



DEPARTMENT OF PEDIATRICS

Jawaharlal Nehru Medical College

Aligarh Muslim University

Course Title : M.D. PEDIATRICS

Course code : MDPD

Course category : Postgraduate training programme for MD in Pediatrics

Course duration : 3 years

Type of Course : Theory and Practical (Clinical)

PROGRAM GOALS

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

- (i). recognizes the health needs of infants, children and adolescents and carries out professional obligations in keeping with principles of National Health Policy and professional ethics;
- (ii). has acquired the competencies pertaining to pediatrics that are required to be practiced in the community and at all levels of health care system;
- (iii). has acquired skills in effectively communicating with the child, family and the community;
- (iv). is aware of the contemporary advances and developments in medical sciences as related to child health;
- (v). is oriented to principles of research methodology; and
- (vi). has acquired skills in educating medical and paramedical professionals.

PROGRAM OBJECTIVES

At the end of the MD training program a Pediatric Postgraduate is expected to possess the following Subject Specific Competencies:

Cognitive domain

At the end of the MD course in Paediatrics, the students should be able to:

1. Recognize the key importance of child health in the context of the health priority of country
2. Practice the specialty of Paediatrics in keeping with the principles of professional ethics

3. Identify social, economic, environmental, biological and emotional determinants of child and adolescent health, and institute diagnostic, therapeutic, rehabilitative, preventive and promotive measures to provide holistic care to children
4. Recognize the importance of growth and development as the foundation of Paediatrics and help each child realize her/his optimal potential in this regard
5. Take detailed history; perform full physical examination including neuro-development and behavioral assessment and anthropometric measurements in the child and make clinical diagnosis
6. Perform relevant investigative and therapeutic procedures for the paediatric patient
7. Interpret important imaging and laboratory results
8. Diagnose illness based on the analysis of history, physical examination and investigations
9. Plan and deliver comprehensive treatment for illness using principles of rational drug therapy
10. Plan and advice measures for the prevention of childhood disease and disability
11. Plan rehabilitation of children with chronic illness and handicap and those with special needs
12. Manage childhood emergencies efficiently
13. Provide comprehensive care to normal, 'at risk' and sick neonates
14. Demonstrate skills in documentation of case details, and of morbidity and mortality data relevant to the assigned situation
15. Recognize the emotional and behavioral characteristics of children, and keep these fundamental attributes in focus while dealing with them
16. Demonstrate empathy and humane approach towards patients and their families and keep their sensibilities in high esteem
17. Demonstrate communication skills of a high order in explaining management and prognosis, providing counseling and giving health education messages to patients, families and communities
18. Develop skills as a self-directed learner. Recognize continuing educational needs; use appropriate learning resources and critically analyze published literature in order to practice evidence-based Paediatrics
19. Demonstrate competence in basic concepts of research methodology and epidemiology
20. Facilitate learning of medical/nursing students, practicing physicians, paramedical health workers and other providers as a teacher-trainer
21. Implement National Health Programs, effectively and responsibly
22. Organize and supervise the desired managerial and leadership skills
23. Function as a productive member of a team engaged in health care, research and education.
24. Recognize mental conditions, characterized by self absorption, reduced ability to respond, abnormal functioning in social interaction with or without repetitive

behavior, poor communication (autism) and collaborate with Psychiatrists/Child Psychologists for the treatment of such patients.

Affective Domain

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

Psychomotor domain

At the end of the course, the student should have acquired following skills:

1. History and Examination

The student must gain proficiency in eliciting, processing and systemically presenting Pediatrics history and examination with due emphasis of the important and minimization of less important facts. The following skills must be achieved:

- i. Recognition and demonstration of physical findings
- ii. Recording of height, weight, head circumference and mid arm circumference and interpretation of these parameters using growth reference standard assessment of nutritional status and growth
- iii. Assessment of pubertal growth
- iv. Complete development assessment by history and physical examination, and recognizing developmental disabilities, including autism
- v. Systematic examination
- vi. Neonatal examination including gestation assessment by physical neurological criteria
- vii. Examination of the fundus and the ear-drum
- viii. Skills related to IMNCI and IYCF

2. Monitoring Skills

Non-invasive monitoring of blood pressure, pulse and respiratory rates, saturation; ECG

