

السنة الثالثة – الفصل الثاني
الجهاز البولي التناسلي
Genitourinary System
(500361)
(6) Credit Hours

Objectives:

By the end of this course, the student should be able to:

- 1- identify the external and internal gross anatomical and micro-anatomical features of each organ of the urinary system
- 2- describe the arterial supply, venous drainage, lymphatic drainage and nerve supply of each organ
- 3- identify the external and internal gross anatomical features of each organ of the Male and female Reproductive Systems and their blood and nerve supply.
- 4- describe the functional anatomy of the kidney. Role of the renal system in homeostasis.
- 5- Describe Glomerular filtration and its relations in term of (rate, compositions, dynamics, control, and measurements etc.
- 6- Define tubular reabsorption and secretion (The concept of clearance by the kidney and its interpretations). Understand tubular reabsorption and secretion for Na⁺, K⁺, and H⁺.
- 7- describe how germ cells (Spermatozoa and Oocyte) are formed and the regulation of their production.
- 8- mention variation in sex hormones formation(at different age periods), regulation, metabolism and specific function of each one.
- 9- describe menstrual cyclic and its disorders.
- 10- mention the optimum period of fertility, early pregnancy and implantation
- 11- explain the concept of positive and negative feedback mechanism and hypothalamic pituitary gonadal axis.
- 12- describe the hormonal changes of pregnancy with emphasis on early stage.
- 13- describe breast development, milk production and secretion
- 14- describe Puberty, menopause / andropause, meaning of terms and endocrinology of these stages.
- 15- mention the pathologic basis and clinical manifestations of diseases affecting the female and male genital tracts and mammary glands.**
- 16- describe the pathologic basis and clinical manifestations of renal diseases and collecting system.
- 17- describe the major causative agents, transmission and antimicrobial treatment of urinary tract infection and sexually transmitted diseases in males and females.
- 18- mention laboratory methods used in isolation and identification of causative agents leading to urinary
- 19- list risk factors of sexually transmitted diseases, their prevalence, control and prevention.
- 20- describe the pathogenesis and manifestations of the immunological diseases affecting the urogenital system of the males and females.**
- 21- list drugs used for the treatment of urinary and genital tract disorders, their pharmacological actions, their mechanism of action, their clinical uses, their major side effects and drug-drug interactions.
- 22- mention major clinical manifestations of urological, renal and genital diseases
- 23- take proper history and conduct comprehensive physical examination of the urogenital system in mal

Content Summary:

Topic

Hours

Anatomy and histology	22
Physiology	14
Pathology	28
Microbiology	10
Pharmacology	7
Epidemiology	2
Clinical Aspects	5
Total	94

1. Anatomy and Histology of the genitourinary system (22 hours)

A- Gross Anatomy of the Urinary System (6 hours; 4 Lectures and 2 Practical)

Lectures:

1. Kidneys
2. Ureters
3. Urinary bladder
4. Urinary bladder

Practical:

5. Kidneys and Ureters
6. Urinary bladder

B- Gross Anatomy of Reproductive System (6 hours; 4 Lectures and 2 Practical)

1- Male Reproductive System (3 hours; 2 Lectures and 1 Practical)

Lectures:

7. Testis, Epididymis, Vas deferens and Spermatic Cord
8. Seminal Vesicles, Prostate and Penis

Practical:

9. Male Reproductive System

2- Female Reproductive System (3 hours; 2 Lectures and 1 Practical)

Lectures:

10. Uterus, Uterine tubes
11. Ovaries, Vagina and Mammary glands

Practical:

12. Uterus, Uterine tubes, Ovaries, Vagina and Mammary gland

Lectures:

13. Kidney
14. Ureter, Urinary bladder

Practical:

15. Urinary System

D- Histology of Male Reproductive System (4 hours; 3 Lectures and 1 Practical)

Lectures:

16. Testis, spermatogenesis, Epididymis and Vas deferens
17. Prostate, Penis and Seminal Vesicle

Practical:

18. Male Reproductive System

E- Histology of Female Reproductive System (4 hours; 3 Lectures and 1 Practical)

Lectures:

19. Uterus, Uterine tubes
20. Ovaries, Vagina
21. Mammary glands

Practical:

22. Female Reproductive System

2. Physiology of the genitourinary system (19 hours):

A. Renal Physiology (10 lectures and one practical)

Lectures:

