

# Curriculum

## FNB Fellowship

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# Maternal & Foetal Medicine

- ◆ Teaching and Training Activities
- ◆ Syllabus
- ◆ Log Book

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## I. TEACHING AND TRAINING ACTIVITIES:

Institutional Teaching Programme over 2 years should cover complete curriculum. In addition to clinical work and postings, following format (minimum no of sessions) is recommended.

1. Multidisciplinary Case discussion
  - i. Maternal Medicine - 10
  - ii. Fetal Medicine - 5
2. Basic Sciences Lectures - 5
3. Seminars - 6
4. Journals Clubs - 4
5. CTG meetings - 6
6. Clinical Audits - 2
7. Grand Rounds - 20
8. Clinical Risk Management - 1 each per candidate
9. Maternal Mortality Review - 1 each per candidate
10. Perinatal Mortality Review - 1 each per candidate

In addition to these FNB classes, FNB students should also attend relevant PG classes in the institution.

### **Research Project**

Candidate must carry out a research project under the guidance of designated teacher and write a project report of 50 pages which should be targeted to learn research methodology followed by presentation / publication.

### **Timeline for Project:**

Topic Allocation - 1st 6 months

Project Completion – 6 months prior to completion of tenure

Project report of 50 pages to be submitted along with the logbook at the time of exam.

20 marks of logbook may be divided into 15 marks for logbook + 5 marks for research project.

He/ she would also be given opportunity to take part in the research projects going on in the departments to learn their planning, methodology and execution so as to learn various aspects of research.

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## II. SYLLABUS:

Curriculum will be covered under following modules. This is indicative and not limited only to following the modules.

Skills for counselling the patient and her family, taking of informed consent from the patient, being available to answer questions especially in an unexpected situation must be part of training for ALL modules. Counselling skills must include preconception care and counselling where required/ indicated.

### Details of Modules:

Module 1: Maternal Medicine

Module 2: Antenatal Complications

Module 3: Intrapartum Care

Module 4: Postnatal care

Module 5: Fetal Medicine

Module 6: Genetics

Module 7: Neonatal Care: Medical & Surgical

Module 8: Miscellaneous

### 1. Module 1: Maternal Medicine:

The pathophysiology, presentation and implications for maternal and/ or fetal health of common maternal conditions present at booking or that may occur during pregnancy. Effect of pregnancy on the medical conditions, impact of treatment on mother and fetus.

### Topics:

Detailed knowledge of following:

- i. Hypertension [HT]-chronic HT, preeclampsia, eclampsia, others
- ii. Renal Disease-Chronic Kidney disease, Acute Renal Injury/ failure, Others
- iii. Cardiac Disease - congenital Heart Disease [corrected, uncorrected], Rheumatic Heart Disease [Operated, unoperated], Postpartum Cardiomyopathy.
- iv. Hepatic Disorders, Obstetric Cholestasis, Acute fatty liver of pregnancy, Hepatitis, Preexisting liver disease, Others.
- v. Gastrointestinal Disease-Preexisting GI disease, Hyper emesis Gravid arum, Appendicitis, others
- vi. Respiratory problems – Bronchial asthma, Influenza etc.
- vii. Neurology-seizure disorders, Migraine, ICSOL, CVA, Others
- viii. Autoimmune/Connective Tissue Disease-SLE, APS, Others
- ix. Hematological-Anemia, Haemoglobinopathies, Thrombocytopenia, Others