3. Investigative Procedures

- i. Venous, capillary and arterial blood sampling using appropriate precautions
- ii. Pleural, peritoneal, pericardial aspiration; subdural, ventricular and lumbar puncture
- iii. Tuberculin test
- iv. Biopsy of liver and kidney
- v. Urethral catheterization and suprapubic tap
- vi. Gastric content aspiration

4. Therapeutic Skills

- i. Breast feeding assessment and counseling; management of common problems
- ii. Establishment of central and peripheral vascular access; CVP monitoring
- iii. Administration of injections using safe injection practices
- iv. Determination of volume and composition of intravenous fluids and their administration
- v. Neonatal and Pediatric basic and advanced life support
- vi. Oxygen administration, CPAP and nebulization therapy
- vii. Blood and blood component therapy
- viii. Intraosseous fluid administration
- ix. Phototherapy, umbilical artery and venous catheterization and exchange transfusion
- x. Nasogastric feeding
- xi. Common dressings and abscess drainage; intercostal tube insertion
- xii. Basic principles of rehabilitation
- xiii. Peritoneal dialysis
- xiv. Mechanical ventilation

5. Bed side investigations, including

- i. Complete blood counts, micro ESR, peripheral smear
- ii. Urinalysis
- iii. Stool microscopy and hanging drop
- iv. Examination of CSF and other body fluids
- v. Blood sugar
- vi. Shake test on gastric aspirate
- vii. Gram stain, ZN stain

6. Patient Management Skills

- i. Proficiency in management of pediatric emergencies, including emergency triaging
- ii. Drawing and executing patient management plan and long term care
- iii. Documenting patient records on day to day basis and problem oriented medical record
- iv. Care of a normal and sick newborn, management of neonatal disorders hypothermia, sepsis, convulsions, jaundice, metabolic problems
- v. Identifying need for timely referral to appropriate departments/health facility and pre-transport stabilization of the sick child

7. Communication Skills; Attitudes; Professionalism

- i. Communicating with parents/child about nature of illness and management plan prognostication, breaking bad news
- ii. Counseling parents on breast feeding, nutrition, immunization, disease prevention, promoting healthy life style
- iii. Genetic counseling
- iv. Communication and relationship with colleagues, nurses and paramedical workers
- v. Appropriate relation with pharmaceutical industry

- vi. Health economics
- vii. Professional and research ethics

8. Interpretation of Investigations

- i. Plan x-ray chest, abdomen, skeletal system
- ii. Contrast radiological studies: Barium swallow, barium meal, barium enema, MCU
- iii. Ultrasound skull and abdomen
- iv. Histopathological, biochemical and microbiological investigations
- v. CT Scan and MRI (skull, abdomen, chest)
- vi. Electrocardiogram, electroencephalogram
- vii. Arterial and venous blood gases
- viii. Desirable: Interpretation of radio-isotope studies, audiogram, neurophysiological studies, (BERA, VER, Electromyography [EMG], Nerve Conduction Velocity [NCV]), lung function tests

9. Academic Skills

- i. Familiarity with basic research methodology, basic IT skills. Planning the protocol of the thesis, its execution and final report
- ii. Review of literature
- iii. Conducting clinical sessions for undergraduates medical students
- iv. Desirable: writing and presenting a paper. Teaching sessions for nurses and medical workers

SYLLABUS

Course contents

Guidelines

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

Basic Sciences

- Principles of inheritance, chromosomal disorders, single gene disorders, multifactorial / polygenic disorders, genetic diagnosis and prenatal diagnosis, pedigree drawing.
- Embryogenesis of different organ systems especially heart, genitourinary system, gastro-intestinal tract. Applied anatomy and functions of different organ systems.
- Physiology of micturition and defecation; placental physiology; fetal and neonatal circulation; regulation of temperature, blood pressure, acid base balance, fluid electrolyte balance and calcium metabolism.
- Vitamins and their functions.
- Hematopoiesis, hemostasis, bilirubin metabolism.

- Growth and development at different ages, growth charts; puberty and its regulation.
- Nutrition: requirements and sources of various nutrients.
- Pharmacokinetics of common drugs, microbial agents and their epidemiology.
- Basic immunology, biostatistics, clinical epidemiology, ethical and medico-legal issues.
- Teaching methodology and managerial skills.

