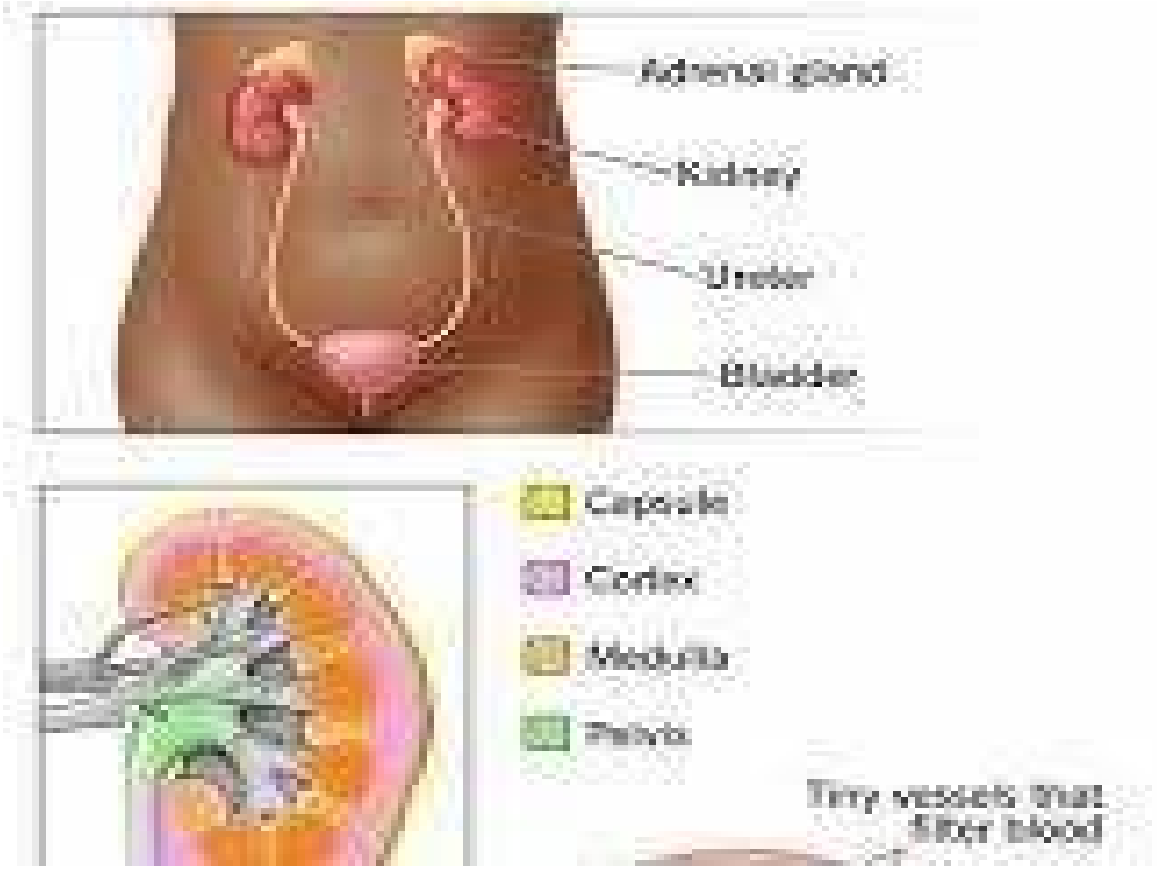
RNS-315
Student study guide



Block RNS-315

2025-2026

Prepared by

Anatomy & Histology

Physiology & Biochemistry

Microbiology & Parasitology

Pathology & Pharmacology

Departments

Faculty of Medicine

Sohag University

Contact Information of Staff Responsible for Block (RNS-315)

Heads of the Departments involved in teaching the block

- **Anatomy Department: Prof. Ahmed Talaat**
- **Histology Department: Prof. Doha Saber Mohamed**
- **Physiology Department: Dr. Amany Abd El-Rahman**
- **Medical Biochemistry Department: Prof. Nagwa Sayed Ahmed**
- **Microbiology and Immunology Department: prof. Asmaa Nasr El-Din**
- **Parasitology Department: Prof. Hanaa Ahmed El-Hady,** Professor of Medical Parasitology, Faculty of Medicine, Sohag University.
- **Pathology Department: Prof. Fatma El-Zahraa Salah El-Din,** Professor of Medical Pathology.
- **Pharmacology Department: Prof. Sanaa Abd Elaal Omran**

Block RNS-315 Coordinator

- **Dr. Asmaa Kamal Abd Ellah, Lecturer of** Medical Parasitology, Faculty of Medicine, Sohag University.

Department Coordinators

Anatomy Department: Prof. Ahmed Talaat
Histology Department: Prof. Doha Saber Mohamed
Dr. Sahar Mohamed Gebril

- **Physiology Department: Dr. Amany Abd El-Rahman**

Medical Biochemistry Department: Dr. Nagwa Mohamed Abdel-mawgoud, Dr Reda Salah Yousef &Dr Marwa Shaaban
Microbiology and Immunology Department. Asmaa Mohamed Goda, Nesma Atef
Parasitology Department: Dr. Hesham Ebrahim Osman Ahmed
Pathology Department: Prof. Fatma El-Zahraa Salah El-Din,
Dr. Rasha Mokhtar Abdelkareem
Pharmacology Department: Dr. Azza Mahmoud Ahmed Abouelella

Contents

Basic Information about the Block

Program on which the course is given: Bachelor of Medicine and Surgery (M.B.B.Ch.).

Elements (major or minor) of the program: Undergraduate

Departments offering the course: Integrated between Anatomy, Histology, Biochemistry, Physiology, Microbiology, Parasitology, Pathology and Pharmacology Departments.

Academic year/level: Sem.5/ Year 3 **Date of specification approval:** 2024-2025 2026-2025 /

Θ **Title:** Urinary System

Θ **Code: RNS-315**

Θ Weeks :**3 weeks.**

Θ Credit points:4.5

Θ **Lectures:** 27 h

Θ **Practical:** 19 h

Θ **Student learning activities:61 hours** / & formative assessment (6 h)

Case -based group discussion (22 h)

Θ **Total:** 135 hours

Block Map

Block	Department involved	**Code**	Points	Weeks	Learning activities		
Urinary systems	All Departments of Basic Sciences	RNS-315	4.5	3 weeks	Contact hours/points	Formative assessment/ feedback	Assignments and other home and self-learning (portfolio based evidence)
					68 / 2.26 points	0.2 points	2.04 points

NARS competencies covered by the block:

NARS areas covered by the block

The competency areas of the NARS- Medicine competency framework are

1- The graduate as a health care provider.

2- The graduate as a health promoter.

3- The graduate as a professional.

4- The graduate as a scholar and scientist.

5- The graduate as a member of the health team and a part of the health care system.

6- The graduate as a lifelong learner and researcher.