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- x. Thromboembolic Disease-Previous VTE, Thrombophilia [with and without previous VTE], Acute DVT, Pulmonary embolism, Others
  - xi. Psychiatric Disease- Post natal depression, Puerperal psychosis, Maniac depressive disorders, Addictions
  - xii. Legal and Medico legal issues, Others
  - xiii. Diabetes-Gestational diabetes mellitus, Type I DM, Type II DM, Others
  - xiv. Other Endocrinological Diseases-Thyroid disorders [Hypothyroidism, Hyperthyroidism], Pheochromocytoma
  - xv. Pregnancy after ART
  - xvi. Skin diseases in pregnancy
  - xvii. Substance Abuse-Smoking/ Tobacco/ Alcohol, Others
  - xviii. Neoplastic diseases -Before/ During pregnancy
  - xix. Infections –Tuberculosis, HIV, Hepatitis, Other Viral Infections, Urinary Tract Infections, Pulmonary infections, Genital tract infections, vector borne diseases [Malaria, dengue], Covid and other new/ unusual infections, H1N1, etc.
  - xx. Acute Abdomen and other surgical problems during pregnancy – acute appendicitis, Cholecystitis, SAIO etc.
  - xxi. Pregnancy after special surgery- post transplant, Bariatric surgery etc.
  - xxii. Domestic violence, mental health issues etc.
  - xxiii. Vaccination in pregnancy
  - xxiv. Critical care obstetrics

### **Competencies / Skills**

#### **[Mandatory / Must Know]**

- i. Drugs/ Prescribing in Pregnancy
- ii. Risk/ Severity Scoring of various types
- iii. Patient Evaluation / Stabilization of the High Risk Parturient
- iv. Maternal and Fetal Surveillance in High Risk Pregnancies
- v. Planning and Conduct of delivery in these cases
- vi. Fluid and Electrolyte management
- vii. Near- miss morbidity and scoring systems for prediction
- viii. Maternal death, Review and audit

#### **[Desirable / Good to know]**

- i. ABG Interpretation
- ii. ECG Interpretation
- iii. Chest X-Ray interpretation
- iv. Insertion of CVP line

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## 2. Module 2: Antenatal Complications:

### Topics

- i. Miscarriages / Fetal death - Recurrent early pregnancy losses [RPL], - diagnosis, investigations and management. Intrauterine death, Ectopic pregnancy, Trophoblastic diseases, Cervical incompetence, Septic abortion, others
- ii. Antepartum haemorrhage- Placental abruption, Placenta Previa, PAS disorders
- iii. Preterm Birth-Prior history of preterm/PROM, Preterm labor, PROM [< 24, weeks,>24 Weeks], Elective preterm delivery, diagnosis, management, prediction and prevention
- iv. Multiple pregnancy - Complications, Single fetal demise, Co- twin demise after 12 weeks, Malpresentation, Delivery planning, Higher order multiple pregnancies.
- v. Breech presentation at term/ other Malpresentation
- vi. Postdate pregnancy
- vii. Pregnancy with previous CS
- viii. Polyhydramnios
- ix. Abdominal/ Gynecological Problems-Acute abdomen, Ovarian mass, Fibroid uterus, **Others**

### Competencies / Skills

- i. Ultrasonography

### [Mandatory / Must Know]

- i. First trimester scan: CRL, Chorion city, NT measurement, NB and other gross abnormalities
- ii. Anomaly scan in detail
- iii. Doppler Studies-Uterine, umbilical, Middle cerebral artery, Ductus venosus Doppler,
- iv. Screening for preterm birth – Measurement of cervical length
- v. Growth scan and comparison with other standards
- vi. Biophysical profile
- vii. Ultrasound assessment of placental site (TVS)
- viii. Morbid adherence of Placenta
- ix. Cervical Cerclage – Elective
- x. External Cephalic version

### [Desirable / Good to know]

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- i. Doppler's of other vessels
  - ii. Cervical Cerclage – Rescue, Abdominal

### **3. Module 3: Intrapartum Care**

#### **Topics**

- i. Normal labour and partogram (All types)
- ii. Intrapartum fetal monitoring
- iii. Failure to Progress-First stage of labour, Second stage of labour
- iv. TOLAC
- v. Multiple pregnancy
- vi. Malpresentation- Breech labour and delivery, Transverse lie
- vii. Shoulder Dystocia-Prior history of shoulder dystocia, Shoulder dystocia
- viii. Instrumental delivery- Forceps/ vacuum
- ix. Prevention and management of PPH- Massive PPH [with/Without laparotomy], Balloon tamponade, UAE, DIC etc.
- x. Genital tract Trauma-Prior history of 3rd/4th degree perineal tear, Diagnosis and repair of OASI, Uterine scar rupture, Others
- xi. Caesarean Section, Cesarean hysterectomy, PAS disorders
- xii. Anaesthesia/Analgesia- Assessment and Counselling high risk case
- xiii. Maternal Collapse-Massive hemorrhage, Amniotic fluid embolism, Cerebrovascular accidents, septic shock
- xiv. Assessment, transfer and management of critically Ill woman in HDU/ICU

