ASSESSMENT MATERIALS FOR INTERIM CERTIFICATION IN THE DISCIPLINE

Clinical Pathological Anatomy, Semester 11

Code, Field of Study:	**31.05.01** **General Medicine**
Field of Study:	**General Medicine**
Form of Study:	**Full-time**
Development Department	**Department of Pathophysiology and General Pathology**
Graduate Department:	**Internal Medicine**

TYPICAL TEST ASSIGNMENTS:

Abstract (from the Latin refero – I report, I communicate) – a presentation of the results of an analysis of modern literature on a chosen topic, based on the study of various literary sources (articles in medical journals, including foreign ones, monographs, textbooks, reference books) and presented in a structured format. The structure of the abstract includes: the relevance of the chosen topic (epidemiology, place in the structure of morbidity, unexplored pathogenetic mechanisms, the ineffectiveness of existing treatment as an inducer for studying this process, or new data relevant to diagnosis and treatment), the objective (corresponding to the topic and aimed at its disclosure), sections whose content covers the topic, discussion and conclusions, and a list of references.

Abstract topics are presented in the student's independent study guide and in the "Assessment Tools" section of the work program.

The abstract is presented as a presentation and in printed form and is defended publicly during class.

Abstract topics:

1. The history of the development of the pathological anatomical service in Russia as an example of the development of general pathological thinking in physicians.
2. The history of the development of pathological anatomy. Periods of development of pathological anatomy. Structure, tasks, and methods of the pathological anatomical service.
3. The subject of clinical pathological anatomy (clinical pathology).
4. General pathology as a basis for developing a physician's clinical thinking.
5. Biopsy diagnostics. Light and electron microscopic diagnostics. Application and clinical significance.
6. Cytological diagnostics. Application and clinical significance.
7. Immunohistochemistry in clinical morphology.
8. Molecular genetic analysis, whole-genome studies of polymorphic alleles. Application and clinical significance.
9. Diagnostic capabilities of modern endoscopic examination methods in the clinic.

10. General characteristics of diagnostic imaging methods (ultrasound and tomographic technologies, intravital oximetry and fluorescence imaging, etc.).
11. Modern methods of cardiovascular imaging in the diagnosis of ischemic heart disease (methods of visualizing atherosclerotic lesions of the coronary arteries - coronary angiography, intravascular ultrasound, multislice computed tomography (MSCT) with contrast CA, MSCT assessment of coronary calcium; methods of analyzing myocardial function - stress echocardiography, stress MRI, methods of radioisotope diagnostics - myocardial perfusion scintigraphy, single-photon emission computed tomography (SPECT) and positron emission tomography (PET).
12. The structure of clinical and pathological diagnosis. Categories of diagnostic discrepancies.
13. Features of the formulation and coding of diagnoses of diseases of individual classes of ICD-11 (diseases of the cardiovascular system - ischemic heart disease, hypertension, atherosclerosis; diseases of the respiratory system, etc.).
14. Myocardial remodeling in hypertension.
15. Myocardial remodeling in ischemic heart disease.
16. Precancerous diseases and cancer.
17. Targeted therapy in oncology.
18. The concept of comorbidity and its clinical significance.
19. General characteristics of extreme conditions.
20. Collapse. Shock. Causes, patho- and morphogenesis, outcomes and complications. Features of the pathogenetic mechanisms of collapse and shock.
21. Coma. Causes and types of coma, patho- and morphogenesis, outcomes and complications.
22. Acute intestinal obstruction. Causes, patho- and morphogenesis, complications and outcomes.
23. Multiple organ failure syndrome - causes, patho- and morphogenesis.
24. Terminal states. Stages in thanatogenesis. Signs of clinical and biological death.
25. Post-resuscitation illness.
26. Pulmonary embolism. Causes, pathogenesis and morphogenesis, outcomes and complications.
27. Adult RDS. Causes, pathogenesis and morphogenesis, outcomes and complications.
28. Sepsis. Causes, pathogenesis and morphogenesis, outcomes and complications.
29. Myocardial infarction. Causes, pathogenesis and morphogenesis, outcomes and complications.
30. Connective tissue as a system. Key functions of the connective tissue system. The importance of the connective tissue system in health and disease. Types of connective tissue damage.
31. The concept of connective tissue dysplasia. Its importance in health and disease. The concept of stigmatization as a reflection of impaired connective tissue differentiation.
32. Connective tissue dysplasia and cardiovascular pathology
33. Connective tissue dysplasia and obstetric and gynecological pathology
34. Connective tissue dysplasia and endocrine pathology
35. Connective tissue dysplasia and urinary tract pathology
36. Connective tissue dysplasia and gastrointestinal tract pathology
37. Hypertrophy. Left ventricular myocardial hypertrophy, pathogenesis, and significance in pathology.
38. Circulatory Disorders. Acute and Chronic Venous Congestion in the Pulmonary Circulation. Comparison with the Clinical Classification of CHF.
39. Circulatory Disorders. Venous Congestion in the Systemic Circulation. Pathogenesis and Clinical and Morphological Manifestations.
40. Atherosclerosis: Causes, Pathogenesis and Morphogenesis, and Clinical Significance.
41. Hypertension: Pathogenesis and Morphogenesis. Pathogenetic Mechanisms of Myocardial Remodeling in Hypertension.
42. Cardiosclerosis: Classification, Pathogenesis, and Morphogenesis of Various Variants. Cardiosclerosis as a Manifestation of Myocardial Remodeling.
43. Pathogenetic Basis of Systemic Lesions of Borderline Epithelia: An Example of Combined Lesions of the Glandular Mucosa and the Urinary Tract.
44. The Concept of Comorbidity and Its Clinical Significance.