Sub competencies

1.5. Prioritize issues to be addressed in a patient encounter.
1.6. Select the appropriate investigations and interpret their results taking into consideration cost/ effectiveness factors.
1.7. Recognize and respond to the complexity, uncertainty, and ambiguity inherent in medical practice.
1.8. Apply knowledge of the clinical and biomedical sciences relevant to the clinical problem at hand
1.9. Retrieve, analyze, and evaluate relevant and current data from literature, using information technologies and library resources, in order to help solve a clinical problem based on evidence (EBM).
1.10. Integrate the results of history, physical and laboratory test findings into a meaningful diagnostic formulation.
1.15. Provide the appropriate care in cases of emergency, including cardiopulmonary resuscitation, immediate life support measures and basic first aid procedures .
1.16. Apply the appropriate pharmacological and nonpharmacological approaches to alleviate pain and provide palliative care for seriously ill people, aiming to relieve their suffering and improve their quality of life.
2.1 Identify the basic determinants of health and principles of health improvement.
2.2Recognize the economic, psychological, social, and cultural factors that interfere with well being
2.3 Discuss the role of nutrition and physical activity in health .
2.4 Identify the major health risks in his/her community, including demographic, occupational and environmental risks; endemic diseases, and prevalent chronic diseases .
2.5 Describe the principles of disease prevention, and empower communities, specific groups or individuals by raising their awareness and building their capacity .
2.6 Recognize the epidemiology of common diseases within his/her community, and apply the systematic approaches useful in reducing the incidence and prevalence of those diseases.
2.9 Adopt suitable measures for infection control .
3.1 Exhibit appropriate professional behaviors and relationships in all aspects of

practice, demonstrating honesty, integrity, commitment, compassion, and respect .
3.2 Adhere to the professional standards and laws governing the practice, and abide by the national code of ethics issued by the Egyptian Medical Syndicate .
3.3. Respect the different cultural beliefs and values in the community they serve.
3.7 Recognize and manage conflicts of interest .
3.8. Refer patients to appropriate health facility at the appropriate stage.
4.1Describe the normal structure of the body and its major organ systems and explain their functions .
4.2 Explain the molecular, biochemical, and cellular mechanisms that are important in maintaining the body's homeostasis .

4.3 Recognize and describe main developmental changes in humans and the effect of growth, development and aging on the individual and his family.
4.5 Identify various causes (genetic, developmental, metabolic, toxic, microbiologic, autoimmune, neoplastic, degenerative, and traumatic) of illness/disease and explain the ways in which they operate on the body (pathogenesis).
4.6 Describe altered structure and function of the body and its major organ systems that are seen in various diseases and conditions.
4.7 Describe drug actions: therapeutics and pharmacokinetics; side effects and interactions, including multiple treatments, long term conditions and non-prescribed medication; and effects on the population.
4.8 Demonstrate basic sciences specific practical skills and procedures relevant to future practice, recognizing their scientific basis, and interpret common diagnostic modalities, including: imaging, electrocardiograms, laboratory assays, pathologic studies, and functional assessment tests.
5.2 Respect colleagues and other health care professionals and work cooperatively with them, negotiating overlapping and shared responsibilities and engaging in shared decision-making for effective patient management.
5.3 Implement strategies to promote understanding, manage differences, and resolve conflicts in a manner that supports collaborative work.
5.4 Apply leadership skills to enhance team functioning, the learning environment, and/or the health care delivery system .
5.5 Communicate effectively using a written health record, electronic medical record, or other digital technology .
5.6 Evaluate his/her work and that of others using constructive feedback .
5.7 Recognize own personal and professional limits and seek help from colleagues and supervisors when necessary .
5.9 Use health informatics to improve the quality of patient care.
6.1 Regularly reflect on and assess his/her performance using various performance indicators and information sources .
6.2 Develop, implement, monitor, and revise a personal learning plan to enhance professional practice
6.3 Identify opportunities and use various resources for learning .
6.4 Engage in inter-professional activities and collaborative learning to continuously improve personal practice and contribute to collective improvements in practice .
6.5 Recognize practice uncertainty and knowledge gaps in clinical and other professional encounters and generate focused questions that address them .
6.6 Effectively manage learning time and resources and set priorities.

Professional Information
Block Aims

Overall Aims

Integrative respiratory and urinary systems provide comprehensive and integrated coverage of anatomy, physiology, histology and embryology of the respiratory and urinary system. Microbiology, biochemistry, and pharmacology relating to the system are discussed. Pathology of both systems is presented along with clinical presentations of diagnostic and treatment modalities. Teaching methods include lectures, labs and case- based group discussion.

Intended Learning Outcomes of the Block:

A- Knowledge and understanding

Upon completion of the course, students should be able to:

A1- Describe the normal anatomy of the kidneys (Position, Dimentions, Hilum, Renal pelvis and sinus, Coverings, Gross structure, Anatomical relations, Blood supply and lymphatic drainage, Renal vascular segments, Nerve supply).

A2- Describe the normal anatomy of the ureters (Length and course, Anatomical relations, Anatomical narrowings, blood supply and lymphatic drainage, Nerve supply).

A3- Describe the surface landmarks of the kidneys (Anterior and posterior surface markings of the kidney).

A4- Describe the surface landmarks of the ureters (Anterior and posterior surface markings of the ureters).

A5- Describe the histological structure of the kidney; medullary and cortical organization.

A6- Describe the uriniferous tubules (structural units).

A7- Discriminate the different parts of the nephron (functional units)

A8- Describe the histological structure of the renal corpuscles and correlate the histological structure and function of these corpuscles.

A9- Describe the histological structure of The glomerular filtration barrier.

A10- Compare between the histological structure of the Proximal convoluted tubules, loop of Henle, Distal convoluted tubules & collecting ducts and

discriminate the type of their lining epithelium and identify their functions.

A11- Describe the histological structure of the Juxtaglomerular apparatus and identify its functions.

A12- Describe the blood supply of the kidney

A13- Describe the normal anatomy of the urinary bladder (Position, Shape, Surfaces, Relations, Trigone and sphincters, Peritoneal coverings, Blood supply and lymphatic drainage, Innervation).

A14- Describe the normal anatomy of the male and female urethra (Length, Parts, lymphatic drainage).

A15- Describe the different types of the nephron.

A16- Describe the functions of juxtaglomerular apparatus and its physiological significance.

A17- Know nerve supply to the kidneys.

A18- Know the different functions of the kidneys

A19- Define the basic renal processes that result in urine formation.

A20- Understand the renal handling of different substances and how does this determine the urinary excretion of these substances.

A21- Understand how glomerular filtrate is formed and the composition of this filtrate.

A22- Describe main determinants of solute filterability.

A23- Define glomerular filtration rate (GFR) and forces affecting its formation.

A24- Define renal blood flow (RBF), renal plasma flow (RPF) and the filtration fraction (FF).

A25- Describe the different mechanisms that regulate RBF and GFR

A26- Describe the histological structure of the minor calyces, the major calyces, the renal pelvis, the ureter, the bladder and the urethra .

A27- Identify the transitional epithelium which is characteristic to all the urinary passages.

A28- Define the renal process: Tubular reabsorption.

A29- Know the different modes of transport (active and passive).

A30- Describe the mode of reabsorption of different substances (e.g. Na+, water, Cl-, glucose, urea, phosphate) through renal tubules.

A31- Define transport maximum (Tm), renal plasma threshold and splay.

A32- Describe gradient time transport.

A33- Know reabsorption and secretion along different tubular segments of the kidney.

A34- Describe the different stages of development of the kidneys and ureters.

A35- Describe the developmental defects of the kidneys.

A36- Describe the developmental defects of the ureters.

A37- Understand the functions of proximal tubule, loop of Henle, early and late distal tubule and collecting ducts.

A38- Describe how the kidneys can produce dilute or concentrated urine.

A39- Describe the different factors contributed to increase medullary osmolality.

A40- Describe the counter current mechanism (counter current multiplier and counter current exchanger)

A41- Know the role of urea

A42- Know some disorders of urine concentrating ability.

A43- Describe the different stages of development of the urinary bladder and urethra.

A44- Describe the developmental abnormalities of the urinary bladder.

A45- Describe the developmental defects of the urethra.

A46- Describe the local mechanisms that regulate tubular functions.

A47- Describe a nervous mechanism that regulates tubular function (renal sympathetic nerves).

A48- Describe the hormonal mechanisms that regulate tubular function.

A49- Define the normal range for plasma pH.

A50- Explain the role of the kidney in the steady state elimination of acid produced daily by metabolism.

A51- Outline the defense mechanisms which act to prevent an abrupt change in pH in response to an acid load.

A52- Describe the mechanism for acid transport in the different nephron segments.

A53- Recognize the clinical and biochemical features of metabolic acidosis, list some causes and give an approach to the differential diagnosis.

