

## LIST OF EXAM QUESTIONS FOR MEDICAL STUDENTS

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### General nosology

1. Pathophysiology. Subject, purpose, tasks, and its place among other medical disciplines. The importance of pathophysiology in medicine.
2. Methods of pathophysiology. Experimental modeling of diseases: its types, opportunities, and limitations.
3. General nosology as a branch of pathophysiology. Basic concepts of general nosology: pathological reaction, pathological process, pathological condition. Examples. The concept of a typical pathological process.
4. Normal, healthy, pre-illness. Examples.
5. Disease: definition of the concept, stage of the disease. Specific and non-specific manifestations of the disease. General and local manifestations of the disease, their interrelation. The concept of the syndrome.
6. Sanogenesis: definition of the concept, mechanisms.
7. Etiology: definition of the concept. The role of causes and conditions in the occurrence and development of diseases. Theoretical and practical significance of studying etiology.
8. Classification and characterization of etiological factors. Iatrogenic diseases, classification, examples.
9. Pathogenesis, definition of the concept. Causal relationships in pathogenesis: initial and leading links of pathogenesis, "vicious circles", their role and examples.
10. The importance of studying etiology and pathogenesis. The concept of etiotropic, pathogenetic, symptomatic, sanogenetic, and substitution therapy. Principles of disease prevention.
11. Terminal states. Dying as a stepwise process.
12. Pathophysiological foundations of resuscitation. Post-resuscitation disorders and post-resuscitation disease.
13. Reactivity of an organism: definition of the concept, types and forms of reactivity. Examples. Methods and significance of patient reactivity assessment.
14. External and internal environmental factors affecting reactivity. The importance of studying reactivity.
15. Body resistance: definition of the concept, non-specific and specific resistance factors, examples of their violations.
16. Hereditary diseases: classification, etiology, pathogenesis, examples. The role of environmental factors in the occurrence and development of hereditary diseases.
17. Enzymopathies: general characteristics, etiology, pathogenesis, examples.
18. Human chromosomal diseases: general characteristics, etiology, pathogenesis, examples.
19. Epigenomic diseases: general characteristics, etiology, pathogenesis, examples.
20. Stress: definition of the concept, mechanisms of stress development. Protective-adaptive and pathogenic significance of stress. The concept of "adaptation diseases".

### Typical pathological processes

1. Cell damage: definition of the concept, causes, and mechanisms of cell damage. Manifestations of cell damage.
2. Disorders of regulation of intracellular processes: etiology, pathogenesis, examples.
3. Etiology and mechanisms of cell energy supply disorders. Mitochondrial cytopathies, examples.
4. Mechanisms of cell membrane damage. The role of oxidative stress in cell membrane damage.
5. Mechanisms of short- and long-term compensation in response to cell damage. Examples.
6. Ischemia-reperfusion syndrome: etiology, pathogenesis, and manifestations. Examples.
7. Types and mechanisms of cell death. Examples of increased and insufficient cell death in pathology.
8. Inflammation: definition of the concept, etiology, local and systemic signs of inflammation, their pathogenesis and interrelation. Biological significance of inflammation.
9. Primary and secondary alterations, changes in the blood vessels of the microcirculatory bed during inflammation, pathogenesis, manifestations.

