PROGRAMM OF PATHOPHYSIOLOGY FOR EXAM

I. GENERAL PATHOPHYSIOLOGY

SUBJECT OF PATHOPHYSIOLOGY


DISORDERS OF MICROCIRCULATION


INFLAMMATION


Leukocyte recruitment: margination, adherence to vascular wall, emigration through vascular wall, chemotaxis. Phagocytosis. Stages: chemotaxis, adherence to bacteria, absorption (phagosome formation), digestion (phagolysosome formation). Pus. Composition. Proliferation and regeneration. Types to regenerations. Categorization of inflammation: on velocities of development (sharp, subsharp, chronic), on dominating stage (alterative, exudative, proliferate), on the exudate type (serous, festering, fibrinous, hemorrhagic and others).

Local signs of inflammation (rubor, tumor, dolor, color, functio laesae) and mechanisms their development. General reactions at the inflammation (fever, leukocytosis, increase growing of settling an red blood cells and others.). Inflammation mediators (histamine, bradykinine, complement system, prostaglandins, leukotrienes). Role of mediators. Outcomes of inflammation. Factors, influencing upon the current of inflammation. Biological role of inflammation.
THERMAL REGULATORY DYSFUNCTION. FEVER. HYPERTERMIA. HYPOTHERMIA

Fever. Causes and mechanisms of fever development, its biological role, etiopathogenesis and consequences of hyperthermia and hypothermia influence on the organism.


Hyperthermia. Causes. Disturbances at organism under hyperthermia. Differentiation hyperthermia from the fever.


REACTIVITY AND RESISTENCE. IMMUNOLOGICAL DISORDERS. CATEGORIZATION. AIDS.


ALLERGY.

Allergy. Causes. Allergens, their categorization and description. Types of allergic reactions. Pathogenesis of allergic reactions of different types. Stages of allergy: (immunological stage, pathochemical stage, pathophysiological stage). Allergic mediators. Sensibilization. Experimental model of anaphylactic shock on guinea pig. Description of allergic disorders (allergic rhinitis (pollinosis), bronchial asthma, e.g.). Desensibilization (hyposensibilization).

PATHOPHYSIOLOGY OF METABOLISM FASTING.

Types of fasting. Metabolic and functional disturbances at fasting. Principals of fasting therapy. Therapeutic fasting.

Consequences of total and partial fasting (carbohydrates, lipids and protein deficits). Protein-calorie malnutrition. Particularities in children (Kwashiorcor).

PATHOLOGY OF CARBOHYDRATE METABOLISM.


Causes and consequences of carbohydrate intermediary metabolism. Causes and consequences of lipid intermediary metabolism.


PATHOLOGY OF LIPID METABOLISM.


PATHOLOGY OF PROTEIN METABOLISM.


Gout. Pathogenesis. Symptoms and therapy.

PATHOLOGY OF WATER-MINERAL BALANCE.


Edema, classification. Influence factors of edema development. Pathogenesis of cardiac, renal, hepatic, inflammatory, allergic, toxic edema. Disturbances of mineral metabolism (Na+, K+, Ca^{2+}).

CLASSIFICATION OF ACID-BASE DISTURBANCES.


PATHOLOGY OF VITAMINES METABOLISM.


HYPOXIA. HYPEROXIA.

ROLE OF HEREDITY IN PATHOLOGY

EXTREME CONDITIONS. STRESS. SHOCK. COMA. COLLAPSE
TUMOR GROWING
The tumor growth. Malignant and nonmalignant tumors. Description.
Pathogenesis of tumor growth. Stages: transformation, promotion, progression.
Antitumor activity of human organism.

RADIATION SICKNESS
Radiation. Issues and power of different radiation rays. Units of radiation assay.

II. PATHOPHYSIOLOGY OF ORGANS AND SYSTEMS

PATHOPHYSIOLOGY OF BLOOD
DISORDERS OF CIRCULATIVE BLOOD VOLUME (HYPERVOLEMA, HYPOVOLEMA). BLEEDING.

Erythrocytosis. Polycythemia vera or Wakes’s disease.

ANEMIAS.
Clinical symptoms of anemia and mechanisms of there development. Categorization of anemias by: etiopathogenesis, color parameter, severity of anemia, regenerative possibility, type of hematopoiesis, erythrocyte’s size.
Post-hemorrhagic anemia. Description, the picture of the blood under acute and chronic post-hemorrhagic anemia.


Vitamin B<sub>12</sub> and folic acid deficiency anemia. Etiology, pathogenesis. The picture of the blood. Addison-Biermer disease.

Hemolytic anemia. Types (congenital, autoimmune e.g.). The picture of the blood. Clinical symptoms. Newborn hemolytic anemia.

**LEUKOCYTOSIS. LEUCOPENIAS.**

Stages of leucopoiesis. Leukocyte’s description on different stages of leucopoiesis. Leukocyte’s functions (neutrophils, eosinophils, basophils, monocytes, lymphocytes).


Leukocyte’s formula. Nuclear shift of leukocyte’s formula to left, to right. Clinical importance of leukocyte’s formula calculation.

**LEUKEMIA.**


Characteristic of morphological picture of blood at acute and chronic myeloid and lymphoid leukemia. The leukemia clinical syndromes.

Clinical syndromes under leukemia: anemic, hemorrhagic, infective, metastatic, and intoxicative. Leukemic reactions and the pathogenesis.