Understanding the definition, epidemiology, aetiopathogenesis, presentation, complications, differential diagnosis and treatment of the following, but not limited to:

Growth and development

- principles of growth and development
- normal growth and development
- failure to thrive and short stature
- sexual maturation and its disturbances
- Autism (as mentioned in objective 24)

Neonatology

- perinatal care
- care in the labor room and resuscitation
- prematurity
- common transient phenomena
- infections
- jaundice
- neurologic disorders
- renal disorders
- thermoregulation and its disorders
- low birth weight
- newborn feeding
- respiratory distress
- apnea
- anemia and bleeding disorders
- gastrointestinal disorders
- malformations
- understanding of perinatal medicine

Nutrition

- maternal nutritional disorders; impact on fetal outcome
- infant feeding including complementary feeding
- breast feeding
- adolescent nutrition
- nutrition for the low birth weight
- protein energy malnutrition
- vitamin and mineral deficiencies
- obesity
- parenteral and enteral nutrition
- nutritional management of systemic illness (GI, hepatic, renal illness)

Cardiovascular

- congenital heart diseases (cyanotic and acyanotic)
- infective endocarditis
- disease of myocardium (cardiomyopathy, myocarditis)
- hyperlipidemia in children
- rheumatic fever and rheumatic heart disease
- arrhythmia
- diseases of pericardium
- systemic hypertension

Respiratory

- congenital and acquired disorders of nose, tonsils and adenoids
- congenital anomalies of lower respiratory tract
- foreign body in larynx, trachea and bronchus
- subglottic stenosis (acute, chronic)
- bronchial asthma
- acute pneumonia, bronchiolitis
- recurrent, interstitial pneumonia
- atelectasis
- pleural effusion
- infections of upper respiratory tract
- obstructive sleep apnea
- acute upper airway obstruction
- trauma to larynx
- neoplasm of larynx and trachea
- bronchiolitis
- aspiration pneumonia, GER
- suppurative lung disease
- lung cysts, mediastinal mass

Gastrointestinal and liver disease

- disease of oral cavity
- peptic ulcer disease
- intestinal obstruction
- malabsorption syndrome
- irritable bowel syndrome
- Hirschsprung disease
- hepatitis
- chronic liver disease
- metabolic diseases of liver
- disorders of deglutition and esophagus
- congenital pyloric stenosis
- acute and chronic pancreatic disorders
- acute and chronic diarrhea
- inflammatory bowel disease
- anorectal malformations
- hepatic failure
- Budd-Chiari syndrome
- cirrhosis and portal hypertension

Nephrologic and Urologic disorders

- acute and chronic glomerulonephritis
- hemolytic uremic syndrome
- VUR and renal scarring
- renal tubular disorders
- congenital and hereditary renal disorders
- posterior urethral valves
- undescended testis, hernia, hydrocoele
- xanthema syndrome
- urinary tract infection
- involvement in systemic diseases
- neurogenic bladder, voiding dysfunction
- renal and bladder stones
- hydronephrosis
- Wilms tumor

Neurologic disorders

- seizure and non-seizure paroxysmal events
- meningitis, encephalitis
- febrile encephalopathies
- neurocysticercosis and other neuroinfestations
- neurometabolic disorders
- neuromuscular disorders
- learning disabilities
- acute flaccid paralysis and AFP surveillance
- movement disorders

- SSPE

Hematology and Oncology

- deficiency anemias
- aplastic anemia
- thrombocytopenia
- blood component therapy
- bone marrow transplant/stem cell transplant
- myelodysplastic syndrome

Endocrinology

- hypopituitarism/hyperpituitarism
- pubertal disorders
- adrenal insufficiency
- adrenogenital syndromes
- hypoglycemia
- gonadal dysfunction and intersexuality

Infections

- bacterial (including tuberculosis)
- fungal
- rickettsial
- protozoal and parasitic
- control of epidemics and infection prevention

Emergency and Critical Care

- emergency care of shock
- respiratory failure
- status epilepticus
- fluid and electrolyte disturbances
- poisoning
- scorpion and snake bites

Immunology and Rheumatology

- arthritis (acute and chronic)
- immunodeficiency syndromes

ENT

- acute and chronic otitis media
- post-diphtheritic palatal palsy
- allergic rhinitis/sinusitis

- epilepsy, epileptic syndromes

- neuroblastoma hemolytic anemias
- pancytopenia
- disorders of hemostasis
- transfusion related infections
- acute and chronic leukemia
- Lymphoma
- hypercoagulable state