10. Pathogenesis of edema in inflammation. The role of biologically active substances in the regulation of vascular wall permeability. Types of exudates, examples. Differences between exudate and transudate.
11. Mediators of inflammation, classification, their sources and role in the formation of inflammation.
12. Leukocyte reactions in inflammation: types, mechanisms, significance.
13. Phagocytosis inflammation, stages. Oxygen-dependent and oxygen-independent killing mechanisms.
14. Stage of proliferation in inflammation: main stages, mechanisms and types of repair, regulation.
15. Chronic inflammation: features of etiology and pathogenesis, examples of diseases. Principles of anti-inflammatory therapy.
16. Allergy: definition of the concept, classification according to Jell and Coombs, general characteristics of allergic reactions. General pathogenesis of allergic reactions.
17. Allergens: definition of the concept, classification. The concept of sensitization and desensitization. Principles of therapy.
18. Allergic reactions type I: etiology, pathogenesis, manifestations, principles of therapy and prevention, examples.
19. Allergic reactions type II: etiology, pathogenesis, manifestations, principles of therapy and prevention, examples.
20. Allergic reactions type III: etiology, pathogenesis, manifestations, principles of therapy and prevention, examples.
21. Allergic reactions type IV: etiology, pathogenesis, manifestations, principles of therapy and prevention, examples.
22. Allergic reactions type V: etiology, pathogenesis, manifestations, principles of therapy and prevention, examples.
23. Autoimmune diseases: definition, etiology, pathogenesis, manifestations, principles of therapy and prevention, examples.
24. Primary and secondary immunodeficiency states: etiology, pathogenesis, manifestations, principles of therapy and prevention, examples.
25. Fever: definition of the concept, etiology. Biological significance of fever. The difference between fever and overheating of the body.
26. Types of febrile reactions, their diagnostic significance. The concept of pyrotherapy.
27. Pathogenesis of fever. Thermoregulation at different stages of fever.
28. Changes in the metabolism, function of organs and systems in fever. Biological significance of fever.
29. Body overheating: definition of the concept, etiology, pathogenesis, manifestations.
30. Etiology and pathogenesis of overheating syndromes: heat exhaustion, heat stroke, sunstroke, malignant fever, heat injury due to overexertion (marching fever).
31. Hypothermia: definition of the concept, etiology, pathogenesis, manifestations. Therapeutic hypothermia.
32. Hypoxia: definition of the concept, classification. Mechanisms of hypoxic necrobiosis.
33. Hypoxic hypoxia: types, etiology, pathogenesis, indicators of oxygen supply to the body.
34. Hemic and circulatory hypoxia: types, etiology, pathogenesis, indicators of oxygen supply to the body.
35. Histotoxic hypoxia: etiology, pathogenesis, indicators of oxygen supply to the body. Hyperoxia as a cause of hypoxia. Hyperoxygenation: therapeutic and pathological effects.
36. Urgent and long-term compensation mechanisms for hypoxia.
37. Water balance in the body, mechanisms of regulation of water metabolism. Classification of water balance disorders.
38. Hypohydration: definition, classification, etiology, pathogenesis, manifestations, compensation mechanisms.
39. Hyperhydration: definition, classification, etiology, pathogenesis, manifestations, compensation mechanisms.
40. Edema: definition of the concept, classification, mechanisms of development.

41. Pathogenesis of edema in heart failure.
42. Pathogenesis of edema in nephrotic syndrome.
43. Pathogenesis of inflammatory, hunger and hepatic edema.
44. Violation of sodium metabolism: etiology, pathogenesis, and manifestations.
45. Violation of potassium metabolism: etiology, pathogenesis, manifestations.
46. Violation of calcium metabolism: etiology, pathogenesis, manifestations.
47. Violation of magnesium and phosphorus metabolism: etiology, pathogenesis, manifestations.
48. The concept of the acid-base state: definition, role in the body, mechanism of its regulation, main indicators. Classification and general characteristics of acid-base state disorders.
49. Acidosis: definition, classification, etiology, compensation mechanisms, clinical and laboratory manifestations.
50. Alkaloses: definition, classification, etiology, compensation mechanisms, clinical and laboratory manifestations.
51. Tumor growth: definition of the concept. Tumor as a hyperbiotic process. Comparative characteristics of benign and malignant tumors. The role of physical factors in carcinogenesis.
52. Etiology of malignant tumors.
53. The role of epigenetic changes in the development of malignant neoplasms.
54. Initiation stage in carcinogenesis. The concept of proto-oncogenes, anti-oncogenes and their products.
55. Promotion stage in carcinogenesis. Tumor atypism and its types.
56. Stage of tumoral progression: mechanisms and consequences. Mechanisms and pathways of metastasis.
57. Antitumor resistance of the body: immune and non-immune factors.
58. Shock: definition of the concept, classification, general pathogenesis, manifestations.
59. General pathogenesis of shock: changes in central hemodynamics.
60. General pathogenesis of shock: changes in microcirculation, metabolism and cell damage during shock.
61. Features of pathogenesis of traumatic shock, burn shock, cardiogenic shock.
62. Features of etiology and pathogenesis of septic shock and anaphylactic shock Principles of shock therapy and prevention.
63. Pain: definition, meaning, and components. Nociceptive system. Antinociceptive system. Principles of pain therapy.