45. Pathogenetic basis for the development of the most common disease combinations:
46. Lungs and gastrointestinal tract;
47. Gastrointestinal tract and urinary system;
48. Cardiovascular system and lungs, cardiovascular system, and other organs.
49. Overweight, obesity, and cancer.
50. Hyperestrogenemia and associated pathology. Hyperestrogenemia, causes, pathogenetic mechanisms (mitotic and genotoxic effects) of tissue impact, clinical markers, morphogenetic potential of the process.
51. Concept and current capabilities of targeted therapy. The importance of pathomorphology and immunohistochemical research methods for treatment tactics in oncology.

Defense of the Problem Solution

The student, like the topic of the paper, selects a problem to independently solve and publicly defend, presented in the form of a presentation, in accordance with the solution algorithm, which is reflected in the sequence of steps involved in the solution.

Problem Solution Algorithm

1. Analysis of the patient's complaints
2. Analysis of the anamnesis data
3. Analysis of the data from objective research methods
—patient examination, physical examination methods.

4. Analysis of the results of additional research methods available at this stage of work with the patient

These first 3-4 stages allow 70-80% of the time to formulate a correct diagnostic hypothesis (preliminary diagnosis), compile a list of diseases included in the "differential diagnosis," and move on to additional research methods that can confirm or refute the proposed diagnostic hypothesis. The results of additional research methods should prove or corroborate the diagnosis and allow for the formulation of a clinical diagnosis. Thus, after points 1-6 comes the examination plan (point 7), which includes the additional research methods you plan to use to confirm the diagnostic hypothesis (or preliminary diagnosis).

5. Preliminary Diagnosis
6. Differential Diagnosis
7. Examination Plan
8. Analysis of the Results
9. Clinical Diagnosis, presented in accordance with the diagnosis structure
10. Pathogenesis of the Disease
11. Description of the Morphological Substrate of the Disease
12. Potential of the Pathological Process in a Given Clinical Case (Prognosis)

TYPICAL QUESTIONS FOR THE CREDIT WITH GRADE:

Task for assessing the "Knows" descriptor indicators

Formulate detailed answers to the following theoretical questions:

1. The subject and objectives of clinical pathological anatomy, research methods, and clinical significance.
2. Organization of the pathological service, procedure for submitting biopsy material for pathohistological examination.
3. Biopsy diagnostics. Features of biopsy diagnostics in gastroenterology, gynecology, and other areas.
4. Principles of collecting, storing, and working with biopsy material.
5. Features of interpreting the morphological picture of biopsies.
6. Structure of clinical and pathological diagnosis. Comparison of clinical and pathological diagnoses. Categories of diagnostic discrepancies.
7. Light and electron microscopic diagnostics. Application and clinical significance.
8. Cytological diagnostics. Application and clinical significance. 9. Immunohistochemistry in Clinical Morphology
10. Molecular Genetic Analysis, Genome-Wide Studies of Polymorphic Alleles.
11. Diagnostic Capabilities of Modern Endoscopic Clinical Research Methods.
12. General Characteristics of Diagnostic Imaging Methods (Ultrasound and Tomography Technologies, Intravital Oximetry and Fluorescence Imaging, etc.).
13. Extreme Conditions – Collapse, Shock, Coma, Acute Intestinal Obstruction.
14. Collapse – Causes, Pathogenesis and Morphogenesis, Outcomes.
15. Shock. Types of Shock, Pathogenesis and Morphogenesis, Outcomes, and Complications.
16. Coma. Causes or Types of Coma, Pathogenesis and Morphogenesis, Outcomes.
17. Acute Intestinal Obstruction. Causes, pathogenesis and morphogenesis, complications, and outcomes.
18. Identify common pathogenetic mechanisms in the development of extreme conditions.
19. Identify the differences in the pathogenetic mechanisms of shock and collapse.
20. What, if any, are the stereotypical morphological changes at the tissue (organ) level during shock, collapse, and coma?
21. What constitutes the morphogenetic basis of multiple organ failure?
22. Terminal conditions. Signs of clinical and biological death.
23. Myocardial remodeling in pathology, chronic heart failure - from the perspective of cellular pathology.
24. Respiratory distress syndrome in adults and newborns as a manifestation of cellular pathology.
25. MODS as a manifestation of cellular pathology.
26. Atrophy as a major general pathological process and a manifestation of dysregeneration. Characteristics of the atrophic process at various structural levels. Significance in pathology.
27. Connective tissue as a system. Key functions of the connective tissue system. Significance of the connective tissue system in health and disease. Types of connective tissue damage.
28. The concept of connective tissue dysplasia. Significance in health and disease. The concept of stigmatization as a reflection of impaired connective tissue differentiation.
33. Hypertrophy. Left ventricular myocardial hypertrophy, pathogenesis, and significance in pathology.
34. Circulatory disorders. Acute and chronic venous congestion in the pulmonary circulation. Comparison with the clinical classification of CHF.
35. Circulatory disorders. Venous congestion in the systemic circulation. Pathogenesis and clinical and morphological manifestations.
36. Atherosclerosis: causes, pathogenesis and morphogenesis, clinical significance.
37. Hypertension. Pathogenesis and Morphogenesis. Pathogenetic Mechanisms of Myocardial Remodeling in Hypertension.

38. Cardiosclerosis. Classification, Pathogenesis, and Morphogenesis of Various Variants. Cardiosclerosis as a Manifestation of Myocardial Remodeling.
39. Pathogenetic Basis of Systemic Damage to Borderline Epithelia: Example of Combined Damage to the Gastric Mucosa and the Urinary Tract.
40. The Concept of Comorbidity and Its Clinical Significance. Pathogenetic Basis for the Development of the Most Common Disease Combinations: Lungs and Gastrointestinal Tract; Gastrointestinal Tract and Urinary Tract; Cardiovascular System and Lungs; Cardiovascular System and Organs of Other Systems.
Task for the evaluation indicator of the descriptor "Can do", "Has mastered"

Solve a clinical problem – formulate a clinical or pathological diagnosis in accordance with the diagnostic structure:

Task 1. A 73-year-old male patient was admitted to the emergency department. Complaints: burning chest pain lasting 45 minutes, severe weakness. Objectively: pale skin, acrocyanosis, white spot phenomenon lasting 5 seconds, arterial hypotension 80/60 mmHg, dyspnea 25 breaths per minute, heart rate 100 breaths per minute. History: arterial hypertension (blood pressure up to 170/100 mmHg) since age 50, urolithiasis diagnosed for the past 10 years. Formulate a preliminary diagnosis and develop an examination plan.
Additional examination findings:
Echocardiogram: areas 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 recorded in leads I, II, and AVL.
Ultrasound of the kidneys: stones in the right kidney with parenchymal atrophy and hydronephrosis.
Ultrasound of the large vessels: atherosclerotic ulcerated plaques in the aorta.

Task 2. A 45-year-old man was admitted to hospital on August 18th with complaints of nausea, vomiting, abdominal distension, and weight loss. He died after surgery on August 26th. Clinical diagnosis: gastric cancer with metastases to the liver and other organs. Gastrointestinal bleeding, peritonitis, dynamic intestinal obstruction, and liver cirrhosis. Autopsy revealed approximately 3 liters of bloody fluid in the abdominal cavity. Fibrous deposits were present on the peritoneum. In the area of the lesser omentum, the porta hepatis, and the head of the pancreas, dense, fused nodules of varying diameters were found, some of which were disintegrating. Grayish-yellow nodules were found in the lung. The diameter of the nodules does not exceed 1-1.5 cm. The lymph nodes of the porta hepatis, para-aortic, and bifurcation nodes were enlarged and reddish-gray. The aortic intima revealed disintegrating atherosclerotic plaques. Histologically, all nodules were confirmed to be mesothelioma.

