

**EXAM QUESTIONS FOR THE ACADEMIC DISCIPLINE  
“PATHOLOGICAL PHYSIOLOGY”  
on the specialty 7-07-0911-03 “DENTISTRY”**

1. The subject and tasks of pathological physiology. Its place in the system of the higher medical education. Pathological physiology as a theoretical basis of modern clinical medicine.
2. Modeling of diseases. Acute and chronic experiment (Claude Bernard, I. P. Pavlov). The requirements to the experiment and the researcher. The basic conditions of performing a biological experiment. Moral-ethical aspects of experimenting on animals.
3. The definition of the notions «disease». The notion of a «pathological process», «pathological reaction», a «pathological condition». The notion of «typical pathological process». Interrelation between «typical pathological process» and «disease».
4. Stages of the disease, possible outcomes.
5. Terminal condition, its stages, characteristic.
6. Main principles of an organism reanimating. Social-deontological aspects of reanimation. General laws of vital functions restoring. Post-reanimation disease.
7. Interrelation between the local and the general, the specific and the nonspecific in development of the disease.
8. The general characteristic of pathological and compensatory reactions of the organism, examples, pathogenic significance.
9. The staging character of the disease. The relationship between pathological and compensatory reactions on different stages of the disease development.
10. The definition of «adaptation» and «compensation». General characteristics, types of adaptive and compensatory reactions. Structural basis and mechanisms of compensatory-adaptive processes.
11. The notion of etiology. The significance of reasons and conditions in disease development. The essence of monocausality, conditionalism and constitutionalism.
12. The definition of «pathogenesis». Interrelation between etiology and pathogenesis. The notion of the main (initial) link in development of the disease.
13. Pathogenic effects of environmental factors. Hyperthermia and hypothermia: etiology, pathogenesis, symptoms. Use of hypothermia in clinical practice.
14. Pathogenic effects of environmental factors. Electric injury. Peculiarities of electric current as a damaging factor. Kinds of electric current injuries (local and general, specific and nonspecific) and their characteristic. The pathogenesis and reasons of death from electrocutions.
15. Pathogenic effects of environmental factors. The influence of high and low barometric pressure on the body. Altitudinal and caisson disease. Dysbarism.
16. Pathogenic effects of environmental factors. Ionizing radiation. The general characteristic, classification, pathogenesis. Forms of Radiation Sickness.

17. Definition of the notions «reactivity». Classification of reactivity forms (normergy, hypoergy, hyperergy, dysergy), basic parameters of reactivity, their role in pathology. Peculiarities of reactivity depending on sex and age.

18. Nonspecific resistance of the organism. Definition of the notions. Factors lowering nonspecific resistance of the organism. Ways and methods of increasing nonspecific resistance.

19. The doctrine of the constitution. Basic principles of constitutional type's classification. Constitutional role in pathology.

20. Immunologic reactivity. Understanding of immunopathological processes. Immunodeficient conditions. Classification, etiology, pathogenesis, manifestations.

21. Allergy, definition of this notion. Forms of allergic reactions (immediate and delayed-type), their characteristic. Anaphylactic shock

22. The concept of extreme factors, extreme conditions of existence and extreme states of the body. Hyper- and hypothermia, their application in medical practice.

23. The effect of electric current on the body. Electrical injury. Features of electric current as a damaging factor.

24. General and local manifestations of electric shock. Pathogenesis of electrical injury, causes of death. First aid principles.

25. The effect of high and low barometric pressure on the body. Altitude and decompression sickness. Disbarism.

26. Radiation injuries. General characteristics, classification, etiology, pathogenesis.

27. Acute radiation sickness, pathogenesis, forms, outcomes.

28. Bone marrow form of acute radiation sickness, pathogenesis, clinical manifestations, outcomes.

29. Intestinal form of acute radiation sickness, pathogenesis, manifestations, outcome.

30. Toxemic and cerebral forms of acute radiation sickness, pathogenesis, manifestations, outcome.

31. Chronic radiation sickness, pathogenesis, main manifestations.

32. Long-term consequences of the action of ionizing radiation. The concept of stochastic and non-stochastic effects of ionizing radiation.

33. The concept of hereditary and congenital diseases. Classification of hereditary forms of pathology. The role of hereditary and environmental factors in the development of diseases.

