

Approved by
Deputy Rector for Academic Affairs

_____ E.V. Konovalova

"16" June 2022, Record No.6

**CLINICAL PATHOLOGICAL
ANATOMY**

Department **Pathophysiology and general pathology**

Curriculum s310501-ЛечДелоИИ-21-1.pli.xml
Specialty 31.05.01 General Medicine

Qualification **General Practitioner**

Form of education **Full-time**

Total (in credits) **2**

Total academic hours	72	Control:
including:		Credit 11 th term
Contact	36	
Self-study	36	

Academic year (Term)	11 (6.1)		Total	
	17 4/6			
Types of classes	Cur	Syl	Cur	Syl
Lectures	4	4	4	4
Practical	32	32	32	32
Contact	36	36	36	36
Self-study	36	36	36	36
Control hours	-	-	-	-
Total	72	72	72	72

The Syllabus is compiled by:
Doctor of Medicine, Professor Naumova L.A. _____

The Syllabus

CLINICAL PATHOLOGICAL ANATOMY

Developed in accordance with Federal State Educational Standard:

Federal State Educational Standard of higher education in the specialty 31.05.01 General medicine (Order of the Ministry of Education and Science of the Russian Federation on August 12, 2020 No. 988)

Based on the Curriculum:

31.05.01 GENERAL MEDICINE

Specialization: General Medicine

Approved by the Academic Council of Surgut State University, “16” June 2022, Record No.6

The Syllabus was approved by the department

Pathophysiology and General Pathology

Head of Department, Doctor of Medicine, Professor Kovalenko L.V.

1. COURSE OBJECTIVES	
1.1	The aim of the course of clinical pathological anatomy in higher educational medical institutions is to form a system of ideas about the basic laws of human diseases as integral biological phenomena, based on the generalization of factual data obtained using various research methods used in biomedical disciplines, knowledge of typical pathological processes, their etiology, patho- and morphogenesis, outcomes and complications; the formation of the skill of clinical and morphological comparisons and the foundations of general pathological thinking - the analysis of various (clinical and anamnestic, laboratory, functional, morphological, etc.) data about the process or the patient with the formation of a holistic vision of pathology; formation of a conscientious approach to the use of the best diagnostic and therapeutic methods based on evidence-based medicine.
2. COURSE OVERVIEW	
Course code (in curriculum)	Б1.О.04.55
2.1	Assumed background:
	Hominal physiology
	Human anatomy
	Biology
	Chemistry
	Histology, embryology, cytology
	General surgery
	Biochemistry
	Pathological anatomy
	Pathological physiology
2.2	Post-requisite courses and practice:
	Disaster Medicine
	Clinical Pharmacology
	Anaesthesiology, resuscitation, intensive care
	Hospital therapy (6 th year)
	Hospital Surgery
	Preparation for State Final Examination and State Final Examination
	Forensic Medicine
3. COMPETENCES UPON COMPLETION OF THE COURSE (MODULE)	
PC-9.1: Analyzes medical information	
PC-9.2: Provides evidence-based health information	
GPC-4.1: Knows the physical principles of instrumental methods and equipment for diagnosing human diseases aimed at effective and differentiated application in professional activities	
GPC-4.2: Knows instrumental and morphological criteria for diagnosing diseases and conducting clinical interpretation of the results of instrumental examination methods	
GPC-4.3: Able to apply knowledge and skills in conducting a diagnostic search for diseases using medical equipment (products) to establish a diagnosis	
GPC-5.7: Knows the principles and methods of intravital and postnatal diagnosis and examination of various nosologies in real clinical and forensic practice	
GPC-8.2: Able to provide and monitor the effectiveness of the patient's medical rehabilitation, including the individual rehabilitation and habilitation programs for the disabled	
By the end of the course students must:	
3.1	know:
3.1.1.	The range and principles of the most important instrumental diagnostic methods, their diagnostic capabilities, their diagnostic level (macro-, microscopic, ultrastructural), indications for their use, their syndromology.
3.1.2	Pathogenesis and morphogenesis (structural basis) of pathological processes (diseases), peculiarities of their manifestation at different levels of diagnosis, principles of interpretation of the results obtained.
3.1.3	The principles of constructing a diagnostic algorithm based on knowledge of the structural foundations of pathology and the possibilities of the proposed diagnostic methods for materializing the substrate of the disease.
3.1.4	Principles and methods of intravital and postmortal diagnostics, principles of clinical and morphological comparisons.
3.1.5	The etiology, patho- and morphogenesis of general pathological processes, their outcomes and complications, allowing us to understand the patterns of prevention, treatment and rehabilitation, as well as to assess the effectiveness of medical rehabilitation of a particular patient.
3.1.6	To know the logic of the development of the pathological process, the probable outcomes and complications, the peculiarities of its manifestations at various levels of diagnosis (systemic, organ, tissue, cellular, subcellular, etc.), using various diagnostic methods, which make it possible to have information about the disease and to analyze this information.

3.1.7	The best research methods for diagnosis and the best treatment methods for each individual patient's disease, based on clinical guidelines based on the integration of the best scientific evidence and clinical knowledge.
3.2	be able to:
3.2.1	Explain the choice of diagnostic methods at various levels for the diagnosis (materialization of the substrate of the disease).
3.2.1	Evaluate changes in organs and substantiate the nature of the process and its manifestations at various levels.
3.2.3.	Think logically, knowing the patho- and morphogenesis of the pathological process, the features of its manifestations at various levels of the system.
3.2.4	Evaluate changes in organs and substantiate the nature of the process and its manifestations.
3.2.5	Analyze the dynamics of the pathological process, its reflection in the dynamics of research results.
3.2.6	To compare the clinical manifestations of the disease with the results of changes according to the data of various research methods
3.2.7	Analytically work with medical literature (articles, monographs, recommendations), evaluate the effectiveness of various diagnostic and treatment methods based on literature data.
3.3	have skills of:
3.3.1	The ability to compare the manifestations of the process (substrate of the disease) with the data of various diagnostic methods (physical, laboratory, various instrumental, etc.).
3.3.2	Interpreting the results of instrumental methods.
3.3.3	Comparing the manifestations of a pathological process at various levels of its manifestation and diagnosis.
3.3.4	Comparing morphological and clinical manifestations of diseases.
3.3.5	Comparison, analysis and conclusions.
3.3.6	Comparing morphological and clinical manifestations of diseases.
3.3.7	Up-to-date information on the best diagnostic methods and therapeutic approaches to treating diseases in a particular patient, accurately and conscientiously using the best of them in each case.
3.3.8	Formulating a conclusion (diagnosis) in complex tasks, assessing the results of histological research.

4. STRUCTURE AND CONTENTS OF THE COURSE (MODULE)

Class Code	Topics /Class type	Term / Academic year	Academic hours	Competences	Literature	Interactive	Notes
	Section 1.						
1.1	The subject and objectives of clinical pathological anatomy, methods of making morphological diagnosis, the value for the clinic. / Lec /	11	2	GPC-4.1 GPC-4.2 GPC-4.3 GPC-5.7 GPC-8.2 PC-9.1 PC-9.2	L 1.1	0	
1.2	The structure of the diagnosis. Endoscopic and biopsy diagnostics in clinical morphology / Lec /	11	2	GPC-4.1 GPC-4.2 GPC-4.3 GPC-5.7 GPC-8.2 PC-9.1 PC-9.2	L 1.1	0	
1.3	The subject and objectives of clinical pathological anatomy. The organization of the patho-anatomical service. The structure of the diagnosis. / Pr /	11	4	GPC-4.1 GPC-4.2 GPC-4.3 GPC-5.7 GPC-8.2 PC-9.1 PC-9.2	L 1.1	0	Oral quiz, clinical case-studies
1.4	Current methods of morphological diagnostics. Endoscopic and biopsy diagnostics in clinical morphology. /Pr/	11	4	GPC-4.1 GPC-4.2 GPC-4.3 GPC-5.7 GPC-8.2 PC-9.1 PC-9.2	L 1.1	0	Oral quiz, clinical case-studies, description of slides

1.5	The extreme States. Terminal States / Pr /	11	4	GPC-4.1 GPC-4.2 GPC-4.3 GPC-5.7 GPC-8.2 PC-9.1 PC-9.2	L 1.1	0	Oral quiz, clinical case- studies
1.6	Current methods of diagnostic visualization. Comparison of data of different levels and investigation methods as a way to materialize the substrate of the disease. / Pr /	11	4	GPC-4.1 GPC-4.2 GPC-4.3 GPC-5.7 GPC-8.2 PC-9.1 PC-9.2	L 1.1	0	Oral quiz, clinical case- studies, description of slides
1.7	Intra-vital morphological diagnostics of precancerous diseases and cancer of the main localizations – stomach, colon, lungs, prostate gland / Pr /	11	4	GPC-4.1 GPC-4.2 GPC-4.3 GPC-5.7 GPC-8.2 PC-9.1 PC-9.2	L 1.1	0	Oral quiz, test
1.8	Intra-vital morphological diagnostics of precancerous diseases and cancer of the main localizations - the cervix, endometrium and breast. / Pr /	11	4	GPC-4.1 GPC-4.2 GPC-4.3 GPC-5.7 GPC-8.2 PC-9.1 PC-9.2	L 1.1	0	Oral quiz, clinical case- studies, description of slides, essays
1.9	Comorbidity. / Pr /	11	4	GPC-4.1 GPC-4.2 GPC-4.3 GPC-5.7 GPC-8.2 PC-9.1 PC-9.2	L 1.1	0	Oral quiz, clinical case- studies
1.10	Final class / Pr /	11	4	GPC-4.1 GPC-4.2 GPC-4.3 GPC-5.7 GPC-8.2 PC-9.1 PC-9.2	L 1.1	0	Oral quiz, clinical case- studies, description of slides, test, essay
1.11	Preparation for practical classes according academic calendar / SS /	11	32	GPC-4.1 GPC-4.2 GPC-4.3 GPC-5.7 GPC-8.2 PC-9.1 PC-9.2	L 1.1	0	Essay, literature review
1.12	Preparation for the credit /SS /	11	4	GPC-4.1 GPC-4.2 GPC-4.3 GPC-5.7 GPC-8.2 PC-9.1 PC-9.2	L 1.1	0	Oral quiz, clinical case- studies, description of slides, test, essay
1.13	Credit	11	0	GPC-4.1 GPC-4.2 GPC-4.3 GPC-5.7 GPC-8.2 PC-9.1 PC-9.2	L 1.1	0	

5. ASSESSMENT TOOLS				
5.1. Tests and tasks				
Supplement 1				
5.2. Topics for written papers				
Supplement 1				
5.3. Assessment tools				
Supplement 1				
5.4. List of assessment tools				
Oral quiz, case study, test				
6. COURSE (MODULE) RESOURCES				
6.1. Recommended literature				
6.1.1. Main literature				
	Authors,	Title	Publisher, year	amount
L1.1	L. L. Kolesnikov, D. B. Nikitiuk, S. V. Klochkova, I. G. Stelnikova	Textbook of Human Anatomy. In 3 vol. Vol. 2. Splanchnology and cardiovascular system /.	M. : GEOTAR-Media, 2020. - 320 p. https://www.studentlibrary.ru/book/ISBN9785970457641.html	1
6.1.2. Additional literature				
	Authors,	Title	Publisher, year	amount
6.1.3. Methodical development				
	Authors,	Title	Publisher, year	amount
6.2. Internet resources				
HighWire				
Russkiy meditsinskiy zhurnal [Russian Medical Journal]				
Antibiotiki I khimioterapiya [Antibiotics and Chemotherapy]				
Vestnik aritmologii [Arrhythmology Herald]				
Sakharniy diabet [Diabetes Mellitus]				
Vrach [General Practitioner]				
6.3.1 Software				
6.3.1.1	Operational system Microsoft, applied programs pack Microsoft Office			
6.3.2 Information Referral systems				
6.3.2.1	"Garant", "Consultant plus",			
6.3.1 List of software				
6.3.1.1	Microsoft operating systems, Microsoft Office application package			
6.3.2 Reference systems				
6.3.2.1	"Garant", "Consultant Plus",			
7. MATERIAL AND TECHNICAL SUPPORT OF DISCIPLINE (MODULE)				
7.1	Classrooms for lectures, practical classes, group and individual consultations, monitoring and intermediate certification are equipped with: typical classroom furniture, technical teaching aids, employees for the presentation of educational information; classroom of "Vikrhov" pathology, microscopes, posters, micro- and macro-slides.			
8. COURSE (MODULE) MANUALS				
Supplement 2				

ASSESSMENT TOOLS

Syllabus supplement

CLINICAL PATHOLOGICAL ANATOMY

Qualification	Specialist
Specialty	31.05.01
	General Practitioner
Form of education	Full-time
Designer Department	Pathophysiology and general pathology
Graduate department	Internal diseases

Sample tasks and tests

Topic 1. The subject and objectives of clinical pathological anatomy. The organization of the pathoanatomical service. Structure of the diagnosis.