A54- Recognize metabolic alkalosis, list some causes, and explain the pathophysiology of this disturbance during prolonged vomiting.

A55- Describe the physiological anatomy and innervation of the urinary bladder.

A56- Describe micturition reflex and higher control of micturition.

A57- Know abnormalities of micturition reflex.

A58- List the commonest causative agents (Pathogens) of UTI.

A59- Recognize risk factors for UTI.

A60- Explain the pathogenesis and microbiology of UTI.

A61- Recognize classification of UTI.

A62- Describe the clinical manifestations of UTI.

A63- Memorize the complications of UTI.

A64- Outline the laboratory diagnostic approach in different UTIs.

A65- List treatment and specific preventive measures for UTI.

A66- Enumerate congenital anomalies of the kidney and discuss polycystic kidney

A67- Define glomerulonephritis and the pathogenetic mechanisms underlying glomerular injury and the tissue reaction of glomerular injury

A68- Define the terms nephritic and nephrotic syndromes and enumerate its causes.

A69- Outline the clinicopathological features of the common types of glomerulonephritis

A70- Aetiology and pathology of acute tubular necrosis

A71- Define pyelonephritis and describe the risk factors, morphology, and complications of acute and chronic pyelonephritis.

A72- Mention the normal urinary pH describe how its changes can help in diagnosing types of urinary stone.

A73- List the main chemical types of urinary stones.

A74- Mention the radiologic appearance of these stones.

A75- Describe different shapes of urine crystals associated with each type of stone.

A76- Explain the pathological condition and metabolic disorder that lead to the formation of these stones.

A77- Define hydronephrosis and enumerate causes of unilateral and bilateral hydronephrosis and their complication

A78- Discuss the etiology, and pathological consequences of urinary calculi.

A79- Define cystitis and discuss its aetiology and complications

A80- Classification of renal tumors

A81- Renal cell carcinoma, the presenting features and morphological appearances

A82- Nephroblastoma, the presenting features and morphological appearances.

A83- Classify tumors of the renal pelvis , ureter and urinary bladder

A84- List the sites of origin of transitional cell carcinoma and discuss the epidemiology, risk factors and pathology

A85- Discuss squamous cell carcinoma of the urinary bladder; epidemiology, risk factors and pathology

A86- Describe the mechanism and site of actions of diuretics.

A87- Outline the different indications for diuretics.

A88- Identify the adverse effects and contra-indications of different diuretics.

A89- List the major drug-drug interactions with diuretics.

A90- List drug class, common drugs and their nephrotoxic action (s).

A91- Specify the parasites involved in focal renal pathology including (hydatid disease and amoebic abscess).

A92- Specify the parasites involved in diffuse renal pathology.

A93- Differentiate between the mentioned parasites geographical distribution.

A94- Describe for each of the previous parasites the mode of infection, infective stage, diagnostic stages and life cycle.

A95- Describe diagnostic methods for each disease.

A96- Describe the recommended treatment for each of the previous parasites.

A97- Describe the preventive measures for each of the previous parasites.

B- Intellectual skills

B1- Interpret the typical appearance of chest X-ray and CT scan.

B2- Interpret anatomical facts with its major clinical applications

B3- Interpret some clinical findings in relation to developmental basis

B4- Differentiate between the infective and diagnostic stages of different parasites

B5- Interpret cases and problem solving session with diagnosis

B6- Interpret cases and problem solving session with required investigations

B7- Interpret cases and problem solving session with required treatment.

B8- Interpret the normal appearance of the kidneys and ureters in X ray with contrast

B9- Interpret anatomical facts with its major clinical applications (renal stones, kidney approach, psoas abscess).

B10- Interpret anatomical facts with its major clinical applications (Studying the pattern of arterial supply of the kidney is important in segmetal resection of the kidney or removing a staghorn stone).

B11- Interpret anatomical facts with its major clinical applications (Ureteric incisions).

B12- Interpret the normal appearance of the urinary bladder and urethra in X ray with contrast

B13- Interpret anatomical facts with its major clinical applications (Surgical access to the urinary bladder).

B14- Interpret anatomical facts with its major clinical applications (Rupture urethra).

B15- Interpret some clinical findings in relation to developmental basis (Abnormal location of the kidneys, Renal dysplasias and agenesis, Multicystic kidney).

B16- Interpret some clinical findings in relation to developmental basis (Bifid ureter, Ectopic ureteric orifice, Double pelvis of the ureter).

B17- Interpret some clinical findings in relation to developmental basis (Bladder and urethral Defects).

B18- Explain each parasite pathology

B19- Differentiate between the infective and diagnostic stages of different parasites

B20- Interpret cases and problem solving session with diagnosis

B21- Interpret cases and problem solving session with required investigations

B22- Interpret cases and problem solving session with required treatment.

C- Practical/ Professional skills

C1- Identify diagnostic methods and isolation of pathogens causing urinary tract infection

C2- Identify the gross morphology of the kidneys (in cadavers and preserved specimens).

C3- Identify the gross morphology of the ureters.

C4- Identify the surface anatomy of kidneys and ureters.

C5- Identify the gross morphology of the urinary bladder (in cadavers and preserved specimens).

C6- Identify the gross morphology of the urethra.

C7- Describe the histological structure (microscopic appearance) of the kidney

C8- Identify and label a diagram of the proximal convoluted tubules & Distal convoluted tubules.

C9- Identify and label a diagram of Juxtaglomerular apparatus.

C10- Identify and label a diagram of the blood/ renal barrier.

C11- Describe the histological structure (microscopic appearance) of the urinary bladder & the ureter.

C12- Identify diagnostic methods and isolation of pathogens causing lower respiratory tract infection

C13- Define the term clearance.

C14- Knows the clinical significance of GFR measurement.

C15- State what substances are used to measure GFR and RPF.

C16- List data required for clearance calculation.

C17- Predict whether a substance undergoes net reabsorption or net secretion by comparison of its clearance to that of inulin.

C18- List the main biochemical investigations evaluating glomerular and tubular functions of the kidney and describe their importance and interpretation.

C19- Describe the principle of estimation of urea and demonstrate the test.

C20- Describe the diagnostic significance of urea estimation

C21- Describe the principle of estimation of creatinine and demonstrate the test.

C22- Describe the diagnostic significance of creatinine estimation.

C23- Demonstrate the physical and biochemical examination of urine and mention the diagnostic significance of urine analysis.

C24- Define and classify proteinuria.

C25- List the causes of proteinuria.

C26- Mention the normal urinary pH and specific gravity and describe how their changes can help you in diagnosing urinary tract diseases.

C27- List the main non-protein nitrogenous compounds present normally in urine.

C28- Differentiate practically between different types of urinay stones

C29- Identify methods for identification and isolation of pathogens causing urinary tract infection

C30- Recommend a diuretic prescription to a case of congestive heart failure

C31- Outline the main indications of different diuretics in hypertension.

C32- Identify trade name and generic name of different diuretics and nephrotoxic agents.

C33- Identify the gross picture of polycystic kidney and hypoplastic kidney

C34- Identify the gross picture of kidney with chronic glomerulonephritis

C35- Identify the gross picture of hydronephrosis and the effect if renal stones

C36- Identify the gross picture of bilharzial cystitis

C37- Identify the gross picture of urinary tract tumors.

C38- Identify the microscopic picture of bilharzial cystitis

C39- Identify the microscopic picture of chronic pyelonephritis

C40- Identify the microscopic picture of renal cell carcinoma

C41- Identify the microscopic picture of papillary urothelial carcinoma

C42- Identify diagnostic methods for each disease

C43- Identify the infective and diagnostic stages microscopically.

C44- Identify the pathogenesis microscopically.

D- General and transferable skills

D1- Adhere the value of teamwork by acting in small groups.

D2- Qualify adequate cooperation with his/her colleagues.

