

Paper II: Technical Subject

1. Basic Sciences

- 1.1 Basic genetics
- 1.2 Fetal and neonatal immunology
- 1.3 Applied anatomy and embryology
- 1.4 Feto-placental physiology
- 1.5 Neonatal adaptation
- 1.6 Development and maturation of lungs, respiratory control, lung functions, ventilation, gas exchange, ventilation perfusion.
- 1.7 Physiology and development of cardiovascular system, developmental defects, physiology and hemodynamics of congenital heart disease.
- 1.8 Fetal and intrauterine growth.
- 1.9 Development and maturation of nervous system, cerebral blood flow, bloodbrain barrier.
- 1.10 Fetal and neonatal endocrine physiology
- 1.11 Developmental pharmacology
- 1.12 Developmental hematology, bilirubin metabolism
- 1.13 Renal physiology
- 1.14 Physiology of gastrointestinal tract, digestion, absorption.
- 1.15 Electrolyte balance
- 1.16 Metabolic pathways pertaining to glucose, calcium and magnesium
- 1.17 Biochemical basis of inborn errors of metabolism

2. Perinatology

- 2.1 Perinatal and neonatal mortality, morbidity, epidemiology.
- 2.2 High risk pregnancy: detection, monitoring and management.
- 2.3 Fetal monitoring, clinical, electronic; invasive, and non-invasive
- 2.4 Intrapartum monitoring and procedures
- 2.5 Assessment of fetal risk, and decision for termination of pregnancy
- 2.6 Diagnosis and management of fetal diseases
- 2.7 Medical diseases affecting pregnancy and fetus, psychological and ethical considerations
- 2.8 Fetal interventions.
- 2.9 Fetal origin of adult disease

3. Neonatal Resuscitation

4. Neonatal Ventilation

5. Blood Gas and Acid Base Disorders

6. Neonatal Assessment and Follow Up

- 6.1 Assessment of gestation, neonatal behavior, neonatal reflexes
- 6.2 Developmental assessment, and follow up detection of neuromotor delay, stimulation techniques

7. Body Systems

7.1 Respiratory System

- 7.1.1 Neonatal airways: physiology, pathology; management
- 7.1.2 Pulmonary diseases: Hyaline membrane disease, transient tachypnea, aspiration pneumonia, pulmonary air leak syndromes, pulmonary hemorrhage, developmental defects
- 7.1.3 Oxygen therapy and its monitoring
- 7.1.4 Pulmonary infections
- 7.1.5 Miscellaneous pulmonary disorders

7.2 Cardiovascular system

- 7.2.1 Fetal circulation, transition from fetal to neonatal physiology
- 7.2.2 Examination and interpretation of cardiovascular signs and symptoms
- 7.2.3 Special tests and procedures (Echocardiography, angiography)
- 7.2.4 Diagnosis and management of congenital heart diseases
- 7.2.5 Rhythm disturbances
- 7.2.6 Hypertension in neonates
- 7.2.7 Shock: pathophysiology, monitoring, management.

7.3 Gastrointestinal system

- 7.3.1 Disorders of liver and biliary system.
- 7.3.2 Bilirubin metabolism
- 7.3.3 Neonatal jaundice: diagnosis, monitoring, management, phototherapy, exchange transfusion.
- 7.3.4 Prolonged hyperbilirubinemia
- 7.3.5 Kernicterus
- 7.3.6 Congenital malformations
- 7.3.7 Necrotising enterocolitis

7.4 Renal system

- 7.4.1 Developmental disorders
- 7.4.2 Renal functions
- 7.4.3 Fluid and electrolyte management
- 7.4.4 Acute renal failure (diagnosis, monitoring, management).

7.5 Endocrine and metabolism

- 7.5.1 Glucose metabolism, hypoglycemia, hyperglycemia
- 7.5.2 Calcium disorders
- 7.5.3 Magnesium disorders
- 7.5.4 Thyroid disorders
- 7.5.5 Adrenal disorders
- 7.5.6 Ambiguous genitalia
- 7.5.7 Inborn errors of metabolism

7.6 Hematology

- 7.6.1 Physiology
- 7.6.2 Anemia
- 7.6.3 Polycythemia

- 7.6.4 Bleeding and coagulation disorders
- 7.6.5 Rh hemolytic disease
- 7.7 Neurology
 - 7.7.1 Clinical neurological assessment
 - 7.7.2 EEG, ultrasonography, CT scan
 - 7.7.3 Neonatal seizures
 - 7.7.4 Intracranial hemorrhage
 - 7.7.5 Brain imaging
 - 7.7.6 Hypoxic ischemic encephalopathy
 - 7.7.7 Neuro-muscular disorders
 - 7.7.8 Degenerative diseases
 - 7.7.9 CNS malformation
- 7.8 Nutrition
 - 7.8.1 Fetal nutrition
 - 7.8.2 Physiology of lactation
 - 7.8.3 Breast feeding and kangaroo mother care
 - 7.8.4 Lactation management, breast milk banking, maternal medications and nursing
 - 7.8.5 Parenteral nutrition
 - 7.8.6 Vitamins and micronutrients in newborn health
- 7.9 Neonatal infections
 - 7.9.1 Intrauterine infections
 - 7.9.2 Superficial infections
 - 7.9.3 Diarrhea
 - 7.9.4 Septicemia
 - 7.9.5 Meningitis
 - 7.9.6 Osteomyelitis and arthritis
 - 7.9.7 Pneumonias
 - 7.9.8 Perinatal HIV
- 7.10 Neonatal ophthalmology
 - 7.10.1 Developmental aspects
 - 7.10.2 Retinopathy of prematurity
 - 7.10.3 Sequelae of perinatal infections
- 7.11 Neonatal dermatology
- 8. **Surgery and orthopedics**
 - 8.1 Neonatal surgical conditions
 - 8.2 Pre and post operative care
 - 8.3 Neonatal anesthesia
 - 8.4 Metabolic changes during anesthesia and surgery
 - 8.5 Orthopedic problems
- 9. **Neonatal Imaging:** X-rays, ultrasound, MRI, CT Scan, etc.
- 10. **Transport of neonates**
