

FELLOWSHIP PROGRAM IN NEONATOLOGY

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 i.e, 25 million 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 worldwide 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, health care 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 and many centers in India are providing such training in the field of neonatology

2. OBJECTIVES

Knowledge

- a. To be conversant with common neonatal problems – their etiology, pathophysiology, diagnosis, management and prevention
- b. To acquire knowledge regarding neonatal morbidity and mortality and prevention strategies.
- c. To be aware of and recognize importance of multi-disciplinary approach in the management of neonatal problems.
- d. To acquire knowledge with respect to neonatal care in the community
- e. To acquire knowledge with respect to organizing and planning neonatal intensive care units and managing neonates requiring intensive care

Practice

- a. To be able to analyze neonatal health problems and develop preventive strategies to decrease neonatal morbidity and mortality at hospital and community level
- b. To provide primary, secondary and tertiary level care of the highest standard to critically ill neonates.
- c. To be able to plan, establish and manage level I, II and III neonatal care units.
- d. To be able to use and maintain equipment required in the NICU

Attitudes / Communication

- a. To take rational decisions in the face of ethical dilemmas in neonatal and perinatal practice
- b. To exhibit communication skills of a high order and demonstrate compassionate attributes befitting a caring neonatologist
- c. To be able to counsel parents regarding neonatal problems including genetic and hereditary diseases

3. ELIGIBILITY FOR ADMISSION

M.C.I recognized Post-graduation in Paediatrics or Diploma in Child Health

4. DURATION OF COURSE

Total 12 months from the date of joining the course

5. MEDIUM OF INSTRUCTION

English

6. ATTENDANCE: 80% attendance

7. COURSE CONTENTS

KNOWLEDGE

A) Basic Sciences

- Feto-placental physiology
- Neonatal adaptation
- Fluid and electrolyte balance
- Blood gas
and acid base disorders
- Thermoregulation and Kangaroo Mother Care

B) General Neonatology

- Neonatal resuscitation
- Birth injury and perinatal asphyxia
- Assessment of gestation, neonatal behavior, neonatal reflexes
- Normal newborn and common neonatal problems
- Preterm and low birth weight neonates
- Neonatal Pain assessment and pain management.
- Follow - up of high-risk neonate
- 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

C) Fetal Medicine

- Perinatal and neonatal mortality, morbidity and 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

D) Systemic neonatology

i) Respiratory system

- Examination and interpretation of respiratory signs and symptoms
- Congenital malformations of respiratory system
- Pulmonary diseases: Hyaline membrane disease, transient tachypnea, meconium aspiration syndrome, pneumonia, pulmonary air leak syndromes, pulmonary hemorrhage, persistent fetal circulation.
- Apnea
- Oxygen therapy and its monitoring
- Neonatal ventilation: principles and practices
- Pulmonary infections
- Miscellaneous pulmonary disorders

ii) Cardiovascular system

- 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

iii) Gastrointestinal 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

iv) Renal system

- Developmental disorders
- Renal functions
- Acute renal failure-Urinary tract infection

v) Endocrine and metabolic

- Hypoglycemia, hyperglycemia
- Calcium and 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 diseases

vii) Neurology

- Neurological evaluation
- Neonatal seizures
- Intracranial hemorrhage
- Hypoxic ischemic encephalopathy
- CNS malformation and neural tube defects

viii) Nutrition

- Breast feeding
- 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

ix) Surgery and Orthopaedics

- Neonatal surgical conditions
- Pre and post-operative management
- Neonatal Orthopedic problems: Congenital and acquired

x) Neonatal Ophthalmology – Retinopathy of prematurity

xi) Neonatal Hearing screening

xii) Neonatal Dermatology – Common problems

xiii) Neonatal Pharmacology - General principles

E. Neonatal Infections

- Intrauterine infections
- Perinatal HIV
- Bacterial infection
- Viral infections-Fungal infections
- Septicemia
- Meningitis Osteomyelitis and arthritis
- Pneumonias
- Diarrhea
- Superficial infections
- Nosocomial infections
- Infection control measures
- Emerging new infections