1.1. List of points for oral quiz:

1. The subject and objectives of clinical pathological anatomy, research methods, the value for the clinic.
2. Historical periods of the development of pathological anatomy.
3. Development of pathological anatomy in Russia.
4. Organization of the pathoanatomical service, the direction of biopsy material for histohistological study.
5. Structure of the clinical and pathoanatomical diagnosis.
6. Features of the formulation and coding of diagnoses of diseases of certain classes of ICD-10.

1.2. Examples of clinical case-studies with reference answers:

Provide a description of the morphological substrate of the disease according to your diagnosis (your vision of this disease), based on existing symptoms, syndromes and the results of additional research methods.

№ 1. Formulate the pathological diagnosis.

An autopsy revealed: shriveled kidneys (both kidneys weigh 180 g, the surface is fine-grained, the consistency is dense), heart hypertrophy (weight 500 g, left ventricular wall thickness - 2.5 cm), fibrinous pericarditis ("hairy heart"), fibrinous gastritis, pulmonary and cerebral edema, deformed gallbladder with a thickened wall and calculi in the lumen. There is no clinical evidence of primary kidney disease.

Answer: The main disease is hypertension. Complications of the underlying disease - arteriolosclerotic nephrosclerosis (primary contracted kidneys); uremia: fibrinous pericarditis, fibrinous gastritis, uremic pulmonary edema and brain tissue. Concomitant disease - gallstone disease.

№ 2. Formulate the pathological diagnosis.

Autopsy revealed: a sharp decrease in body weight, brown atrophy of the myocardium and liver, multiple metastases in the liver and lungs, carcinomatosis of the peritoneum with effusion in the abdominal cavity, a large tumor without clear boundaries in the area of the pancreas body, widespread atherosclerosis, uterine myoma ...

Answer: The main disease is pancreatic cancer with metastases to the liver, lungs and peritoneal carcinomatosis. A complication of the underlying disease is cancer cachexia: brown atrophy of the myocardium and liver. Concomitant diseases - common atherosclerosis, uterine fibroids.

№ 3. Formulate the pathological diagnosis.

An autopsy revealed: disintegrating ulcerative infiltrative cancer of the gastric outlet, diffuse purulent peritonitis, multiple metastases in the liver, lungs and lymph nodes, heart hypertrophy (weight 550 g, wall thickness of the left ventricle 2.8 cm), arteriolosclerotic nephrosclerosis, widespread atherosclerosis, massive hemorrhage in the brain with a breakthrough in the ventricles, adenomatous hyperplasia of the prostate gland.

Answer: Competing diseases: disintegrating ulcerative-infiltrative cancer of the gastric outlet with multiple distant metastases; hypertension and widespread atherosclerosis. Complications of the main disease: purulent peritonitis, massive hemorrhage in the brain with a breakthrough into the ventricles. Concomitant disease - adenomatous prostatic hyperplasia.

1.3. Topics of essays for the credit

1. The history of the formation of pathological surveillance in Russia.
2. The history of the development of pathological anatomy. Periods of development of pathological anatomy.
3. Subject of clinical pathological anatomy.
4. General pathology as the basis for the formation of a doctor's clinical thinking.
5. The structure, tasks and methods of the pathological service.
6. The concept of comorbidity and its clinical significance.

7. The most frequent combinations of diseases: combined diseases of the lungs and gastrointestinal tract.
8. The most frequent combinations of diseases: concomitant diseases of the stomach and urinary system.
9. The most frequent combinations of diseases: hyperestrogenemia and stomach diseases.
10. The most common combinations of diseases: overweight, obesity and cancer. Cysts and cystogenesis.
11. Hyperestrogenemia and its clinical significance.
12. Hyperprolactinemia and its clinical significance.
13. Remodeling of myocardia in hypertensive disease.
14. Remodeling of the myocardium in IHD.
15. Pretumor diseases and cancer.
16. Targeted therapy in oncology.

Topic 2. Modern methods of morphological diagnostics. Endoscopic and biopsy diagnostics in clinical morphology.

1.1 List of points for oral quiz

1. Light and electron microscopy
2. Cytological diagnostics
3. Immunohistochemistry in clinical morphology
4. Molecular genetic analysis, genome-wide studies of polymorphic alleles.
5. Diagnostic capabilities of modern endoscopic research methods in the clinic.
6. Biopsy diagnostics. Features of biopsy diagnostics in gastroenterology, gynecology and other sections.
7. Principles of collection, storage and work with biopsy material.
8. Features of the interpretation of the morphological picture of biopsies.

1.1. Tests

Choose one correct answer

1. Overview histological staining:

- a) mucycarmine,
- b) picrofuchsin,
- c) hematoxylin and eosin (+)
- d) alcian blue.

The answer is in. Observational histological staining - hematoxylin and eosin.

Choose one correct answer:

2. Selective staining for collagen fibers

- a) hematoxylin and eosin,
- b) Sudan PI,
- c) mucycarmine,
- d) picrofuchsin (+).

Choose one correct answer

3. Selective coloring for fat:

- a) Sudan III (+)
- b) picrofuchsin,
- c) alcian blue,
- d) Congo red.

Choose one correct answer

4. Selective staining for amyloid:

- a) Sudan III,
- b) hematoxylin and eosin,
- c) Congo red (+)
- d) eosin.

Choose one correct answer

5. Selective staining for mucus:

- a) picrofuchsin,
- b) Sudan III,
- c) mucycarmine (+)
- d) Congo red.

Choose one correct answer

6. Concentration of formalin solution for tissue fixation:

- a) 1%,
- b) 10% (+)
- in 20 %,
- d) 30%.

Answer: b. The optimal concentration of formalin for tissue fixation is 10%. Formalin in lower concentrations does not prevent rotting. At high concentrations, tanning of the surface parts of the piece occurs.

Choose one correct answer

7. The fixing property is possessed by:

- a) distilled water,
- b) alcohol (+)
- c) gasoline,
- d) xylene

Answer: b. Alcohol has a fixing property.

Choose one correct answer

8. The fixing property possesses:

- a) toluene,
- b) xylene,
- c) acetone (+)
- d) paraffin.

Select all correct answers

9. For tissue fixation use:

- a) alcohol (+)
- b) acetone (+)
- c) formalin (+)
- d) paraffin.

The answer is a, b, c. Alcohol, acetone are used to fix the tissue. or formalin.

Choose one correct answer

10. The operating material is recorded:

- a) before cutting,
- b) after cutting,
- c) after pouring,
- d) before painting

The answer is a. The tissue is fixed immediately after extraction, before cutting, to prevent autolytic processes.

1.3 Examples of clinical problems with response standards:

№ 1. Patient A, 32 years old, was admitted to the gynecological department with complaints of menstrual irregularities of the type of metrorrhagia, recurrent pains in the lower abdomen, scanty leucorrhoea, fever in the evenings to subfebrile numbers. On the 15th day of the menstrual cycle, therapeutic and diagnostic curettage of the uterine cavity was performed. The material was sent for histological examination to the pathological department the next day. Clinical diagnosis: Chronic endometrium in the acute stage. The conclusion of the pathologist: The endometrium corresponds to the early stage of the secretion phase of the menstrual cycle. Chronic nonspecific endometritis in the acute phase. Answer the following questions: 1. What type of material is the scraping from the uterine cavity obtained during diagnostic and treatment

curettage and directed for histological examination? 2. What method of fixing the material is most often used in such cases? 3. What is the nature of this postmortem report? 4. What are the terms of the study of the material in this case are normative, and what is the name of such a study, depending on the timing of the response?

Answer:

1. The material is called biopsy (biopsy) - a morphological study of 112 tissues and parts of organs that were in vivo excised or otherwise removed for the purpose of diagnosis and / or assessment of the effectiveness of the applied treatment. Depending on the method of obtaining the diagnostic material, this is a curettage-biopsy obtained as a result of scraping.
2. To prevent tissue autolysis, objects for intravital morphological diagnostics must be fixed; for this purpose, a 10% solution of neutral formalin is most often used.
3. This pathological conclusion is final, since it allows the patient to verify a specific pathological process with the allocation of its clinical morphological variant and features of the course.
4. The conclusion of the pathologist on the results of the study is given 4 working days after the receipt of the material. Such a conclusion is called planned, as opposed to an urgent one (the answer is given after 20-25 minutes).

№ 2. A 48-year-old patient is clinically diagnosed with a tumor of the right breast. Tumor biopsy was performed; after morphological examination, poorly differentiated breast carcinoma was diagnosed. The pathologist prescribed an in-depth morphological study, as a result of which the glandular nature of the neoplasm was established, and the presence and concentration of receptor proteins for estrogens (ER) and progesterones (PgR) were determined, a marker of proliferative activity (Ki67) and a prognostic marker (Her2 / neu) in tumor cells. Answer the following questions: 1. What research allowed to establish the malignant nature of the tumor? 2. What method of molecular research was carried out? 3. What is the diagnostic value of this method in this case? 4. What molecular research method would determine the ability of a tumor to produce mucopolysaccharides? 5. What method of research will determine the level of amplification of the oncogene encoding the Her2 / neu protein in tumor cells?

Answer:

1. Histological examination (light-optical microscopy), since it was it that made it possible to reveal signs of cellular and tissue atypism - important properties of a malignant tumor.
2. Immunohistochemical - a method for determining protein receptor molecules in tissue cells on the basis of an immunological reaction between the desired antigen and an antibody to it, followed by visualization of the immune complex.
3. Possibilities of immunohistochemical research for the detection of cyto and tissue-specific antigens make it possible to establish tumor histogenesis.
4. The ability of mucopolysaccharides to give a colorful reaction with Schiff's reagent and alcian blue in histological sections allows the use of histochemical examination for their identification and localization.

№ 3. A 62-year-old patient has clinically determined an increase in the cervical lymph node. On examination, a knot of dense consistency, lumpy, soldered to the underlying tissues. A biopsy of this formation was performed with a referring clinical diagnosis: chronic nonspecific lymphadenitis, tumor? During the morphological study of the biopsy specimen, scattered groups of atypical cells that do not form ordered structures were revealed. An immunohistochemical study with the "first panel" of antibodies revealed a positive reaction of tumor cells to antibodies to cytokeratin, a negative reaction to vimentin, total leukocyte antigen and S-100 protein. Answer the following questions: 1. What research made it possible to establish the malignant nature of the tumor and why? 2. What is the most probable origin of tumor cells, given their antigenic profile? 3. What type of tumor lesion of the lymph node is most likely in this case and why? 4. What subsequent immunohistochemical studies will be the most informative? 5. What diagnostic value will the immunohistochemical method have in this case?

Answer:

1. Histological examination (light-optical microscopy), since it was it that made it possible to reveal signs of cellular and tissue atypism - important properties of a malignant tumor.
2. Epithelial origin, considering that cytokeratins are specific markers of epithelial cells, and antigens of other types of tissues (mesenchymal and neuroectodermal origin) were not found in tumor cells.

3. The most likely metastatic character of the lymph node lesion, since primary tumors of epithelial origin in the lymph nodes do not develop.
4. Reactions with type-specific and tissue-specific antibodies to cytokeratins to determine the histogenetic and organ affiliation of tumor cells.
5. A comprehensive immunohistochemical study using a wide range of anti-cytokeratin antibodies will determine the histogenesis of the tumor and its possible primary organ localization.

Topic 3. Extreme States. Terminal states.

1.1 List of points for oral quiz

1. General characteristics of extreme conditions.
2. Collapse - causes, patho- and morphogenesis, outcomes and complications.
3. Shock. Types of shock, pathogenesis and morphogenesis, outcomes and complications.
4. Coma. Causes and types of coma, patho- and morphogenesis, outcomes and complications.
5. Acute intestinal obstruction. Causes, pathogenesis and morphogenesis, complications and outcomes.
6. Highlight common pathogenetic mechanisms in the development of extreme conditions.
7. Identify the differences in the pathogenetic mechanisms of shock and collapse.
8. What are (if they are) stereotyped morphological changes at the tissue (organ) level in shock, collapse and coma?
9. Syndrome of multiple organ failure - causes, patho- and morphogenesis.
10. What is the morphogenetic basis of multiorgan failure? Its clinical and laboratory manifestations.
11. Terminal States. Stages in thanatogenesis. Signs of clinical and biological death.

1.2. Tests

Choose all correct answers

1. A 23-year-old man with a burn with a loss of more than 20% of the skin surface developed hypovolemic shock and death. Mechanisms of hypovolemia in burns:

- a) sweating of plasma from damaged vessels,
- b) severe dehydration,
- c) severe pain syndrome,
- d) DIC syndrome,
- e) blood clotting.

Answer to problem 1 - a, e. With extensive burns with a loss of 10% or more of the surface of the skin, hypovolemic shock may develop. Hypovolemia is a decrease in the volume of circulating fluid, in which venous return of blood decreases. The reason for the development of hypovolemia is a consequence of the sweating of plasma from damaged microvessels and a significant thickening of the blood.

