



## **College of Physicians and Surgeons of Mumbai**

### **Syllabus for CPS-PG-Course**

#### **DNEO-DIPLOMA IN NEONATOLOGY**

**College of Physicians and Surgeons of Mumbai**

CPS House, Dr. E. Borges Marg, Parel, Mumbai – 400012.

## **DNEO-DIPLOMA IN NEONATOLOGY**

### **GOALS**

The aim of the fellowship programme is to provide basic and advanced training in neonatology to produce competent doctors, who are able to provide clinical care of the highest order to the newborn infants.

Objectives Knowledge

To be conversant with common neonatal problems –their etiology, pathophysiology, diagnosis, management and prevention

To acquire knowledge regarding neonatal morbidity and mortality and prevention strategies to decrease these

To be aware of and recognize importance of multidisciplinary approach in the management of neonatal problems.

To acquire knowledge with respect to neonatal care in the community

To acquire knowledge with respect to organizing and planning neonatal intensive care units and managing neonates requiring intensive care

### **COURSE DESCRIPTION**

Eligibility Criteria for Candidates:

- i. A candidate should possess MBBS degree/ equivalent degree as per provisions of Indian Medical Council Act. &
- ii. Candidates having a recognized 3 years degree Qualification (MD/MS/DNB) in Paediatrics speciality or 2 years Diploma Qualification in Paediatrics specialty

Duration of the Course : 2 years

### **SYLLABUS**

#### 1. Preamble

Neonatology has made outstanding progress in recent years. India faces the biggest newborn health challenge of any country in the world. Every year 20% of world's infants – 26 millions babies are born in this vast country, of these 1.2 million die in the first four weeks of life, accounting for 30% of neonatal deaths world wide each year. The very scale of neonatal mortality and morbidity in India seem an insurmountable challenge. Yet India is on the threshold of a neonatal survival revolution due to commitment to newborn health shared by the Government agencies, healthcare professionals and academic institutions.

Academic institutions can contribute by means of training, research and community work. Aim of the fellowship programme in Neonatology is to provide basic and advanced training in neonatology to produce competent doctors, who are able to provide clinical care of highest order to the newborn infants. There is tremendous scope for such training programmes as only few centers in India and only one centre in Karnataka is providing such training in the field of neonatology

Infrastructure NICU facility

Practice

To be able to analyse neonatal health problems and develops preventive strategies to decrease neonatal morbidity and mortality at hospital and community level

To provide primary, secondary and tertiary level care of the highest standard to critically ill neonates.

To be able to plan, establish and manage level I, II and III neonatal care units.

To be able to use and maintain equipments required in the NICU

Attitudes / Communication

To take rational decisions in the face of ethical dilemmas in neonatal and perinatal practice

To exhibit communication skills of a high order and demonstrate compassionate attributes befitting a caring neonatologist

To be able to counsel parents regarding neonatal problems including genetic and hereditary diseases

Duration of Course

Total 24 months from the date of joining the course

Course Contents KNOWLEDGE

Basic Sciences

Feto-placental physiology

Neonatal adaptation

Fluid and electrolyte balance

Blood gas and acid base disorders

Thermoregulation and Kangaroo Mother Care

General Neonatology

Neonatal resuscitation

Birth injury and birth asphyxia

Normal newborn and common neonatal problems

Preterm and low birth weight neonates

Follow - up of high risk neonate

Assessment of gestation, neonatal behaviour, neonatal reflexes

Developmental assessment, detection of neuromotor delay, developmentally supportive care

Immunization including immunization of a preterm neonate

Discharge planning

Communicating neonatal death

Neonatal transport

Traditional practices in neonatal medicine

Neonatal equipments

Neonatal procedures

Organization of neonatal care including level I, II & III care

Fetal Medicine

Perinatal and neonatal mortality, morbidity & epidemiology

Fetal and neonatal consequences of high risk pregnancy

Fetal monitoring : Clinical, electronic, invasive and non-invasive

Intrapartum monitoring and procedures

Medical diseases affecting pregnancy and fetus

Respiratory system

Examination and interpretation of respiratory signs and symptoms

Congenital malformations of respiratory system

Pulmonary diseases: Hyaline membrane disease, transient tachypnea, meconium aspiration, pneumonia, pulmonary air leak syndromes, pulmonary hemorrhage, persistent fetal circulation, developmental defects

Apnea

Oxygen therapy and its monitoring

Neonatal ventilation : principles and practices

Pulmonary infections

Miscellaneous pulmonary disorders

Fetal circulation, transition from fetal to neonatal physiology

Examination and interpretation of cardiovascular signs and symptoms

Congenital heart diseases

Hypertension in neonates

Shock : pathophysiology, monitoring, management

- Congestive cardiac failure- Other cardiac disorders

Gastrointestinal system and hepatobiliary system

Disorders of liver and biliary system

Bilirubin metabolism

Neonatal jaundice: diagnosis, monitoring, Management (Phototherapy, exchange transfusion and others)