#### **Competencies and skills**

##### **[Mandatory / Must Know]**

- i. CTG interpretation
- ii. Plotting and interpretation of partogram
- iii. Digital Fetal scalp stimulation test
- iv. Cesarean section- all types including repair of scar rupture
- v. Versions-External cephalic
- vi. Assisted vaginal delivery- Forceps/ vacuum/ breech/twin vaginal delivery
- vii. Managing shoulder dystocia
- viii. Repair of OASI
- ix. Surgical management of PPH, genital trauma
- x. Massive transfusion protocols
- xi. ICU management including fluid and electrolyte management, ABG interpretation

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**[Desirable / Good to know]**

- i. Vibroacoustic stimulation test
- ii. Cesarean hysterectomy for PPH, PAS etc.
- iii. Use of different postures for birthing, Water birth
- iv. Internal podalic version
- v. ICU management - Intubation for mother and neonate, Knowledge of ventilator settings etc.
- vi. Labour analgesia techniques
- vii. Cephalocentesis / craniotomy

**4. Module 4: Postnatal care**

**Topics**

- i. Routine postnatal care
- ii. Complications of puerperium
- iii. Lactation – Physiology, Method, Problems, Solutions
- iv. Contraception and Pregnancy termination– especially for high risk cases
- v. Postpartum depression

**Competencies and skills**

**[Mandatory / Must Know]**

- i. Ideal position for breast feeding
- ii. Clinical Diagnosis and Management of common complications
- iii. Contraceptive counselling pertinent to a case

**5. Module 5: Fetal Medicine**

**Topics**

- i. Embryology – normal and development of fetal abnormalities
- ii. Normal fetal behavior and activity and its abnormalities
- iii. Fetal circulation and adaptation at birth
- iv. Management of pregnancies complicated by fetal abnormalities of various organ systems
- v. Offer prenatal tests, liaise with multidisciplinary team for care, and make a plan for management, and counsel about pregnancy and long term outcome. Make a genetic referral and its justification.
- vi. PCPNDT Act
- vii. Occurrence, Diagnosis, Management, Prognostication etc. of Anomalies listed below:

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- a. CNS Anomalies-Anencephaly, Spina bifida, Ventriculomegaly, Dandy walker malformations/variant, Holoprosencephaly, Others
  - b. Cardiac: ASD, VSD, Hypoplastic right and left heart, TOF etc Anomalies of various chambers, Outflow tract abnormalities, Arrhythmias, Others
  - c. Renal Anomalies-Renal agenesis, Hydronephrosis, Polycystic Kidney (AR/AD), Megacystis/LUTO, Others
  - d. Pulmonary abnormalities-CCAM, Diaphragmatic hernia, Others
  - e. Face & Neck Anomalies-Cystic hygroma, Facial cleft, Others
  - f. Abdominal wall & gastrointestinal anomalies-Gastroschisis, Exomphalos, Others
  - g. Skeletal anomalies-Talipes, Skeletal dysplasias, Others
  - viii. Assessment of fetal growth & growth abnormalities
  - ix. Pregnancy complicated by red cell allo- immunization – diagnosis of fetal anemia, interpretation of MCA Doppler, IUT, Delivery
  - x. Hydrops – Nonimmune: Causes, investigations, management, counselling, plan for pregnancy management
  - xi. Multiple pregnancy- Establishing chorion city, Antenatal and Intrapartum care, Growth problems in twins. Complications of monochromic twins – TTTS, sFGR, TAPS and TRAP – diagnosis, follow up and management
  - xii. Fetal Infections-TORCH, Parvovirus, others – Interpret lab tests, Explain fetal and newborn effects on infection, prenatal diagnosis and management
  - xiii. Liquor Abnormalities-Oligo / Polyhydramnios
  - xiv. Prenatal fetal therapy

