

Must know

- Pediatric doses, drug combinations,

Should Know:

- drug interactions,

May Know

- age specific choice of antibiotics,

List of X-rays

Must know

1. Pneumonia
2. Primary complex, Miliary tuberculosis
3. Obstructive emphysema
4. Pleural effusion

Should know

5. Pneumothorax
6. Normal thymus
7. Congenital heart disease with increased/ decreased pulmonary blood flow
8. Rickets, scurvy

May Know

9. Skull (suture separation, enlarged sella, and raised intracranial tension)
10. Hemolytic anemia

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List of Instruments & equipments

Must know

1. Tuberculin syringe
2. Intravenous cannula
3. Feeding tube, suction catheter
4. Lumbar puncture needle

Should know

5. Bone marrow aspiration needle
6. Liver biopsy needle
7. Ambu bag and mask
8. Endotracheal tube, airways
9. Laryngoscopes
10. Emergency drugs/ vaccine
11. Radiant warmer
12. Phototherapy unit
13. Fibro-optic phototherapy unit
14. Nebulization set
15. Infantometer
16. Callipers for skin fold thickness measurement
17. Weighing scale
18. Syringe infusion pump

May know

19. Pulse oximeter
20. Oxygen delivery devices

List of Procedures

Must know

1. Injections (IM, IV, S/C, I/D)
2. Blood sampling, IV cannula insertion
3. Naso-gastric tube insertion

Should know

4. Lumbar puncture
5. Pleural/ Ascitic tap
6. Bone marrow aspiration
7. Liver/ Kidney biopsy

May know

8. Peritoneal dialysis
9. Umbilical cannulation
10. Urethral catheterization

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