JINNAH SINDH MEDICAL UNIVERSITY

STUDY GUIDE	
PROGRAM	**MBBS-2024**
MODULE TITLE	**Reproductive system -I**
ACADEMIC YEAR	**2nd Year MBBS, 2025**
INTRODUCTION	This module provides detailed information about the structure and functions of the reproductive system. It is the first step towards producing doctors who know the ground issues and have the basic information about reproductive health. This module forms the basis for Reproductive module-2 in year-4 and then Obstetrics & Gynecology in final year MBBS. These latter modules are mainly clinical and help students acquire necessary skills in diagnosing and developing management plans for common Obstetrics & Gynecology- related topics
RATIONALE	Reproductive health is one of the major issues in Pakistan. A high infant and maternal mortality rates are constant worrying problems. In order for the country to offer safe health care delivery and to produce safe health care practitioners, it is imperative to provide a sound knowledge base to the learners.
OUTCOMES	By the end of the module, students will be able to describe the normal structure and functions of the male and female reproductive systems
DEPARTMENTS INVOLVED	1. Anatomy 2. Biochemistry 3. Physiology
MODULE OBJECTIVES	By the end of the module, students will be able to:
LECTURES **ANATOMY**	**1. Pelvis and its types (Sacrum + Joints of Pelvis)** • Discuss the features of bony pelvis • Describe the boundaries of pelvic inlet & outlet • Differentiate between male and female pelvis • Discuss the important points of pelvimetery • Explain the types, articulations, ligaments, relations and movements of

joints of pelvis

- List factors providing stability to the joints of pelvis

2. Osteology of Sacrum

- Discuss the osteology of sacrum
- List the muscles and ligaments attached to sacrum

3. Pelvic Boundaries

- Describe the anatomy of the pelvic walls
- Enumerate the muscles of pelvic floor/pelvic diaphragm
- Discuss the attachment & actions of muscles of pelvic floor/pelvic diaphragm
- Discuss the blood supply, nerve supply& lymphatic drainage of pelvic floor muscles
- Describe the attachment & significance of pelvic fascia
- Discuss the clinical conditions associated with the pelvic floor & fascia
- Discuss the role of pelvic floor in urinary and fecal continence

4. Pelvic Malformations

- Discuss pelvic malformations in males and females

5. Blood supply, venous and lymphatic drainage of pelvis

- Describe the blood supply, nerve supply & lymphatic drainage of pelvis

6. Testis, Epididymis and Scrotum

- Describe the anatomy of the testis
- Describe the anatomy of Ductus Deferens, Epididymis & Ejaculatory duct
- Describe the histological features of the testis and epididymis

7. Pelvic peritoneal reflections in male & female

- Describe pelvic reflections in males and females

8. Perineum: division, spaces and urogential region

- Describe the gross anatomical features of perineum
- List the boundaries of perineum
- Discuss the blood supply, nerve supply and lymphatic drainage of the perineum
- Describe male urogenital triangle and its contents
- Describe the gross anatomy, blood supply, nerve supply and lymphatic drainage of male urethra
- Discuss the clinical conditions associated with penis & male urethra
- Describe female urogenital triangle and its contents

9. Perineum: Anal triangle, Anal canal and Ischiorectal Fossa

- Describe the division of perineum into anal and urogenital triangles
- Discuss the boundaries and features of anal triangle
- Discuss the importance of pectinate line with respect to the vasculature and lymphatic drainage of the rectum and anal canal

10. Nerves of pelvis, perineum and sacral plexus

- Enumerate the nerves innervating pelvis
- Describe Sacral plexus and its formation
- Describe the branches and divisions of sacral plexus
- Discuss coccygeal plexus
- Describe hypogastric plexus, its location, formation and branches
- Discuss the injuries associated with the nerves of pelvis, perineum and sacral plexus

11. Prostate, Seminal vesicles & Bulbourethral glands

- Describe the gross features of following male internal organs:
    i. Prostate gland
    ii. Seminal Vesicles
    iii. Ductus deference

iv. Bulbourethral glands

- Discuss their location, relations, blood supply, nerve supply & lymphatic drainage.
- Discuss the clinical conditions associated with prostate gland, seminal vesicles & bulbourethral glands
- Describe the histological features of the prostate, seminal vesical and bulbourethral gland

12. Development of male reproductive system and Spermatogenesis

- Describe the process of spermatogenesis
- List the timeline of development of male reproductive system
- Describe the process of development of parts of male reproductive system
- Discuss the development of male external genitalia
- Discuss the congenital anomalies of male genital system
  i. Cryptorchidism (un-descended testes)
  ii. Hypospadiasis and other malformation of urethra