## **Competencies & Skills**

### **[Mandatory / Must Know]**

- h. Multifetal pregnancy- Detect, monitor a twin pregnancy, Manage pregnancy with growth problems
- iii. Care for woman with red cell all immunization – Monitoring for fetal anemia, Intrauterine transfusion, Delivery, Postnatal Management etc.
- iv. USG for normal fetal anatomy and diagnosis of fetal anomalies of fetal CNS, Face and Neck, Thorax, CVS, abdominal wall and GIT, UGT, Fetal skeleton and extremities[TIFFA]
- v. Able to use USG in pregnancy – optimize image, appropriate Doppler
- vi. USG for fetal growth, recognize and manage early and late onset FGR
- vii. Counselling for prenatal invasive procedures, Prerequisites, Procedures, Post procedure care and follow up
  - a. Mniocentesis

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- b. Chorion villus sampling
  - c. Cordocentesis
  - viii. Diagnose abnormalities of liquor, Amnioreduction
  - ix. Counselling for termination of pregnancy for fetal anomalies
  - x. Prognostication of the anomalous fetus
  - xi. Communication skills- Breaking bad news
  - xii. Preconception counselling for cases whose last pregnancy affected by any of above
  - xiii. Counselling for Neonatal Surgery-Abdominal wall defect, Diaphragmatic hernia, Bowel atresia, Spina bifida, others
  - xiv. Workup of previous/ unexplained stillbirth
  - xv. Coordination with Paediatric Physician/ Surgeon for postnatal management

**[Desirable / Good to know]**

- i. Monochorionic twins: TTTS, sFGR, TRAP – Diagnosis, Management, Prognosis etc.
- ii. Exchange transfusion
- iii. Advanced USG – Fetal Echocardiography, Neuroanatomy etc. as per ISUOG guidelines
- iv. Selective fetal reduction in dichorionic twins and vasoocclusive techniques in MC twins
- v. Fetal pathology and Fetal autopsy
- vi. Fetal red cell intravascular/ intraperitoneal transfusion

**6. Module 6: Genetics**

**Topics**

- j. Normal chromosome structure and function. Gene structure and function
- i. Patterns of genetic inheritance and susceptibility
- ii. Types of aneuploidy, including structural rearrangements, Deletions, Trisomies, Sex-chromosome abnormality etc.
- iii. Genetic etiology of single gene disorders, with reference to common disorders: Hemoglobinopathies and Bleeding disorders, Inborn errors of metabolism, Muscular dystrophy
- iv. Knowledge of common syndromes and associations: e.g. Meckel-Gruber, Beckwith-Wiedmann, DiGeorge etc.
- v. Pre and postnatal phenotypes of common aneuploidies, Single gene disorders, Syndromes

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- vi. Methods of screening of aneuploidy including – USG, biochemical, Non-invasive.
  - vii. Understand terms relevant to screening, Sensitivity, Specificity, False positive, False negative, LR.
  - viii. Invasive tests – amniocentesis, CVS, FBS
  - ix. Molecular basis and Laboratory techniques for analyzing parental and fetal samples, including PCR, FISH, Karyotyping, microarray, Mutational analysis, Next Generation Sequencing (NGS)
  - x. Chromosomal Anomalies-Previous history/family history/ affected fetus
  - xi. Genetic anomalies - Previous/family history/current pregnancy
  - xii. Syndromic anomalies - Previous/family history/current pregnancy
  - xiii. Index child workup
  - xiv. Modes of Inheritance
  - xv. Preimplantation Genetic Diagnosis [PGD]