D3- Justify the efforts required to accomplish the tasks in specified time.

D4- Set the use of sources of biomedical information to remain current with advances in knowledge and practice.

D5- Practice the skill of self-learning.

D6- Demonstrate personal responsibility.

D7- Practice the skill of respecting colleagues.

D8- Qualify adequate cooperation with his/her colleagues.

D9- Set the use of sources of biomedical information to remain current with advances in knowledge and practice.

D10- Display freely, keeping an ethical behavior

D11- Share in the work efficiently with the instruments and equipment's of the department in a responsible manner keeping them intact and clean.

D12- Modify his/her capability to describe, discuss and solve problems.

D13- Reflect on and assess his/her performance using various performance indicators and information sources

Streucture of the block

	Lectures	Practical	Case-based group discussions	Formative assessment	Revisions , Assignments and Exams	Total
Contact / non-contact Hours	27	19	22	6	61	135
Credit	**1**	**0.6**	**0.7**	**0.2**	2	**4.5**

Learning Methods

1- Lectures/ team-based or flipped for knowledge and intellectual skill outcomes.

2- Practical sessions to gain practical skills aided with the practical book.

3- Case-based group discussions.

Methods of Student Assessment

1. Formative:

This is used to monitor student's learning to provide ongoing feedback that can be used by instructors to improve their teaching and by students to improve their learning.

It's given at least once in the form of quizzes that is made available for the students at the E-learning site at the end of the block.

Answers are presented instantly after the attempts and discussed on the students groups or in person with the teaching staff

Questions should be consistent with the level of the final exam. The student's attendance is a condition for entering the summative exams. The electronic or paper achievement file must be used to follow up on the students' evaluation, and its completion is a condition for entering the final exams

2. Summative

It is used to evaluate student's achievements at the end of an instructional unit. The grades tell whether the student achieved the learning goal or not.

The student's performance will be assessed according to the following:

Assessment task	Type of assessment	Proportion of total assessment	
		%	Marks
End block exam	MCQ	20%	13
Portfolio		10%	8
Final written exam	50%MCQ 50% Short answer questions & modified essay questions	40%	27
OSPE/OSCE Final		30%	20
Total		**100%**	**68**

Block evaluation

- Students' results
- Students' feedback
- Tutors' feedback

Block Contents
Lecture Topics and Their Intended Learning Outcomes

No.	Lecture Title	ILOs	Reference book (s)	Week	Contact hours	Department
1.	Anatomy of the kidney and ureters	A1-A4, B8-B11	Oxford handbook of Medical Sciences 2011, Page(s). 474-478.	4	1h	Anatomy
2.	Histology of the Kidney (1)	A5- A12	First Aid for the Basic Sciences : CHAPTER 8 PAGE(S). 590-594	4	1h	Histology
3.	Histology of the Kidney (2)	A5- A12	First Aid for the Basic Sciences : CHAPTER 8 PAGE(S). 590-594	4	1h	Histology
4.	Anatomy of the urinary bladder and urethra	A13-A14, B12-B14	Oxford handbook of Medical Sciences 2011, Page(s). 480-481.	4	1h	Anatomy
5.	Functional organization of the Kidney and renal blood flow	A15-A18	First Aid for the Basic Sciences: Organ Systems, Third Edition, Page(s). 608	4	1h	Physiology
6.	Mechanism of urine formation: I- Glomerular filtration	A19-A25	First Aid for the Basic Sciences: Organ Systems, Third Edition, Page(s) 616-620	4	1h	Physiology
7.	Histology of the external collecting system	A26-A27	First Aid for the Basic Sciences : CHAPTER 8 PAGE(S). 590-594	4	1h	Histology
8.	Mechanism of urine formation: II- Reabsorption and secretion	A28-A30	First Aid for the Basic Sciences: Organ Systems, Third Edition, PAGE(S).610-611, 620-622	4	1h	Physiology
9.	Tubular load, tubular transport maximum (Tm) and gradient time transport	A31-A33	First Aid for the Basic Sciences: Organ Systems, Third Edition, Page(s) 620-622	4	1h	Physiology

10.	**Development & congenital anomalies of the kidneys and ureters**	**A34-203, B15-B16**	**-Lippincott Illustrated Reviews: Integrated systems, Page(s).253-256.** **-Oxford handbook of Medical** **Sciences Page(s). 676-677.**	**5**	**1h**	**Anatomy**
11.	**Functions of the different parts of the nephron** **.**	**A37**	**-First Aid for the basic Sciences: organ systems, Third edition, Page(s) 622-624** **-Lippincott illustrated reviews: Integrated system Page(s).268, 269,270,271,272** **-Oxford Hand Book For** **Medical Sciences Page(s). 490, 491, 492.**	**5**	**1h**	**Physiology**

12.	Renal concentration and dilution of urine	A38-A42	-First Aid for the basic Sciences: organ systems, Third edition, Page(s) 624-625 -Lippincott illustrated reviews: Integrated system Page(s).272, 273	5	1h	Physiology
13.	Development & congenital anomalies of the urinary bladder and urethra	A43-2012, B17	-Lippincott Illustrated Reviews: Integrated systems, Page(s).253-256. -Oxford handbook of Medical Sciences Page(s). 676- 677.	5	1h	Anatomy
14.	Regulation of tubular functions	A46-A48	-First Aid for the basic Sciences: organ systems, Third edition, Page(s) 626-630 -Lippincott illustrated reviews: Integrated system Page(s).265, 266, 267	5	1h	Physiology
15.	Renal regulation of acid-base balance and the micturition reflex	A49-A57	-First Aid for the basic Sciences: organ systems, Third edition, Page(s) 630-634 -Oxford Hand Book For Medical Sciences Page(s). 502, 503 -Lippincott illustrated reviews: Integrated system p 277-278, Page(s) 282-283 -Oxford Hand Book For Medical Sciences Page(s). 504, 505	5	1h	Physiology
16.	Urinary tract infection (1)	A58-A65	Lippincott illustrated reviews: Integrated Systems Page(s). 284- 285, lecture notes, department book (p 38-44)	5	1h	Microbiology and Immunology
17.	Urinary tract infection (2)	A58-A65	Lippincott illustrated reviews: Integrated Systems Page(s). 284- 285, lecture notes, department book (p 38-44)	5	1h	Microbiology and Immunology
18.	Congenital anomalies of the kidneys- Glomerular diseases (1)	A65-A68	First aid for the basic sciences, Chapter 8 Page(s) 623..., 636 Pages 643-646	5	1h	Pathology
19.	Glomerular diseases (2)	A69	First aid for the basic sciences, Chapter 8 Page(s) 623 -636	6	1h	Pathology
20.	Diseases of the tubules and interstitium	A70-A71	First aid for the basic sciences, Chapter 8 Page(s) 638-643	6	1h	Pathology
21.	Urinary stones	A72-A76	First Aid for the Basic Sciences – Organ Systems Pages 651-652	6	1h	Medical Biochemistry
22.	Urinary outflow obstruction - Diseases of the urinary bladder	A77-A79	First aid for the basic sciences, Chapter 8 Page(s) 636-638	6	1h	Pathology
23.	Tumors of urinary tract	A80- A85	First aid for the basic sciences, Chapter 8 Pages 647-650	6	1h	Pathology
24.	Diuretics (1)	A86- A89	First aid for the basic sciences, Chapter 8 Page(s) 91-95, 670-673	6	1h	Pharmacology
25.	Diuretics (2)	A86- A89	First aid for the basic sciences, Chapter 8 Page(s) 91-95, 670-673	6	1h	Pharmacology

26.	Nephrotoxic Drugs	A90	First aid for the basic sciences, Chapter 8 Page(s) 675	6	1h	Pharmacology
27.	Parasitic infection of the renal system	A91-A97, B18-B22	-Oxford handbook of Medical Sciences 2011 pages 818-819 -First Aid for the Basic Sciences 641, 663 Lippincott Illustrated Reviews: Integrated systems;293	6	1h	Parasitology
	Revisions and Exams					
	Total				27 hrs	

