Physiology (including the physiology of the maxillofacial region)

Plan of lectures

II semester

1. Morpho-functional features of the organization of the heart. The cardiac cycle. Valve apparatus. Physiological properties of the heart muscle. Typical and atypical cardiomyocytes, the conduction system of the heart. The nature of electrogenesis of heart cells. Automation, its centers and gradient. Extrasystoles and their causes. Methods of studying the activity of the heart. ECG, Nervous and humoral mechanisms of intracardiac and extracardiac regulation.
2. Vascular physiology. Large and small circulatory circles Functional classification of blood vessels. Main the laws of hemodynamics. Parameters of peripheral blood circulation (blood pressure, linear and volumetric blood flow rates, time blood circulation). The concepts of systolic, diastolic, pulse and average blood pressure. Factors determining the value of blood pressure. Arterial and venous pulse. Microcirculation and its role in the mechanisms of fluid and various substances exchange between blood and tissues. Nervous, humoral and myogenic regulation of vascular tone. Vasomotor center.
3. Blood physiology. Blood functions. The components of blood. Role plasma and shaped elements (erythrocytes, leukocytes, platelets). Red blood cells. The system of human blood groups – ABO and Rh system.
4. Mechanisms of immunity, its types.
5. Platelets. Blood clotting. The phases of primary and secondary hemostasis. Anti-clotting system.
6. The physiology of respiration. The structure and functions of the respiratory organs. External breathing. The structure and functions of the respiratory center. Gas exchange in lungs and tissues. The composition of inhaled, exhaled and alveolar air. Transportation of gases by blood. Regulation of breathing.
7. Physiology of excretion. Excretory organs, their significance. Mechanisms of glomerular filtration, reabsorption, secretion in the nephron, and their regulation. Primary urine. The rotary-countercurrent mechanism of urine concentration. Secondary urine. Mechanism urination, its regulation.
8. General and private physiology of the endocrine system.

III semester

1. The structure and functions of biological membranes. Mechanisms of formation of biopotentials at rest. The action potential and its phases. Refractoriness, its phases.
2. Physiological properties of skeletal and smooth muscles. The mechanism of skeletal and smooth muscle contraction. Electromechanical coupling. Motor units.
3. The physiology of the central nervous system. The structure and general principles of functioning of the central nervous system, interneuronal connections, central nervous system mediators. The reflex principle of the nervous system. The reflex arc. The value of inhibition in the central nervous system. Morphofunctional organization of a neuron as a unit of the nervous system.
4. The role of various parts of the central nervous system (spinal cord, medulla oblongata, midbrain) in the regulation of physiological functions. Functions of the cerebellum, intermediate brain, subcortical nuclei. Afferent, efferent and associative areas of the cerebral cortex.
5. General physiology of sensory systems. The concept of a receptor. The structure of sensory systems. The organization of visual and auditory sensory systems.
6. The structure of sensory systems. Sensory functions of the oral cavity. Taste, pain, temperature, tactile reception.
7. Physiology of digestion. The organization and physiology of the maxillofacial region. Digestion in the oral cavity. Digestion in the stomach. Gastric secretion. Pancreatic secretion.

8. Physiology of digestion. The main functions of the digestive tract. The physiology of the liver. Bile. Biliary excretion. Digestion in the intestine. Defecation and formation of feces. The mechanisms of absorption of digestive products in various parts of the gastrointestinal tract. Motor activity of the gastrointestinal tract. Humoral and nervous regulation of digestive tract functions.

Plan of practical classes

1. Physiology of the heart. Morpho-functional features of the organization of the heart. The cardiac cycle. Valve apparatus. ECG. Regulation of heart activity
2. Hemodynamics. Vascular physiology. Large and small circulatory circles. Blood pressure, Arterial pulse Regulation blood circulation.
3. Module on topics 1-2
4. Components of blood. Shaped elements. Red blood cells. Blood functions. Hemoglobin.
5. Leukocytes. Immunity, its types and mechanisms. ESR of the blood group.
6. Platelets. Blood clotting. The phases of primary and secondary hemostasis. Anti-clotting system.
7. Module on topics 4-6
8. The structure and functions of the respiratory system. External and tissue respiration. Gas exchange. Regulation of breathing.
9. Physiology of excretion. The structure and functions of the organs of the excretory system. Regulation.
10. Issues of general and private physiology of the endocrine system.
11. Bioelectric phenomena. MP, AP.
12. Physiological properties of skeletal and smooth muscles. Muscle contraction, tetanus.
13. Conducting arousal on nervous and muscle fibers. Transmission mechanism a signal in a chemical synapse.
14. Module on topics 11-13
15. General physiology of the central nervous system. The structure and general principles of functioning of the central nervous system. Interneuronal connections.
16. Private physiology of the central nervous system.
17. Regulation of integrative functions
18. Module on topics 15-17
19. General physiology of sensory systems. The organization of visual and auditory sensory systems.
20. Organization of skin sensitivity and sensory function of the oral cavity.
21. Physiology of the digestive system (part 1). Digestion in the oral cavity.
22. Physiology of the digestive system (part 2).
23. Module on topics 21-22