### **Competencies & Skills**

#### **[Mandatory / Must Know]**

- i. Ultrasound screen for aneuploidy 11-13+6 weeks' scan – measurement of CRL, NT, NB, DV, TR, identification of gross structural anomaly
- ii. Genetic counselling – Pedigree charting
- iii. Interpretation of screening test and further management of abnormal test
- iv. Pregnancy at risk / affected by aneuploidy – take history, arrange parental and prenatal investigations, counsel regarding risk, screening and testing options, genetic consultation if needed.
- v. Pregnancy at risk / affected by single gene disorder – take history, make family tree, Parental investigations, communicate risk, Screening and testing options, Referral for genetic consultation.
- vi. Diagnosis and management of genetic and syndromic disorders
- vii. Biochemical screening, molecular, cytogenetic tests for prenatal diagnostic investigations- interpretation and communication of test results and appropriate multidisciplinary consultation.
- viii. Fetal autopsy – Counselling, Indications, Technique

#### **[Desirable / Good to know]**

- i. Lab knowledge of molecular testing
- ii. Conducting / Performing fetal autopsy

## **7. Module 7: Neonatal Care: Medical & Surgical**

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## Topics

- i. Characteristics of healthy neonate
- ii. Neonatal resuscitation
- iii. Birth asphyxia
- iv. Meconium aspiration syndrome
- v. Birth trauma
- vi. Small for gestational age
- vii. Neonatal jaundice
- viii. Assessment of Newborn
  - a. Newborn resuscitation
  - b. Newborn screening
  - c. Newborn with gross congenital anomaly
  - d. Evaluation and Management of Antenatally diagnosed structural anomaly
  - e. Birth trauma
  - f. Cord Blood ABG
  - g. Others

## Competencies & Skills

### [Mandatory / Must Know]

- i. Essential care of Newborn including resuscitation
- ii. Palade feeding
- iii. Kangaroo mother care
- iv. Gestational age assessment postnatally (Ballard scoring)
- v. Growth evaluation- Ponderal index etc.

### [Desirable / Good to know]

- i. Sick newborn care
- ii. Cord and IV cannulation

## 8. Module 8: Miscellaneous

### Topics

- i. Dietary recommendation in pregnancy
- ii. Modification of diet in special condition e.g. diabetes in pregnancy
- iii. Exercise in normal pregnancy
- iv. Modifications of Exercise routine and dietary counselling for special cases e.g. Hypertension, Obesity, Renal and Hepatic disorders
- v. Non-conventional methods of pain relief in labor- Hypnotherapy, Meditation, Yoga and other traditional methods

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### III. LOG BOOK:

#### 1. Log Book should be simple.

- i. Log book is mandatory.
- ii. In the absence of production of log book, the result will not be declared.
- iii. Should not exceed 120 pages in total

#### 2. List of following is to be included

- i. Departmental presentations:
  - a. Clinical Audits
  - b. Seminars
  - c. Journals Club
  - d. Case presentations
  - e. Quality improvement processes
  - f. Research project summary- two pages
- ii. Scientific meeting and courses attended by the fellow
- iii. Papers presented at scientific meetings
- iv. Published papers

Log book should be maintained module wise. It should reflect both case mix seen and details of few special cases in which student participated. Details of few interesting cases especially those managed by student in each module may be elaborated.

**Suggested format is presented below:**

S.no.	Name	Age	CR no.	DOA	DOD	Diagnosis	Faculty Signature

For more details, the following format can be followed: Adapted from European Association of Perinatal Medicine (EAPM)/ European Board College of Obstetrics and Gynecology (EBCOG).

Suggested summary at the end of each module can be on following lines:

**3. Evaluation of Clinical Skills: Scoring System:**

- i. Passive attendance, assistance
- ii. Needs close supervision
- iii. Able to carry out procedure under some supervision
- iv. Able to carry out procedure without supervision
- v. Able to supervise and teach the procedure

The general aim is to get at least mark 4.