Choose all correct answers

2. The non-progressive stage of shock is characterized by:

- a) a decrease in blood pressure,
- b) a decrease in the volume of cardiac output,
- c) damage to the endothelium and cell membranes,
- d) vasodilation,
- e) functional organ failure.

Answer: a, b, d. The non-progressive (early shock) stage of shock is characterized by a compensated decrease in blood pressure and cardiac output, vasodilation with preservation of normal blood circulation in organs. In the latter, the initial manifestations of metabolic and circulatory disorders in the form of dystrophy are noted.

Choose all correct answers

3. A 43-year-old woman developed anaphylactic shock due to kidney disease after intravenous administration of urografin (contrast agent) for diagnostic purposes. Death came from pulmonary failure. Signs of a shock lung:

- a) collapse of lung tissue,

- b) hemorrhagic heart attacks,
- c) hyaline blood clots in microvessels,
- d) serous-hemorrhagic edema,
- e) fibrin in the lumen of the alveoli.

The answer is a, c, d, e. In anaphylactic shock, changes most often develop in the lung, and pulmonary heart failure may prevail in the mechanism of death. Shock lung is characterized by foci of atelectasis (collapse of lung tissue), serous-hemorrhagic edema; in the lumen of the alveoli, fibrin can be found, and in the microvessels there is sludge and agglutination of blood corpuscles with the formation of hyaline and platelet thrombi.

Choose all correct answers

4. In the heart in shock, they find:

- a) venous congestion,
- b) subendocardial hemorrhage,
- c) areas of necrosis,
- d) compression and compaction of muscle fibers,
- e) hemorrhagic edema.

Answer: b, c, d. The occurrence of insufficient blood supply in shock at the level of the microvasculature leads to damage to the endothelium, then to the cell membranes in the tissues. Simultaneously with the development of DIC syndrome due to coagulopathy of consumption, multiple hemorrhages appear. In pathological examination, subendocardial hemorrhages, areas of necrosis are found in the heart, and areas of compression and compaction in muscle fibers. The latter is associated with the shortening of the sarcomeres and the fragmentation of the Z-discs. which is especially clearly manifested in the study of the myocardium in polarized light.

Choose one correct answer

5. A 62-year-old woman suffered from atherosclerosis with the development of an aneurysm of the abdominal aorta. The ruptured aneurysm resulted in massive acute blood loss. Cause of death:

- a) myocardial infarction,
- b) hypovolemic shock,
- c) iron deficiency anemia,
- d) cerebral edema.

Answer: b. In case of rupture of an atherosclerotic aneurysm of the abdominal aorta, a massive retroperitoneal hematoma could form. At the same time, a massive acute loss of a large amount of blood ends in death. The most common mechanism is the development of hypovolemic shock, which is manifested by a decrease in the volume of circulating blood. As a rule, this occurs with a rapid loss of about 50% of the blood mass.

1.3 Practical tasks

Description of micropreparations:

1. "Mixed thrombus in a vessel."
2. "Organizing blood clot".
3. "Fatty embolism of the lung."
4. "Myocardial infarction".
5. "Chronic venous plethora of the liver."
6. "Brown induration of the lungs."
7. "Hemorrhage in the brain."

1.4 Examples of clinical case-studies with reference answers:

№ 1. Patient A., 73 years old, was admitted to the clinic with a picture of an acute abdomen. It is known from the anamnesis that he had no operations on the abdominal organs. A year ago, she suffered an ischemic cerebral infarction, six months ago - a repeated myocardial infarction; according to the ultrasound scan of the polyclinic - compaction and deformation of the abdominal aorta. This disease began suddenly with cramping pains in the abdominal cavity, nausea and vomiting appeared, which did not bring relief, stool

and gas retention, flatulence. X-ray examination shows signs of small bowel obstruction. In the analysis of blood, moderate leukocytosis.

Questions:

1. What kind of bowel disease can be suspected in this observation?
2. Name the most common causes and underlying diseases for the development of intestinal gangrene.
3. Describe the macroscopic changes in the bowel.
4. List the types of intestinal infarctions in acute ischemic bowel disease.
5. Name the manifestations of chronic ischemic bowel disease.

Answers:

1. Based on the history and clinical data, gangrene of the small intestine can be suspected.
2. The most common causes of intestinal gangrene are thrombosis or thromboembolism, developing against the background of atherosclerosis of the mesenteric arteries. Anamnesis data on cerebral and myocardial infarctions and changes in the aorta suggest that the patient has atherosclerosis with lesions of various groups of arteries.
3. The intestinal wall is edematous, thickened, flabby consistency, black-red, mucous membrane with ulceration.
4. Serous membrane is dull, filamentous fibrin overlays are visible on it. Depending on the depth of damage to the intestinal wall, acute ischemic bowel disease is manifested by three types of heart attacks: infarction of the intestinal mucosa; intramural infarction; transmural intestinal infarction.
5. Chronic ischemic bowel disease is manifested by chronic ischemic colitis and strictures.

№ 2. A young man was admitted to the hospital with numerous fractures and rupture of the spleen, massive bleeding, several hours after the traffic accident. He received a blood transfusion and underwent surgery. BP 90/50 mm Hg. Art. After the operation, 300 ml of urine of a dark rusty color was released per day. Urine analysis: daily urine output 300 ml; relative density 1015; protein 0.5 g / l; there is no glucose; acetone is absent; the titration acidity of urine is 8 mmol / day (the norm is 10-30 mmol / day). Microscopic examination of the sediment: erythrocytes 5-15 in the field of view; leukocytes 10-15 in the field of view; large quantities of granular and waxy cylinders. Biochemical blood test: residual nitrogen 210 mmol / l (norm 14.3-28.6 mmol / l); creatinine 140 μmol / l (norm 60-120 μmol / l); plasma potassium 6.5 meq / l (norm 3.44-5.3 meq / l); acid-base state of blood: pH 7.25 (norm 7.35-7.45), PaCO₂ 52 mm Hg. Art. (norm 35-45 mm Hg), SB 18.5 mmol / l (norm 21-25 mmol / l); BB 38.5 mmol / l (norm 45-50 mmol / l); BE — 7.0 mmol / l (norm +2.5 mmol / l); lactic acid 2.8 mmol / l (norm 0.55-2.22 mmol / l).

The next day, there were swelling of soft tissues in the lower back, lower extremities and ascites. The patient is worried about dry mouth, thirst, shortness of breath, pain in the heart, arrhythmia. After the complex therapy, the patient's condition returned to normal.

Questions:

1. What syndrome did the patient develop?
2. Indicate the causes and pathogenesis of the disease.
3. Describe the quantitative and qualitative changes in urine and blood.
4. List the basic principles of correction of this pathological condition.
5. Describe the macroscopic view of the kidney.
6. Describe the characteristic microscopic changes in the kidneys during the development of oliguria and anuria.

Answers:

1. A patient has prerenal acute renal failure.
2. The reason is blood loss, development of a shock kidney. The main link in the pathogenesis of acute renal failure is impaired renal blood flow, accompanied by renal ischemia and a sharp drop in glomerular filtration.
3. Oliguria, proteinuria, hematuria, cylindruria, leukocyturia, hypsrazotemia, hyperscreatininemia, anemia, arterial hypotension. CBS blood: uncompensated acidosis (gas + metabolic and renal excretory). Hyperkalemia.
4. Treatment should be aimed at combating hypovolemia, microcirculation disorders, disseminated intravascular coagulation, acidosis and electrolyte disorders. In severe cases, hemodialysis is indicated.

5. The kidneys are slightly enlarged in size, flabby, the bark is pale in section, the pyramids and intermediate zones are full-blooded.

6. Necrosis of the epithelium of the tubules of the main divisions, tubulorexis, plethora of the vessels of the medulla; edema and leukocyte infiltration of the stroma; hemorrhage.

№ 3. Patient B., 23 years old, with a gunshot wound to the neck, died from acute renal failure as a result of massive blood loss and developed post-hemorrhagic shock. An autopsy revealed anemia of internal organs.

Questions:

1. What pathological process has developed in the kidneys?
2. Name the type of this pathological process according to its etiology.
3. What is the pathogenesis of the pathological process in the kidneys?
4. Describe the micropreparation demonstrating the pathological processes of the kidneys.
5. Describe the condition of the tubular basement membranes.
6. Name the favorable outcome of this pathological process in the kidneys.
7. Name other etiological factors that can cause a similar pathological process in the kidneys.

Answers:

1. Necrosis of the epithelium of the proximal and distal tubules of the kidney.
2. Indirect, vascular necrosis.
3. With shock of any genesis, collapse develops. Compensatory centralization of blood circulation occurs, when all organs, with the exception of the heart and brain, switch to reduced blood circulation. In the kidneys, blood is discharged from the arteries into the veins through arteriovenous shunts. As a result, ischemia of the cortex develops, where the proximal and distal tubules of the kidneys are located. Due to their high functional activity (participation in the processes of reabsorption), these parts of the nephron are most sensitive to ischemia and undergo necrosis.
4. In the kidney tissue ischemia of the vessels of the cortical layer and renal glomeruli and a sharp plethora, up to the development of hemorrhages from the vessels of the medulla and the intermediate zone, where the arteriovenous shunts are located. The epithelium of the proximal and distal tubules with signs of necrosis - karyolysis, karyopycnosis, cytoplasmcoagulation, cytoplasmolysis and cytoplasm decay into clumps. In some tubules, there is a rupture of the basement membranes - tubulorexis.
5. Basement membranes can be preserved or undergo tubulorexis. The latter leads to the impossibility of regeneration of the epithelium and the death of the nephron.
6. In the case of timely hemodialysis, regeneration of the epithelium and restoration of renal function may occur.
7. Acute renal failure can develop with shock of any genesis, as well as due to poisoning with nephrotoxic poisons, such as mercury, arsenic, tetraethyl lead. In case of toxic damage, coagulation necrosis occurs due to the blockade of enzyme systems.
In this case, necrosis occurs quickly, in fact, without the participation of enzymes, which leads to the predominance of protein coagulation.

Topic 4. Modern methods of diagnostic imaging. Comparison of data of different levels and research methods as a way to materialize the substrate of the disease.

1.1 List of points for oral quiz

1. General characteristics of diagnostic imaging methods (ultrasound and tomographic technologies, intravital oximetry and fluorescence imaging, etc.).
2. Modern methods of cardiovascular imaging in the diagnosis of coronary artery disease (methods of visualization of atherosclerotic lesions of coronary arteries - coronary angiography, intravascular ultrasound, multispiral computed tomography (MSCT) with CA contrast, MSCT-assessment of coronary calcium; methods of analysis of myocardial function - stress echocardiography, stress-MRI, methods of radioisotope diagnostics - myocardial perfusion scintigraphy, single-photon emission computed tomography (SPECT) and positron emission tomography (PET).
3. Ultrasound diagnostics: general characteristics of the method, application possibilities.
4. Doppler sonography: general characteristics of the method, application possibilities.

5. Radiography: general characteristics of the method, application possibilities.
6. Angiography: general characteristics of the method, application possibilities.

1.2 Examples of clinical case-studies with reference answers:

№ 1. Patient B., 70 years old. Diagnosis: IHD: exertional angina of the II functional class; hypertension stage III, arterial hypertension of the 2nd degree, the risk of cardiovascular complications is very high. He complained of pressing pains in the region of the heart, usually associated with increased blood pressure. Stress echocardiography was performed and the test was positive. The images show slices in the apical four-chamber position in systole and overlay color mapping of wall motion using speckle tracking technology. A decrease in the contractility of the lateral segments along the entire length is visible, which indicates a lesion in the circumflex artery basin. Further diagnostic tactics?

Answer. It was decided to conduct planned coronary angiography. The following data were obtained: right type of coronary blood supply, stenosis of the left coronary artery trunk 40%, anterior interventricular branch without significant narrowing, stenosis at the orifice of the diagonal branch 50%, stenosis in the proximal segment of the circumflex artery 60%, stenosis at the mouth of the blunt edge branch 90%, diameter less than 2 mm, stenosis in the proximal third of the right coronary artery 50%. Thus, the revealed stenosis of the circumflex artery supplying the lateral wall had a borderline value, but stress echocardiography made it possible to establish that it is hemodynamically significant and needs to be corrected.

№ 2. Patient R., 48 years old. Diagnosis: Ischemic heart disease: exertional angina of I functional class. Complaints about discomfort in the chest during physical exertion is higher than everyday. He applied after coronary angiography, which revealed an isolated borderline stenosis of the anterior interventricular branch of 60%. Aimed at conducting stress echocardiography to determine the hemodynamic significance of the lesion. The images show sections in the apical four-chamber position during systole and color mapping of longitudinal deformity of the LV myocardium using speckle tracking technology. According to the results of the study, the development of hypokinesis of the middle and apical segments of the interventricular septum (pool of the anterior interventricular branch) was noted. Your interpretation of the received data.

Answer. According to the results of the study, the development of hypokinesis of the middle and apical segments of the interventricular septum (pool of the anterior interventricular branch) was noted. which indicated the functional significance of the stenosis. The optimal therapy for the treatment of angina pectoris was prescribed and a decision was made to install a stent in this vessel if it was ineffective.