Task 3. 50-year-old male. He had been hospitalized multiple times. Currently, the patient complains of severe shortness of breath, a cough with purulent sputum. Physical examination reveals severe acrocyanosis, a respiratory rate of 22 beats per minute, a heart rate of 98 beats per minute, and blood pressure of 160 and 70. The skin has a powdery appearance. Laboratory data: elevated urea and creatinine levels, and a decreased glomerular filtration rate. Renal ultrasound reveals moderate scarring of both kidneys. Radiographic examination of the lungs reveals multiple cavities containing fluid, pleural adhesions (cavity obliteration), and severe pneumofibrosis. A biopsy of the rectal mucosa, in the submucosa and around the vessels, reveals homogeneous eosinophilic masses that are positive for Congo red.

Task 4. A 46-year-old woman was diagnosed with nonspecific aortoarteritis, chronic bronchitis, and arterial hypertension a year ago. She was admitted to the hospital with acute

cerebrovascular accident, motor aphasia, and right-sided hemiparesis. Six days later, a coma developed and the patient died.
Final clinical diagnosis: Acute cerebrovascular accident in the left middle cerebral artery territory. Right-sided hemiparesis, motor aphasia. Nonspecific aortoarteritis. Chronic obstructive bronchitis, pneumofibrosis, bilateral lower lobe congestive pneumonia. Stage III arterial hypertension.
Pathological examination data. A round, mushy lesion (6.5 cm in diameter) of gray color was found in the parietal lobe of the left cerebral hemisphere. The 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 there are obstructing vermiform, dryish, gray-red masses. The inner lining 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 prestenotic saccular dilation. It contains parietal, dense, gray-red masses fixed to the internal lining, covering the orifice of the left renal artery. The remaining blood vessels are visibly unchanged. A small amount of foamy, light-gray fluid is present in the lumen of the large bronchi; the mucous membrane is yellow-gray. The lungs are bluish-red (intensely red in the lower lobes); the cut surface is granular, with alternating areas of dense and elastic consistency; the tissue of the lower lobes sinks in water. The pulmonary blood vessels protrude above the cut surface. The renal cortex is pale gray, and the pyramids of the medulla are dark red.
Bacteriological examination of the lungs revealed S. aureus (107 CFU).
Histological examination results. In the walls of the arch, the abdominal part of the aorta, its large branches, the arteries of the carotid and vertebrobasilar basins
Histological examination results. In the walls of the arch, the abdominal part of the aorta, its large branches, the arteries of the carotid and vertebrobasilar basins, large cerebral arteries, as well as in the area of the coronary artery orifices, there is diffuse sclerosis of all vascular wall membranes, a large number of plethoric vasa vasorum, focal infiltration by lymphocytes, plasma cells and macrophages with single Langhans giant cells. In the brain tissue, there are extensive areas of necrosis with a polymorphic cellular inflammatory reaction along the perimeter, fibrosis of the pia mater. Lungs: some alveoli are dilated, with ruptures of the interalveolar septa; others (in the tissue from the lower lobes) are filled with eosinophilic homogeneous and filiform masses with neutrophils; The interalveolar septa are thickened and infiltrated with lymphocytes and neutrophils; the bronchial epithelium is desquamated, with diffuse leukocyte infiltration of all layers of the bronchial walls and hyperplasia of the mucous glands of the large bronchi; peribronchial and perivascular sclerosis. Arteriolosclerotic nephrosclerosis.
Task 5. A patient was hospitalized in the oncology department with a diagnosis of stomach cancer. On the second day after hospitalization, he developed severe burning chest pain, severe weakness, and a drop in blood pressure to 60/40 mmHg. He died with increasing symptoms of acute heart failure. Autopsy revealed severe left ventricular hypertrophy and moderate granular renal atrophy, stenosing atherosclerosis of the coronary arteries with an ulcerated atherosclerotic plaque with an attached thrombus in the left descending coronary artery, large-focal myocardial infarction of the anterior and lateral walls of the left ventricle, pulmonary edema, diffuse gastric cancer (signet ring cell carcinoma) with metastases to the liver, mesentery, lower extremity bones, and the brain. Cachexia.