**Module-1: Diagnosis and management of medical and surgical complications of pregnancy**

Target	Expected competence level Fellow ticks when achieved					Trainer sign when competence level achieved	
	1	2	3	4	5	Sign	Date
Hypertension							
Kidney diseases							
Heart diseases							
Liver diseases							
Fluid balance and transfusion							
Diabetes							
Other endocrine disorders							
Gastrointestinal diseases							
Differential diagnosis of abdominal pain							
Lungs diseases							
Auto-immune,Haematological diseases							
CNS diseases							
Cancers							
Psychiatric disorders							
Infectious , parasitic diseases							

Similar table would need to be made for each module Ultra Sonographic Competencies:

Target Perform ultrasound scan to assess:	Expected competence level Fellow ticks when achieved					Trainer sign when competence level achieved	
	1	2	3	4	5	Sign	Date
Biometry to assess gestational age and fetal growth							
Anomaly scanning (morphology)							
Biophysical profile							
Doppler ultrasound blood velocity scanning of all the major vessels of the fetus and placenta							
Alternative imaging technique like MRI							

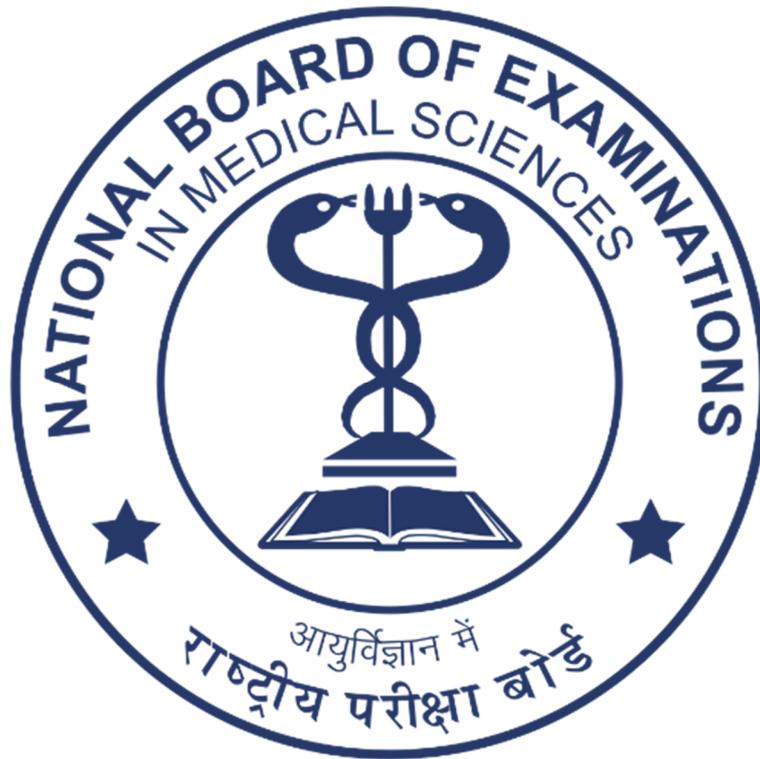
List of Ultrasound guided invasive procedures:

Target	Expected competence level Fellow ticks when achieved					Trainer sign when competence level achieved	
	1	2	3	4	5	Sign	Date
Amniocentesis							
CVS							
Fetal blood sampling							
Fetal blood transfusion							
Feto-amniotic shunting							
Other invasive procedures (specify)							

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**Number of Procedures Performed During the Training:**

<b>PROCEDURES</b>	<b>Number performed</b>
Caesarean section < 32 weeks	
Caesarean hysterectomy	
Cervical cerclage	
External cephalic version	
Operative vaginal delivery	
Technique for control of haemorrhage	
Management of postpartum and Postoperative complications	
Medical and surgical first and second trimester abortion	
Embryo reduction	
Ultrasound guided ovarian cyst Aspiration during pregnancy	
Amniocentesis	
Cvs	
Fetal blood sampling	
Fetal blood transfusion	
Feto-amniotic shunting	
Other fetal invasive procedures (specify)	



**आयुर्विज्ञान में राष्ट्रीय परीक्षा बोर्ड**  
स्वास्थ्य एवं परिवार कल्याण मंत्रालय, भारत सरकार  
मेडिकल एन्क्लेव, अंसारी नगर, नई दिल्ली – 110029

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**Medical Enclave, Ansari Nagar, New Delhi- 110029**