- diabetes insipidus
- hypo – and hyper-thyroidism
- Cushing syndrome
- Diabetes mellitus
- Short stature
- Obesity

- viral (including HIV)
- parasitic
- mycoplasma
- nosocomial infections
- safe disposal of infective material

- cardio-respiratory arrest
- acute renal failure
- acute severe asthma
- acid-base disturbances
- accidents

- vasculitides
- systemic lupus erythematosus

- hearing loss
- acute/chronic tonsillitis/adenoids
- foreign body

Skin Diseases

- exanthematous illnesses
- pigment disorders
- infections
- atopic, seborrheic dermatitis
- alopecia
- vascular lesions
- vesicobullous disorders
- Steven-Johnson syndrome
- drug rash
- ichthyosis

Eye problems

- refraction and accommodation
- cataract
- strabismus
- disorders of retina, including tumors
- partial/total loss of vision
- night blindness
- conjunctival and corneal disorders

Behavioral and Developmental disorders

- rumination, pica
- sleep disorders
- breath holding spells
- mood disorders
- attention deficit hyperactivity disorders
- enuresis, encopresis
- habit disorders
- anxiety disorders
- temper tantrums
- autism (as mentioned in objective 24)

Social/Community Paediatrics

- National health programs related to child health
- Vaccines: constituents, efficacy, storage, contraindications and adverse reactions
- rationale and methodology of pulse polio immunization
- child labor, abuse, neglect
- disability and rehabilitation
- National policy of child health and population
- Principles of prevention, control of infections (food, water, soil, vector borne)
- Investigation of an epidemic
- IMNCI
- adoption
- rights of the child
- juvenile delinquency

Orthopaedics

- major congenital orthopedic deformities
- bone and joint infections
- common bone tumors

APPROACH TO CLINICAL PROBLEMS

Growth and development

- precocious and delayed puberty
- developmental delay
- impaired learning

Neonatology

- low birth weight newborn
- sick newborn

Nutrition

- lactation management and complementary feeding
- failure to thrive
- protein energy malnutrition (underweight, wasting, stunting) and micronutrient deficiencies

Cardiovascular

- Murmur
- Cyanosis
- congestive heart failure
- arrhythmia
- systemic hypertension
- shock

GIT and Liver

- Acute diarrhea
- abdominal pain and distension
- vomiting
- gastrointestinal bleeding
- hepatosplenomegaly
- persistent and chronic diarrhea
- ascites
- constipation
- jaundice
- hepatic failure and encephalopathy

Respiratory

- Cough/chronic cough
- wheezy child
- hemoptysis
- respiratory distress

Infections

- acute onset pyrexia
- recurrent infections
- nosocomial infections
- prolonged pyrexia with and without localizing signs
- fever with xanthema

Renal

- Hematuria/dysuria
- voiding dysfunctions
- hypertension
- bladder/bowel incontinence
- renal failure (acute and chronic)

Hematology and Oncology

- Anemia
- bleeding

Neurology

- limping child
- paraplegia, quadriplegia
- macrocephaly and microcephaly
- convulsions
- cerebral palsy
- floppy infant

- acute flaccid paralysis

- headache

Endocrine

- thyroid swelling
- obesity

- ambiguous genitalia
- short stature

Miscellaneous

- skin rash
- epistaxis
- lymphadenopathy

- proptosis
- arthralgia, arthritis

RECOMMENDED READING

Books (latest edition)

1. Nelson's Textbook of Pediatrics, Robert M Kliegman, et al (Editors)
2. PG Textbook of Pediatrics, Piyush Gupta, PSN Menon, S Ramji, et al (Editors)
3. IAP Textbook of Pediatrics, A Parthasarathy (Editor)
4. Manual of Neonatal care, Cloherty
5. Care of the newborn, Meharban Singh
6. Park's Pediatric Cardiology for Practitioners, Myung K Park
7. Pediatric Nephrology, RN Srivastava, A Bagga (Editors)
8. Clinical Methods in Pediatrics, Piyush Gupta
9. Pediatric Clinical Methods, Meharban Singh
10. Hutchison's Clinical Methods, Michael Glynn William M Drake (Editors)

Journals

03-05 International Journals and 02 National (all indexed) journals