13. Gross anatomy of female genital tract, Ovary & Fallopian tube

- State the location of ovary & fallopian tube
- Describe the parts & functions of fallopian tube
- Explain the ligaments of ovary & fallopian tube
- Describe the blood supply, nerve supply & lymphatic drainage of ovary & fallopian tube
- Discuss the clinical correlates of ovary & fallopian tube
- Describe the histological features of ovary & fallopian tube

14. Gross anatomy of Uterus, Cervix & Vagina

- List the parts of uterus, cervix & vagina
- Describe the location & relations of uterus, cervix and vagina with surrounding structures

	• Describe the ligaments of uterus • Discuss the blood supply, nerve supply & lymphatic drainage of uterus, cervix & vagina • Describe the histological features of the uterus, cervix and vagina • Discuss the clinical conditions associated with uterus, cervix and vagina **15. Development of Female reproductive system** • Discuss the primordial germ cells, their precursors and migration • Describe the location and division of genital ridges • Describe the development of female genital ducts • Discuss the development and differentiation of Paramesonephric ducts, and the development of uterus and vagina • Discuss the congenital anomalies associated with the female reproductive system
BIOCHEMISTRY	**1. Male Sex Hormones** • List the male sex hormones • Discuss the production of male sex hormones • Explain the synthesis, chemical structure, mechanism of action and metabolic functions of male sex hormones • Discuss the hypothalamic pituitary axis of male sex hormones • Discuss the regulation and feedback mechanism of male sex hormones • Describe the clinical diseases and complication associated with male sex hormones **2. Female sex hormones** • List the female sex hormones • Discuss the production of female sex hormones • Explain the synthesis, chemical structure, mechanism of action and metabolic functions of female sex hormones

	• Discuss the hypothalamic pituitary axis of female sex hormones • Discuss the regulation of female sex hormones and feedback mechanism • Describe the clinical diseases and complication associated with female sex hormones **3. Pituitary Hormone and Menstrual Cycle** • Explain the biochemical functions of female reproductive system • Discuss hormonal regulation (the hypothalamic-pituitary-ovarian axis) during prepuberty, puberty and menopause • Describe the menstrual cycle (Ovarian and uterine cycles) • Discuss the three phases of the ovarian cycle (Follicular, Ovulation and Luteal) • Discuss the three phases of the uterine cycle (Menstrual, Proliferative and Secretory) • Explain the hormonal changes at menarche and menopause • Discuss the clinical abnormalities of the menstrual cycle and its biochemical investigations **4. Biochemical changes during menopause** • Define menopause • Discuss the hormonal and biochemical changes during menopause • Discuss the clinical conditions associated with menopause • Describe the types of amenorrhea **5. Biochemical role of Placenta** • List the placental hormones • Discuss the cells type and production of placental hormones • Explain the synthesis, chemical structure, mechanism of action and metabolic functions of placental hormones • Discuss the hypothalamic pituitary axis of placental hormones • Discuss the regulation of placental hormones and feedback

mechanism

- Describe the clinical conditions associated with placental hormones and their lab investigations

6. Amniotic fluid Analysis

- Discuss the normal composition of amniotic fluid
- List the biochemical markers of fetal development
- Discuss the functions of amniotic fluids
- Describe the clinical conditions associated with amniotic fluid
- Discuss the laboratory investigations of amniotic fluid

7. DNA & RNA structure

- Explain the central dogma of molecular biology
- Describe the biochemical structure, types and functions of DNA and RNA
- Briefly discuss the genetic disorders

8. DNA Replication

- Define Replication
- Classify the types of replication in prokaryotes and eukaryotes
- Describe the steps of DNA Replication
- Discuss the disorders related to DNA replication and repair (e.g. Xeroderma pigmentosa and radiation damage)

9. Transcription

- Define Transcription
- Explain the process of Transcription in Prokaryotes
- Describe the mechanism of transcription in Eukaryotes
- Discuss the process of Post transcription modification (mRNA, tRNA, and rRNA)
- Explain the retroviruses in relation with cancers and AIDS and the effects of drugs