Topic 5. «Intravital morphological diagnosis of precancerous diseases and gastric cancer, precancerous diseases of the colon and colorectal cancer. Morphological diagnosis of pretumor diseases and lung cancer».

1.1 List of points for oral quiz

1. Definition of chronic gastritis (CG). Etiology, patho- and morphogenesis, clinical and morphological variants of chronic hepatitis.
2. The concept of chronic atrophic gastritis (CAG), its morphogenesis (morphogenetic scheme) and clinical significance.
3. Morphological criteria of CAG, its classification, metaplastic, non-metaplastic CAG.
4. The concept of "functional" atrophy in the mucous membrane of the stomach (coolant).
5. The main morphological phenomena observed in the coolant in the progression of chronic inflammation (atrophy, mucoidization, enterolization, intestinal metaplasia complete and incomplete, dysplasia).
6. Determination of peptic ulcer (YAB). Etiology, pathogenesis and morphogenesis of ulcer, its clinical significance. The main morphological phenomena observed in the coolant in BU.
7. Epidemiology of gastric cancer, its place in the structure of cancer morbidity and mortality. Risk factors for the development of gastric cancer. Features of gastric carcinogenesis: gastric cancer intestinal and diffuse types. Epidemiological, clinical and pathological features of the intestinal and diffuse types of gastric cancer. Symptoms of anxiety in the diagnosis of gastric cancer.
8. Precancerous diseases of the stomach - chronic active hepatitis, peptic ulcer, Menetries disease, adenomatous polyps, stomach stump.

9. Pretumor changes of the gastric mucosa (atrophy, intestinal metaplasia, dysplasia)
10. The value of biopsy in the diagnosis of diseases of the stomach.
11. **Colorectal cancer (CRC)**. Epidemiology. Risk factors. Pretumor diseases and syndromes - adenomatous polyps, hereditary syndromes of polypous and non-polypous colorectal cancer.
12. Hyperplastic and adenomatous polyps. Definition, morphological differences.
13. Hereditary polypous CRC syndromes - juvenile polyps, Peutz-Jeghers syndrome, familial adenomatous polyposis, Gardner syndrome, Türko syndrome.
14. Inherited syndromes of non-polypous CRC - Lynch I syndrome, Lynch II syndrome.
15. Ulcerative colitis, Crohn's disease and CRC? The value of chronic inflammation in the development of tumor transformation.
16. The sequence of tumor growth in CRC (carcinogenesis scheme). Features of clinical manifestations.
17. **Lung cancer**. Epidemiology. Risk factors.
18. Pretumor lung diseases.
19. Pathogenesis and morphogenesis of lung cancer. Pretumor changes in the bronchial mucosa.
20. Classification of lung cancer, features of clinical manifestations depending on the topography of the tumor process (central, peripheral lung cancer) and its histotype (non-small cell and small cell lung cancer).
21. **Pre-cancerous conditions and prostate cancer**. Benign tumors and tumor-like diseases of the prostate gland (benign prostatic hyperplasia, prostate adenoma), manifestations, diagnostic methods, value.
22. Prostatic intraepithelial neoplasia (PIN, PIN), etiology, manifestations, significance. Screening methods for the diagnosis of precancerous changes and prostate cancer.
23. Prostate cancer. Epidemiology, etiology, pathogenesis, classification, general characteristics of the main forms of prostate cancer (acinar carcinoma, duct carcinoma), diagnostic methods.

1.2 Practical tasks

Description of microslides:

1. Squamous cell carcinoma of the esophagus (without keratinization).
2. Adenocarcinoma of the stomach
3. Diffuse stomach cancer
4. Barrett's esophagus
5. Chronic bronchitis
6. Squamous cell lung cancer
7. Bronchiectasis
8. Small cell lung cancer

1.3 Examples of clinical case-studies with reference answers:

№ 1. Patient L., 50 years old, consulted a doctor about constant aching pain in the epigastrium. From the anamnesis it is known that the patient has been suffering from rheumatoid arthritis for a long time, for which she is taking non-steroidal anti-inflammatory drugs (NSAIDs). Gastroscopy was performed, smoothing of the folds of the mucous membrane was found, in the antrum there were defects up to 0.5 cm in diameter with a brownish bottom. A biopsy was taken from the area of the smoothed folds.

Questions

1. Diagnose a pathological process that can be found in a biopsy of the gastric mucosa.
2. What are the defects of the mucous membrane found in the antrum called?
3. Explain the mechanism of development of the diagnosed pathological processes. What other possible reasons for the development of the listed pathological processes?
4. What pathological process can develop in the area of mucosal defects during chronic disease?

Answers

1. Smoothing of folds is one of the signs of chronic atrophic gastritis. In a biopsy, microscopic examination reveals a thinning of the gastric mucosa and a decrease in the number of glands, the main and parietal cells are replaced by cells that produce mucus, a diffuse lymphohistiocytic infiltrate, single lymphoid follicles, signs of mucosal sclerosis are revealed in the lamina propria of the mucous membrane. There may be phenomena of intestinal metaplasia.
2. Detected defects - acute erosions and ulcers of the mucous membrane.

3. With prolonged use of NSAIDs, acetylsalicylic acid, which is part of them, does not dissociate into ions, but is absorbed by passive non-ionic diffusion. At a neutral pH value inside the cells of the integumentary epithelium of the stomach, it becomes an ionized acid that destroys the cells and creates conditions for the damaging action of the acid-peptic factor. Acetylsalicylic acid and other NSAIDs interfere with the synthesis of prostaglandins, which reduces the resistance of the gastric mucosa. Violation of the secretory function of epithelial cells, damage to the mucous barrier creates conditions for the subsequent reverse diffusion of hydrogen ions, which further damages the integumentary epithelium and mucous membrane, erosion develops, and then an ulcer.

4. Acute erosions and acute ulcers - stages of morphogenesis of chronic ulcers, which is a morphological substrate of gastric ulcer.

№ 2. Patient N., 65 years old, was admitted to the clinic with complaints of weight loss, weakness, recurrent epigastric pain, discoloration of feces. The patient underwent X-ray examination and gastroscopy. On the lesser curvature of the stomach, a formation of 6x4 cm in size with roller-like edges and a sunken central part covered with a gray bloom was found. A biopsy was taken, in the study of which a picture of cancer was found, the stomach, greater and lesser omentum were resected.

Questions

1. Name the macroscopic form of stomach cancer.
2. Name, what growth in relation to the lumen of the stomach is characteristic for her.
3. What histological type of cancer is most often found in this S-form of stomach cancer?
4. Why were the major and minor omentaries removed together with the stomach?
5. Where else can one look for lymphogenous metastases of gastric cancer, what is the peculiarity of lymphogenous metastasis of this tumor?
6. Why did the color of feces change, what complications of cancer does this indicate?

Answers

1. Saucer-shaped.
2. Exophytic.
3. Adenocarcinoma.
4. Greater and lesser omentum removed, as they contain regional lymph nodes, which are primarily metastasized by gastric cancer.
5. Lymphogenous metastases can be found in distant lymph nodes. In addition, stomach cancer can metastasize by a retrograde lymphogenous pathway to both ovaries (Krukenberg metastases), to pararectal tissue (Schnitzler metastases) and to the left supraclavicular lymph node (Virchow's gland).
6. The color of the stool may have changed due to bleeding from an ulcerated tumor. Chronic bleeding and impaired absorption of food leads to the development of iron deficiency anemia.

№ 3. Patient J., 49 years old, consulted a doctor with complaints of loss of appetite, weakness, weight loss, frequent epigastric pain, constant nausea, frequent vomiting of undigested food. The listed symptoms increase within 2 years, a gastroscopic examination with a biopsy was carried out. Histological findings - chronic superficial gastritis. The patient was hospitalized. X-ray examination revealed a thickened inextensible stomach in the form of a "leather bag". Gastroscopy revealed a thickening of the folds of the gastric mucosa in all sections, a biopsy was taken, which revealed signs of cancer.

Questions

1. Name the macroscopic form of stomach cancer.
2. Name, what growth in relation to the lumen of the stomach is characteristic for her.
3. What histological type (or types) of cancer are most often found in this form of stomach cancer?
4. What changes were found in the left supraclavicular lymph node?
5. What is the probable cause of late tumor diagnosis?

Answers

1. Diffuse stomach cancer.
2. Endophytic.
3. Cricoid or skirr.
4. Retrograde lymphogenous metastasis of cancer - Virchow's gland.

5. The peculiarity of diffuse cancer is long-term growth in the deep parts of the mucous membrane and along the submucosa without ulceration, which complicates the histological examination.

Colorectal cancer.

№ 1. Patient R., 30 years old, was admitted to the clinic with complaints of increasing weakness, moderate headache, fever up to 39-40 ° C, decreased appetite. When viewed on the skin of the upper abdomen and lower chest, roseola rash, rough rumbling of the cecum and soreness in the right iliac region. The liver and spleen are enlarged on palpation. *S. typhi* was found in stool and skin lesions. On the 18th day of illness, while in the clinic, signs of an acute abdomen appeared, and peritonitis was diagnosed. An operation was performed, during which part of the small intestine was removed. During the revision of the abdominal cavity, changes in the mesenteric lymph nodes, fibrinous-purulent exudate were found. In the pathological department, during the study of the operating material, changes in the mesenteric lymph nodes were confirmed, deep ulcers were found in the ileum in the area of necrotic group follicles. One of the ulcers is perforated.

Questions

1. What disease are we talking about?
2. What stage of the disease?
3. What type did the mesenteric lymph nodes look like?
4. What formations in group follicles and lymph nodes of the mesentery have diagnostic value during histological examination?
5. What microscopic structure do these formations have?
6. What can cause the development of peritonitis?

Answers

1. Typhoid fever.
2. Stage of ulcer formation,
3. Enlarged in size, gray-red, with signs of necrosis.
4. Typhoid granulomas.
5. Granulomas are built from typhoid cells - macrophages.
6. The development of peritonitis is due to perforation of ulcers and necrosis of the splanchnic lymph nodes.

№ 2. Patient G., 27 years old, consulted a doctor with complaints of right-sided abdominal pain, diarrhea, fever. The examination revealed steatorrhea. X-ray examination revealed an intestinal fistula, which caused the development of malabsorption syndrome and steatorrhea, as well as signs of stenosis of the terminal ileum. The patient underwent resection of the ileum. Macroscopically - the intestinal wall is thickened, the intestinal lumen is narrowed, long, narrow ulcerative defects penetrate to the muscular membrane and have smooth edges.

Questions

1. What disease is the patient supposed to be suffering from?
2. What microscopic changes can confirm the presumptive diagnosis?
3. Is the colon affected in this disease?
4. What intestinal complications usually develop with this disease?
5. Name the extraintestinal complications of this disease.

Answers

1. A patient has Crohn's disease.
2. Microscopically, in Crohn's disease, pronounced inflammatory infiltration of all layers of the intestinal wall, deep ulcers-cracks, fibrosis of the intestinal wall, sarcoid-like granulomas are revealed.
3. In Crohn's disease, the colon is affected in half of the cases.
4. Intestinal complications include fistulas, intestinal strictures and stenoses, perianal complications, rarely colorectal cancer.
5. Extraintestinal complications include erythema nodosum, ankylosing spondylitis, polyarthritis, sacroiliitis, sclerosing cholangitis, etc.

№ 3. A segment of the sigmoid colon, resected from patient N., 32 years old, was delivered to the pathological laboratory. It is known that for 10 years the patient periodically developed bloody diarrhea. Sigmoidoscopy revealed numerous erosions and ulcers, numerous polyps. On microscopic examination, inflammatory lesions were detected mainly in the mucous membrane of the colon.

Questions and Answers

1. What disease is the patient supposed to be suffering from?
2. What microscopic changes can confirm the presumptive diagnosis?
3. Is it possible to develop colorectal cancer with this disease?
4. What dangerous intestinal complication can develop with this disease?
5. Name the extraintestinal complications of this disease.

Answers

1. The patient may be expected to develop idiopathic inflammatory bowel disease. The most probable diagnosis is "ulcerative colitis", which is confirmed by clinical symptoms, lesion localization, macroscopic picture.
2. On histological examination of 13 lamina propria of the intestinal mucosa, a picture of chronic productive inflammation with diffuse lymphohistiocytic infiltration with an admixture of eosinophils, individual neutrophils, mucosal atrophy, sclerosis. Crypt abscesses and inflammatory polyps are characteristic.
3. The risk of developing colon cancer with UC is higher than with Crohn's disease.
4. In UC, the most dangerous intestinal complication is toxic intestinal dilatation (toxic megacolon), as well as perforation of the intestinal wall with the development of peritonitis and paraproctitis.
5. Extraintestinal complications - manifestations of UC include hepatic steatosis, liver abscesses, sclerosing cholangitis, liver cirrhosis, pericholangitis, arthritis, uveitis, Wegener's granulomatosis, etc.