Conjugated hyperbilirubinemia

Congenital malformations

Necrotizing enterocolitis

Diarrheal diseases

Renal system

Developmental disorders

Renal functions

Acute renal failure

Urinary tract infection

Endocrine and metabolic

Hypoglycemia, hyperglycemia

Calcium disorders  
Magnesium disorders  
Pituitary disorders  
Thyroid disorders  
Adrenal disorders  
Ambiguous genitalia  
Inborn errors of metabolism  
Other endocrine and metabolic disorders vi) Hematology  
Clinical evaluation of a neonate with hematological problems  
Anemia  
Polycythemia  
Bleeding and coagulation disorders  
Rh and ABO hemolytic disease  
Hydrops fetalis : Immune and Non-immune - Other hemolytic disease vii) Neurology  
Neurological evaluation  
Neonatal seizures  
Intracranial hemorrhage  
Hypoxic ischemic encephalopathy  
CNS malformation and neural tube defects  
Developmental assessment  
Nutrition  
Breastfeeding  
Lactation management  
Lactation counseling and education  
Recommended daily requirements of nutrients  
Enteral feeding in special situations including LBW / preterm neonate  
Vitamins and micronutrients in newborn health and disease Parenteral nutrition  
Surgery and Orthopedics  
Neonatal surgical conditions  
Pre and post operative management  
Neonatal Orthopedic problems : Congenital and acquired  
Neonatal Ophthalmology – Retinopathy of prematurity xi) Neonatal Dermatology–  
Common problems  
Neonatal Infections  
Intrauterine infections  
Perinatal HIV  
Bacterial infection

Viral infections  
Fungal infections  
Septicemia  
Meningitis  
Osteomyelitis and arthritis  
Pneumonias  
Diarrhoea  
Nosocomial infections  
Superficial infections  
Infection control measures  
Community Neonatology  
Vital statistics, health system  
Causes of neonatal and perinatal mortality  
Neonatal care priorities  
Care at primary health center  
Care of secondary level  
Role of different health functionaries  
National programmes pertaining to newborn care  
National Neonatology Forum  
Investigations and imaging  
Laboratory medicine  
Normal values  
X-rays, ultrasound, MRI, CT Scan etc

Clinical Skills  
Neonatal resuscitation  
Neonatal examination, anthropometry  
Gestation assessment  
Developmental assessment  
Blood sampling : Capillary, venous, arterial  
Cannulation of peripheral artery and umbilical arterial catheterisation  
Intraosseous needle insertion  
Neonatal ventilation  
Monitoring : Non-invasive  
Enteral feeding (Katori-spoon, gavage, breast)  
Lactation management  
Lumbar puncture

Suprapubic aspiration  
Placing of intercostal tube  
Exchange transfusion : peripheral and central  
Peritoneal dialysis  
Phototherapy  
Kangaroo Mother Care  
Chest physiotherapy  
Endotracheal tube suction  
Fundus examination  
Limb restraintment  
Bedside tests: Shake test, apt test, sepsis screen, hematocrit, urine analysis  
CSF analysis, Kleihauer technique etc.,  
Neonatal drug therapy  
Nursery house keeping routines and aseptic procedures  
Universal precautions  
Handling, effective utilization and trouble shooting of neonatal equipment  
Infection control  
Interpretation of investigations and imaging studies  
Record keeping  
Computer data entry  
Education / Training  
Teaching skills : Lectures, Tutorials  
Participatory and small group learning skill

Self-Directed Learning  
Learning need assessment, literature search, evaluating evidence  
Communication  
Communication with parents, families and community  
Counselling parents  
Communicating neonatal death  
Obtaining informed consent  
Genetic counseling  
SKILLS

PI – Perform independently

PA – Perform with Assistance O – Observed

	O	PA	PI
Newborn resuscitation		5	20
Meconium suction		5	10
Lactation management and counselling			20
Peritoneal dialysis*	2	2	-
Exchange transfusion*		3	5
Umbilical / peripheral arterial cannulation		2	3
Parenteral nutrition*		2	3
Neurosonography	5		
ECHO	5		
Counselling parents			20
Ventilation		5	15
Peripheral exchange transfusion*		2	2
Gestational assessment			50
Developmental evaluation			20
Chest tube placement*	2	2	2
Feeding tube insertion			10
BAER / OAE	3		
ROP Screening	3		
Surfactant administration	2	2	2

\* Subject to number of procedures performed in the unit

TeachingHours

#### TEACHING LEARNING ACTIVITIES

Learning will be self directed and will take place as a continuous process but in addition the following formal sessions are recommended

##### 1. Academic session

In addition to attending all the academic sessions, the candidate needs to make a minimum number of presentations in these academic sessions during the training period of 1 year