Practical Topics and Their Intended Learning Outcomes

No.	ILOs	Practical Topic	Week No.	Hrs
1.	C2-C6	**Practical 10 Anatomy:** Anatomy of the urinary system (kidneys, ureters, urinary bladder and urethra)	1	2h
2.	C7-C11	**Practical 11 Histology:** Histology of the kidney & external collecting system.	1	2h
3.	C12	**Practical 12 Microbiology:** Respiratory tract pathogens II	1	2h
4.	C13-C17	**Practical 13 Physiology: Renal plasma clearance**	1	1h
5.	C18-C28	**Practical 14 Biochemistry: Kidney function tests/ Urine and Urinary stones**	2	2h
6.	C29	**Practical 15 Microbiology: Laboratory diagnosis of UTI**	2	2h
7.	C30-C32	**Practical 16 Pharmacology: Diuretics and nephrotoxic drugs**	2	2h
8.	C33-C37	**Practical 17 Pathology: Renal pathology 1**	2	2h
9.	C38-C41	**Practical 18 Pathology: Renal pathology 2**	3	2h
10.	C42-C44	**Practical 19 Parasitology: Parasitic infection of the respiratory and renal systems**	3	2h
		Total		20 hrs

Topics of Case -based Group Discussion

No.	ILOs	Topics	Week No.	hrs
1.	C2-C6 D1,2	**GD 1 Histology:** Renal system I	2	2
2.	C7-C11 D 1,2,3,4	**GD 2 Anatomy:** Renal system	2	2
3.	C12 D5,6,7	**GD 3 Physiology:** GFR – Glucosuria- Polyuria (Failure of urine concentration)	2	2
4.	C13-C17 D8,9	**GD 4 Anatomy:** Renal emberyology	2	1
5.	C18-C28 D9,10 D10,11	**GD 5 Histology:** Renal system II	2	1
6.	C29 D11,12	**GD 6 Physiology:** Metabolic acid- base imbalance	3	1
7.	C30-C32 D11,12	**GD 7 Microbiology:** Renal group discussion I	3	2
8.	C33-C37 D 12 ,13	**GD 8 Pharmacology:** Tuberculosis	3	2
9.	C38-C41, D10.11	**GD 9 Pathology:** Renal system I	3	2
10.	C42-C44, D9,10,13	**GD 10 Pathology:** Renal system II	3	2
11.	C2-C6 D1,2	**GD 11 Pharmacology:** Diuretics and nephrotoxic drugs.	3	2
12.	C7-C11 D 1,2,3,4	**GD 12 Parasitology:** Parasitic infection of the renal system.	3	1
13.	C12 D5,6,7	**GD 13 Biochemistry:** Renal system cases	3	2
	Total			22 hrs.

Formative assessment

This is used to monitor student's learning to provide ongoing feedback that can be used by instructors to improve their teaching and by students to improve their learning.

It's given at least once in the form of quizzes that is made available for the students at the E-learning site at the end of the block.

Answers are presented instantly after the attempts and discussed on the students groups or in person with the teaching staff

Questions should be consistent with the level of the final exam. The student's attendance is a condition for entering the summative exams. The electronic or paper achievement file must be used to follow up on the students' evaluation, and its completion is a condition for entering the final exams

Blueprint of the block

No.	List of Topics	DEPARTMENT	Contact Hours	Total marks	End of the block	Final exam
1.	**Anatomy of the kidney and ureters**	**Anatomy**	**1h**	**2 mark**	**1 mark**	**1 mark**
2,3.	**Histology of the Kidney (1) & (2)**	**Histology**	**2h**	**3 marks**	**1 mark**	**2 marks**
4.	**Anatomy of the urinary bladder and urethra**	**Anatomy**	**1h**	2 marks	1 mark	1 mark
5.	**Functional organization of the Kidney and renal blood flow**	**Physiology**	**1h**	2 marks	1 mark	1 mark
6.	**Mechanism of urine formation: I- Glomerular filtration**	**Physiology**	**1h**	2 marks	1 mark	1 mark
7.	**Histology of the external collecting system**	**Histology**	**1h**	1.5 mark	0.5 mark	1 mark
8.	**Mechanism of urine formation: II-Reabsorption and secretion**	**Physiology**	**1h**	2 marks	1 mark	1 mark
9.	**Tubular load, tubular transport maximum (Tm) and gradient time transport**	**Physiology**	**1h**	1 mark	1 mark	1 mark
10.	**Development &congenital anomalies of the kidneys and ureters**	**Anatomy**	**1h**	1 mark	0 mark	1 mark
11.	**Functions of the different parts of the nephron.**	**Physiology**	**1h**	1 mark	0 mark	1 mark

12.	**Renal concentration and dilution of urine**	**Physiology**	**1h**	1 mark	0 mark	1 mark
13.	**Development &congenital anomalies of the urinary bladder and urethra**	**Anatomy**	**1h**	1 mark	0 mark	1 mark
14.	**Regulation of tubular functions**	**Physiology**	**1h**	1 mark	0 mark	1 mark
15.	**Renal regulation of acid-base balance and the micturition reflex**	**Physiology**	**1h**	2 marks	0 mark	1 mark
16&17	**Urinary tract infection(1)& (2)**	**Microbiology**	**2h**	3 marks	1 mark	2 marks
18.	**Congenital anomalies of the kidneys- Glomerular diseases (1)**	**PATHOLOGY**	**1h**	2 marks	1 mark	1 mark
19.	**Glomerular diseases (2)**	**PATHOLOGY**	**1h**	2 marks	1 mark	1 mark
20.	**Diseases of thetubules and interstitium**	**PATHOLOGY**	**1h**	1 mark	0 mark	1 mark
21.	**Urinary stones**	**Biochemistry**	**1h**	1.5marks	0.5 mark	1mark

22.	**Urinary outflow obstruction - Diseases of the urinary bladder**	**PATHOLOGY**	**1h**	1 mark	0 mark	1 mark
23.	**Tumors of urinary tract**	**PATHOLOGY**	**1h**	1 mark	0 mark	1 mark
24&25	**Diuretics (1) &(2)**	**Pharmacology**	**2h**	3 marks	1 mark	2 marks
26.	**Nephrotoxic Drugs**	**Pharmacology**	**1h**	1.5 mark	0.5 marks	1 mark
27.	**Parasitic infection of the renal system**	**Parasitology**	**1h**	1.5 mark	0.5 mark	1 mark
Total			**27 hrs**	**40 Marks**	**20% 13 marks**	**40% 27 marks**

Department	Anatomy	Histology	Physiology	Biochemistry	Pathology	Pharma	Micro	Para	Total
Lecture Hours/Wt%	4 14.8%	3 11.1%	8 29.6%	1 3.7%	5 18.5%	3 11.1%	2 7.5%	1 3.7%	27 100%
Mid-block Marks	2	1.5	4	0.5	2	1.5	1	0.5	13 Marks
Final – Block Marks	4	3	8	1	5	3	2	1	27 Marks

	List of Topics Blueprint of Practicals	ILOs	Contact Hours	Final practical exam
1.	**Practical 10 Anatomy:** Anatomy of the urinary system (kidneys, ureters,	C2-C6	2 h	2 marks
2.	**Practical 11 Histology:**	C7-C11	2h	2marks
4.	**Practical 12 Microbiology:** Respiratory tract pathogens	C12	2h	2 marks
5.	**Practical 13 Physiology:**	C13-C17	1h	1 mark
6.	**Practical 14 Biochemistry:**	C18-C28	2h	2marks
7.	**Practical 15 Microbiology:**	C29	2h	2 marks
8.	**Practical 16 Pharmacology: Diuretics**	C30-C32	**2h**	2 marks
9.	**Practical 17 Pathology:**	C33-C37	**2h**	2 marks
10.	**Practical 18 Pathology:**	C38-C41	**3h**	3 marks
11.	**Practical 19 Parasitology: Parasitic infection of the respiratory and renal**	C42-C44	**2h**	2 mark
Total			**20 hs**	30% 20 marks

