D.Y. PATIL UNIVERSITY,

KOLHAPUR

SYLLABUS

“Fellowship Course in Neonatal Intensive Care”

FELLOWSHIP PROGRAM IN NEONATAL INTENSIVE CARE (F.N.I.C)

1. **Proper name of the course: Fellowship Course in Neonatology**
2. **Duration of Course: one year for M.D. & one and half year for D.C.H./D.N.B.(Paediatrics);** Residential course & the candidate will have to stay In the hospital campus – to be available for all sorts of Neonatal Emergencies/calls.
3. **I) Eligibility criteria for admission : M.D. or D.N.B. Paediatrics/D.C.H.**
   II) Intake capacity : as per rules prescribed by University
4. **Complete Curriculum of the Course**

Statement of Goals & Specifications of Objectives

(I)Aim

The aim of the fellowship program in Neonatal intensive care 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 programs.MD Paediatrics & DCH qualified students need to further augment their skills in all aspects of advanced Neonatal care specially Neonatal Ventilation.

Goals

Neonatal Intensive Care Fellowship program is to provide training in advanced neonatal care , teaching, research and administration. Upon completion, the trainee will have acquired the knowledge and clinical skills to manage most neonatal critical conditions and understand the principles and practice of evidence- based neonatology. The trainee will also acquire the skills to teach others involved in neonatal care and the trainee will be fully acquainted with all aspects of Neonatal Ventilatory care in details.

(II)Objectives

A. Knowledge

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

b. To acquire knowledge regarding neonatal morbidity and mortality and prevention strategies to

B. Practice

1. To be able to analyse neonatal danger signs and develop preventive strategies to decrease neonatal morbidity and mortality at hospital and community level

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

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

4. To be able to use and maintain equipments required in the NICU, including ventilators of all types & getting well acquainted with its working.

C. 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

d. To be able to counsel parents regarding neonatal complications during course of disease and treatment as well as in case of neonatal death.

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

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 organizing and planning neonatal intensive care units and managing neonates requiring intensive care.

e. To get complete training & hands on experience in all life saving procedures in Neonatology like Exchange Transfusion , Surfactant Administration, Ventilatory Care, and all invasive procedures.

f. The trainee should be in a position to deliver his knowledge to all Doctors & Nurses involved in Child birth.

COURSE CONTENTS

Since the fellows are trained with the aim of practicing as independent specialists, particularly in Neonatal Intensive Care, this course content will be mainly a guideline. The emphasis shall therefore be on the practical management of the problem of the individual cases and the community within the available resources, specially in respect of Neonatal care.

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 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

C) Fetal Medicine

- Perinatal and neonatal mortality, morbidity & epidemiology
- Fetal and neonatal consequences of high risk pregnancy
- Fetal monitoring : Clinical, electronic, invasive and non-invasive

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 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

- 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, 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

- Necrotising enterocolitis
- Diarrheal diseases

iv) Renal system

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

v) Endocrine and metabolic

- Hypoglycemia, hyperglycemia
- Calcium disorders
- Magnesium disorders
- Pitutiary disorders
- Thyroid disorders
- Adernal disorders
- Ambiguous genitlia
- 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

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

x) Neonatal Ophthalmology – Retinopathy of prematurity

xi) Neonatal Dermatology – Common problems

- 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

E. 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

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
- National Neonatology Forum

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 arterial catheterisation
- Intraosseous needle insertion
- Neonatal ventilation
- Monitoring : Non-invasive and 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 restrainment
- Bed side tests : Shake test, apt test, sepsis screen, hematocrit, urine analysis
- CSF analysis,Kleihauer technique etc.,
- Neonatal drug therapy
- Nursery house keeping routines and aspesis 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 & Research Methodology Basics
- Small group learning skill

SKILLS	Observed	Perform with assistance	Perform independently
Newborn resuscitation		5	20
Meconium suction		5	10
Lactation management and counseling			20
Peritoneal dialysis	2	2	
Exchange transfusion		3	5
Umbilical/ peripheral arterial cannulation		2	3
Parenteral nutrition		2	3
Neurosonography	5		

- 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

TEACHING LEARNING METHODS AND 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

Presentations Frequency

a. Seminars / Symposia 2 per month
b. Journal club 2 per month
c. Perinatal meeting 1 per month
d. Clinical case presentation 2 per month
e. Bedside presentation 2 per month

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
BERA/OAE	3		
ROP Screening	3		
Surfactant administration	2	2	2

f. Interdepartmental meeting with 1 per month
Radiology / Pediatric surgery and others
g. Grand rounds 1 per week
h. Mortality meeting and audit meeting 1 per month
Teaching learning process will also take place during the daily ward rounds and during teaching rounds.

Clinical postings:
Total period of fellowship course is 12 months
Essential Rotation
- Obstetrics department 15 days
- Pediatric 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

SHORT TERM RESEARCH PROJECT (STRP) – 6 months

Preparation and presentation of a STRP: Every Fellow trainee will be required to carry out one research project over six months under the supervision of his guide as identified by the institution. The project should be completed within 6 months of training, and then reviewed by the guide and given its final shape by the end of eleven months, one month before the stipulated date of completion of the Fellowship course.

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
- How many Neonatal Procedures done

RECOMMENDED BOOKS AND JOURNALS

References

1. Taeusch HW, Ballard RA. Diseases of the newborn.
2. Avery GB, Fletcher MA. Neonatology Pathophysilogy and Management of the newborn.
3. Rennie M, Robertson NRC. Textbook of Neonatology
4. Singh M. Care of the newborn
5. Clotherty's Manual of Neonatal Care
6. Klaus MH, Fanaroff AA. Care of the high risk neonate
7. Remington JS, Klein JO. Infectious diseases of the fetus and newborn infant
8. Goldsmith JP, Karotkin EH. Assisted ventilation of the neonate
9. 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

Websites

www.cochrane.mcmaster.ca/neonatal/
www.nichd.nih.gov/cochrane
www.neonatology.org
www.emedicine.com/ped/neonatology.htm
www.nnfi.org

EXAMINATION

AT the end of one year (for M.D. candidates) / one and half year(for D.C.H/D.N.B candidates).

Theory Exam (Will be conducted by the Institution)

Practical Exam (Will be conducted by the Institution)

Mixed pattern: OSCE and clinical.
To evaluate skills, interpretation and counseling

Theory: Two papers of 100 marks each of 3hours duration.

Two days – one paper set by External Examiner & one by Internal Examiner.

Practical: One internal + One External appointed by MUHS

1.Case – 50 marks

2.Normal Newborn – 50 marks

3.OSCE – 50 marks

4.Log Book – 20 + Internal Assessment 30 – 50 marks

The student have to pass separately in Theory and Practicals with 50% marks.