23. General physiological concepts and overview of the kidney. Functional Anatomy of the Kidney (Gross Anatomy:Internal anatomy: Innervation of the Kidney:Blood supply). Types of nephron. Renal Plasma Flow (RPF) and Renal Blood Flow (RBF).
24. Assessment of renal function. Glomerular filtration Rate (Tubular load: Measurements:Dynamics: Control). Regulation of Renal Blood Flow.
25. Tubular function I: General concepts: The micropuncture technique. Different forms of transport. Clearance (definition, usages & interpretations).
26. Tubular function II. Reabsorption and secretion. Absorptive capabilities of different tubule segments (Transport maximum (T_m) and Glucose Titration curve).
25. Tubular function III. Reabsorption and secretion of Na⁺, K⁺ & H⁺
- 27-28. Concentration and dilution of urine. The Countercurrent Mechanism. The minimum obligatory urine output. Why we need to make diluted or concentrated urine. Understand and describe the renal handling of urea. Specific Gravity versus osmolality. The diuretics and their mechanism of action.
29. Acid base balance I. Acidosis. Alkalosis. Defense Against Changes in hydrogen ion concentration [H⁺]. (buffers: Lungs: Kidneys). Volatile acid and non-volatile acid. Henderson-Hasselbalch Equation.
30. Acid base balance II. Renal Control of Acid-Base Balance
The three major goals of the kidney in Acid-Base Balance.
31. Acid-Base Imbalance III. Acidosis Vs Alkalosis. Metabolic Vs Respiratory. Compensation.
32. **Practical.**

B. Physiology of the reproductive system. (8 hours)

Lectures:

33. Spermatogenesis: Hormonal factors regulating initiation, maintenance of spermatogenesis.
Function of sex organs.
34. Androgens. Regulation of secretion. Mechanism of action, metabolism.
Chronological pattern of secretion.
35. Oogenesis, Follicular recruitment and development. Monthly follicular and hormonal changes and subsequent endometrial changes.
36. Ovulation, fertility period, Corpus luteum (CL) formation, life span endocrine function, regression and consequences. Changes in the female following ovulation.
CL of pregnancy Extended function of CL.
37. Female hormones, regulation of secretion and different functions.
Hypothalamic pituitary gonadal(testis and ovaries) regulation.
Positive and negative feedback.
38. Early stage of embryo development and implantation in the maternal endometrium. Pregnancy hormones (hCG, Somatomammotropin) secretion and importance of such hormones). Materno-feto-placental hormone secretion. Other hormones as prolactin.
39. Breast development. Hormonal interaction. Milk synthesis and secretion.
Milk letdown reflex
40. Puberty (male and female), menopause, andropause physiological changes.
Physiological aspect of infertility.

3- Pathology of the genitourinary system (29 hours)

Lectures

FEMALE GENITAL SYSTEM AND BREAST

Vulva

41. Vulvitis
 - Non -neoplastic epithelial disorders
 - (Vulvar dystrophies)**
 - Lichen sclerosus
 - squamous hyperplasia
42. Tumors
 - Condylomas
 - Carcinoma of the vulva
 - Intraepithelial neoplasia
 - Extramammary paget's disease
 - Melanoma of the vulva

Vagina

- Vaginitis
- Vaginal intraepithelial neoplasia and squamous cell carcinoma
- Sarcoma Botryoides

Cervix

43. Cervicitis
 - Tumors of the cervix
 - Endocervical polyp
44.
 - cervical intraepithelial neoplasia and squamous cell carcinoma
 - cervical intraepithelial neoplasia (IN), squamous intraepithelial lesion (SIL)
 - Invasive carcinoma of the cervix

Body of uterus and endometrium

45. Endometritis
 - Adenomyosis
 - Endometriosis
 - Dysfunctional uterine bleeding
 - Endometrial hyperplasia
46. Tumors of the endometrium and myometrium
 - Endometrial polyps
 - Leiomyoma and leiomyosarcoma
 - Endometrial carcinoma

47. Fallopian tubes disorders

Ovaries

follicle and luteal cysts

polycystic ovaries

tumors of the ovary

48. Surface epithelio-stromal tumors
 - Serous tumors
 - Mucinous tumors
 - Endometrioid tumors
 - Cystadenofibroma
 - Benner tumor

Other Ovarian Tumors

49. Diseases of pregnancy

Placental inflammations and infections

Ectopic pregnancy

- 50. Gestational trophoblastic disease
 - Hydatidiform mole: Complete and partial
 - Invasive mole
 - Chorioarcoma
 - Preeclampsia/ eclampsia (toxemia of pregnancy)**