### **Pathophysiology of organs and systems.**

64. Hyperglycemia: определения definitions, types, mechanisms of development, significance for the body. Hyperosmolar coma: etiology, pathogenesis, and manifestations.
65. Hypoglycemia: definition of the concept, types, mechanisms of development, significance for the body. Hypoglycemic coma: etiology, pathogenesis, and manifestations.
66. Diabetes mellitus: definition, classification, criteria. The mechanism of action of insulin. Contraceptives.
67. Insulin-dependent diabetes mellitus: etiology, pathogenesis.
68. Non-insulin-dependent diabetes mellitus: etiology, pathogenesis.
69. Diabetes mellitus: pathogenesis of manifestations, principles of prevention and therapy.
70. Diabetic comas: ketoacidotic, lactic-acidemic. Etiology, pathogenesis, and manifestations.
71. Anemia: definition of the concept, classification, clinical and hematological manifestations. Erythrocytosis, general characteristics.
72. Acute posthemorrhagic anemia: etiology, pathogenesis, features of clinical manifestations, characteristics of hematopoiesis and principles of laboratory diagnostics.
73. Iron metabolism in the body and its disorders.
74. Iron deficiency anemia: etiology, pathogenesis, features of clinical manifestations, characteristics of hematopoiesis and principles of laboratory diagnostics.
75. Hypoplastic anemia: etiology, pathogenesis, features of clinical manifestations, characteristics of hematopoiesis and principles of laboratory diagnostics.
76. Vitamin B<sub>12</sub>-deficient and folate-deficient anemia: etiology, pathogenesis, features of clinical manifestations, characteristics of hematopoiesis and principles of laboratory diagnostics.

77. Acquired (exoerythrocytic) hemolytic anemia: etiology, pathogenesis, manifestations, characteristics of hematopoiesis and principles of laboratory diagnostics.
78. Congenital (endoerythrocytic) hemolytic anemia: classification, etiology, pathogenesis, manifestations, characteristics of hematopoiesis and principles of laboratory diagnostics.
79. Leukocytosis: definition, types, etiology, pathogenesis. Diagnostic significance of changes in the leukocyte formula.
80. Leukopenia: определение definition, types, etiology, pathogenesis, and manifestations. Agranulocytosis.
81. Leukocyte dysfunctions: types, etiology, pathogenesis, and manifestations.
82. Acute leukemias: definition of the concept, classification, etiology, pathogenesis, manifestations, characteristics of hematopoiesis and principles of laboratory diagnostics.
83. Chronic leukemias: definition, classification, etiology, pathogenesis, manifestations, characteristics of hematopoiesis and principles of laboratory diagnostics.
84. Leukemoid reactions: types, etiology, pathogenesis, differences from leukemias.
85. Hemostasis and antihemostasis: vascular, cellular, and plasma components, and their role in ensuring the rheological properties of blood in normal and pathological conditions. Types of bleeding.
86. Clinical and laboratory methods of hemostatic system research. Types of bleeding disorders.
87. Vasopathies: definition, classification, etiology, pathogenesis, manifestations, principles of laboratory diagnostics.
88. Thrombocytopenia: definition, classification, etiology, pathogenesis, manifestations, principles of laboratory diagnostics.
89. Thrombocytopathies: definition, classification, etiology, pathogenesis, manifestations, principles of laboratory diagnostics.
90. Coagulopathies: definition, classification, etiology, pathogenesis, manifestations, principles of laboratory diagnostics.
91. Thrombophilic syndrome: определение definition, classification. etiology, pathogenesis, manifestations, principles of laboratory diagnostics. Outcomes and complications of thrombosis.
92. DIC-syndrome: definitions, etiology, pathogenesis, manifestations, laboratory screening.
93. Heart defects: definition, classification, compensation mechanisms.
94. Congenital heart defects: definition, classification, etiology, features of pathogenesis and hemodynamic disorders.
95. Acquired heart defects: definition, classification, etiology, pathogenesis of hemodynamic disorders in mitral and aortic valves defects.
96. Acquired heart defects: definition, classification, etiology, pathogenesis of hemodynamic disorders in tricuspid valve and pulmonary artery valve defects.
97. Local and systemic mechanisms of blood pressure regulation. Arterial hypertension: definition of the concept, etiology, classification.
98. Features of blood circulation in the small circle. Small circulatory hypertension: etiology, mechanisms of development and compensation, consequences.
99. Primary arterial hypertension (hypertension): definition, etiology, pathogenesis.
100. Secondary (symptomatic) arterial hypertension: definition, types, causes and main mechanisms of their development.
101. Atherosclerosis: definition of the concept, etiology. Risk factors and laboratory signs.
102. Atherosclerosis: pathogenesis, stages. Clinical consequences of atherosclerosis.
103. Heart failure: definition, classification, etiology, compensation mechanisms.
104. Chronic cardiac insufficiency: pathogenesis, manifestations, mechanisms of compensation and decompensation.
105. Pathological myocardial hypertrophy, pathogenesis. The concept of pheart remodeling in chronic heart failure.
106. Acute heart failure: types, etiology, pathogenesis, manifestations.
107. Breathing as a process. Methods for evaluating ventilation, lung perfusion, and gas diffusion. Respiratory failure: definition of the concept, classification.
108. Ventilation form of respiratory failure: types, etiology, pathogenesis, manifestations. The concept of chronic obstructive pulmonary disease.