34. Etiology of hereditary forms of pathology. Mutations, their types. The concept of antimutagenesis and antimutagenic factors.

35. Genetic diseases. Etiology, general patterns of pathogenesis. Clinical manifestations of some hereditary metabolic diseases (alkaptonuria, phenylketonuria, galactosemia, hepato-cerebral dystrophy).

36. Chromosomal diseases. Trisomy: Down's Syndrome, Klinefelter's Disease, Trisomy X, XYY Syndrome, Patau Syndrome, Trisomy 8 Syndrome, Edwards Syndrome. Karyotype, clinical manifestations.

37. Chromosomal diseases. Monosomy and deletion: Shereshevsky-Turner Syndrome, Wolf-Hirschhorn Syndrome, Cri du chat (Cat's-Cry) Syndrome). Karyotype,

clinical manifestations. Etiology of inflammation. Primary and secondary alteration in inflammation. The significance of inflammation mediators in the development of secondary alteration.

**38. Malformations of the maxillofacial region in congenital and hereditary diseases.**

39. Arterial and venous hyperemia. Definition of concepts, classification, etiology, pathogenesis, manifestations, outcomes.

40. Ischemia. Definition of the concept, classification, etiology, pathogenesis, manifestations, outcomes. Structure types of collaterals in various organs. Mechanisms of inclusion of collateral blood flow. Factors determining the consequences of ischemia.

41. Thrombosis. Definition of the concept, etiology, pathogenesis of thrombosis, consequences and outcomes of thrombosis.

42. Embolism, definition of the concept, classification, manifestations and consequences of embolism. Types of emboli.

43. Typical microcirculation disorders: extra-, intravascular, intramural. Sludge, capillarotrophic insufficiency. Etiology, pathogenesis, outcomes.

44. Cell damage. Etiology and the most common links in the pathogenesis of cell damage. Specific and non-specific reactions in cell damage.

45. Definition of the concept, classification and general characteristics of the components of inflammation. Inflammation as a typical pathological process. Local and systemic manifestations of inflammation.

46. Etiology of inflammation. Primary and secondary alteration in inflammation. The role of inflammatory mediators in the development of secondary alteration.

47. Main inflammatory mediators, their origin, principles of classification, main effects. Endogenous anti-inflammatory factors.

48. Physical and chemical changes in the focus of inflammation, mechanisms of their development, significance.

49. Vascular reactions, dynamics of peripheral circulation disorders in the focus of inflammation, biological significance.

50. Exudation, definition of the concept. Causes and mechanisms of increasing the permeability of the vascular wall in the focus of inflammation. The value of exudation in inflammation. Types of exudates.

51. Stages, ways and mechanisms of leukocyte emigration during inflammation. The main chemoattractants that cause the migration of leukocytes.

52. Definition of the concept and the biological role of phagocytosis (I.I. Mechnikov). Stages of phagocytosis, mechanisms of bactericidal action of phagocytes. Causes and types of phagocytosis disorders. Hereditary defects of phagocytes.

53. Stage of proliferation, its main manifestations and mechanisms of development. Types and outcomes of inflammation. Basic theories of inflammation.

54. Connection of local and general phenomena in inflammation. The role of the nervous, endocrine and immune systems in the development of inflammation. The positive and negative significance of inflammation for the body.

**55. Inflammatory diseases of the maxillofacial region. Features of the occurrence and course of inflammatory reactions in the tissues of the oral cavity.**

**56. Features of changes in the white blood system in inflammatory processes of the maxillofacial region.**

57. Fever. Concept definition. Etiology of fever. Primary pyrogens, their types. The role of primary pyrogens in the development of fever.

58. Pathogenesis of fever. Secondary pyrogens, their origin, central and systemic effects. Fever stages. Changes in thermoregulation processes in different stages of fever.

59. Changes in the functions of organs and systems during the development of fever. The biological significance of the febrile reaction. The concept of pyrogenic therapy.

60. Types of fever. Types of temperature curves.

61. Changes in the function of the salivary glands and the state of the oral cavity during fever.

62. Hypoxia. Definition of the concept, classification, pathogenic characteristics of various types of hypoxia.

63. Mechanisms of urgent and long-term compensatory-adaptive reactions during hypoxia. Adaptation to hypoxia, stages of development. Systemic structural trace of adaptation to hypoxia. Principles of pathogenic therapy of hypoxic conditions.