№ 4. Patient T., 68 years old, was undergoing dispensary observation by an oncologist for recurrent adenomatous polyps of the colon, for the last two years she lived abroad and did not undergo medical examination. I went to the doctor with complaints of growing weakness, periodic spastic pain in the left abdomen, loss of body weight, blood in the feces. Examination revealed a large, dense, tuberous liver, hypochromic anemia. When sigmoidoscopy revealed a tumor, circularly covering the wall of the sigmoid colon, with ulceration in the central part.

Questions

1. Name the pathological process found in the sigmoid colon.
2. Indicate the probable precancerous changes in the intestine, the stages of colon cancer morphogenesis.
3. What are the current views on the pathogenesis of colon cancer?
4. Name the pathological process found in the liver and the mechanism of its development.
5. What other ways of metastasis are characteristic of cancer, where to look for metastases to resolve issues of treatment tactics and prognosis of the disease?
6. What other tumors can occur in the colon?
7. What are the reasons for the development of hypochromic anemia in the patient?

Answers

1. Circular stenosing cancer of the sigmoid colon.
2. Colorectal cancer in most cases develops from exophytic adenomas (adenomatous polyps). Stages of colon cancer morphogenesis: normal epithelium, increased proliferation of intestinal epithelium, adenoma with an increase in the degree of intraepithelial neoplasia, cancer.
3. A specific feature of colon cancer is the existence of a model for the molecular pathogenesis of this disease. In more than 85% of cases, chromosomal instability is revealed, expressed in multiple deletions, amplifications and rearrangements of large sections of chromosomes. Recently, a new type of colon cancer pathogenesis has begun to be identified, which is characterized by an imbalance in DNA methylation, which leads to instability of the hMLH1 gene associated with the syndrome of hereditary non-polyposis colon cancer. Colon cancer is characterized by staged morphological transformation, which is due to the staged accumulation of mutations leading to the activation of oncogenes and inactivation of suppressor genes. In about half of the cases, mutations are noted in the KRAS gene, which initiates a mitogenic signal, the latter contributes to the division of stem cells of the intestinal epithelium. The most well-known suppressor gene involved in the development of colon cancer (and many tumors of other localizations) is the p53 gene,

which is responsible for the stable state of the genome. When DNA is damaged, p53 is activated, which leads to cell apoptosis. Inactivation of the p53 gene allows the cell to accumulate mutations, including damage, which activate oncogenes and inactivate anti-oncogenes. Mutations in the p53 gene are usually punctate, although deletions can also be observed. The inactivation of the p53 gene is associated with the frequent occurrence of the loss of heterozygosity in chromosome 17p. Colon cancer is also characterized by damage to the APC gene located on chromosome 5q, which is accompanied by the activation of transcription of a number of oncogenes. Inactivation of the suppressor genes DCC, SMAD2 and SMAD4 leads to the deletion of chromosome 18q.

4. Hematogenous metastases of colon cancer were revealed in the liver.

5. Colorectal cancer spreads to regional and distant lymph nodes. Hematogenous metastasis is most often observed in the liver, less often in the lungs, bones, meninges. It is also possible to develop peritoneal carcinomatosis (contact pathway).

6. Carcinoids, lymphomas (T-cell and B-cell), stromal tumors from the connective tissue.

7. The reasons for the development of hypochromic anemia can be chronic blood loss due to ulceration of the tumor and impaired iron absorption.

Lung cancer

№ 1. A patient with lung cancer died from widespread tumor metastases. It is known that he smoked a pack of cigarettes a day for 20 years, worked in construction, where he had contact with asbestos. An autopsy diagnosed with a central, nodular, highly differentiated squamous cell carcinoma.

Questions

1. Describe the macropreparation of central nodular lung cancer.
2. Describe a micropreparation of highly differentiated squamous cell lung cancer.
3. By what criteria is the level of differentiation of squamous cell lung cancer determined?
4. Specify the possible localization of the first metastases of lung cancer.
5. Name the risk factors for the development of lung cancer in this patient.

Answers

1. In the root zone of the lung, a large tumor nodule of whitish color with indistinct contours is visible, growing through the wall of the lobar bronchus. The tumor invades the peribronchial lymph nodes
2. The tumor is built of large complexes of atypical cells with developed, often vitreous eosinophilic cytoplasm and large hyperchromic nuclei. There are figures of mitosis. In tumor complexes, stratification of the epithelium, intercellular bridges are preserved, and "cancer pearls" are determined in the center of individual complexes. The tumor has a developed stroma and invades the bronchial wall.
3. The level of differentiation of squamous cell lung cancer is established by the presence and type of keratinization (intracellular or extracellular), as well as the severity of cellular atypism.
4. The first metastases of squamous cell lung cancer should be sought in the peribronchial lymph nodes.
5. Risk factors - smoking, contact with asbestos.

№ 2. In a 55-year-old patient who had previously had secondary tuberculosis, a peripheral shadow associated with a subpleural focus of fibrosis with petrification was found in the upper lobe of the right lung. An atypical marginal resection of the lung was performed, and a histological examination diagnosed bronchioloalveolar cancer.

Questions and Answers

1. Describe the macropreparation of peripheral lung cancer.
2. Describe the micropreparation of bronchioloalveolar cancer.
3. What is the presumptive pathogenesis of the tumor in this patient?
4. What precancerous process and characteristic expression of what cellular oncogene can be detected in this type of precancerous changes?
5. List the options for bronchioloalveolar lung cancer.

Answers

1. In the subpleural parts of the lung, a node of a white-black cyst with indistinct contours is visible, not associated with large bronchi. The pleura over the formation is thickened, hyalinized, retracted.

2. Micropreparation "Bronchioloalveolar cancer" (staining with hematoxylin and eosin). The tumor consists of atypical large cells with vesicular nuclei containing large nucleoli, and with developed vacuolated cytoplasm filled with mucus. Tumor cells grow on the surface of the alveoli, in places without destroying their epithelial cover, and grow into the adjacent lung tissue. In the center of the tumor there is fibrous tissue and petrification. The stroma of the tumor is represented by the preserved connective tissue base of the alveolar septa (bronchioloalveolar cancer from mucous cells).
3. The pathogenesis of bronchioloalveolar cancer in this patient is associated with post-tuberculous scar.
4. A precancerous process in peripheral cancer is most often atypical adenomatous hyperplasia with K-ras expression.
5. Bronchioloalveolar cancer can also consist of non-mucus-producing cells, there are also mixed cell types of cancer.

№ 3. A patient who worked at a uranium production was admitted to chemotherapy due to a histologically confirmed diagnosis of stage III small cell lung cancer. After 2 years, the patient developed melanosis of the skin, and he died from widespread metastases of cancer.

Questions and Answers

1. Describe the micropreparation and electron diffraction pattern of small cell carcinoma. I
2. Indicate the most frequent localization and histogenesis of small cell I cancer.
3. What are the features of small cell carcinoma metastasis?
4. What paraneoplastic syndromes are typical for small cell lung cancer?
5. Name other neuroendocrine lung tumors.

Answers

1. The tumor is built of scattered atypical lymphocyte-like tumor cells with a narrow rim of the cytoplasm. In the tumor, there are figures of mitosis, as well as foci of necrosis. The tumor invades the wall of a large bronchus. Electronogram "Neuroendocrine granules": granules in the cytoplasm of a tumor cell have a rounded shape, an electron-dense core and a double membrane.
2. Small cell carcinoma often has a central localization. Histogenesis is neuroendocrine.
3. Features of metastasis - early lymphogenous and hematogenous metastasis.
4. In small cell lung cancer, endocrinopathies most often develop due to ectopic production of AKLT, calcitonin, bombesin and other hormones and neurotransmitters by tumor cells.
5. Neuroendocrine tumors of the lungs - carcinoids (typical and atypical). In addition, neuroendocrine differentiation is also characteristic of some types of non-small cell lung cancer.

Prostate cancer

№ 1. Male 65 years old. Examined in connection with complaints of dysuria. PSA 54 N / ml, rectal compaction of the left lobe of the prostate, asymmetry of the gland. Histology - prostate adenocarcinoma, Glisson's number 3 + 4. According to MRI and ultrasound, prostate adenoma, malignancy ?, there are signs of infiltration of the left seminal vesicle. Scintigraphy of the skeleton - foci of pathological bone formation were not revealed. The patient is shown:

Answer: radiation therapy and hormone therapy

№ 2. A 50-year-old man complained of mild dysuria, discomfort in the perineal region. History of chronic prostatitis. Your further sequence of actions for making a diagnosis:

Answer: PSA, rectal examination, ultrasound of the prostate (including transrectal probe)

Topic 6. Intravital morphological diagnostics of precancerous diseases and cancer of the main localizations - the cervix, endometrium and breast.

1.1 List of points for oral quiz

Precancerous diseases and cervical cancer.

1. Epidemiology of cervical cancer (CC). Risk factors. Modern ideas about the patho- and morphogenesis of cervical cancer.
2. The main methods of screening and diagnosis of cervical cancer.

3. Cervical ectopia, definition, synonyms, causes of development, morphological manifestations. The value of the transformation zone in the development of cervical tumor pathology.
4. Endocervix hyperplasia (glandular and glandular-cystic hyperplasia of the endocervix, microglacial hyperplasia, atypical microglacial hyperplasia of the endocervix): morphological characteristic, meaning.
5. Pre-cancerous diseases of the cervix, the concept of dysplasia, cervical intraepithelial neoplasia (CIN, CIN), squamous intraepithelial lesions (SIL, low grade, high grade), etiology, pathogenesis, manifestations, diagnostic methods, value.
6. Precursors of cervical adenocarcinoma, concept of endocervical epithelial dysplasia (endocervical dysplasia, cervical intraepithelial glandular neoplasia (CIGN), in situ adenocarcinoma), morphological manifestations, diagnostic methods, significance.
7. Cervical cancer, epidemiology, classification (squamous cell carcinoma, micro-invasive carcinoma, micro-invasive adenocarcinoma, invasive adenocarcinoma), major risk factors, clinical manifestations, the value of the morphological method in the diagnosis of cervical cancer.

Precancerous diseases and endometrial cancer.

1. Glandular hyperplasia of the endometrium, classification, characterization of various forms of hyperplasia, the value of the morphological method for the diagnosis of endometrial hyperplastic changes, the biological significance.
2. Endometrial polyps: the classification of their characteristics, the value of the morphological method for diagnosing endometrial hyperplastic changes, the biological significance.
3. Endometrial adenocarcinoma, epidemiology, classification, manifestation, significance of the morphological method in the diagnosis of endometrial cancer.

Precancerous diseases and changes in breast cancer

1. Proliferative and hyperplastic processes in the mammary gland: fibrocystic disease, ductal and lobular hyperplasia of the mammary gland, intraductal papilloma of the mammary gland, fibrosing adenosis, radial scar.
2. Epidemiology of breast cancer (BC). Risk factors. Modern concepts of carcinogenesis in the mammary gland.
3. Basic methods of breast cancer screening and diagnostics.
4. Breast cancer, classification, general characteristics of the main forms of breast cancer (prototype: non-invasive, invasive; lobular cancer: non-invasive, invasive), features of their course and prognosis.
5. Immunohistochemical method in the diagnosis and treatment of breast cancer, the importance of determining the status of receptors for estrogen, progesterone and HER2 / NEU. Molecular classification of ductal breast cancer. Clinical significance of immunohistochemical diagnostics of breast cancer.

1.2 Practical tasks

Description of micropreparations:

1. CIN
2. Squamous cell carcinoma of the cervix
3. Ductal breast cancer
4. Fibroadenoma of the breast

1.3. Tests

1. For the choice of hormone therapy for breast cancer, the following combination of steroid hormone receptors is optimal:
 - a) RE- and RP-
 - b) RE + and RP + (+)
 - c) RA- and RE-
2. Which of the additional methods of breast cancer treatment is used most often:
 - a) oophorectomy
 - b) radiation therapy (+)
 - c) hormone therapy

3. Against the background of glandular tissue, lipoma is revealed in the form:

- a) lipoma does not stand out against the background of glandular tissue
- b) darkening with clear and even contours
- c) enlightenment with clear and even contours (+)

4. Benign breast tumors include:

- a) fibroadenoma (+)
- b) diffuse mastopathy
- c) nodular fibrocystic mastopathy

5. The first metastases in breast cancer localized in the upper inner quadrant should be sought in the lymph nodes:

Answer options

- 1 Axillary (score - 0)
- 2 Supraclavicular (score - 0)
- 3 Subclavian (score - 9) (+)
- 4 All of the above is true (score - 0)
- 5 Correct A and B (score - 0)
- 6. Among breast cancers, cancer has a more favorable clinical prognosis:

Answers

- 1 Non-infiltrative ductal (score - 9) (+)
- 2 Medullary (score - 0)
- 3 Mucous (score - 0)
- 4 Correct A and B (score - 0)
- 5 Correct B and C (score - 0)

7. Cellular atypism in tumors is characterized by:

Answer options

- 1 Difference of cells in shape and size
- 2 Hyperchromatosis of nuclei
- 3 Increased nuclear-cytoplasmic ratio
- 4 All of the above is true (+)
- 5 Correct B and C

8. Malignant tumors are characterized by:

Answer options

- 1 Severe cell anaplasia and tissue structure disorder
- 2 Infiltrative growth
- 3 Presence of metastases and relapses after tumor removal
- 4 All of the above is true (+)
- 5 Correct A and B

9. The first metastases in breast cancer localized in the upper inner quadrant should be sought in the lymph nodes:

Answer options

- 1 Axillary
- 2 Supraclavicular
- 3 Subclavian (+)
- 4 All of the above is true
- 5 Correct A and B

1.2 Examples of clinical case-studies with reference answers:

№ 1. In a 45-year-old woman, during a routine examination by a gynecologist, a whitish area of irregular shape with a rough surface was revealed on the cervix. A biopsy of the affected area was performed. In the biopsy specimen, a stratified squamous epithelium with signs of atypia: the nuclei of cells are polymorphic,

hyperchromic, there are figures of mitosis. In some places, there is a violation of the polarity and complexity of the cells. There are coilocytes. The described changes are noted in the lower and middle thirds of the epithelial layer.