Practical	Anatomy	Histology	Physiology	Pathology	Pharma	Micro	Bio	Para	Total
Hours/ Wt%	**2 10%**	**2 10%**	**1 5%**	**5 25%**	**2 10%**	**4 20%**	**2 10%**	**2 10%**	**20/ 100%**
الدور الاول %30 **Marks**	**2**	**2**	**1**	**5**	**2**	**4**	2	2	20M
الدور الثانى %40 **Marks**	**3**	**3**	**1**	**6**	**3**	**5**	**3**	**3**	**27 M**

Outlines of the Lectures

Lecture (1): *Anatomy of the kidney and ureters*

By the end of the lecture the student will be able to:

A1- Describe the normal anatomy of the kidneys (Position, Dimentions, Hilum, Renal pelvis and sinus, Coverings, Gross structure, Anatomical relations, Blood supply and lymphatic drainage, Renal vascular segments, Nerve supply).

A2- Describe the normal anatomy of the ureters (Length and course, Anatomical relations, Anatomical narrowings, blood supply and lymphatic drainage, Nerve supply).

A3- Describe the surface landmarks of the kidneys (Anterior and posterior surface markings of the kidney).

A4- Describe the surface landmarks of the ureters (Anterior and posterior surface markings of the ureters).

B8- Interpret the normal appearance of the kidneys and ureters in X ray with contrast

B9- Interpret anatomical facts with its major clinical applications (renal stones, kidney approach, psoas abscess .)

B10- Interpret anatomical facts with its major clinical applications (Studying the pattern of arterial supply of the kidney is important in segmetal resection of the kidney or removing a staghorn stone.)

B11- Interpret anatomical facts with its major clinical applications (Ureteric incisions).

Lecture (2): Histology of the Kidney (1)

By the end of the lecture the student will be able to:

A5- Describe the histological structure of the kidney; medullary and cortical organization.

A6- Describe the uriniferous tubules (structural units).

A7- Discriminate the different parts of the nephron (functional units)

A8- Describe the histological structure of the renal corpuscles and correlate the histological structure and function of these differential diagnosis.

corpuscles.

A9- Describe the histological structure of The glomerular filtration barrier.

A10- Compare between the histological structure of the Proximal convoluted tubules, loop of Henle, Distal convoluted tubules & collecting ducts and discriminate the type of their lining epithelium and identify their functions.

A11- Describe the histological structure of the Juxtaglomerular apparatus and identify its functions.

A12- Describe the blood supply of the kidney

Lecture (3): Histology of the Kidney (2)

By the end of the lecture the student will be able to:

A5- Describe the histological structure of the kidney; medullary and cortical organization.

A6- Describe the uriniferous tubules (structural units).

A7- Discriminate the different parts of the nephron (functional units)

A8- Describe the histological structure of the renal corpuscles and correlate the histological structure and function of these corpuscles.

A9- Describe the histological structure of The glomerular filtration barrier.

A10- Compare between the histological structure of the Proximal convoluted tubules, loop of Henle, Distal convoluted tubules & collecting ducts and discriminate the type of their lining epithelium and identify their functions.

A11- Describe the histological structure of the Juxtaglomerular apparatus and identify its functions.

A12- Describe the blood supply of the kidney

Lecture (4): *Anatomy of the urinary bladder and urethra*

By the end of the lecture the student will be able to:

differential diagnosis.

A13- Describe the normal anatomy of the urinary bladder (Position, Shape, Surfaces, Relations, Trigone and sphincters, Peritoneal coverings, Blood supply and lymphatic drainage, Innervation).

A14- Describe the normal anatomy of the male and female urethra (Length, Parts, lymphatic drainage).

B12- Interpret the normal appearance of the urinary bladder a n_4 d_9 urethra in X ray with contrast

B13- Interpret anatomical facts with its major clinical applications (Surgical access to the urinary bladder .)

B14- Interpret anatomical facts with its major clinical applications (Rupture urethra).

Lecture (5): Functional organization of the Kidney and renal blood flow

By the end of the lecture the student will be able to:

A15- Describe the different types of the nephron.

A16- Describe the functions of juxtaglomerular apparatus and its physiological significance.

A17- Know nerve supply to the kidneys.

A18- Know the different functions of the kidneys

Lecture (6): Mechanism of urine formation:I- Glomerular filtration

By the end of the lecture the student will be able to:

A19- Define the basic renal processes that result in urine formation.

A20- Understand the renal handling of different substances and how does this determine the urinary excretion of these substances.

A21- Understand how glomerular filtrate is formed and the composition of this filtrate.

A22- Describe main determinants of solute filterability.

A23- Define glomerular filtration rate (GFR) and forces affecting its formation.

A24- Define renal blood flow (RBF), renal plasma flow (RPF) and the filtration fraction (FF).

A25- Describe the different mechanisms that regulates RBF and GFR

Lecture (7): Histology of the external collecting system

By the end of the lecture the student will be able to:

A26- Describe the histological structure of the minor calyces, the major calyces, the renal pelvis, the ureter, the bladder and the urethra .

A27- Identify the transitional epithelium which is characteristic to all the urinary passages.

Lecture (8): Mechanism of urine formation: II- Reabsorption and secretion

By the end of the lecture the student will be able to:

A28- Define the renal process: Tubular reabsorption.

A29- Know the different modes of transport (active and passive).

A30- Describe the mode of reabsorption of different substances (e.g. Na+, water, Cl-, glucose, urea, phosphate) through renal tubules.

Lecture (9): Tubular load, tubular transport maximum (Tm) and gradient time transport

By the end of the lecture the student will be able to:

A31- Define transport maximum (Tm), renal plasma threshold and splay.

A32- Describe gradient time transport.

A33- Know reabsorption and secretion along different tubular segments of the kidney.

Lecture (10): *Development & congenital anomalies of the kidneys and ureters*

By the end of the lecture the student will be able to:

A34- Describe the different stages of development of the kidneys and ureters.

A35- Describe the developmental defects of the kidneys.

A36- Describe the developmental defects of the ureters.

differential diagnosis.

B15- Interpret some clinical findings in relation to developmental basis (Abnormal location of the kidneys, Renal dysplasias and agenesis, Multicystic kidney.)

B16- Interpret some clinical findings in relation to developmental basis (Bifid ureter, Ectopic ureteric orifice, Double pelvis of the ureter).

Lecture (11): *Functions of the different parts of the nephron*

By the end of the lecture the student will be able to:

A37- Understand the functions of proximal tubule, loop of Henle, early and late distal tubule and collecting ducts.
A38- Describe how the kidneys can produce dilute or concentrated field urine.

A39- Describe the different factors contributed to increase medullary osmolality.

A40- Describe the counter current mechanism (counter current multiplier and counter current exchanger)

A41- Know the role of urea

A42- Know some disorders of urine concentrating ability.

Lecture (12): *Renal concentration and dilution of urine*

By the end of the lecture the student will be able to:

A37- Describe how the kidneys can produce dilute or concentrated urine.
A38- Describe the different factors contributed to increase medullary osmolality.
A39- Describe the counter current mechanism (counter current multiplier and counter current exchanger)
A40- Know the role of urea
A41- Know some disorders of urine concentrating ability.

Lecture (13): *Development & congenital anomalies of the urinary bladder and urethra*

By the end of the lecture the student will be able to:

A43- Describe the different stages of development of the urinary bladder and urethra.

A44- Describe the developmental abnormalities of the urinary bladder.

differential diagnosis.

A45- Describe the developmental defects of the urethra.