64. Main dysfunctions of organs and systems in hypoxic conditions.

**65. The role of local hypoxia in the pathogenesis of inflammatory and degenerative processes in the maxillofacial region. The use of hyperbaric oxygen therapy in dentistry.**

66. Violations of the acid-base state. Classification of acidosis and alkalosis. The main manifestations of acidosis and alkalosis.

67. Mechanisms of compensation for violations of the acid-base state. Laboratory criteria for violations and compensation of the acid-base state.

**68. Local disturbance of acid-base balance in the area of dental plaque, its causes and role in the pathogenesis of caries.**

69. Water balance. Types of water balance disorders. Etiology, pathogenesis and manifestations of hyper- and dehydration.

70. Edema. Concept definition. Classification. The main pathogenic factors in the development of edema. Pathogenesis of renal, cardiac, cachectic, toxic edema. Types and functions of cellular oncogenes, the role of oncoproteins in violation of the functions of the transformed cells. The concept of antioncogen.

71. Tumors. Concept definition. Characteristics of blastomatous growth, its differences from other types of tissue growth and from benign tumors. Features of the spread of tumors in phylo- and ontogenesis. The main reasons for the increase in cancer incidence.

72. Etiology of tumors. Classification of blastomogenic agents. Carcinogenic substances of exogenous and endogenous origin. Methods of experimental reproduction of tumors.

73. Significance of heredity, age, sex, diet, bad habits in the occurrence and development of tumors.

74. Basic biological features of tumors. Metastasis of tumors mechanisms, stages. The concept of tumor progression.

75. Types and main manifestations of atypia of tumor cells.

76. Pathogenesis of tumors. Modern ideas about the molecular genetic mechanisms of neoplastic transformation (oncogene concept). The role of mutations, viruses and epigenetic disorders in the mechanisms of the transformation of a proto-oncogene into an oncogene.

77. Types and functions of cellular oncogenes, the role of oncoproteins in the dysfunction of transformed cells. The concept of anti-oncogenes.

78. The relationship of dysfunctions of the nervous and endocrine systems with the emergence and growth of tumors. Hormonally dependent tumors.

79. Interrelation of disorders of the immune system with the emergence and growth of tumors. The main causes and manifestations of immunosuppression in cancer.

80. Systemic effect of a tumor on the body. Paraneoplastic syndrome, its pathogenesis, main manifestations. The pathogenesis of cancer cachexia.

81. The concept of precancerous conditions. Obligate and facultative precancer. Stages of development of malignant tumors (L.M. Shabad). Basic principles of therapy and prevention of neoplasms.

82. The concept of extreme states. Shock. Definition of the concept, types, stages, general mechanisms of development.

83. Traumatic shock. Etiology, pathogenesis, stages, manifestations. Theories of traumatic shock.

84. The essence and mechanisms of hemodynamic disorders in shock. Centralization and shunting of blood flow, their pathogenic assessment.

85. Collapse, its types, pathogenesis, differences between shock and coma.

86. Coma, its types, common links in the pathogenesis of coma.

87. Starvation, its types, periods of development.

88. Hypo- and hyperglycemic conditions. Etiology, pathogenesis, clinical manifestations.

89. Hyper-, hypo-, dysproteinemia, paraproteinemia. Etiology, pathogenesis, clinical manifestations.

90. Hyperlipidemia: alimentary, transport, retention. Primary and secondary dyslipoproteinemias.

91. Changes in the mass of circulating blood. Hyper- and hypovolemia. Etiology, pathogenesis, types, clinical manifestations.

92. Blood loss. Etiology, pathogenesis, types and consequences of blood loss. Factors that determine the severity and outcome of blood loss. Urgent and long-term mechanisms of compensation in acute blood loss.

93. Definition of the concept of "anemia". Etiopathogenic and morpho-functional classifications of anemia. Clinical manifestations of anemia.

94. Qualitative and quantitative changes of erythron in anemia. Regenerative and degenerative forms of erythrocytes.

95. Etiology, pathogenesis, clinical manifestations and blood picture in acute and chronic posthemorrhagic anemia.

96. Etiology, pathogenesis, clinical manifestations and blood picture in iron deficiency and sideroahrestic anemia.

97. Etiology, pathogenesis, clinical manifestations and blood picture in B12- and folic deficiency anemia.

98. Etiology, pathogenesis, clinical manifestations and blood picture in hereditary hemolytic anemia.

**99. The main manifestations of anemia and erythrocytosis in the oral cavity.**

100. Leukopenia and leukocytosis. Etiology, types, mechanisms of development.

101. Agranulocytosis, etiology, pathogenesis, types, blood picture, clinical manifestations. Panmyelophthisis, blood picture.