Frequency#      Min.No

Presentations of

Seminars / Symposia	1 per month	5
Journal club	1 per month	5
Perinatal meeting	1 per month	4
Clinical case conference	1 per month	5
Bedsidepresentation	1 per month	5
Interdepartmental meetingwith		
Radiology /Paediatricsurgery      and others	1 per month	



Grand rounds	1 per week	
Mortality meeting and audit meeting	1 per month	
Record meetings	Once in 2 weeks	

Teaching learning process will also take place during the daily ward rounds and during teaching rounds

May be increased if required

Clinical postings :

Total period of fellowship course is 12 months

Essential Rotation

- Obstetrics department 15 days - Paediatric surgery\* 15 days

Conference, CME's and Workshops

During the one year training period he/she should attend at least One State / National Conference

One CME Programme should present a paper in the conference

Teaching

The candidate will be involved in teaching nursing students , nursing staff Undergraduate and post - graduate students

Special Training Programme

The candidate must attend and be certified in the following training programs Neonatal resuscitation programme (NALS)

Human lactation management

LOG BOOK

Log book for evaluation of the following

Interpersonal and communication skills

Medical knowledge

Patient Care

Practice Care

Practice based learning and improvement

Professionalism

Systems-based practice

Attendance and availability

Enthusiasm and responsiveness

\* May not be required if surgical neonates are managed in the NICU

# Subject to the availability of course during training period

Declaration of Results Passing Criteria

Candidate should obtain 50% of Marks in both Theory and Practical Examination Separately to be declared as pass.

Examiners

2 Examiners – One Internal and One External

Eligibility to become an examiner

Professor / PG Teacher

Qualification: DM Neonatology / DNB Neonatology / Fellowship in Neonatology

Affiliated to MCI / UGC recognized University / Recognized Autonomous Institution

**DNEO-DIPLOMA IN NEONATOLOGY****Examination Pattern****Theory Examination:**

<b>PAPER I</b>	<b>PAPER II</b>	<b>PAPER III</b>
General Neonatology ,Infections Perinatology, Community neonatology	THERAPEUTICS Clinical Neonatology Systemic Neonatology	APPLIED SCIENCES & RECENTADVANCES
<b>Section I</b>	<b>Section I</b>	<b>Section I</b>
Q.1. 10 Marks	Q.1. 10 Marks	Q.1. 10 Marks
Q.2. 10 Marks	Q.2. 10 Marks	Q.2. 10 Marks
Q.3. 10 Marks	Q.3. 10 Marks	Q.3. 10 Marks
Q.4. 10 Marks	Q.4. 10 Marks	Q.4. 10 Marks
Q.5. 10 Marks	Q.5. 10 Marks	Q.5. 10 Marks
<b>Total 50 Marks</b>	<b>Total 50 Marks</b>	<b>Total 50 Marks</b>
<b>Section II</b>	<b>Section II</b>	<b>Section II</b>
Q.6. 10 Marks	Q.6. 10 Marks	Q.6. 10 Marks
Q.7. 10 Marks	Q.7. 10 Marks	Q.7. 10 Marks
Q.8. 10 Marks	Q.8. 10 Marks	Q.8. 10 Marks
Q.9. 10 Marks	Q.9. 10 Marks	Q.9. 10 Marks
10. 10 Marks	10. 10 Marks	10. 10 Marks
<b>Total 50 Marks</b>	<b>Total 50 Marks</b>	<b>Total 50 Marks</b>
Section I + II = 100 Marks	Section I + II = 100 Marks	Section I + II = 100 Marks
<b>Total Theory = 300 Marks, Passing = 150 (i.e. 50%) Marks in aggregate</b>		

<b>Practical Examination:</b>		<b>Marks</b>
<b>Paper - IV</b>	Clinical Practical	100
<b>Paper - V</b>	Oral & Viva	100
<b>Paper - VI</b>	Case	100
<b>Total Marks</b>	<b>(Aggregate marks for passing is 50% out of total.)</b>	<b>300</b>

**BOOKS :**

References

Taeusch HW, Ballard RA. Diseases of the newborn.

Avery GB, Fletcher MA. Neonatology Pathophysiology and Management of the newborn.

Rennie M, Robertson NRC. Textbook of Neonatology

Singh M. Care of the newborn

Clotherty's Manual of Neonatal Care

Klaus MH, Fanaroff AA. Care of the high risk neonate

Vidyasagar D. Text book of neonatology.

Remington JS, Klein JO. Infectious diseases of the fetus and new born infant

Goldsmith JP, Karotkin EH. Assisted ventilation of the neonate

Jones KL. Smith's recognizable patterns of human malformation

Journals

Clinics in Perinatology

Archives of diseases of childhood

Journal of pediatrics

Pediatrics

Pediatric Clinics of North America

Indian Pediatrics

Indian Journal of Pediatrics

Journal of Neonatology (National Neonatology Forum of India)

Seminars in neonatology

Tropical pediatrics

Note : Books and Journals mentioned above are suggestive. Students can refer to any other books and Journals. Refer to the most recent edition of the books and Journals