B17- Interpret some clinical findings in relation to developmental basis (Bladder and urethral Defects).

Lecture (14): Regulation of tubular functions

By the end of the lecture the student will be able to:

A46- Describe the local mechanisms that regulate tubular functions.

A47- Describe a nervous mechanism that regulates tubular function (renal sympathetic nerves).

A48- Describe the hormonal mechanisms that regulate tubular function.

Lecture (15): Renal regulation of acid-base balance and the micturition reflex

By the end of the lecture the student will be able to:

A49- Define the normal range for plasma pH.

A50- Explain the role of the kidney in the steady state elimination of acid produced daily by metabolism. **A51-** Outline the defence mechanisms which act to prevent an abrupt change in pH in response to an acid load. **A52-** Describe the mechanism for acid transport in the different nephron segments.

A53- Recognize the clinical and biochemical features of metabolic acidosis, list some causes and give an approach to the differential diagnosis.

A54- Recognize metabolic alkalosis, list some causes, and explain the pathophysiology of this disturbance during prolonged vomiting.

A55- Describe the physiological anatomy and innervation of the urinary bladder.

A56- Describe micturition reflex and higher control of micturition.

A57- Know abnormalities of micturition reflex.

Lecture (16): Urinary tract infection (1)

By the end of the lecture the student will be able to:

A58- List the commonest causative agents (Pathogens) of UTI.

A59- Recognize risk factors for UTI.

A60- Explain the pathogenesis and microbiology of UTI.

A61- Recognize classification of UTI.

A62- Describe clinical manifestations of UTI.

A63- Memorize the complications of UTI.

A64- Outline the laboratory diagnostic approach in different UTIs.

A65- List treatment and specific preventive measures for UTI.

Lecture (17): Urinary tract infection (2)

By the end of the lecture the student will be able to:

A58- List the commonest causative agents (Pathogens) of UTI.

A59- Recognize risk factors for UTI.

A60- Explain the pathogenesis and microbiology of UTI.

A61- Recognize classification of UTI.

A62- Describe clinical manifestations of UTI.

A63- Memorize the complications of UTI.

A64- Outline the laboratory diagnostic approach in different UTIs.

A65- List treatment and specific preventive measures for UTI.

Lecture (18): Congenital anomalies of the kidneys -Glomerular diseases (1)

By the end of the lecture the student will be able to:

A65- List treatment and specific preventive measures for UTI.

A66- Enumerate congenital anomalies of the kidney and discuss polycystic kidney

A67- Define glomerulonephritis and the pathogenetic mechanisms underlying glomerular injury and the tissue reaction of glomerular injury

A68- Define the terms nephritic and nephrotic syndromes and enumerate its causes.

Lecture (19): Glomerular diseases (2)

By the end of the lecture the student will be able to:

A69- Outline the clinicopathological features of the common types of glomerulonephritis

Lecture (20): Diseases of the tubules and interstitium

By the end of the lecture the student will be able to:

A70- Aetiology and pathology of acute tubular necrosis

A71- Define pyelonephritis and describe the risk factors, morphology, and complications of acute and chronic pyelonephritis.

Lecture (21): Urinary stones

By the end of the lecture the student will be able to:

A72- Mention the normal urinary pH describe how its changes can help in diagnosing types of urinary stone.

A73- List the main chemical types of urinary stones.

A74- Mention the radiologic appearance of these stones.

A75- Describe different shapes of urine crystals associated with each type of stone.

A76- Explain the pathological condition, metabolic disorder that5l4ead to the formation of these stones.

Lecture (22): Urinary outflow obstruction Diseases of the urinary bladder

By the end of the lecture the student will be able to:

A77- Define hydronephrosis and enumerate causes of unilateral and bilateral hydronephrosis and their complication

A78- Discuss the etiology, and pathological consequences of urinary calculi.

A79- Define cystitis and discuss its aetiology and complications

Lecture (23): Tumors of urinary tract

By the end of the lecture the student will be able to:

A80- Classification of renal tumors

A81- Renal cell carcinoma, the presenting features and morphological appearances

A82- Nephroblastoma, the presenting features and morphological appearances.

A83- Classify tumors of the renal pelvis , ureter and urinary bladder

A84- List the sites of origin of transitional cell carcinoma and discuss the epidemiology, risk factors and pathology

A85- Discuss squamous cell carcinoma of the urinary bladder; epidemiology, risk factors and pathology

Lecture (24): Diuretics I

By the end of the lecture the student will be able to:

A86- Describe the mechanism and site of actions of diuretics.

A87- Outline the different indications for diuretics.

A88- Identify the adverse effects and contra-indications of different diuretics.

A89- List the major drug-drug interactions with diuretics.

Lecture (25): Diuretics II

By the end of the lecture the student will be able to:

A86- Describe the mechanism and site of actions of diuretics.

A87- Outline the different indications for diuretics.

A88- Identify the adverse effects and contra-indications of different diuretics.

A89- List the major drug-drug interactions with diuretics.

Lecture (26): Nephrotoxic Drugs

By the end of the lecture the student will be able to:

A90- List drug class, common drugs and their nephrotoxic action (s).

Lecture (27): Parasitic infection of the renal system

By the end of the lecture the student will be able to:

A91- Specify the parasites involved in focal renal pathology including (hydatid disease and amoebic abscess).

A92- Specify the parasites involved in diffuse renal pathology.

A93- Differentiate between the mentioned parasites geographical distribution.

A94- Describe for each of the previous parasites the mode of infection, infective stage, diagnostic stages and life cycle.

A95- Describe diagnostic methods for each disease.

A96- Describe the recommended treatment for each of the previous parasites.

A97- Describe the preventive measures for each of the previous parasites.

B18- Explain each parasite pathology

B19- Differentiate between the infective and diagnostic stages of different parasites

B20- Interpret cases and problem solving session with diagnosis

B21- Interpret cases and problem solving session with required investigations

B22- Interpret cases and problem solving session with required treatment.

Outlines of Topics for Practical lessons

Practical (1): Anatomy: Anatomy of the urinary system (kidneys, ureters, urinary bladder and urethra)

ILOs:

C2- Identify the gross morphology of the kidneys (in cadavers and preserved specimens).

C3- Identify the gross morphology of the ureters.

C5- Identify the gross morphology of the urinary bladder (in cadavers and preserved specimens).

C6- Identify the gross morphology of the urethra.

Practical (2): Histology: Histology of the kidney & external collecting system.

ILOs:

C7- Describe the histological structure (microscopic appearance) of the kidney

C8- Identify and label a diagram of the proximal convoluted tubules & Distal convoluted tubules.

C9- Identify and label a diagram of Juxtaglomerular apparatus.

C10- Identify and label a diagram of the blood renal barrier.

C11- Describe the histological structure (microscopic appearance) of the urinary bladder & the ureter.

Practical (3): Microbiology: Respiratory tract pathogens II

ILOs:

C12- Identify diagnostic methods and isolation of pathogens causing lower respiratory tract infection

Practical (4): Physiology: Renal plasma clearance

ILOs:

C13- Define the term clearance.

and interpretation.

C14- Knows the clinical significance of GFR measurement.

C15- State what substances are used to measure GFR and RPF.

C16- List data required for clearance calculation.

C17- Predict whether a substance undergoes net reabsorption or net secretion by comparison of its clearance to that of inulin.

Practical (5): Biochemistry : tests/ Urine and Urinary stones

ILOs:

C18- List the main biochemical investigations evaluating glomerular and tubular functions of the kidney and describe their importance and interpretation.

C19- Describe the principle of estimation of urea and demonstrate the test.

C20- Describe the diagnostic significance of urea estimation

C21- Describe the principle of estimation of creatinine and demonstrate the test.

C22- Describe the diagnostic significance of creatinine estimation.

C23- Demonstrate the physical and biochemical examination of urine and mention the diagnostic significance of urine analysis.