**PATHOLOGY OF HEMOSTASIS.**

Components of hemostasis (blood vessel, platelets, plasma coagulation factors), primary and secondary hemostasis. Disorders of hemostasis (thrombophylic, hemorrhagic, thrombohemorrhagic hemostasiopathias).

**Thrombosis.** Outcomes and consequences. Mechanism of white and red thrombosis development. Causes and conditions of thrombosis development. Virchow’s triad (vascular injury, blood coagulant system activation, blood flow decrease).

**Hemorrhagic disorders of hemostasis.**


Disseminated intravascular coagulation (DIG). Causes. Stages, mechanisms of development.

**PATHOPHYSIOLOGY OF NERVOUS SYSTEM.**


**PATHOPHYSIOLOGY OF HIGH NERVOUS SYSTEM ACTIVITY.**

Classification of types of high nervous system activity. A role of the generator of pathologically enhanced excitation, pathological system in occurrence of a pathology of the excitatory system. Common etiology of high nervous system activity disorders.


Influence of alcohol on an organism. The characteristic of exhibitions of acute intoxication. Severity levels.

Syndrome of dependence on alcohol (alcoholism). Stages, the characteristic of infringements. An abstinent syndrome. Occurrence mechanisms.

Infringements of intelligence, memory, emotions, behaviour, etc.


The characteristic of exhibitions and a cause of infringement of a cycle a sleep-wakefulness.

**PATHOPHYSIOLOGY OF ENDOCRINE SYSTEM.**


PATHOLOGY OF RESPIRATORY SYSTEM.
Pulmonary volumes and capacities. Respiratory failure (etiologies, causes, symptoms). Types of disturbances of alveolar ventilation. Obstructive and restrictive disturbances.
Pulmonary hypertension. Pulmonary edema.
Pathogenesis of periodic breathing (Cheyne-Stokes, Biote Cussmaul).

PATHOPHYSIOLOGY OF CARDIOVASCULAR SYSTEM.

ARRHYTHMIAS.

HYPERTENSION. HYPOTENSION.
Factors involved in regulation of blood pressure. Severity levels of an arterial hypertensia. Stages.

PATHOPHYSIOLOGY OF KIDNEY.
Role of kidney in an organism. Etiology and pathogenesis of kidney disease.
Pathogeny of infringements of formation of urine (infringement of a filtration, a reabsorption, secretion and excretion). The causes and mechanisms of infringements of a diuresis. Quantitative and qualitative infringements of formation
of urine (oliguria, anuria, polyuria). Hypostenuria, isostenuria, hyperstenuria. The causes.
Pathogenesis of acute glomerulonephritis. An aetiology, a pathogeny and the basic exhibitings. Mechanisms of development of a hypertensia and hypostases at nephrites.
Consequences of chronic glomerulonephritis.
Pyelonephritis. Ethiopathogenesis. The characteristic of infringements.
Pathogenesis of nephritic and nephrotic oedema.
Urolithic illness. Factors and the mechanisms promoting formation of stones.

**PATHOPHYSIOLOGY OF LIVER.**
Studying of functions of a liver in experiment and clinic. Functional trials.
Therapy principles. Concept about haemosorption. A liver transplantation.
Portal hypertension. The causes. The characteristic надпеченочной, hepatic и подпеченочной a portal hypertension.
Jaundice. Kinds. The characteristic of infringements of a pigmental exchange at separate kinds of jaundices (haemolytic, liver, mechanical).
Cholelithiasis. The basic mechanisms and exhibitings of cholelithiasis. Cholestasis. The causes of cholestasis. Infringements in an organism at cholestatic syndrome.

**PATHOPHYSIOLOGY OF GASTROINTESTINAL TRACT.**
Role of digestive organs. Aetiology of diseases of a gastrointestinal disorders. A role of alcohol, smoking and other factors in their occurrence.
Disorders of appetite. (an anorexia, гиперрексия, a bulimia, полифагия). The causes of infringements. Disorders of food intake.
Patholody of digestion in stomach Quantitative and qualitative infringements of secretory function of a stomach. Pathologic types of gastric secretion.
Achlorhydria. Achylia.
LIST OF PRACTICAL SKILLS

List of practical skills:
The students have obligated:

1. **To use** proficiency:
   - obtained knowledge in clinical practice;
   - electrocardiogram in cardiac arrhythmia diagnosis;
   - parameters of pulmonary ventilation for revealing of disorders of lung functions;
   - blood gas parameters for determine of hypoxia type;
   - parameters of pigment metabolism for determine of jaundice type;
   - data of stomach juice for eliciting of pathological gastric secretion type;
   - obtained practical skills during experiments on the animals, anesthesia, taking of investigative material, analysis of obtained results and conclusions according *Principles for the Care and Use of Animals* recommended by the Ethical Committee

2. **To wield** the methods of:
   - calculation and estimation of value in blood:
     - red blood cells (erythrocytes) level;
     - white blood cells (leucocytes) level;
     - platelets (thrombocytes) level;
     - reticulocytes level;
     - leukocytemic formula;
     - hematocrit
     - hemoglobin;
     - color index
   - determine of pathological blood cells in blood samples;
   - differentiation of leukemia by blood picture;
   - performing in experimental animals:
     - anesthesia;
     - subcutaneous, intravenous, intramuscular infusions
     - taking of blood samples;
     - registration of temperature
     - registration of electrocardiogram