	10. Translation • Define Translation • Explain genetic code, codon, and wobble hypothesis • Explain the process of Translation • Discuss the inhibitors of protein synthesis • Discuss the process of Post translation modification • Describe the different types of mutations
PHYSIOLOGY	**1. Spermatogenesis, Semen & Capacitation of Sperms** • Explain the stages of spermatogenesis • Describe the hormonal control of spermatogenesis **2. Male Sex Hormone: Testosterone & its functions** • Describe the synthesis, function and regulation of male sex hormones **3. Abnormalities of Male sexual function** • Discuss the abnormalities of male sexual function (hypo and hypergonadism) **4. Functions of Ovary; Ovarian Cycle** • Discuss oogenesis, stages of follicle development through ovulation, and formation of corpus luteum **5. Menstrual Cycle, Menarche, Puberty & Menopause** • Describe the synthesis, function and regulation of hormones of female reproductive system • Describe the hormonal changes and control mechanism of the changes that occur during puberty • Explain the secondary sexual characteristics that develop during puberty in males and females • Explain the control of secretion of FSH and LH through negative and positive feedback during menstrual cycle • Describe the cyclical changes that occur in endometrium and hormonal mechanisms that control these changes **6. Hormones of Pregnancy and Functions of Placenta** • Describe the functions of various hormones associated with pregnancy: HCG, Somatomammotropin, Relaxin, Estrogen and

	Progesterone. • Explain the functions of placenta and various factors associated with transport across placenta. **7. Maternal Changes During Pregnancy & Parturition** • Describe the physiological changes during pregnancy with respect to all organs and systems • Briefly describe parturition especially its stages, mechanism & hormones **8. Mammary Gland & Lactation** • Describe the hormonal requirements for development of mammary gland during pregnancy and milk ejection reflexes
TUTORIALS/ DEMONSTRATIONS ANATOMY	• The topics and objectives are same as mentioned in Anatomy Lectures.
BIOCHEMISTRY	**1. Male sex hormones** • Discuss the clinical importance of Male Sex hormones (e.g. Infertility) • Interpret relevant clinical conditions correlated with their laboratory investigations **2. Menstrual abnormalities** • Discuss the clinical importance of menstrual cycle abnormalities • Interpret relevant clinical conditions correlated with their laboratory investigations **3. Amniocentesis** • Discuss the clinical importance of amniocentesis • Interpret relevant clinical conditions correlated with their laboratory investigations **4. Mutations** • Discuss the clinical importance of mutations (e.g. sickle cell anemia

	etc.) • Interpret relevant clinical conditions correlated with their laboratory investigations
BIOCHEMISTRY	**1. Pregnancy test** • Outline the methods for performance of pregnancy test • Explain the principle of HCG one step pregnancy test • Perform urine pregnancy test by using dip stick (β-HCG levels) • Interpret relevant clinical conditions correlated with their laboratory investigations **2. Polymerase Chain Reaction (PCR)** • Explain the principle and procedure of PCR • Describe the applications of PCR • Interpret relevant clinical conditions correlated with their laboratory investigations
PHYSIOLOGY	**1. Infertility** • Define infertility. • List the physiological causes of male and female infertility. • Identify the screening and testing methods of infertility and associated treatments. **2. PCO's (polycystic ovarian disease)** • Define PCO's. • Discuss the pathophysiology. • List the diagnostic criteria for PCOs. • Discuss the appropriate the management plan for patients with PCOs.
PRACTICALS **HISTOLOGY**	**1. Histology of testes and duct system** • List the male reproductive organs • Describe the histological features of testes and male genital duct system • Describe the histology of seminiferous tubules, sertoli cells, spermatozoa, leydig cells, rete testis and epididymis

	• Identify the histological features of testis and duct system under light microscope **2. Histology of Prostate, Seminal vesicles & Bulbourethral glands** • Identify the histological features of the following, under light microscope: i. Prostate gland ii. Seminal Vesicle iii. Bulbourethral glands **3. Histology of ovary & fallopian tube** • Identify the histological features of ovary (follicles in different stages) • Identify layers of different parts of fallopian tubes under light microscope • Explain the microscopic features of Ovary and Fallopian tube **4. Histology of Uterus, Cervix & vagina** • Identify the histological features of: i. Walls of the uterus; perimetrium, myometrium, endometrium ii. Lining epithelium of uterus • Identify the histological features and parts of cervix & vagina under light microscope • Explain the microscopic features of Uterus, Cervix & vagina
INTERNAL ASSESSMENT	• Internal evaluation carries 20% weight in professional examination. The mode of internal assessment may vary from one institution to the next.
ANNUAL EXAMINATION	• MCQs and OSPE (observed + un-observed)
MODULE EVALUATION	• Course evaluation will be obtained through a feedback form which will be posted on the JSMU website