109. Diffusive form of respiratory failure: etiology, pathogenesis, manifestations. Adult respiratory distress syndrome.
110. Ventilation form of respiratory failure: violation of central respiratory regulation, etiology, pathogenesis, manifestations.
111. Perfusion form of respiratory failure: etiology, pathogenesis. Pulmonary hypertension: mechanism of development and compensation, consequences.
112. Dyspnea: definition, pathogenesis. Pathological types of breathing.
113. Pulmonary edema: types, causes, and mechanisms of development.
114. Violation of motor, evacuation and secretory functions of the stomach: etiology, mechanisms of development, manifestations and consequences.
115. Peptic ulcer of the gallbladder and duodenum: definition of the concept, etiology. The role of dysregulation of gastric secretion.
116. Peptic ulcer of the stomach and duodenum: pathogenesis, complications.
117. Consequences of gastrointestinal surgery. Dumping syndrome, shortened bowel syndrome, consequences of vagotomy: etiology, pathogenesis of manifestations.
118. Maldigestion and malabsorption syndrome: definition of concepts, etiology, pathogenesis. Intestinal enzymopathies.
119. Hepatic-cellular insufficiency: definition, etiology, pathogenesis, manifestations.
120. Hepatic encephalopathy: definition, etiology and pathogenesis. The role of alcohol and environmental factors in the occurrence and progression of liver diseases.
121. Jaundice syndrome: definition, classification, manifestations and consequences.
122. Hemolytic and mechanical jaundice: etiology, pathogenesis, diagnostic criteria.
123. Parenchymal and enzymopathic jaundice: etiology, pathogenesis, diagnostic criteria.
124. Portal hypertension: definition of the concept, etiology, classification, pathogenesis of the main symptoms.
125. Cirrhosis of the liver: definition of the concept, etiology, classification, pathogenesis of the main symptoms.
126. Disorders of glomerular filtration, tubular reabsorption, secretion: etiology, pathogenesis of manifestations.
127. Acute renal failure: definition, etiology, pathogenesis, stages, clinical and laboratory criteria, manifestations.
128. Nephrotic syndrome: definition, etiology, pathogenesis, clinical and laboratory manifestations.
129. Nephritic syndrome: definition, etiology, pathogenesis, clinical and laboratory manifestations.
130. Chronic renal failure: definition, etiology, pathogenesis, stages, manifestations. The concept of dialysis and kidney transplantation.