Questions

1. Name the changes found in the patient's cervix. What is the extent of these changes?
2. Name the most probable etiological factor of such changes in the cervix. Give the characteristics of this etiological agent.
3. Give a definition of the term "coilocyte". Describe the morphological features of the coilocyte.
4. Describe the possible dynamics of the pathological process that has developed in the cervix.

Answers

1. Cervical intraepithelial neoplasia (CIN) was revealed in the stratified squamous epithelium of the cervix. There are three degrees of CIN. CIN1 is characterized by damage to the lower third of the epithelial layer, with CIN2 2/3 of the epithelial layer is affected. With CIN3, dysplastic changes in the epithelium occupy more than 2/3. or completely the entire thickness of the epithelial layer, but do not penetrate through the basal membrane (cancer in situ). This patient has CIN2.
2. The leading cause of CIN development in the cervix is human papillomavirus infection. Different types of virus have different malignant potential. HPV types 16, 18, 45 and 56 are considered to be at high risk for developing cervical cancer. At the initial stages of infection, viral particles are located episomally, later they are incorporated into the genome of stratified squamous epithelium cells. At the same time, proteins E6 and E7 are produced, inactivating the p53 and Rb genes, which leads to uncontrolled cell proliferation, progression of CIN and the development of cancer.
3. The cytopathic effect of papillomavirus on stratified squamous epithelium is manifested by the formation of coilocytes. Coilocytes have a rim of clear cytoplasm around a large hyperchromic nucleus with coarse lumps of chromatin. The nuclear membrane of coilocytes is thickened, irregular in shape.
4. CIN2 can progress to CIN3 and invasive cervical cancer. The rate of progression of dysplastic changes in the cervix is primarily determined by the type of papillomavirus that caused the lesion, its oncogenic potential, as well as the characteristics of the woman's immune status.

№ 2. A 58-year-old woman with uterine bleeding underwent curettage of the uterine cavity. Histological examination of scraping diagnostics in endometrial adenocarcinoma.

Questions

1. Describe the microscopic changes that characterize this tumor.
2. What changes in the endometrium preceded the development of adenocarcinoma?
3. Name the leading etiological factor in endometrial cancer. List the diseases and conditions that predispose to the development of endometrial cancer.
4. Describe the pathways of endometrial cancer metastasis.

Answers

1. Under the microscope, the tumor is represented by atypical glandular complexes of various sizes and shapes, lined with cylindrical cells with polymorphic, hyperchromic nuclei. Cells can be located in one or several layers, their polarity is violated. The basement membrane of the glandular complexes is absent in places. In the tumor, mitoses, including pathological ones, are determined.
2. Development of endometrial adenocarcinoma in most cases is preceded by glandular hyperplasia. The highest risk of malignancy is in complex atypical endometrial hyperplasia.
3. The leading etiological factor of endometrial adenocarcinoma is relative or absolute hyperestrogenemia. The risk of developing endometrial cancer is increased in non-pregnant and nulliparous women, with obesity, diabetes mellitus, taking estrogen-containing drugs and estrogen-producing ovarian tumors.
4. The first metastases of endometrial cancer are lymphogenous, to the pelvic and para-aortic lymph nodes. Hematogenous metastases - to the lungs, ovaries, liver, and other organs. In the later stages, implantation metastases appear in the abdominal cavity.

№ 3. A 40-year-old woman complains of pain in the lower abdomen, profuse long periods, dizziness, weakness. A blood test shows signs of iron deficiency anemia. Hysteroscopy was performed. In the myometrium, directly under the mucous membrane, a round-shaped node with clear boundaries protruding

into the uterine cavity was found. The node has been removed. On a macroscopic examination, the node has a dense consistency, on a gray section, fibrous structure.

Questions

1. What kind of tumor are you talking about most likely?
2. Describe the microscopic structure of the tumor. What histochemical staining will make it possible to clarify the histogenesis of the tumor?
3. List the macro- and microscopic signs indicating the benign nature of the tumor.
4. What types of tumors are isolated depending on their localization in the myometrium? Which of the varieties was observed in this patient?
5. List the histological variants of the tumor.
6. List the main clinical manifestations of this tumor

Answers

1. Localization of the tumor in the myometrium, clear boundaries, dense consistency and fibrous structure of the tumor make it possible to make a diagnosis of leiomyoma with a high degree of probability, but histological examination is necessary to confirm the diagnosis.
2. Under a microscope, it can be seen that the tumor is built of smooth muscle cells with a wide eosinophilic cytoplasm and elongated monomorphic nuclei. Mitoses are absent or isolated. The bundles of cells have different thicknesses and run in different directions. A different amount of connective tissue is determined between the cell bundles. When stained with picrofuchsin according to van Gieson, muscle cells are stained yellow, and collagen fibers - brick-red. A tumor with a lot of connective tissue is called a fibroid.
3. The benign nature of the tumor is evidenced by expansive growth, the absence of cellular atypism.
4. Depending on the localization in the myometrium, subserous, intramural, submucous tumors are isolated. In this patient, the tumor decomposed submucous. Histological types of leiomyoma: simple, cellular, epithelioid, bizarre, mitotically active, lipoleiomyoma.
5. Leiomyomas can be accompanied by uterine bleeding, lead to compression of adjacent organs and, thus, be accompanied by dysuric disorders and constipation. Multiple leiomyomas can lead to infertility and premature birth.

№ 4. A 55-year-old woman consulted an oncologist with a painful lump in the right mammary gland. On examination: the right mammary gland is deformed, the nipple is retracted, palpation revealed a node without clear boundaries; the skin over the knot resembles a lemon peel. In the right axillary region, enlarged lymph nodes are palpated. It is known that the patient's sister died of breast cancer at the age of 50.

Questions

1. What tumor of the breast - benign or malignant - has developed in the patient? Justify your answer.
2. List the possible histological variants of this tumor.
3. Name the ways of breast cancer metastasis.
4. Name the genes whose mutations are characteristic of hereditary breast cancer. What is the main mechanism of action of these genes?
5. Amplification of which protooncogene is most typical for breast cancer? What is the significance of the immunohistochemical determination of this substrate in the tumor tissue?

Answers

1. The absence of clear tumor boundaries, the symptom of "lemon peel", nipple retraction indicate the infiltrating nature of tumor growth, and the defeat of the lymph nodes - about metastasis. Based on these changes, it can be assumed that the patient has developed breast cancer,
2. The main histological variants of infiltrating breast cancer include: invasive ductal carcinoma, medullary, colloid, tubular and invasive lobular carcinoma.
3. Lymphogenous metastases of breast cancer are found in the axillary lymph nodes, nodes along the pectoralis minor and pectoralis major, supraclavicular and other groups of lymph nodes, hematogenous metastases - in the lungs, bones, liver, adrenal glands and other organs.
4. The frequency of breast cancer and familial predisposition to cancer is observed with mutations in the BRCA1 genes (localized on chromosome 17q21.3) and BRCA2 (localized on chromosome 13q12-13). According to the mechanism of action, these genes are suppressive.

5. The most important from a prognostic point of view is the amplification of the protooncogene ERBB2, which encodes the transmembrane tyrosine kinase receptor for epidermal growth factor (HER-2). The determination of this protein (immunohistochemical or in situ hybridization) is used before prescribing monoclonal antibodies to HER-2 in breast cancer (specific anticancer therapy).

Topic 7. Comorbidity.

1.1 List of points for oral quiz

1. The concept of comorbidity and its clinical significance.
2. The most frequent combinations of diseases:
 - combined diseases of the lungs and gastrointestinal tract;
 - combined diseases of the stomach and urinary system;
 - hyperestrogenemia and diseases of the stomach; - cancer and obesity.
3. The concept and modern possibilities of targeted therapy. The value of pathology and immunohistochemical methods in treatment tactics.

1.2. Examples of clinical case-studies with reference answers:

№ 1. Patient A., 73 years old, was admitted to the clinic with a picture of an acute abdomen. It is known from the anamnesis that he had no operations on the abdominal organs. A year ago, she suffered an ischemic cerebral infarction, six months ago - a repeated myocardial infarction; according to the ultrasound scan of the polyclinic - compaction and deformation of the abdominal aorta. This disease began suddenly with cramping pains in the abdominal cavity, nausea and vomiting appeared, which did not bring relief, stool and gas retention, flatulence. X-ray examination shows signs of small bowel obstruction. In the analysis of blood, moderate leukocytosis.

Questions

1. What kind of bowel disease can be suspected in this observation?
2. Name the most common causes and underlying diseases for the development of intestinal gangrene.
3. Describe the macroscopic changes in the bowel.
4. List the types of intestinal infarctions in acute ischemic bowel disease.
5. Name the manifestations of chronic ischemic bowel disease.

Answers

1. Based on the history and clinical data, gangrene of the small intestine can be suspected.
2. The most common causes of intestinal gangrene are thrombosis or thromboembolism, developing against the background of atherosclerosis of the mesenteric arteries. Anamnesis data on cerebral and myocardial infarctions and changes in the aorta suggest that the patient has atherosclerosis with lesions of various groups of arteries.
3. The intestinal wall is edematous, thickened, flabby consistency, black-red, mucous membrane with ulceration.
4. Serous membrane is dull, filamentous fibrin overlays are visible on it. Depending on the depth of damage to the intestinal wall, acute ischemic bowel disease is manifested by three types of heart attacks: infarction of the intestinal mucosa; intramural infarction; transmural intestinal infarction.
5. Chronic ischemic bowel disease is manifested by chronic ischemic colitis and strictures.

№ 2. Patient K., 45 years old, became ill acutely after hypothermia. Weakness, headache, food aversion, edema were noted. After 2 months. the patient was admitted to the hospital with severe pneumonia. Upon admission, the patient complains of pain in the region of the heart, dizziness, shortness of breath, nausea. Objectively: the face is pale and edematous, BP is 180/100 mm Hg. Art., heart rate 96 in 1 min. The abdomen is soft and painless. There are no symptoms of peritoneal irritation. The edge of the liver is palpable at the edge of the costal arch. The spleen is not palpable. Laboratory research. Blood test: hemoglobin 105 g / l; erythrocytes 2.7×10^{12} / l; leukocytes 12.6×10^9 / l (stab neutrophils 14%, segmented neutrophils 50%, eosinophils 4%, monocytes 5%, lymphocytes 27%); ESR 40 mm / h. Biochemical blood test: total blood serum protein 48 g / l (norm 62-81 g / l); albumin 27 g / l (norm 35-50 g / l); creatinine 630

vmol / l (norm 44-88 $\mu\text{mol} / \text{l}$). General urine analysis: daily urine output 450 ml, relative density 1008, proteinuria 2.4 g / l. Daily proteinuria 4.2 g. Microscopic examination of the sediment: 20-30 erythrocytes in the field of view; 10-15 leukocytes in the field of view; erythrocyte, leukocyte, granular and waxy casts in large numbers. Ultrasound: the size of the kidneys is not changed. Despite the treatment, the symptoms of pulmonary and renal failure increased, and the patient died. Autopsy revealed "large variegated kidneys."

Questions

1. What kind of kidney disease did the patient have? Argument your answer.
2. Indicate the etiology of the disease.
3. What is the pathogenesis of the disease?
4. Explain the mechanisms of development of oliguria in this disease.
5. Describe the macroscopic changes in the kidneys.
6. What changes in the kidneys are detected by microscopic examination?
7. For what histological form of glomerulonephritis are they characteristic?
8. What are the mechanisms of hematuria in this disease?
9. Why does proteinuria occur in such patients?
10. Explain the mechanisms of development of edema in this disease.
11. Name the main mechanisms of the development of hypertensive syndrome.