C24- Define and classify proteinuria.

C25- List the causes of proteinuria.

C26- Mention the normal urinary pH and specific gravity and describe how their changes can help you in diagnosing urinary tract diseases.

C27- List the main non-protein nitrogenous compounds present normally in urine.

C28- Differentiate practically between different types of urinay stones

Practical (6): Microbiology: Laboratory diagnosis of UTI

ILOs:

C29- Identify methods for identification and isolation of pathogens causing urinary tract infection

Practical (7): Pharmacology: Diuretics and nephrotoxic drugs

ILOs:

C30- Recommend a diuretic prescription to a case of congestive heart failure

C31- Outline the main indications of different diuretics in hypertension.

C32- Identify trade name and generic name of different diuretics and nephrotoxic agents.

Practical (8): Pathology: Renal pathology 1

ILOs:

C33- Identify the gross picture of polycystic kidney and hypoplastic kidney

C34- Identify the gross picture of kidney with chronic glomerulonephritis

C35- Identify the gross picture of hydronephrosis and the effect if renal stones

C36- Identify the gross picture of bilharzial cystitis

C37- Identify the gross picture of urinary tract tumors.

Practical (9): Pathology: Renal pathology 2

ILOs:

C38- Identify the microscopic picture of bilharzial cystitis

C39- Identify the microscopic picture of chronic pyelonephritis

C40- Identify the microscopic picture of renal cell carcinoma

C41- Identify the microscopic picture of papillary urothelial carcinoma

Practical (10): Parasitology: Parasitic infection of the respiratory and renal systems

ILOs:

C42- Identify diagnostic methods for each disease

C43- Identify the infective and diagnostic stages microscopically.

C44- Identify the pathogenesis microscopically.

Outlines of Topics for Case-Based Group Discussion (GD)

GD (1): Microbiology: Renal group discussion I

ILOs:

D1- Adhere the value of teamwork by acting in small groups.

D2- Qualify adequate cooperation with his/her colleagues.

D3- Justify the efforts required to accomplish the tasks in specified time.

D4- Set the use of sources of biomedical information to remain current with advances in knowledge and practice.

D5- Practice the skill of self-learning.

D6- Demonstrate personal responsibility.

D7- Practice the skill of respecting colleagues.

D8- Qualify adequate cooperation with his/her colleagues.

D9- Set the use of sources of biomedical information to remain current with advances in knowledge and practice.

D10- Display freely, keeping an ethical behavior

D11- Share in the work efficiently with the instruments and equipment's of the department in a responsible manner keeping them intact and clean.

D12- Modify his/her capability to describe, discuss and solve problems.

D13- Reflect on and assess his/her performance using various performance indicators and information sources

GD (2): Pharmacology: Tuberculosis

ILOs:

D1- Adhere the value of teamwork by acting in small groups.

D2- Qualify adequate cooperation with his/her colleagues.

D3- Justify the efforts required to accomplish the tasks in specified time.

D4- Set the use of sources of biomedical information to remain current with advances in knowledge and practice.

D5- Practice the skill of self-learning.

D6- Demonstrate personal responsibility.

D7- Practice the skill of respecting colleagues.

D8- Qualify adequate cooperation with his/her colleagues.

D9- Set the use of sources of biomedical information to remain current with advances in knowledge and practice.

D10- Display freely, keeping an ethical behavior

D11- Share in the work efficiently with the instruments and equipment's of the department in a responsible manner keeping them intact and clean.

D12- Modify his/her capability to describe, discuss and solve problems.

D13- Reflect on and assess his/her performance using various performance indicators and information sources

GD (3): Pathology: Renal system I

ILOs:

D1- Adhere the value of teamwork by acting in small groups.

D2- Qualify adequate cooperation with his/her colleagues.

D3- Justify the efforts required to accomplish the tasks in specified time.

D4- Set the use of sources of biomedical information to remain current with advances in knowledge and practice.

D5- Practice the skill of self-learning.

D6- Demonstrate personal responsibility.

D7- Practice the skill of respecting colleagues.

D8- Qualify adequate cooperation with his/her colleagues.

D9- Set the use of sources of biomedical information to remain current with advances in knowledge and practice.

D10- Display freely, keeping an ethical behavior

D11- Share in the work efficiently with the instruments and equipment's of the department in a responsible manner keeping them intact and clean.

D12- Modify his/her capability to describe, discuss and solve problems.

D13- Reflect on and assess his/her performance using various performance indicators and information sources

GD (4): Pathology: Renal system II

ILOs:

D1- Adhere the value of teamwork by acting in small groups.

D2- Qualify adequate cooperation with his/her colleagues.

D3- Justify the efforts required to accomplish the tasks in specified time.

D4- Set the use of sources of biomedical information to remain current with advances in knowledge and practice.

D5- Practice the skill of self-learning.

D6- Demonstrate personal responsibility.

D7- Practice the skill of respecting colleagues.

D8- Qualify adequate cooperation with his/her colleagues.

D9- Set the use of sources of biomedical information to remain current with advances in knowledge and practice.

D10- Display freely, keeping an ethical behavior

D11- Share in the work efficiently with the instruments and equipment's of the department in a responsible manner keeping them intact and clean.

D12- Modify his/her capability to describe, discuss and solve problems.

D13- Reflect on and assess his/her performance using various performance indicators and information sources

GD (5): Pharmacology: Diuretics and nephrotoxic drugs

ILOs:

D1- Adhere the value of teamwork by acting in small groups.

D2- Qualify adequate cooperation with his/her colleagues.

D3- Justify the efforts required to accomplish the tasks in specified time.

D4- Set the use of sources of biomedical information to remain current with advances in knowledge and practice.

D5- Practice the skill of self-learning.

D6- Demonstrate personal responsibility.

D7- Practice the skill of respecting colleagues.

D8- Qualify adequate cooperation with his/her colleagues.

D9- Set the use of sources of biomedical information to remain current with advances in knowledge and practice.

D10- Display freely, keeping an ethical behavior

D11- Share in the work efficiently with the instruments and equipment's of the department in a responsible manner keeping them intact and clean.

D12- Modify his/her capability to describe, discuss and solve problems.

D13- Reflect on and assess his/her performance using various performance indicators and information sources

GD (6): Parasitology: Parasitic infection of the renal system.

ILOs:

D1- Adhere the value of teamwork by acting in small groups.

D2- Qualify adequate cooperation with his/her colleagues.

D3- Justify the efforts required to accomplish the tasks in specified time.

D4- Set the use of sources of biomedical information to remain current with advances in knowledge and practice.

D5- Practice the skill of self-learning.

D6- Demonstrate personal responsibility.

D7- Practice the skill of respecting colleagues.

D8- Qualify adequate cooperation with his/her colleagues.

D9- Set the use of sources of biomedical information to remain current with advances in knowledge and practice.

D10- Display freely, keeping an ethical behavior

D11- Share in the work efficiently with the instruments and equipment's of the department in a responsible manner keeping them intact and clean.

D12- Modify his/her capability to describe, discuss and solve problems.

D13- Reflect on and assess his/her performance using various performance indicators and information sources

GD (7): Biochemistry: Renal system cases

ILOs:

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Study Resources

1. **Lecture notes**
2. **Books:**

   -Oxford Handbook of Medical Sciences, Second edition

   -Lippincott Illustrated Reviews: Integrated Systems (Lippincott Illustrated Reviews Series)

   -First Aid for the Basic Sciences: Organ Systems

   -The Human Body in Health & Disease

3. **Websites :** General references, journals, periodicals, newspapers, web sites, which enrich the learning process as:

   - Alta Vista Search http://www.altavista.com/
   - Google http://www.google.com/
   - Medline - Free from National Library of Medicine (US) http://www.ncbi.nlm.nih.gov/Pubmed

C4- Identify the surface anatomy of kidneys and ureters.