F. 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

G. 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 vessels
- 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
- Bed side tests : Shake test, apt test, sepsis screen, hematocrit, urine analysis,CSF analysis, Kleihauer -Betke technique etc.,
- Neonatal drug therapy
- Nursery house keeping routines and asepsis procedures
- Universal precautions
- Handling, effective utilization and trouble shooting of neonatal equipments
- 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
- Counseling 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
Lactation management and counselling			20
Peritoneal dialysis*	2	2	
Exchange transfusion*		3	5
Umbilical / peripheral arterial cannulation		2	3
Parenteral nutrition*		2	3
Neurosonography	20		
Echocardiography	10		
Counselling parents			20
Ventilation		5	15
Peripheral exchange transfusion*		2	2
Gestation assessment			50
Developmental evaluation			20
Chest tube placement*	2	2	2
Feeding tube insertion			20
BAER / OAE	3		
ROP Screening	3		
Surfactant administration	2	2	2

* Subject to number of procedures performed in the unit

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

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 one year

	Frequency #	Min. No of Presentations
a. Seminars / Symposia	1 per month	5
b. Journal club	1 per month	5
c. Perinatal meeting	Once in 2 months	2
d. Clinical case conference	1 per month	3
e. Bedside presentation	1 per month	5
f. Interdepartmental meeting with Radiology / Pediatric surgery and others	Once in 2 months	
g. Grand rounds		
h. Mortality meeting and audit meeting	1 per week	
i. Record meetings	1 per month	
# May be increased if required	Once in 2 weeks	

Clinical postings :

Total period of fellowship course is 12 months

Conference, CME's and Workshops

During the one year training period he/she should attend atleast 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 (NRP), Human lactation management

Log Book

Log book for evaluation of the following

- Interpersonal and communication skills
- Medical knowledge
- Patient Care
- Practice based learning and improvement –
- Professionalism

- Systems-based practice
- Attendance and availability
- Enthusiasm and responsiveness

** Subject to the availability of course during training period

9. SCHEME OF EXAMINATION

Paper - 1: General neonatology, Infections, Perinatology, Community neonatology 100 Marks

Paper - 2: Clinical neonatology, Systemic neonatology 100 Marks

Case Presentation and Viva Voce 200 Marks

Total marks 400 Marks

A) Theory (2 papers, 100 Marks each) 200 Marks

Each paper will have:

2 Long Questions of 20 Marks each - 40 Marks

6 Short Essay Questions of 10 Marks each - 60 Marks

Total 100 Marks

B) Practical Examination - 200 Marks

a) Case Presentation (1 Long Case - 70 marks & 2 Short Cases of 40 marks each)

(one of the short case will be NICU Graduate less than one year on follow-up service) - 150 Marks

b) Viva- Voce (4 tables - 12.5 marks each) - 50 Marks

- 1 Instruments
- 2 X - Rays
- 3 Medications
- 4 Case scenario and laboratory report interpretation

C) Maximum Marks

Theory	Clinical Cases	Viva-Voce	Grand Total
200	150	50	400

10. DECLARATION OF RESULTS

- a) Passing criteria:
50% marks in both theory and practical examination separately.
- b) Declaration of Class: 50% and above pass, 65% and above First Class, 75% and above Distinction.
- c) Unsuccessful candidates will have to appear for next examination without repeating the course.

11. RECOMMENDED BOOKS (LATEST EDITIONS)

- Avery's Diseases of the Newborn – 10th Edition, Christine A Gleason & Sandra E Juul, 2017, Elsevier publications
- Avery's Neonatology-Pathophysiology and Management of the Newborn-7th edition, Mhairi G. MacDonald, Mary M.K. Seshia, 2017, Wolters Kluver
- Cloherty and Stark's Manual of Neonatal Care- 8th edition, Hansen, Anne R.; Eichenwald, Eric C.; Stark, Ann R.; Martin, Camilia R, 2017, Lippincott Williams & Wilkins
- Fanaroff and Martin's Neonatal-Perinatal Medicine- 11th edition, Richard Martin, Avroy Fanaroff, Michele Walsh, 2019, Elsevier publications
- Care of the new born- 8th edition, Meharban Singh, 2017, CBS publications
- Rennie and Robertson's textbook of neonatology- 5th edition- Janet M. Rennie, 2012, Churchill Livingstone
- Gomella's Neonatology, 8th Edition, 2020.

12. RECOMMENDED JOURNALS

- Clinics in Perinatology
- Archives of diseases of childhood
- Journal of 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