51-52. **Breast diseases**

THE KIDNEY AND ITS COLLECTING SYSTEM

- 53. Clinical manifestations of renal diseases
 - Glomerular disease
 - Pathogenesis of glomerular diseases
 - Circulating immune complex nephritis
 - Immune complex nephritis in situ, cell mediated immune glomerulonephritis
 - Mediators of immune injury
 - Other mechanisms of glomerular injury
- 54. Glomerular syndromes and disorders
 - The nephrotic syndromes and disorders
 - Minimal change disease
 - Focal segmental glomerulosclerosis
 - Membranoproliferative glomerulonephritis
- 55. The nephritic syndrome
 - Acute proliferative glomerulonephritis
 - Rapidly progressive glomerulonephritis (Crescentic)
 - IgA nephropathy (Berger's disease)
- 56. Hereditary nephritis
 - Chronic glomerulonephritis

Diseases affecting tubules and interstitium

- 57. Tubulointerstitial nephritis
 - Acute pyelonephritis
 - Chronic pyelonephritis and reflux nephropathy
- 58. Drug - induced interstitial nephritis
 - Acute tubular necrosis

Diseases involving blood vessels

- 59. Benign nephrosclerosis
 - Malignant hypertension and malignant nephrosclerosis
 - Thrombotic microangiopathies

Cystic diseases of the kidney

- 60. Simple cysts
 - Autosomal dominant (adult) polycystic kidney disease
 - Autosomal recessive (Childhood) polycystic kidney disease

Urinary outflow obstruction

- 61. Renal stones
 - Hydronephrosis

Tumors

- 62. Renal cell carcinoma
 - Wilms' tumor
- 63. Tumors of the urinary bladder and collecting system

THE MALE GENITAL SYSTEM

Penis

- 64. -Malformations
 - Inflammatory lesions
 - Neoplasms

Scrotum, testis, and epididymis

- 65. -Cryptorchidism and testicular atrophy
 - Inflammatory lesions
- 66. -Testicular Neoplasms

Prostate

- 67. -Prostatitis
 - Nodular hyperplasia of the prostate
- 68. -Carcinoma of the prostate

Sexually transmitted diseases

- 69. -Syphilis
 - Gonorrhoea
 - Gonococcal Urethritis and Cervicitis
 - Chancroid (soft chancre)
 - Granuloma inguinale
 - Lymphogranuloma venereum
 - Trichomoniasis
 - Genital herpes simplex
 - Human papillomavirus infection

4. Microbiology and Immunology of the genitourinary system (11 hours):

Microbiology (6 hours)

Lectures:

- 70. Enterobacteriaceae, Pseudomonas, Enterococcus, Staphylococcus species, Strep. Group B
- 71. N. gonorrhoea, Mycoplasma, Ureaplasma, Chlamydia
- 72. Mycobacteria, Treponema species, Haemophilus ducreyi
- 73. Candida, Trichomonas, Schistosomiasis,
- 74. Herpes viruses, Papilloma viruses, HIV.
- 75. Hepatitis, Mumps virus

Immunology:

Lectures:

- 76. Mucosal immunity
- 77. Placental immunology
- 78. Immunity in pregnancy, immunology of infertility and abortion
- 79-80. Immune renal diseases

5. Community Medicine of the genitourinary system (2 hours)

Lectures:

- 81-82. Epidemiology of sexually transmitted diseases

6. Pharmacology of the genitourinary system (7 hours)

A- Renal pharmacology:

Lectures:

- 83-84. Diuretics
85. Antidiuretic hormone

B- Pharmacology of the reproductive system

Lectures:

86. Drugs acting on the uterus
87. Pharmacology of GnRH, LH, FSH in males and females
88. Pharmacology of androgens and antiandrogens
89. Pharmacology of estrogens, progestins and oral contraceptive pills

7- Clinical aspects of the genitourinary system (5 hours)

Urology (2 hours)

90-91. Introduction to history, physical examination and clinical manifestations of urological disorders.

Nephrology (2 hours)

92-93. Introduction to history, physical examination and clinical manifestations of renal disorders

Gynecology (1 hour)

94. Introduction to history, physical examination and clinical manifestations of gynecological disorders

Recommended textbooks:

1. Snell, R.: Clinical Anatomy, 7th edition, 2002
Lippincott, Williams & Wilkins.
2. Guyton & Hall: Textbook of Medical physiology, 10th edition
Saunders, 2002.
3. Kumar, Cotran, Robins: Basic Pathology 7th edition, 2003 Saunders.
4. Craig, CR. & Stitzel, RE: Modern Pharmacology
with clinical applications 6th edition 2004
5. Devlin K: Textbook of Biochemistry with clinical applications 5th edition
Wiley liss
6. JAWETZ, Melnick & Adelberg: Medical Microbiology. 5th edition, LANGE