Answers

1. Rapidly progressive glomerulonephritis, which is characterized by the rapid development of renal dysfunction and malignant arterial hypertension.
2. Rapidly progressive glomerulonephritis is divided into three groups: post-infectious (post-streptococcal); with systemic diseases; idiopathic.
3. The pathogenetic mechanisms of rapidly progressive glomerulonephritis are diverse. In 50% of cases of glomerulonephritis, immune complexes are detected, in about 30% - antibodies to the basement membrane of the glomerular capillaries. In some patients, we can talk about a combination of immunocomplex and autoimmune glomerulonephritis,
4. A decrease in the filtration surface of the glomeruli and an increase in water reabsorption due to secondary hyperaldosteronism, hypernatremia and an increase in ADH secretion.
5. The kidneys are enlarged in size, flabby consistency, the cortical substance is wide, grayish-yellowish in color with small red specks, the medulla is dark red in color - "large motley kidney".
6. In the extracapillary space, characteristic "crescents" are formed, initially formed mainly from cellular elements - monocytes, polynuclear leukocytes, podocytes, fibrin nephrotelet, then transforming into fibrocellular and, finally, fibrous. The crescent moon squeezes the capillary glomerulus, in which necrotic changes progress. The phenomena of proliferation of endothelial and mesangial cells are observed. In the interstitium - an inflammatory reaction.
7. Rapidly progressive glomerulonephritis is characterized by the development of extracapillary proliferative glomerulonephritis (glomerulonephritis with crescent moon).
8. The leading mechanism of hematuria in extracapillary glomerulonephritis should be considered perforation of the basement membranes of the glomerular capillaries.
9. The genesis of proteinuria is due to an increase in the permeability of the basement membrane of the glomerular capillaries for protein molecules due to the deposition of immune complexes or autoantibodies in the glomerular filter. Of lesser importance is a decrease in protein reabsorption in the tubular section of the nephron.
10. In this observation, rapidly progressive glomerulonephritis is characterized by the development of a nephrotic variant of the edematous syndrome. In this case, massive proteinuria occurs - more than 3 g of protein per day, peripheral edema is common, and ascites appears. Proteinuria leads to hypoproteinemia and hypoalbuminemia, which causes a decrease in oncotic, then osmotic pressure in the vascular bed, followed by a decrease in circulating blood volume (BCC). In this disease, in parallel with these processes, various inflammatory mediators are activated, which increase the permeability of the vascular wall, which also contributes to a decrease in the BCC. A decrease in BCC includes a system for maintaining intravascular volume, i.e., secretion of aldosterone, activation of antidiuretic hormone, suppression of atrial natriuretic factor.
11. Renovascular (ischemia of the glomeruli of the kidney), secondary hyperaldosteronism.

Topic 8. Final lesson.

Oral quiz, clinical case-studies, essay.

Stage: midterm assessment (credit)

Interim certification is carried out in the form of offset. Tasks contain

Midterm assessment is carried out in the form of credit. Tasks for the credit include questions for an oral answer, practical tasks: a description of micro-slides, clinical case-studies, essay.

Tasks for competence assessment «Knowledge»	Task type
<p>List of theoretical points for oral quiz:</p> <ol style="list-style-type: none">1. The subject and objectives of clinical pathological anatomy, research methods, the value for the clinic.2. Historical periods of the development of pathological anatomy.3. Development of pathological anatomy in Russia.4. Organization of the pathoanatomical service, the direction of biopsy material for histohistological study.5. Structure of the clinical and pathoanatomical diagnosis.6. Features of the formulation and coding of diagnoses of diseases of certain classes of ICD-10.7. Light and electron microscopy8. Cytological diagnostics9. Immunohistochemistry in clinical morphology10. Molecular genetic analysis, genome-wide studies of polymorphic alleles.11. Diagnostic capabilities of modern endoscopic research methods in the clinic.12. Biopsy diagnostics. Features of biopsy diagnostics in gastroenterology, gynecology and other sections.13. Principles of collection, storage and work with biopsy material.14. Features of the interpretation of the morphological picture of biopsies.15. General characteristics of diagnostic imaging methods (ultrasound and tomographic technologies, intravital oximetry and fluorescence imaging, etc.).16. Modern methods of cardiovascular imaging in the diagnosis of coronary artery disease (methods of visualization of atherosclerotic lesions of coronary arteries - coronary angiography, intravascular ultrasound, multispiral computed tomography (MSCT) with CA contrast, MSCT-assessment of coronary calcium; methods of analysis of myocardial function - stress echocardiography, stress-MRI, methods of radioisotope diagnostics - myocardial perfusion scintigraphy, single-photon emission computed tomography (SPECT) and positron emission tomography (PET).17. Ultrasound diagnostics: general characteristics of the method, application possibilities.18. Doppler sonography: general characteristics of the method, application possibilities.19. Radiography: general characteristics of the method, application possibilities.20. Angiography: general characteristics of the method, application possibilities.21. Definition of chronic gastritis (CG). Etiology, patho- and morphogenesis, clinical and morphological variants of chronic hepatitis.	<p>-theoretical</p>

<p>22. The concept of chronic atrophic gastritis (CAG), its morphogenesis (morphogenetic scheme) and clinical significance.</p> <p>23. Morphological criteria of CAG, its classification, metaplastic, non-metaplastic CAG.</p> <p>24. The concept of "functional" atrophy in the mucous membrane of the stomach (coolant).</p> <p>25. The main morphological phenomena observed in the coolant in the progression of chronic inflammation (atrophy, mucoidization, enterolization, intestinal metaplasia complete and incomplete, dysplasia).</p> <p>26. Determination of peptic ulcer (YAB). Etiology, pathogenesis and morphogenesis of ulcer, its clinical significance. The main morphological phenomena observed in the coolant in BU.</p> <p>27. Epidemiology of gastric cancer, its place in the structure of cancer morbidity and mortality. Risk factors for the development of gastric cancer. Features of gastric carcinogenesis: gastric cancer intestinal and diffuse types. Epidemiological, clinical and pathological features of the intestinal and diffuse types of gastric cancer. Symptoms of anxiety in the diagnosis of gastric cancer.</p> <p>28. Precancerous diseases of the stomach - chronic active hepatitis, peptic ulcer, Menetries disease, adenomatous polyps, stomach stump.</p> <p>29. Pretumor changes of the gastric mucosa (atrophy, intestinal metaplasia, dysplasia)</p> <p>30. The value of biopsy in the diagnosis of diseases of the stomach</p> <p>31. Epidemiology of breast cancer (BC). Risk factors. Modern ideas about carcinogenesis in the mammary gland.</p> <p>32. The main methods of screening and diagnosis of breast cancer.</p> <p>33. Pre-cancerous diseases and changes in the mammary gland. Proliferative and hyperplastic processes in the mammary gland: fibrocystic disease, ductal and lobular hyperplasia of the mammary gland, intraductal papilloma of the mammary gland, fibrosing adenosis, radial scar.</p> <p>34. Breast cancer, classification, general description of the main forms of breast cancer (proto-cancer cancer: non-invasive, invasive; lobular cancer: non-invasive, invasive), features of their course and prognosis.</p> <p>35. Immunohistochemical method in the diagnosis and treatment of breast cancer, the importance of determining the status of receptors for estrogen, progesterone and HER2 / NEU. Molecular classification of ductal breast cancer.</p> <p>36. Epidemiology of cervical cancer (CC). Risk factors. Modern ideas about the patho- and morphogenesis of cervical cancer.</p> <p>37. The main methods of screening and diagnosis of cervical cancer.</p> <p>38. Cervical ectopia, definition, synonyms, causes of development, morphological manifestations. The value of the transformation zone in the development of cervical tumor pathology.</p> <p>39. Hyperplasia of the endocervix (glandular and glandular-cystic hyperplasia of the endocervix, glandular hyperplasia, atypical micro-glandular hyperplasia of the endocervix): morphological characteristic, meaning.</p> <p>40. Pre-cancerous diseases of the cervix, the concept of dysplasia, cervical intraepithelial neoplasia (CIN, CIN), squamous intraepithelial lesions (SIL, low grade, high grade), etiology, pathogenesis, manifestations, diagnostic methods, value.</p> <p>41. Precursors of cervical adenocarcinoma, the concept of dysplasia of the endocervical epithelium (endocervical dysplasia, cervical intraepithelial glandular neoplasia (CIGN), in situ adenocarcinoma, morphological manifestations, diagnostic methods, value.</p> <p>42. Cervical cancer, epidemiology, classification (squamous cell carcinoma, micro-invasive carcinoma, micro-invasive adenocarcinoma, invasive adenocarcinoma), manifestation, importance of the morphological method in the diagnosis of cervical cancer.</p>	
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<p>43. Glandular hyperplasia of the endometrium, classification, characterization of various forms of hyperplasia, the value of the morphological method for the diagnosis of endometrial hyperplastic changes, biological significance.</p> <p>44. Endometrial polyps: the classification of their characteristics, the value of the morphological method for diagnosing hyperplastic changes in the endometrium, biological significance.</p> <p>45. Endometrial adenocarcinoma, epidemiology, classification, manifestation, significance of the morphological method in the diagnosis of endometrial cancer.</p> <p>46. Benign tumors and tumor-like diseases of the prostate gland (benign prostatic hyperplasia, prostate adenoma), manifestations, diagnostic methods, value.</p> <p>47. Prostatic intraepithelial metaplasia (PIN, PIN), etiology, manifestations, significance. Screening methods for the diagnosis of precancerous changes and prostate cancer.</p> <p>48. Prostate cancer, etiology, pathogenesis, classification, general characteristics of the main forms of prostate cancer (acinar carcinoma, duct carcinoma), diagnostic methods.</p>	
<p>Tasks for competence assessment «Abilities»</p>	<p>Task type</p>
<p>List of tests:</p> <p>1. The main disease (choose one correct answer):</p> <p>a) peritonitis, b) uremia, c) appendicitis, d) nephrosclerosis.</p> <p>2. Primary disease (choose one correct answer):</p> <p>a) jaundice b) paratiftit, c) peritumor pneumonia, d) pancreatitis.</p> <p>3. Primary disease (choose one correct answer):</p> <p>a) lobar pneumonia, b) periappendicitis, c) post-hemorrhagic anemia, d) omentitis.</p> <p>4. Complication (choose one correct answer):</p> <p>a) pancreatitis b) gastritis, c) omentobursitis, d) adenocarcinoma.</p> <p>5. Complication (choose one correct answer):</p> <p>a) focal pneumonia, b) sarcoma, c) tuberculosis, g) cholecystitis.</p> <p>6. Complication (choose one correct answer):</p> <p>a) cachexia b) sarcoma, c) glomerulonephritis, d) thyroiditis.</p> <p>7. Review histological staining (choose one correct answer):</p>	<p>-practical</p>

<p>a) mucicarmine, b) picro-fuchsin, c) hematoxylin and eosin, d) alcian blue.</p> <p>8. Selective coloring on collagen fibers (choose one correct answer): a) hematoxylin and eosin, b) Sudan PI, c) mucicarmine, d) picro-fuchsin.</p> <p>9. Selective coloring for fat (choose one correct answer): a) Sudan III, b) picro-fuchsin, c) alcian blue, g) Congo red.</p> <p>10. Selective coloring on amyloid (choose one correct answer): a) Sudan III, b) hematoxylin and eosin, c) Congo red d) eosin.</p>	
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Tasks for competence assessment «Abilities»	
<p>Solving a practical problem - morphological diagnostics (light microscopy) on the following topics: Topic 2. "Endoscopic and biopsy diagnostics in clinical morphology." Topic 4. Intravital morphological diagnosis of precancerous diseases of the stomach, stomach cancer. Topic 6. Intravital morphological diagnosis of precancerous lung diseases, lung cancer. Topic 8. Intravital morphological diagnosis of precancerous diseases of the cervix and prostate gland, cervical cancer and prostate cancer.</p>	-practical

Tasks for competence assessment «Skills»	
<p>Case-study: № 1. A sick man, 73 years old, was admitted to the emergency department. Complaints: burning pains behind the sternum, lasting for 45 minutes, severe weakness. Objectively: pallor of the skin, acrocyanosis, white spot phenomenon 5 sec, arterial hypotension 80/60 mm. rt. RT., shortness of breath 25 breaths per minute, heart rate 100 per minute. Anamnesis: from the age of 50, arterial hypertension (BP up to 170/100 mm Hg), the last 10 years, urolithiasis was diagnosed. Formulate a preliminary diagnosis and plan an examination. Data of additional survey methods: EchoCG: zones of hypo- and akinesia in the myocardium of the anterior wall of the left ventricle. Coronary angiography: complete occlusion of the left descending coronary artery. ECG: QS complex is recorded in I, II and AVL leads Ultrasound of the kidneys: stones in the right kidney with atrophy of its parenchyma and hydronephrosis. Ultrasound of large vessels: the presence of atherosclerotic ulcerated plaques in the aorta was established.</p>	- theoretical and practical

№ 2. A 45-year-old man was admitted to hospital treatment on August 18, complaints: nausea, vomiting, abdominal enlargement, weight loss. On August 26, an operation was carried out and death occurred. Clinical diagnosis: stomach cancer with metastases to the liver and other organs. Gastrointestinal bleeding, peritonitis, dynamic intestinal obstruction, liver cirrhosis. Autopsy: in the abdominal cavity about 3 liters of bloody contents. On the peritoneum - fibrous overlays. In the area of the lesser omentum, the gate of the liver, in the head of the pancreas - dense nodes of different diameters welded together, some of them disintegrate. Grayish-yellow nodules are found in the lung. The diameter of the nodes does not exceed 1-1.5 cm. The lymph nodes of the liver hilum, para-aortic, bifurcation are enlarged, red-gray in color. On the intima of the aorta, nausea, disintegrating atherosclerotic plaques. Histologically, all nodes represent mesothelioma.