**102. The main manifestations of agranulocytosis in the oral cavity.**

103. Leukemias. Concept definition. Etiology and pathogenesis. Principles of classification.

The difference between leukemia and leukemoid reactions. Blood picture, clinical manifestations of acute and chronic leukemia.

**104. The main manifestations of acute and chronic leukemia in the oral cavity.**

105. Hereditary coagulopathy: hemophilia A and B. Etiology, pathogenesis, laboratory and clinical manifestations of hemophilia.

106. Acquired coagulopathy: DIC. Etiology, pathogenesis, clinical course, outcomes.

107. Thrombocytopenia and thrombocytopathies. Classification, etiology, pathogenesis, laboratory and clinical manifestations.

108. Hereditary and acquired vasopathies: Rendu-Osler disease, Shenlein-Genoch. Etiology, pathogenesis, clinical manifestations.

**109. The main manifestations of violations of coagulation and vascular platelet hemostasis in the oral cavity.**

110. Circulatory insufficiency, definition of the concept, types. Heart failure, definition of the concept. Classification of heart failure by pathogenesis, localization, course, severity. The concept of primary and secondary heart failure.

111. The concept of systolic and diastolic dysfunction. Etiology, pathogenesis, hemodynamic disorders and clinical manifestations of systolic and diastolic dysfunction, left and right ventricular heart failure.

112. Mechanisms of heart failure compensation, their types and pathogenetic evaluation. The concept of myocardial remodeling. Outcomes of myocardial remodeling in myocardial overload and injury. The role of the renin-angiotensin-aldosterone and sympathoadrenal systems in the progression of heart failure.

113. Compensatory hyperfunction of the heart, stages of its development. Functional and metabolic features of hypertrophied myocardium. Mechanisms of development of decompensation of hypertrophied myocardium.

114. Coronary insufficiency. Definition of the concept, etiological risk factors, clinical forms of IHD. Non-coronary myocardial necrosis.

**115. The main manifestations of heart failure and arterial hypertension in the oral cavity.**

116. Violation of the heart rhythm. Classification of arrhythmias. Violations of automatism, ECG signs of sinus arrhythmias.

117. Violations of the excitability of the heart. ECG signs of extrasystole, paroxysmal tachycardia, flutter and atrial fibrillation and ventricular fibrillation. Hemodynamic disorders.

118. Violation of the conduction of the heart. Types, ECG manifestations.

119. Arterial hypertension, classification. Symptomatic arterial hypertension.
120. Etiology and main theories of the pathogenesis of hypertension.
121. Clinical manifestations of target organ damage in arterial hypertension.
122. Arterial hypotension. Classification. Vascular insufficiency of blood circulation: syncope, collapse. Their etiology and pathogenesis.
123. Atherosclerosis, risk factors, role in the pathology of the cardiovascular system.
124. Insufficiency of the external respiration system. Definition of the concept, classification. Stages of chronic respiratory failure, its clinical manifestations.
125. The main causes of obstructive and restrictive disorders of pulmonary ventilation. Changes in the gas composition of alveolar air and arterial blood in violation of ventilation.
126. The main causes of violations of diffusion of gases through the pulmonary membrane. Changes in the gas composition of alveolar air and arterial blood in violation of diffusion.
127. The main causes of impaired lung perfusion. Chronic pulmonary heart failure: cor pulmonale, etiology, pathogenesis, clinical manifestations.
128. Shortness of breath, periodic and terminal breathing. Their types, pathogenetic characteristics, mechanisms of development.
129. Asphyxia. Etiology, pathogenesis, stages of development.
- 130. Communication of violations of external respiration and pathology of the maxillofacial region.**
- 131. Disturbance of digestion in the oral cavity: main causes, mechanisms of development.**
- 132. Dysfunction of the salivary glands. Causes and manifestations of hypo- and hypersalivation.**
- 133. Chewing disorders. The main causes, manifestations. The role of chewing disorders in disorders of the gastrointestinal tract.**
- 134. Anomalies of the dentition and jaw system: anomalies of individual teeth, dentition, occlusion, jaw deformities (prognathia, micrognathia, progenia), the causes of their development and their role in digestive disorders in the oral cavity.**
- 135. Modern ideas about the etiology and pathogenesis of dental caries.**
- 136. Modern ideas about the etiology and pathogenesis of periodontitis. Participation of autoimmune reactions and neurogenic dystrophies in the pathogenesis of periodontitis.**
- 137. The main causes of swallowing disorders.**
138. The main manifestations of the syndrome of gastric dyspepsia: loss of appetite, nausea, belching, vomiting, pain. reasons for their development.
139. The relationship of violations of the secretory and motor functions of the stomach. Manifestations of hyper- and hypochlorhydria. Pathology of the pyloric reflex.
140. Gastric and duodenal ulcer. Modern ideas about etiology and pathogenesis. The role of *H. pylori* in the etiology and pathogenesis of the disease.
141. Violations of the motor and secretory activity of the intestine and absorption processes. Etiology, pathogenesis, manifestations.
142. Intestinal autointoxication. Etiology, pathogenesis, manifestations.