№ 3. Man - 50 years old. He was hospitalized several times. Currently, complaints of severe shortness of breath, cough with purulent sputum, on examination, pronounced acrocyanosis, NPV 22 per minute, heart rate 98 per minute, blood pressure 160 and 70. The skin has a powdery appearance. Laboratory data: increased levels of urea, creatinine, reduced glomerular filtration rate. Ultrasound of the kidneys: moderately pronounced wrinkling of both kidneys. Radiographically in the lungs, multiple cavities containing fluid, pleural adhesions (obliteration of cavities), severe pneumofibrosis. A biopsy of the rectal mucosa, in the submucosa and around the vessels reveals homogeneous eosinophilic masses, which give a positive reaction with Congo red.

№ 4. A 46-year-old woman was diagnosed with nonspecific aortoarteritis and chronic bronchitis, arterial hypertension a year ago. Was admitted to the hospital with acute cerebrovascular accident, motor aphasia and right-sided hemiparesis. After 6 days, a coma developed and the patient died. Final clinical diagnosis. Acute violation of cerebral circulation in the basin of the left middle cerebral artery. Right-sided hemiparesis, motor aphasia. Nonspecific aortoarteritis. Chronic obstructive bronchitis, pulmonary fibrosis, bilateral lower lobe congestive pneumonia. Stage III arterial hypertension. Pathological examination data. In the parietal lobe of the left hemisphere of the cerebrum, a round, kashitse-like consistency (6.5 cm in diameter) was found with a gray focus. Large arteries of the base of the brain are compacted, thickened, with diffuse narrowing of the lumen; in the lumen of the left middle cerebral artery - obturating worm-like, dry, gray-red masses. The inner shell of the arch, abdominal part and large branches of the aorta (brachiocephalic trunk, left common carotid and subclavian arteries), arteries of the carotid and vertebrobasilar basins, as well as the orifices of the coronary arteries had an intense yellow color; the described sections of the vascular bed are stenotically narrowed. In the upper part of the abdominal part of the aorta, there is a pretenotic sacular expansion. In it - parietal, fixed to the inner shell, dense gray-red masses, covering the mouth of the left renal artery. The rest of the blood vessels are without visible changes. In the lumen of the large bronchi there is an insignificant amount of foamy light gray liquid, the mucous membrane is yellow-gray in color. Lungs are bluish-red (in the lower lobes - intensely red), the surface of the incision is granular, with alternating areas of dense and elastic consistency; the tissue of the lower lobes sinks in water. The blood vessels of the lungs protrude above the incision surface. The cortical substance of the kidneys is pale gray, the pyramids of the medulla are dark red. In bacteriological examination of the lungs, *S. aureus* was isolated (107 CFU). Results of histological examination. In the walls of the arch, the abdominal part of the aorta, its large branches, arteries of the carotid and

vertebrobasilar basins, large cerebral arteries, as well as in the area of the coronary artery orifices, diffuse sclerosis of all membranes
 In bacteriological examination of the lungs, *S. aureus* was isolated (107 CFU).
 Results of histological examination. In the walls of the arch, the abdominal part of the aorta, its large branches, arteries of the carotid and vertebrobasilar basins, large cerebral arteries, as well as in the area of the coronary artery orifices, diffuse sclerosis of all membranes of the vascular wall, a large number of congested vasa vasorum, focal infiltration by lymphocytes, plasma cells and macrophages with single giant cells of Langhans. In the brain tissue, there are extensive fields of necrosis with a polymorphic-cellular inflammatory reaction along the perimeter, fibrosis of the pia mater. Lungs: part of the alveoli is enlarged, with ruptures of the inter-alveolar septa; others (in tissue from the lower lobes) are filled with eosinophilic homogeneous and filamentous masses with neutrophils; interalveolar septa are thickened, infiltrated with lymphocytes and neutrophils; the epithelium of the bronchi is desquamated, diffuse leukocyte infiltration of all layers of the walls of the bronchi, hyperplasia of the mucous glands of the large bronchi; peribronchial and perivascular sclerosis. Arteriolosclerotic nephrosclerosis.

№ 5. The patient was hospitalized in the oncology department with a diagnosis of stomach cancer. On the second day after hospitalization, there were severe burning pains behind the sternum, severe weakness, a drop in blood pressure to 60/40 mm. rt. Art. Died with growing symptoms of acute heart failure. Autopsy revealed: sharp left ventricular hypertrophy and moderate granular atrophy of the kidney, stenosing atherosclerosis of the coronary arteries with an ulcerated atherosclerotic plaque with a thrombus fixed to it in the left descending coronary artery, large-focal myocardial infarction of the anterior and lateral walls of the left ventricle, cancer type (cricoid cell carcinoma) with metastases to the liver, mesentery, bones of the lower extremities, to the brain. Cachexia.

Topics for essay

1. The history of the formation of pathological surveillance in Russia.
2. The history of the development of pathological anatomy. Periods of development of pathological anatomy.
3. Subject of clinical pathological anatomy. General pathology.
4. The structure, tasks and methods of pathological service.
5. The concept of comorbidity and its clinical significance.
2. The most frequent combinations of diseases: combined diseases of the lungs and gastrointestinal tract.
3. The most frequent combinations of diseases: concomitant diseases of the stomach and urinary system.
4. The most frequent combinations of diseases: hyperestrogenemia and stomach diseases.
5. The most common combinations of diseases: overweight, obesity and cancer. Cysts and cystogenesis.
6. Hyperestrogenemia and its clinical significance.
7. Hyperprolactinemia and its clinical significance.
8. Remodeling of myrcardia in hypertensive disease.
9. Remodeling of the myocardium in IHD.
10. Pretumor diseases and cancer.
11. Targeted therapy in oncology.

Formative assessment is a regular checking of student academic progress during the academic term. It is performed in various oral and written forms (quizzes, essays, checking of home assignments, compilation of cases, self-study, colloquiums, and testing). During formative assessment, the teacher monitors the level of student's academic progress according to the curriculum identifying lack of knowledge, or misunderstanding. The tasks of formative assessment are aligned with the Curriculum and Syllabus.

1. Guidelines for assessing the oral quiz:

In assessing the teacher takes into account:

- knowledge and understanding of the subject matter;
- activity during the class;
- consistency of presentation;
- argumentation of the answer, the level of independent thinking;
- ability to link theoretical and practical principles with future professional activity.

Assessment criteria:

The results are assessed in a four-grading scale: "excellent", "good", "satisfactory", "unsatisfactory".

Type of the task	Assessed competences	Assessment criteria	Grade
Oral quiz	GPC-4.1. GPC-4.2 GPC-4.3 GPC-5.7 GPC-8.2 PC-9.1 PC-9.2	The student demonstrates a comprehensive, systematic and in-depth knowledge of the academic material; has learned the required and additional resources. The student demonstrates a consistent and thorough understanding of the required knowledge, concepts, skills of the material learned, and their significance for future profession.	Excellent
		The student demonstrates a comprehensive knowledge of the academic material; has learned the required and additional resources. The student demonstrates a consistent understanding of the required knowledge, concepts, skills of the material learned, but makes minor errors.	Good
		The student demonstrates basic knowledge necessary for further study; has learned basic recommended literature. The student operates with inaccurate formulating, has difficulties in the independent answers, makes significant mistakes but is able to correct them under the guidance of a teacher.	Satisfactory
		The student does not know the obligatory minimum or demonstrates gaps in knowledge of the academic material, makes major mistakes or gives completely wrong answers.	Unsatisfactory

2. Guidelines for case-study assessment:

Assessment criteria:

The results are assessed in a four-grading scale: "excellent", "good", "satisfactory", "unsatisfactory".

Type of the task	Assessed competences	Assessment criteria	Grade
Case - study	GPC -4.1. GPC -4.2. GPC -4.3. GPC - 5.7. GPC - 8.2.	The student correctly and solves the case-study task, demonstrating deep knowledge. There are no errors in logical reasoning and solution, the problem is solved in a rational way. The right answer is obtained, ways are clearly described.	Excellent
	PC -9.1 PC -9.2	The student correctly solves the case-study task, demonstrating deep knowledge. There are minor errors in logical reasoning and solution, the problem is solved in a rational way. The right answer is obtained, ways are clearly described.	Good
		The student correctly solves the case-study task, demonstrating basic knowledge. There are significant errors in logical reasoning and solution. The student demonstrates difficulties, but still is able to solve a case-study task.	Satisfactory
		The student incorrectly solves the case-study task, makes significant mistakes. The student is not able to solve a case-study.	Unsatisfactory

3. Guidelines for test assessment.

Assessment criteria:

The results are assessed in a four-grading scale: "excellent", "good", "satisfactory", "unsatisfactory".

Type of the task	Assessed competences	Assessment criteria	Grade
Test	GPC -4.1. GPC -4.2. GPC -4.3. GPC - 5.7 GPC - 8.2 PC -9.1 PC -9.2	80 – 100%	Excellent
		66 – 80%	Good
		46 – 65%	Satisfactory
		Less Than 46%	Unsatisfactory

6. Essay requirements:

1) Volume: 1500-300 words,

2) Contents structure:

- Introduction

- prove the relevance of the chosen topic

- point out the purpose of the essay

- give a summary of the main points

- Body

- use information obtained from different sources during the research

- show inaccuracy of the opposite points of view

- Conclusion

- List of references

The essay assumes usage of several specialized sources (at least 8-10 publications, monographs, the reference media, manuals). Preference is given to the publications in specialized medical journal and monographs including foreign databases.

Assessment criteria:

The results are assessed in a four-grading scale: "excellent", "good", "satisfactory", "unsatisfactory".

Type of the task	Assessed competences	Assessment criteria	Grade
Essay	GPC -4.1. GPC -4.2 GPC -4.3. GPC - 5.7. GPC - 8.2. PC -9.1 PC -9.2	The requirements are fulfilled: - the problem is formulated and its relevance is proved; - the various approaches to problem are presented; - conclusions are formulated; - the subject is thoroughly studied; - volume is observed; - design requirements are observed; - correct answers to additional questions are given.	Excellent
		The main are fulfilled with some mistakes: - inaccuracies in material statement; - no logical sequence in judgments; - volume is not observed; - errors in design requirements; - incomplete answers are given to additional questions in the process of defense.	Good
		There are significant deviations from requirements: - topic is only partially explored; - mistakes in contents of the paper; - mistakes in answers to additional questions; - no conclusion is given at the process of defense.	Satisfactory
		The essay is not prepared at all. The subject of the essay is not explored, significant misunderstanding of a topic.	Unsatisfactory

Stage: midterm assessment (credit)

Midterm assessment is carried out in the form of credit. Tasks for the credit include theoretical points a for oral quiz and tests.

Methodological guidelines for preparation of credit

Requirements for the student:

- to attend classroom classes regularly; skipping classes is not allowed without a good reason;
- in case of missing the lesson, the student must be ready to answer the questions of the teacher on the topic of the class he/she missed;
 - to hand over written papers on time and to make sure they are credited;
 - preparing for the next class, the student must read the relevant textbooks, manuals, monographs, etc., and be ready to demonstrate their knowledge; student's participation in the discussion is taken into account and assessed;
 - in case the student has not mastered the necessary material or has not understood something, he/she should attend consultation sessions;
 - preparation for one theoretical question is 5-7 minutes;
 - the second stage is the demonstration of a practical skill. The student has to describe indications and conditions and demonstrate technique on the model.

Midterm assessment (credit) are assessed in a two-grading scale

- «passed»;
- «failed»

Type of the task	Assessed competences	Assessment criteria	Grade
Oral quiz	GPC -4.1. GPC -4.2 GPC -4.3. GPC - 5.7. GPC - 8.2. PC -9.1 PC -9.2	The student answers all the questions correctly, clearly, logically and completely. The student closely applies theory and practice and correctly solves the problems of higher complexity with the professional content.	Passed
	GPC -4.1. GPC -4.2 GPC -4.3. GPC - 5.7. GPC - 8.2. PC -9.1 PC -9.2	The student is not able to give logical answer, gives no answer to additional questions and does not understand the topic. He/she makes significant and serious mistakes in answers.	Failed
Test	GPC -4.1. GPC -4.2 GPC -4.3. GPC - 5.7. GPC - 8.2. PC -9.1 PC -9.2	47-100%	Passed
	GPC -4.1. GPC -4.2 GPC -4.3. GPC - 5.7. GPC - 8.2. PC -9.1 PC -9.2	1-46%	Failed