**143. The main manifestations of the pathology of the gastrointestinal tract in the oral cavity.**

144. The main syndromes in the pathology of the liver and biliary tract. Jaundice, types, causes, pathogenesis.

145. Functional insufficiency of the liver, its clinical manifestations. Hepatic coma, the main links of its pathogenesis.

**146. The main manifestations of liver pathology in the oral cavity.**

**147. Urinary syndrome. Causes and mechanisms of their development. Common symptoms in the oral cavity in kidney disease.**

148. Nephritis and nephrotic syndrome. Their etiology and pathogenesis, clinical manifestations.

149. Acute and chronic renal failure. Etiology, pathogenesis, stages of the course, clinical manifestations, outcomes.

150. The main manifestations of renal failure in the oral cavity.

151. Etiology and pathogenesis of endocrinopathies. Principles of their classification. Total (Simmonds disease) and partial hypofunction of the adenohypophysis (pituitary nanism, infantilism), clinical manifestations.

152. Hyperfunction of the adenohypophysis: pituitary gigantism, acromegaly, Itsenko-Cushing's disease, clinical manifestations.

153. Pathology of the posterior pituitary gland: manifestations of hypo- and hypersecretion of vasopressin.

154. Hyper and hypofunction of the thyroid gland, the main clinical manifestations.

155. Hyper- and hypofunction of the parathyroid glands, the main clinical manifestations.

156. Violations of calcium-phosphorus metabolism. Hypo- and hypercalcemia, their etiology and pathogenesis, the main manifestations in the oral cavity.

157. Hypofunction of the adrenal cortex. Acute and chronic adrenal insufficiency, etiology, pathogenesis, clinical manifestations.

158. Hyperfunction of the cortical and medulla of the adrenal glands. Itsenko-Cushing's syndrome, primary and secondary hyperaldosteronism, pheochromocytoma, clinical manifestations.

159. Diabetes mellitus type I and II. Etiology, pathogenesis, clinical manifestations. Mechanisms of hyperglycemia and glycosuria.

160. The main manifestations of endocrinopathies in the oral cavity.

161. Movement disorders in the pathology of the nervous system (akinesia, hyperkinesia) and their pathophysiological characteristics.

162. Hypokinesia: paralysis and paresis. Pathophysiological characteristics and clinical manifestations of central and peripheral paralysis and paresis.

163. Hyperkinesia: trembling and convulsions. Their types and pathophysiological characteristics.

164. Disorders of sensitivity in case of damage to the peripheral nerve and with unilateral damage to the spinal cord (Brown-Sequard syndrome).

165. Violation of the functions of the autonomic nervous system.

166. Pain. Definition of the concept, biological significance. The pathogenesis of pain syndrome. Antinociceptive system and its characteristics.

167. The concept of neurosis (I.P. Pavlov, M.K. Petrova). Significance of types of higher nervous activity in the development of neuroses. Principles of neurosis therapy.

168. The doctrine of nervous trophism and neurogenic dystrophies. Standard form of neurogenic dystrophies (A.D. Speransky). The concept of trophogens and pathogens.

169. The role of neurogenic dystrophies in the pathogenesis of diseases. Manifestations of neurogenic dystrophy in the oral cavity.

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